APPENDIX 17 2023 AQUATIC ECOSYSTEM MONITORING PROGRAM (AEMP) REPORT

Aquatic Effects Monitoring Program 2023 Annual Report

Meliadine Mine

Prepared for:

Agnico Eagle Mines Limited
Meliadine Division
Rankin Inlet, Nunavut X0C 0G0

Final

March 24, 2024

AZIMUTH

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Report Version Log

Version	Dates	Distribution
Draft (Rev0)	February 28 (Section 1, 2, 3) March 4 (Section 5) March 7 (Section 4) March 10 (Section 6 and Plain Language Summary)	e-copy to Agnico Eagle
Final (Rev1)	March 24, 2024	e-copy to Agnico Eagle

The 2023 Aquatic Effects Monitoring Program (AEMP) Annual Report was authored by Medhi Aqdam and Sean Engelking with technical contributions and internal review by Eric Franz (Azimuth Consulting Group Inc). We would like to thank Anne-Laurence Paquet, Jade Robitaille, Lisa Mah, and Sara Savoie for reviewing the draft.

PLAIN LANGUAGE SUMMARY

This document summarizes results from the 2023 Aquatic Effects Monitoring Program (AEMP) for Agnico Eagle's Meliadine Gold Mine near Rankin Inlet, Nunavut. The AEMP is an annual requirement of the Type A Water Licence (2AM-MEL-1631). The purpose of the AEMP is to verify that the Mine is operating as planned and not causing changes in water quality that have the potential to adversely impact aquatic life or traditional uses of Meliadine Lake.

The scope of the 2023 AEMP included the following components:

- Snow core chemistry sampling
- Effluent quality monitoring, including acute and sublethal toxicity testing
- Surface water quality monitoring in Meliadine Lake
- Phytoplankton community and chlorophyll-a sampling in Meliadine Lake
- Surface water quality monitoring in the Peninsula Lakes (Lake A8, Lake B7, and Lake D7).

Data collected in the 2023 AEMP were used to answer the key questions in **Table ES-1**.

Table ES-1. Key Questions for the Meliadine Lake and Peninsula Lakes Studies

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 Final Environmental Impact Statement (FEIS) and 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?
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 in the exposure areas changed over time, relative to baseline conditions?

Meliadine Lake Study

Based on precipitation data collected on Site, 2023 and 2022 were the driest and second driest years since 1981. The relatively small snowpack in 2022/2023 meant less runoff was collected on Site during freshet. Freshet was also early in 2023 due to an unusually warm April and May and Agnico Eagle started discharging treated surface contact water to Meliadine Lake in early June. By mid-July, the lower operating level in CP1 was reached and discharge to Meliadine Lake was halted. Discharge resumed in mid-August and continued until the end of September. In total, approximately 530,000 m^3 of water was discharged into Meliadine Lake in 2023. For context, approximately twice the volume of water was discharged to Meliadine Lake in 2020 (1.03 Mm) after record rainfall in the summer of 2019.

Effluent Quality

Effluent samples were collected weekly for chemistry testing and monthly for acute toxicity testing while the Mine was discharging to Meliadine Lake. There were no exceedances of limits in the Water Licence in 2023 and there were no effects to Rainbow Trout or *Daphnia magna* in any of the acute toxicity tests. Two rounds of sublethal toxicity testing were completed with *Lemna minor* (duckweed), and there were no effects on frond growth or biomass in either test.

Meliadine Lake Water Quality

The water quality monitoring program in Meliadine Lake is designed to assess the effects of effluent discharge to Meliadine Lake. The monitoring program includes one winter sampling event (early April) and open water sampling in July, August, and September. The winter sampling event is primarily used to verify nothing unusual is occurring under the ice. Agnico Eagle discharges water during the open water season, so the focus of the Meliadine Lake water quality assessment is on water quality data collected in July, August, and September.

There were no mining-related exceedances of the AEMP Action Levels in 2023. A small number of samples exceeded the aquatic life water quality guideline for copper, but the exceedances occurred in the mid-field and reference areas. Copper is naturally elevated compared to the aquatic life guideline, but concentrations have been stable going back to the baseline period.

Water quality in Meliadine Lake has changed in recent years. In general, the magnitude of changes in water quality is more pronounced in the East Basin (MEL-01) compared to the mid-field (MEL-02) and far-field reference areas (MEL-03, MEL-04 and MEL-05). Parameters that have increased throughout Meliadine Lake include major ions (chloride, sodium, sulphate), organic carbon, and a few metals (arsenic, molybdenum, strontium, and uranium). For the parameters with effects-based thresholds, such as arsenic and uranium, current concentrations are well below guidelines meant to protect fish and other aquatic organisms and well below Health Canada's guidelines for safe drinking water.

Discharge of effluent was predicted to cause changes in water quality in the East Basin. The spatial extent of effluent-related effects on water quality outside of the East Basin is less certain. The long-term data from other areas in Meliadine Lake suggests that general warming patterns and more variable and extreme precipitation may also be contributing to incremental increases in the concentrations of some parameters (e.g., organic carbon and arsenic).

Phytoplankton Community

Effluent contains nutrients and minerals that can stimulate algal growth and contribute to changes in primary productivity. As in previous years, one phytoplankton sampling event was completed in August to determine if effluent is causing nutrient enrichment and changes in productivity in the East Basin. Changes in productivity are evaluated using the following lines of evidence: phytoplankton biomass (a direct measure of primary productivity), chlorophyll-a (an indirect measure of productivity), the composition of the phytoplankton community, and nutrient productivity relationships.

Phytoplankton biomass was slightly higher in the East Basin in 2023 compared to 2022 but lower than in 2015 to 2018 and below peak biomass observed in 2019 and 2021. Nine years of monitoring continue to support the conclusion that the East Basin of Meliadine Lake is naturally more productive than other areas farther downstream. Unlike phytoplankton biomass, which hasn't shown any consistent upward or downward trend, chlorophyll-a has steadily increased in the East Basin and downstream at MEL-02. It's unclear why chlorophyll-a follows a different trend than biomass, but neither phytoplankton biomass nor chlorophyll-a were strongly correlated with phosphorus or nitrogen concentrations.

Multivariate statistical analyses indicate the phytoplankton community in the East Basin was different in terms of the biomass of different taxonomic groups compared to the phytoplankton community downstream at the mid-field area and the reference areas. The FEIS (Agnico Eagle, 2014) predicted that effluent released to the East Basin could cause a shift in the structure of the phytoplankton community, but the magnitude of the change would be minor compared to baseline conditions. Importantly, no changes were predicted to primary productivity. These predictions accurately describe current conditions for the phytoplankton community in the East Basin.

Peninsula Lakes Study

Snowpack Chemistry

The snowpack sampling program was completed in early April 2023. The purpose of this sampling program is to qualitatively determine the extent and magnitude of off-site migration of metals and other parameters of interest during the winter. The snowpack chemistry results from 2023 indicate mining activities are not a source of metals or other parameters of interest to the snowpack north of the Mine or near Waste Rock Storage Facility 3 compared to the chemistry results at the background station. Off-site migration of dust is detected in the snowpack north of Lake A8. However, dust management practices that were implemented to control off-site migration of dust in 2021 have resulted in lower concentrations for all parameters of interest in snowpack samples collected from the Lake A8 monitoring station in 2021, 2022, and 2023.

Peninsula Lakes Water Quality

Water quality monitoring was completed at three replicate stations in each of the Peninsula Lakes in July and August. Lake A8 and Lake B7 are located next to major infrastructure; Lake A8 is located south of Tiriganiaq Pit 1 and 2 and Lake B7 is located west of the Tailings Storage Facility (TSF). Lake D7 is located west of Lake B7. Water quality data from Lake D7 provides information on the spatial extent of potential mining-related effects from dust, emissions, and alterations to the landscape and hydrology caused by construction of the Mine.

Water quality has changed in both Lake A8 and Lake B7 coinciding with construction and operations. The Changes in water quality are evident when comparing the concentrations of sulphate and arsenic in Lakes A8 and B7 with concentrations in Lake D7. No exceedances of AEMP Action Levels were reported for Lake A8 in 2023, but arsenic concentrations exceeded the AEMP Action Level (18.8 µg/L) in all three samples from Lake B7 in August. Follow-up monitoring was completed in October, and concentrations had decreased by roughly 50 %, from 20 µg/L to 10 µg/L. Arsenic concentrations likely decreased between August and October due to co-precipitation with iron. These data suggest that sediments are likely a sink for arsenic in the fall, but potentially a source of arsenic in the spring when ice comes off the lakes.

There is no evidence that mining activities have caused changes in water quality in Lake D7. Some parameters have increased compared to baseline, but the underlying cause is likely interannual climate variability.

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USE & LIMITATIONS OF THIS REPORT

This report has been prepared by Azimuth Consulting Group Inc. for the use of Agnico Eagle Mines Ltd., who has been party to the development of the scope of work for this project and understands its limitations. The extent to which previous investigations were relied on is detailed in the report.

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In addition, the conclusions of this report are based upon applicable legislation existing at the time the report was drafted. Changes to legislation, such as an alteration in acceptable limits of contamination, may alter conclusions.

This report is time-sensitive and pertains to a specific site and a specific scope of work. It is not applicable to any other site, development, or remediation other than that to which it specifically refers. Any change in the site, remediation or proposed development may necessitate a supplementary investigation and assessment.

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
AWAR	All-weather Access Road connecting the mine site to Rankin Inlet.
Biomass	Biomass is the amount or weight of phytoplankton in per unit of water (μg/L).
Blanks (for quality control)	TB = Travel blanks are analyzed to assess cross contamination occurring during the transport of samples. These samples comprise analyte-free deionized water prepared in the lab by ALS, and travel to the site and back to the lab without being opened. DB = Deionized blanks (or field blanks) are analyzed to verify the "analyte-free" status of the deionized water to help interpret the equipment blank results. These samples are comprised of deionized water poured directly into the sampling containers. EB= Equipment blanks are analyzed to assess cross contamination in the sampling equipment that could lead to elevated concentrations or false positive data. These samples are comprised of analyte-free deionized water passed through the sampling equipment.
CALA	Canadian Association for Laboratory Accreditation
CCME	Canadian Council of Ministers of the Environment
CIRNAC	Crown Indigenous Relations and Northern Affairs Canada
CP	Containment pond / collection pond / control pond: Pond constructed for the collection and temporary storage of surface contact water that is eventually treated and discharged to Meliadine Lake.
DL	Detection limit
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.
IQ	Inuit Qaujimaningit and Inuit Qaujimajatuqangit: -> Inuit Qaujimaningit encompasses Inuit traditional knowledge (and variations thereof or Inuit Qaujimajatuqangit), local and community-based knowledge, as well as Inuit epistemology as it relates to Inuit Societal Values and Inuit Knowledge. -> Inuit Qaujimajatuqangit are the 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)
nMDS	Non-Metric Multidimensional Scaling: a multivariate statistical method used to condense information with multiple variables into a two-dimensional representation of the data. Used here to visually assess differences in benthic invertebrate community structure over space.
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 normal range refers to the range of baseline/reference conditions within the study area lakes. For the water quality monitoring program, the normal range is use to identify parameters that may have increased in concentration due to activities at the mine.

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 are the 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 (QC) refers to samples that are 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.
Species richness	Species richness refers to the number of different (distinct) species in a sample. Use to describe the diversity of the phytoplankton and benthic invertebrate communities in Meliadine Lake.
SSWQO	Site-specific water quality objectives are guidelines developed specifically for the lakes around Meliadine that take into consideration background water quality in the region. SSWQOs were developed for fluoride, arsenic, and iron as part of the AEMP (Golder, 2014).
Surface contact water	Runoff from rain and snow melt that is collected on site. This water is collected, treated, and discharged to Meliadine Lake.
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).
TKN	Total Kjeldahl nitrogen is the sum of organic nitrogen and total ammonia (NH_3)

Acronym / Term	Definition
TN	Total nitrogen is the sum of organic and inorganic nitrogen in water. Total nitrogen = TKN + nitrate + nitrite
TOC	Total Organic Carbon: a measure of the amount of organic matter present
TP	Total phosphorus is 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	Trophic Status Index: a classification system used to "rate" the biological productivity in lakes and other waterbodies.
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.
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
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 from the 2023 Aquatic Effects Monitoring Program for the Meliadine Gold Mine (the Mine). The purpose of the AEMP is to assess if activities at the Mine are causing changes in water quality and impacts to aquatic life beyond those changes that were predicted in the Final Environmental Impact Statement (FEIS; Agnico Eagle, 2014). The AEMP is required under the Type A Amended Water Licence (NWB, 2021) and has been completed annually in Meliadine Lake and the small lakes located near the Mine (collectively referred to as the 'Peninsula Lakes') since 2015. The AEMP has four main objectives:

- Determine the short- and long-term effects of the Mine on the aquatic receiving environment;
- Evaluate the accuracy of predictions made in the FEIS, including the final significance statements regarding impacts to the aquatic ecosystem;
- Assess the efficacy of planned mitigation incorporated into the Mine design; and
- Collect data to make informed decisions regarding the need for mitigation within the Management Response Framework

1.1 Background

The Meliadine Gold Mine (Mine) is 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 Nunavut Impact Review Board (NIRB) on February 26, 2015, subject to terms and conditions in Project Certificate No. 006 (NIRB, 2022) and the Type A Water Licence (2AM-MEL1631) granted by the Nunavut Water Board (NWB; April 1, 2016). An amended Type A Water Licence was issued on June 23, 2021 (referred to hereafter as the Water Licence).

Commercial gold production started in 2019 with mining of the Tiriganiaq deposit. As per the Water Licence, underground and open pit methods have been used to develop the Tiriganiaq deposit. In January 2024, Agnico Eagle submitted a water licence amendment application to the Nunavut Water Board (NWB) for the completion of mining of all deposits permitted under the Project Certificate No. 006 (NIRB, 2022), which include Wesmeg, Wesmeg North, Pump, F Zone, and Discovery deposits. The current extent of the Mine and major infrastructure on Site is shown in **Figure 1-2**. A timeline of major construction activities from 2015 to 2023 is provided in **Table 1-3**.

1.2 Study Design

The AEMP includes separate studies for Meliadine Lake and the Peninsula Lakes. An overview of the Meliadine Lake and Peninsula Lakes studies is provided below.

Meliadine Lake Study

Meliadine Lake is the final discharge point for effluent (treated surface contact water) collected at the Mine and the primary focus of the AEMP. The Meliadine Lake study was designed to detect mining-related changes and define the spatial and temporal extent of those changes. The study design includes two exposure areas (near-field [NF], mid-field [MF]) and three reference areas. The NF area (MEL-01) is located in the East Basin around the diffuser. Changes in water quality and effects to the biological communities caused by discharge of effluent to Meliadine Lake would be expected to occur at MEL-01 first. The MF area (MEL-02) is located approximately 6 km downstream from MEL-01 past the narrows that separates the east and northwest basins. Monitoring data from MEL-02 helps define the spatial extent of potential changes observed at MEL-01. Three reference areas are included in the study design to provide insights into regional trends that would be expected to influence all sampling areas. Reference Area 1 (MEL-03) is in a bay in the northwest basin of Meliadine Lake. Reference Area 2 (MEL-04) is in the northwest area of the lake near the outlet to Peter Lake. Reference Area 3 (MEL-05) is in the southwest basin near the outlet to the Meliadine River.

The current scope of the Meliadine Lake study includes monitoring water, sediment, phytoplankton, benthic invertebrates, fish health, and fish tissue chemistry. To improve efficiency and reduce redundancy, the scope of biological monitoring under the AEMP was harmonized with the Environmental Effects Monitoring (EEM) program required under the Metal and Diamond Mining Effluent Regulations. Biological monitoring studies (benthic invertebrates and fish) are conducted every 3-years. The next biological monitoring study under EEM is scheduled for August 2024.

Peninsula Lakes Study

The water quality component of the Peninsula Lakes AEMP is designed to detect changes in water quality related primarily to the deposition of aerial emissions and alteration of watersheds (i.e., changes to natural drainage paths or hydrologic balance) (Agnico Eagle, 2014). Water quality monitoring is completed at three headwater lakes near the Mine: Lake A8, Lake B7 and Lake D7 (**Figure 1-2**) in July and August. If changes in water quality are detected, follow-up investigations may be conducted to determine the significance of changes in water quality and potential impacts to aquatic life. Importantly, changes in water quality in the Peninsula Lakes area were not predicted to cause changes in water quality downstream in Meliadine Lake.

1.3 Overview of the 2023 AEMP

The scope of the 2023 AEMP was completed as per the *AEMP Design Plan* (Azimuth, 2022) and included the following components:

- Effluent quality monitoring, including monthly acute toxicity tests with Rainbow Trout and Daphnia magna, and quarterly sublethal toxicity testing with *Lemna minor*;
- Snow sampling to monitor off-site dust migration[1];
- Surface water quality monitoring at fixed locations throughout Meliadine Lake;
- Surface water quality monitoring at fixed locations in the Peninsula Lakes; and
- Phytoplankton and chlorophyll-a monitoring in Meliadine Lake (August)

An overview of the sampling design is provided in **Table 1-1**. Key questions for the water quality and phytoplankton community programs are presented in **Table 1-2**.

Table 1-1. Scope of the 2023 AEMP

Lake/Area	Water Quality Monitoring Program Limnology Profiles and Water Chemistry					Phytoplankton Community Study
	Apr	Jul	Aug	Sep	Oct	Aug
Meliadine Lake Study						
MEL-01	✓	✓	✓	✓		✓
MEL-02	✓	✓	✓	✓		✓
MEL-03	✓*	✓	✓	✓		✓
MEL-04			✓			✓
MEL-05			✓			✓
Peninsula Lakes Study						
A8		✓	✓			
B7		✓	✓		✓*	
D7		✓	✓			

Notes:
* Extra sampling was completed in 2023 beyond what is required in the AEMP Design Plan.

[1] The snow core chemistry monitoring program is not a formal component of the AEMP. Annual snow core chemistry data were incorporated into the AEMP in 2020.

Table 1-2. Key Questions for the Meliadine Lake and Peninsula Lakes Studies

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

1.4 Report Structure

The 2023 AEMP report is organized into the following sections and their associated appendices.

- **Section 2** Source Characterization – this chapter presents the results off the effluent quality monitoring program and results from the snow core sampling program in 2023. Supplemental figures and tables are provided in **Appendix B**.
- **Section 3** Meliadine Lake Water Quality – this chapter discusses changes in water quality in Meliadine Lake. Supplemental figures and tables are provided in **Appendix C**.
- **Section 4** Peninsula Lakes Water Quality – this chapter discusses changes in water quality in Lake A8, Lake B7, and Lake D7. Supplemental figures and tables are provided in **Appendix D**.
- **Section 5** Phytoplankton Community – this chapter presents the results of the 2023 phytoplankton community monitoring program and long-term trends in primary productivity in Meliadine Lake. Supplemental figures and tables are provided in **Appendix E**.
- **Section 6** Response Framework and Action Level Assessment
- Quality assurance and quality control methods and results are provided in **Appendix A**

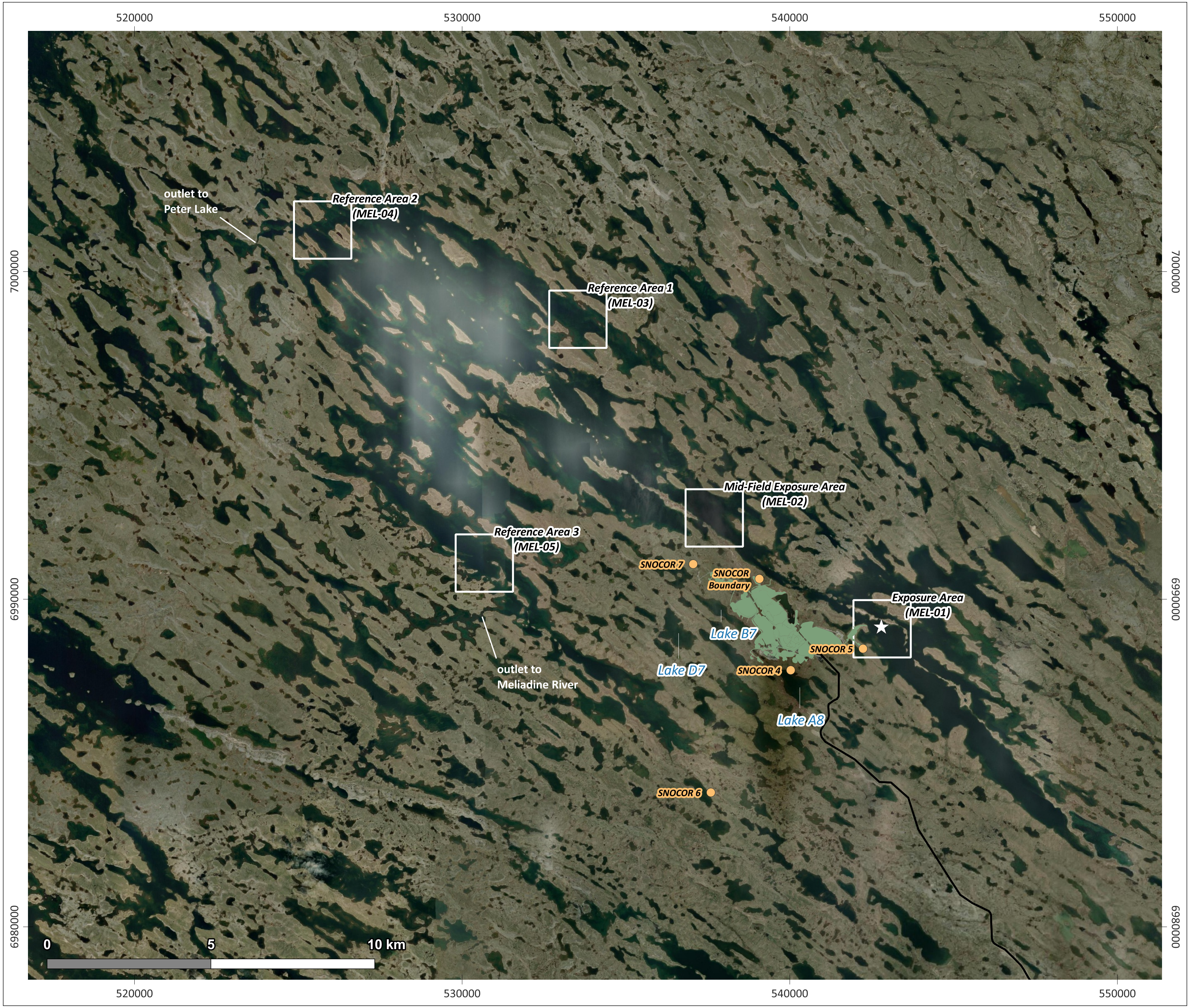

Figure 1-1
Study Area for the Aquatic Effects Monitoring Program

Aquatic Effects Monitoring Program
2023 Annual Report

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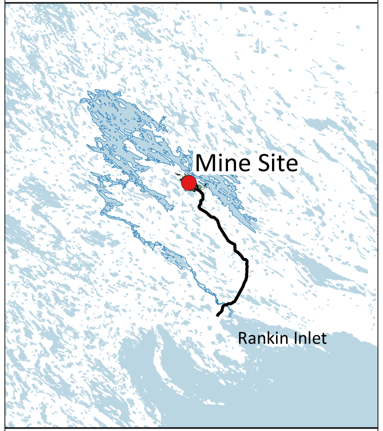
Date:	March 10, 2023
Datum:	NAD 83 UTM Zone 15N
Scale:	1:150,000
Software:	QGIS version 3.22.11-Białowieża
Produced by:	E. Franz

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



Legend

- CP1 Diffuser
- All weather access road
- Meliadine Mine (2022)
- Snowpack Monitoring Station

Figure 1-2. Meliadine Mine (2023)

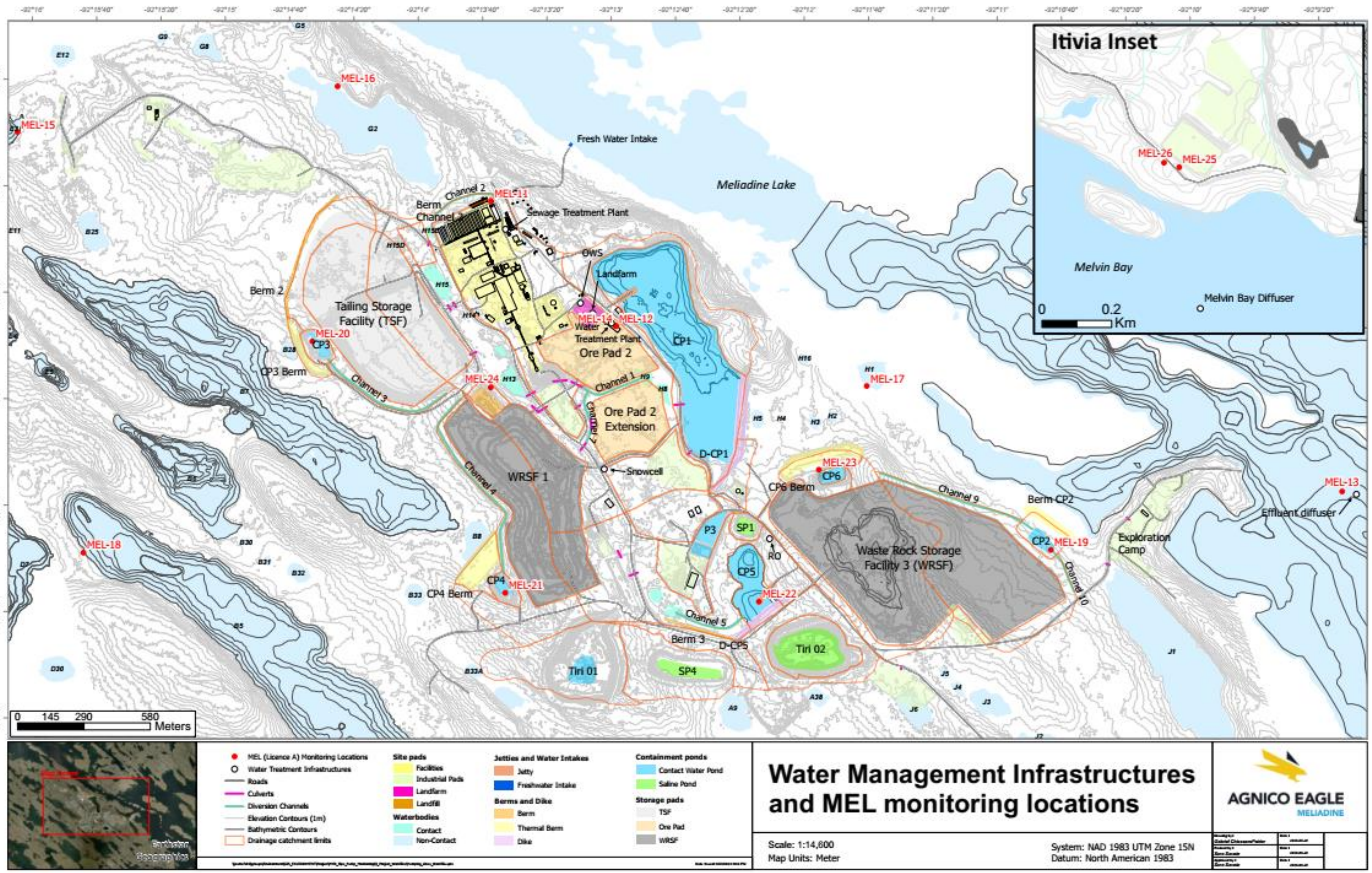


Table 1-3. Summary of Major Development Activities Since the Start of Construction in 2015

Year	Mine Development Activities and Sequence[a]
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**

Year	Mine Development Activities and Sequence[a]
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**

Notes:

Key water management activities are **bolded**.

[a] This table was adapted from the Mine Waste Management Plan (Agnico Eagle 2020).

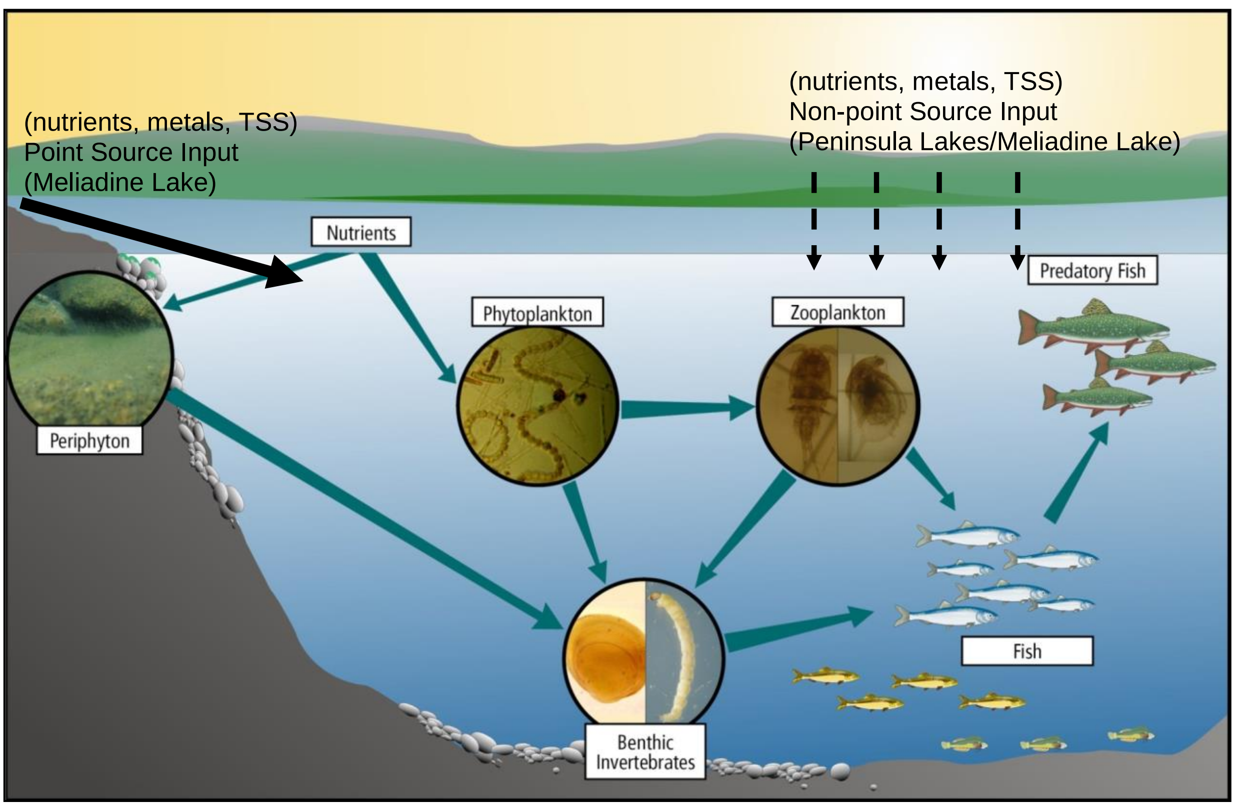
2 SOURCE CHARACTERIZATION

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 (**Figure 2-1**). 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, and water sampling is completed 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.

Figure 2-1. Depiction of point source and non-point source inputs to the aquatic environment

Note: This figure was adapted from Version 1 of the *AEMP Design Plan* (Golder, 2016).



2.1 Findings from the 2023 Effluent Quality and Snow Chemistry Programs

- There were no exceedances of the effluent quality limits in the effluent samples from MEL-14. TDS concentrations were less than ½ of the maximum authorized concentration in grab sample (4,500 mg/L).
- Water discharged to Meliadine Lake was not acutely toxic to Rainbow Trout or the aquatic invertebrate *Daphnia magna*.
- There were no effects to *Lemna minor* frond yield or biomass in the two sublethal toxicity tests (June and August).
- Concentrations of metals and other parameters in the snow core samples collected from north and east of the Mine were within the range of background concentrations in 2023. As in previous years, some parameters were elevated in the snow core sample collected at the monitoring station north of Lake A8 (SNOCOR4) compared to background. Higher concentrations of metals and other parameters in this area are not surprising given the station is down wind from the TSF and Tiriganiaq Pits 1 and 2. Snow pack chemistry results at SNOCOR4 in 2023 were below the peak observed in April 2020, indicating that efforts to mitigate off-site migration of dust have been effective at reducing loadings of metals and other parameters downwind from the Mine.

2.2 Temperature and Precipitation Patterns in the Region

The AEMP is designed to assess if activities at the Mine are causing changes in water quality that may affect aquatic life. As part of the assessment, it is important to understand if there are other process/sources have the potential to contribute to temporal changes in water quality. Other than the Mine, there are no significant anthropogenic sources that have the potential to cause detectable changes in water quality in Meliadine Lake or the Peninsula Lakes. Water quality can, however, respond to changes associated with short-term weather patterns and long-term trends associated with climate variability. The effect of climate change on northern latitude lakes is well-documented, but the underlying processes are complex and difficult to quantify without highly complex models. The effect of climate change on water quality in Meliadine Lake is beyond the scope of the AEMP. However, precipitation and temperature data are qualitatively evaluated to help interpret the timing of some of the temporal trends in water quality observed in Meliadine Lake.

Some high-level observations about recent climate trends that have the potential to affect water quality in Meliadine Lake are provided below based on temperature and precipitation data provided by Agnico Eagle[2]. Tabulated monthly mean temperature and precipitation data are provided in **Table 2-1**. Total

[2] From 1981 through 2014, weather data came from the airport in Rankin Inlet. Starting in 2015, weather data was collected at the Mine.

annual precipitation (rain and snow combined) from 1981 to 2023 is shown in **Figure 2-2** and total rainfall is shown in **Figure 2-4**. Cumulative annual rainfall for 2013 to 2023 is shown in **Figure 2-4**.

- There has been a general warming trend since 2013 compared to historical climate data from 1981 to 2012. The annual temperature in 2023 was -7.8 °C, over 2.5 °C warmer than 1981 to 2012 and 2 °C warmer than the annual mean from 2013 to 2023.
- May 2023 stands out as a particularly warm month compared to historical and recent records. The average temperature in May 2023 was 0.2 °C, approximately 6 °C warmer than normal for May. Higher temperatures in May led to an earlier than normal freshet in the region. Based on aerial photos, the East Basin of Meliadine Lake was ice free by June 14.
- Precipitation patterns fluctuate from year-to-year, but the amount of precipitation has become more variable and extreme in recent years. 2023 and 2022 were the driest years since 1981 and 2016 was the third driest year going back to 1981 (**Figure 2-2**). From January through April 2023, less than 10 mm of precipitation (snow) fell on Site. June was a particularly wet month, but less rain fell in July and August, which contributed low runoff diverted to CP1.
- 2019 was the wettest year since 1981. Approximately 673 mm of rain and snow fell at the Mine, and of that total, 450 mm fell as rain from June 1 to September 30 (**Figure 2-4**). The rainfall total from July and August 2019 (300 mm) was nearly twice the amount of precipitation measured throughout 2023. The large amount of rain would have led to higher runoff from the tundra.
- The large amount of rain in 2019 caused strain on water management infrastructure, which ultimately led to Agnico Eagle applying for (and being granted) an Emergency Authorization to discharge treated water from CP1 to Meliadine Lake that had TDS concentrations greater than 1,400 mg/L. The drawdown of water from CP1 corresponds to the relatively large volume of water that was discharged to Meliadine Lake in June and July 2020 (**Figure 2-5**).

Quantifying the cumulative effect of regional climate variability on changes in water quality in Meliadine Lake is beyond the scope of the AEMP. Instead, the preceding summary is meant to demonstrate that variable (and extreme) precipitation patterns and an overall warming trend are occurring in the region. Warming patterns and changes in precipitation are implicated in changes in water quality for northern latitude lakes (Huser et al., 2020; Prowse et al., 2006).

Table 2-1. Average monthly temperature and precipitation data from 2013 to 2023 compared to data from 1981-2012

Year	Monthly Average Temperature (°C) from 2013 to 2023												Average (°C)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2013	-33.9	-30.4	-19.1	-16.8	-7.3	5.3	11.4	10.2	3.3	-4.2	-19.6	-29.4	-11.0
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
2015	-32.5	-34.4	-27.8	-16.6	-5.4	3.5	10.4	10.0	4.9	-6.1	-15.7	-23.6	-11.0
2016	-27.1	-31.9	-25.6	-20.2	-3.6	4.9	13.5	11.0	5.8	-3.7	-10.9	-25.2	-9.3
2017	-28.1	-28.4	-26.0	-17.7	-5.0	6.5	13.0	11.3	5.3	-5.8	-16.6	-25.7	-9.7
2018	-28.8	-35.2	-21.6	-17.3	-9.4	3.6	13.0	9.7	2.2	-6.9	-21.8	-24.6	-11.3
2019	-33.7	-33.3	-24.2	-16.0	-4.4	5.5	10.5	10.0	5.3	-2.1	-16.6	-24.5	-10.2
2020	-26.6	-30.2	-25.4	-16.6	-7.7	5.4	14.0	12.3	4.4	-3.4	-19.0	-23.9	-9.7
2021	-24.4	-28.1	-24.7	-14.7	-5.2	5.2	11.2	9.7	4.9	1.2	-12.8	-23.3	-8.3
2022	-30.1	-34.4	-24.3	-16.4	-3.2	8.0	15.1	11.8	5.4	-2.3	-19.2	-23.5	-9.3
2023	-26.6	-35.9	-25.1	-14.1	0.2	7.3	13.5	12.3[a]	6.4	-0.7	-14.0	-16.4[a]	-7.8
Monthly Average (2013-2023)	-29.2	-31.9	-24.8	-16.7	-4.7	5.6	12.6	10.7	4.6	-3.4	-16.9	-24.3	-9.8
Monthly Average (1981-2012)	-30.3	-29.8	-25.0	-15.7	-5.7	4.2	10.6	9.8	3.9	-4.5	-16.9	-25.4	-10.4

Year	Cumulative Monthly Precipitation (mm) from 2013 to 2023												Annual Total (mm)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
2013	1.1	22.2	22.5	24.7	92.7	10.7	32.9	19.2	92.1	41.6	7.1	12.9	380
2014	23.6	9.3	8.5	2.5	14.0	21.9	21.9	99.2	71.5	108.8	29.3	36.7	447
2015	4.9	14.9	10.4	19.7	2.5	45.5	84.4	87.1	112.3	28.2	44.1	31.0	485
2016	9.9	20.0	7.9	6.0	0.8	24.1	33.4	13.8	88.6	31.2	34.5	4.4	275
2017	6.0	13.3	10.4	8.5	15.9	19.5	55.1	10.4	25.8	95.6	42.2	11.0	314
2018	10.8	14.5	18.1	12.1	52.1	38.9	21.6	72.3	26.0	33.7	26.6	11.5	338
2019	25.5	3.3	28.5	24.9	51.2	37.3	154.5	154.7	108.8	43.7	21.1	19.6	673
2020	14.5	24.6	15.8	21.6	31.5	5.9	10.7	35.8	73.6	30.8	58.8	136.6	460
2021	11.6	4.4	22.2	31.9	9.8	21.0	65.1	83.5	47.8	59.9	11.6	6.0	375
2022	6.5	2.1	2.9	12.3	6.3	33.8	41.4	31.6	58.6	41.3	18.9	13.8	269
2023	6.9	1.0	0.8	0.0	12.3	69.4	21.8	12.2[a]	16.0	2.8	21.7	5.9[b]	171
Monthly Average (2013-2023)	11.0	11.8	13.5	14.9	26.3	29.8	49.4	56.4	65.6	47.1	28.7	26.3	381
Monthly Average (1981-2012)	16.9	15.8	22.3	31.4	30.1	33.8	46.6	60.2	50.6	57.1	39.7	24.8	429

Notes:
Precipitation data from 1981 to 2015 is from the weather station in Rankin Inlet. Precipitation data from 2015 to 2023 is from the weather station at the Meliadine Mine.
[a] the weather station was out of service for 5 days in August 2023 and 5 days in December.
[b] cumulative precipitation data for December 2023 is based on weather station data from December 1 to 8. Anomalous precipitation readings from December 9 to 31 were omitted from the cumulative precipitation calculations.

Figure 2-2. Annual precipitation (mm) from 1981-2023

Notes: Precipitation data from 1981 to 2015 is from the weather station in Rankin Inlet. Precipitation data from 2015 to 2023 is from the weather station at the Meliadine Mine.
The white number corresponds to the annual rank (i.e., rainfall in 2023 was the lowest since 1981).

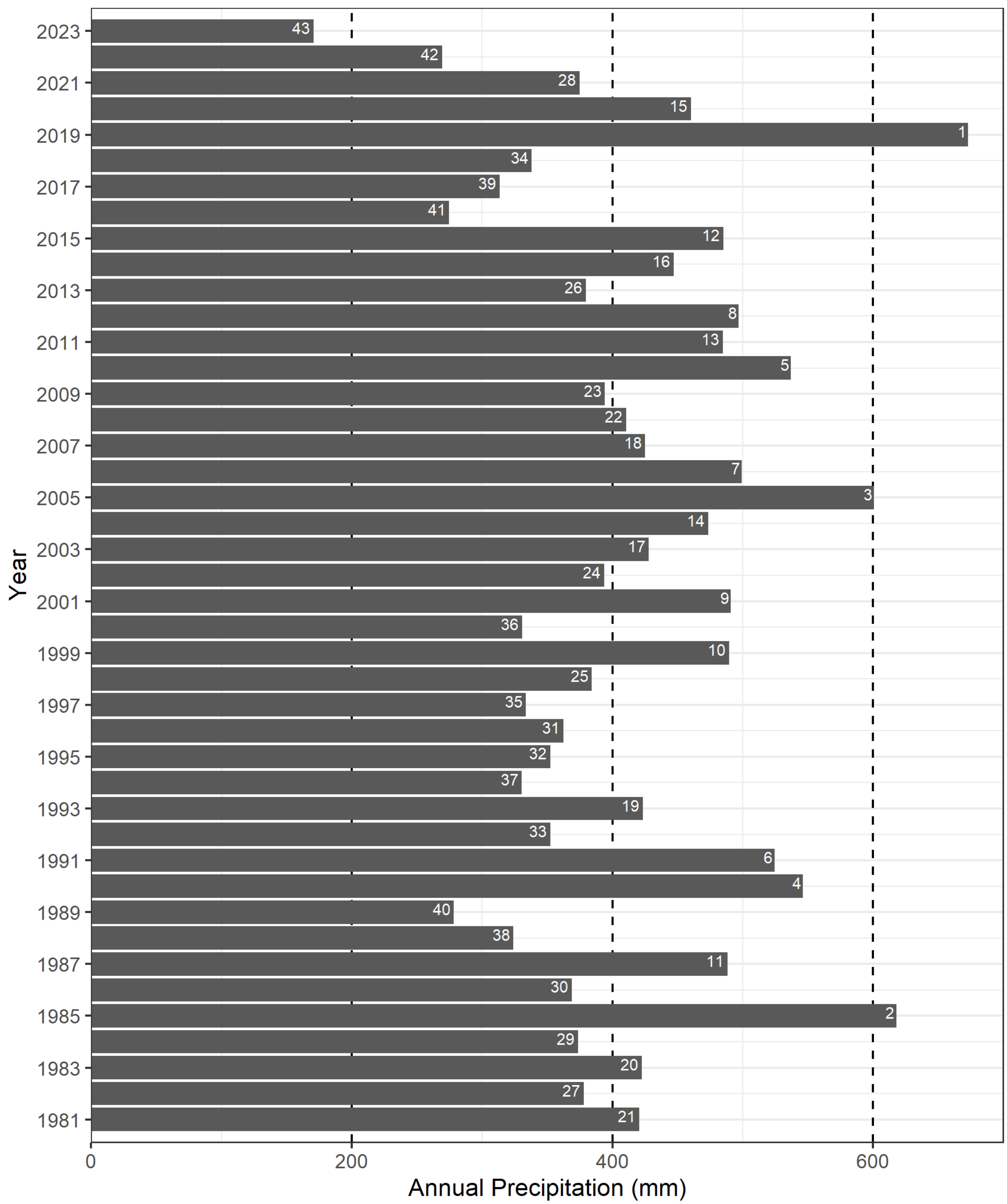


Figure 2-3. Annual rainfall (mm) from 1981-2023

Notes: Precipitation data from 1981 to 2015 is from the weather station in Rankin Inlet. Precipitation data from 2015 to 2023 is from the weather station at the Meliadine Mine.
Precipitation was classified as “rain” if the daily mean temperature was above 0 °C.
The white number corresponds to the annual rank (i.e., rainfall in 2023 was the lowest since 1981).

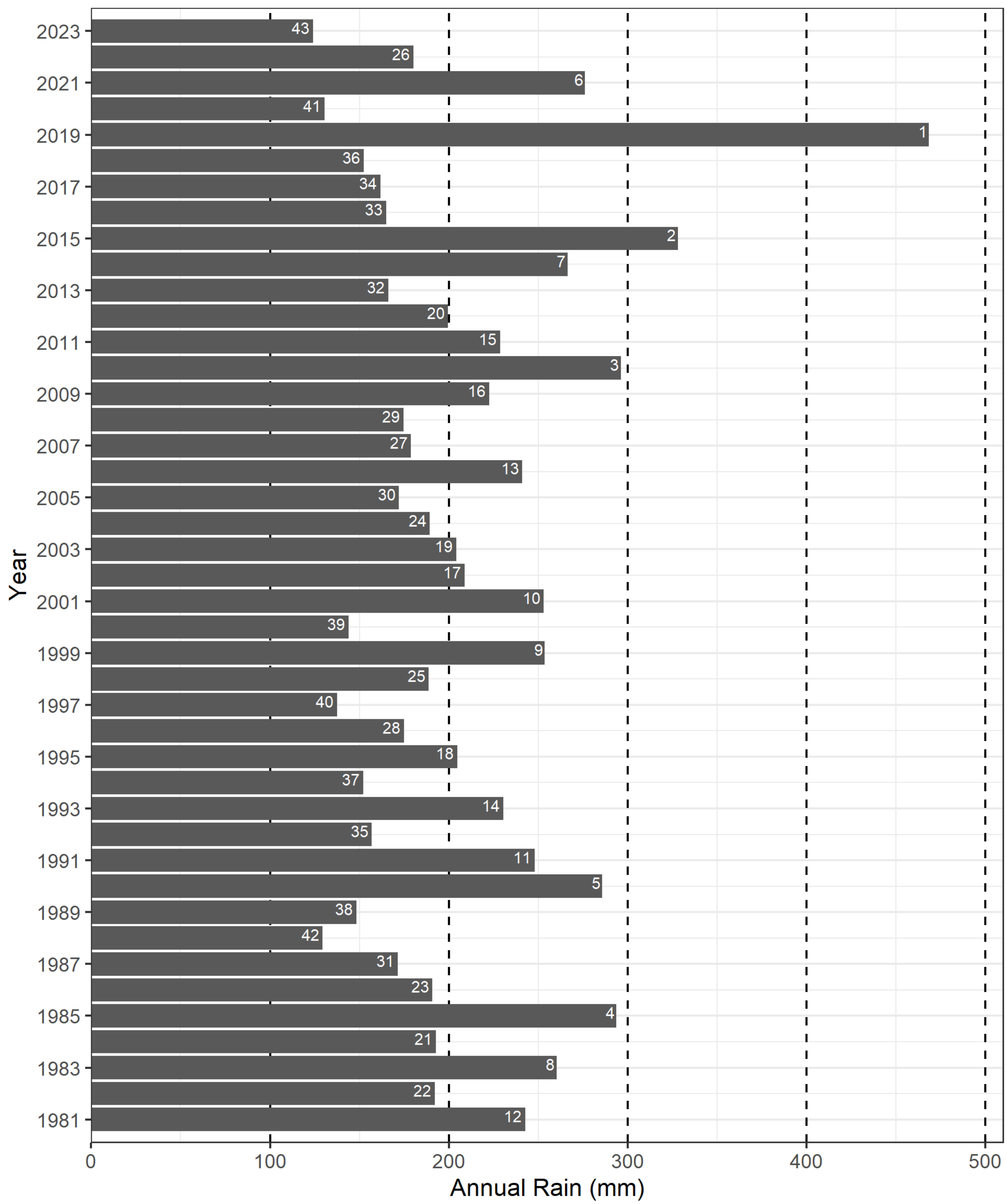
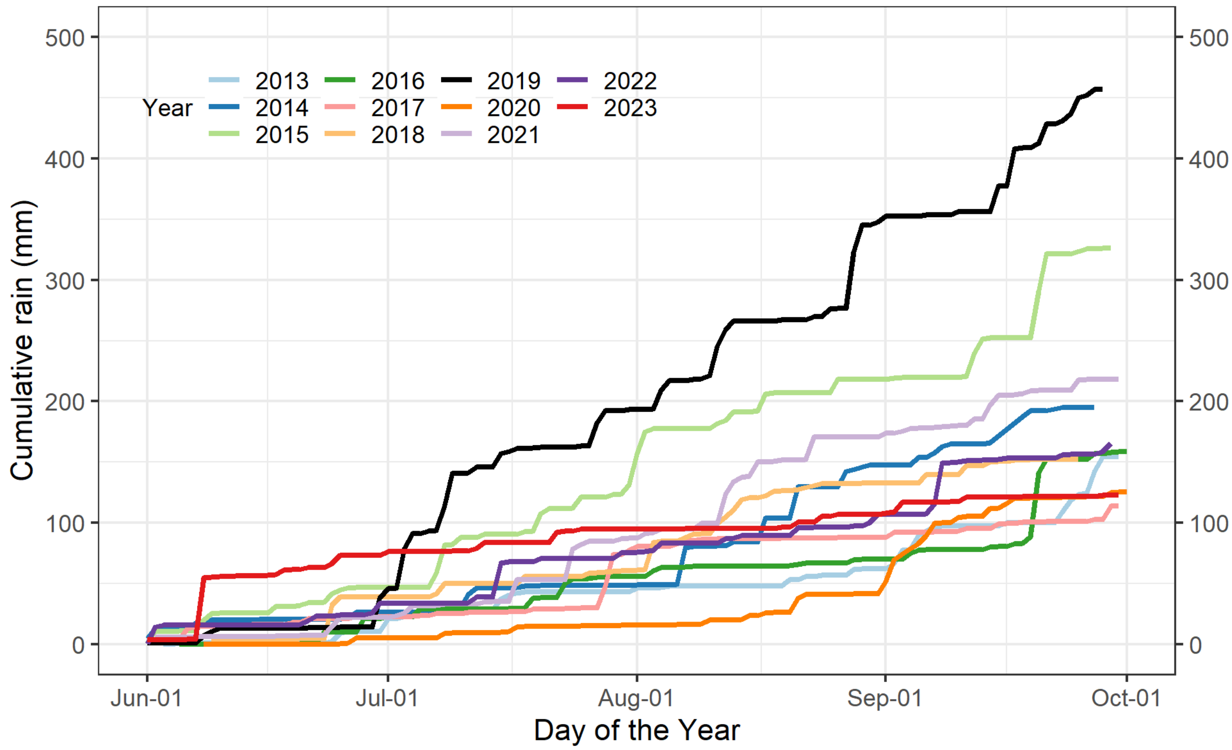


Figure 2-4. Cumulative annual precipitation as rain from 2013 to 2023

Notes: Precipitation data from 2013 to 2015 is from the weather station in Rankin Inlet. Precipitation data from 2015 to 2023 is from the weather station at the Meliadine Mine.
Precipitation was classified as “rain” in daily mean temperature was above 0 °C.



2.3 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 comes in contact with 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.

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

2.3.1 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 to Meliadine through the permanent diffuser from 2018 through 2023 are presented in **Table 2-3**.

Approximately 529,600 m^3 of treated contact water was discharged to Meliadine Lake in 2023. Freshet was early in 2023, and the Mine started discharging water to Meliadine Lake on June 10. From June 10 to June 26, approximately 191,000 m^3 of treated water was discharged to Meliadine Lake. The daily flow rate was reduced to between 4,000 and 5,000 m^3 from June 27 to July 16. The operating level in CP1 was reached on July 19 and discharge was suspended for approximately one month (until August 20). The rate of discharge increased in September to draw down the water level in CP1 before freeze-up as per the Water Management Plan.

Figure 2-5. Daily Discharge (m^3) from CP1 to Meliadine Lake, 2018-2023

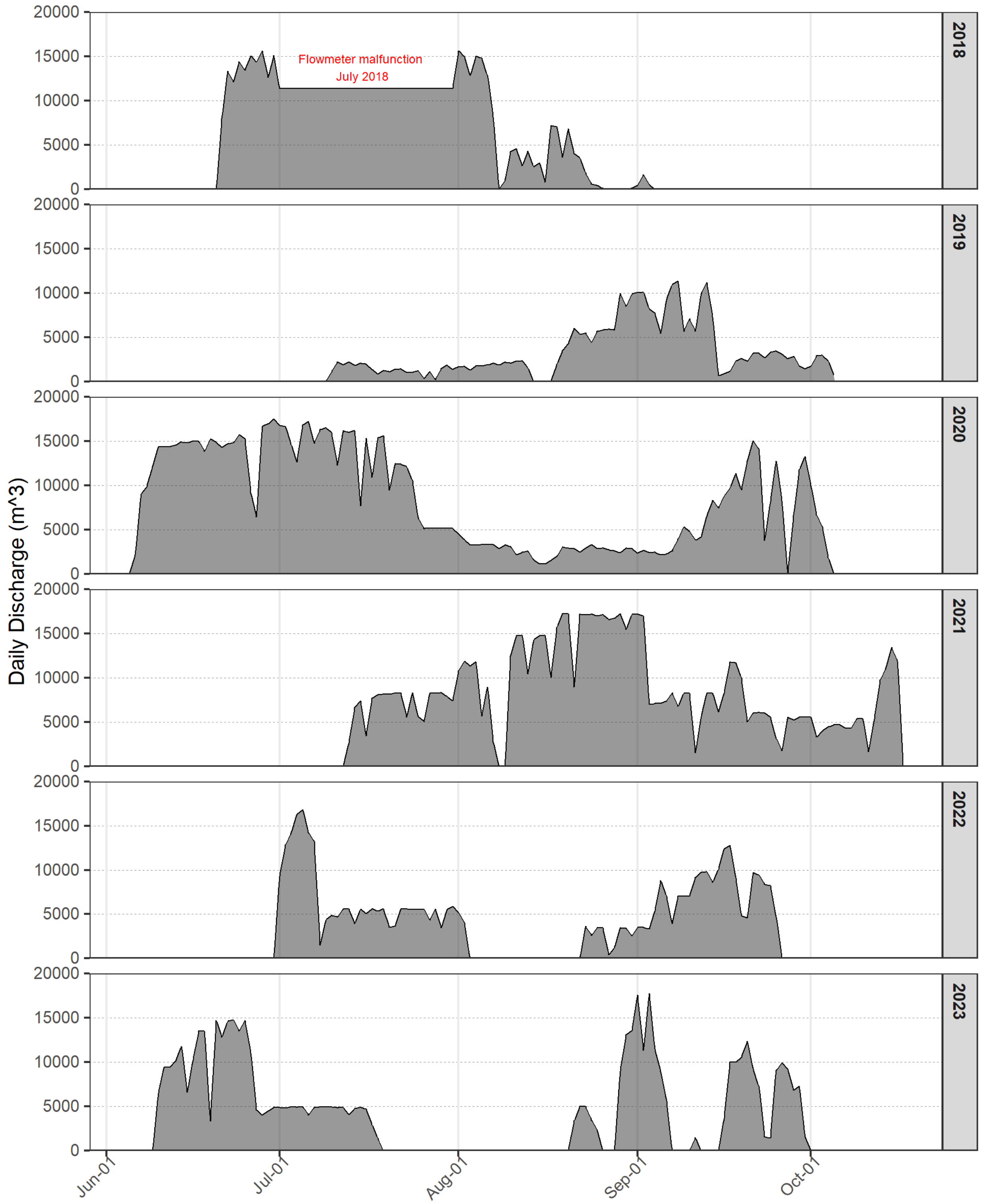


Table 2-3. Monthly discharge (m^3) from CP1 to Meliadine Lake, 2018-2023

Month	2018		2019		2020		2021		2022		2023	
	Days	Discharge (m^3)	Days	Discharge (m^3)	Days	Discharge (m^3)	Days	Discharge (m^3)	Days	Discharge (m^3)	Days	Discharge (m^3)
June	10	134,272	0	0	26	352,954	0	0	0	0	21	209,024
July	na*	352,551	24	30,614	31	366,094	19	133,439	31	214,709	18	81,119
August	26	153,066	31	107,540	31	83,454	29	397,398	11	33,585	8	54,894
September	3	2,632	30	157,912	30	214,845	30	221,210	25	188,337	22	184,508
October	0	0	5	10,707	3	13,829	16	99,079	0	0	0	0
Totals	*70*	*642,521*	*89*	*306,773*	*121*	*1,031,179*	*94*	*851,126*	*67*	*436,631*	***67***	***529,545***

Notes:
* No daily discharge date for July 2018 because of a malfunction with the flow meter.

2.3.2 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, 2022).
[b] The limit for TDS increased in 2020 as per the Amendment of the Water Licence (NWB, 2020).
[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.

Effluent samples were collected weekly from MEL-14 during discharge and submitted to the accredited laboratory Bureau Veritas (Nepean, ON) for analysis. Thirteen (13) weekly sampling events were completed in 2023: four in June, three in July, one in August, and five in September. 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 2023 effluent chemistry data are summarized below:

- No exceedances of effluent limits were reported in 2023 (**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 (730 to 880 mg/L) and trended higher throughout the summer to a maximum of 2,270 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 2023, chloride comprised between 35 and 45 % 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 (Agnico Eagle, 2022).
- In previous years, sodium was consistently the second most abundant major ion in treated surface contact water from MEL-14. In 2023, sulphate concentrations were approximately equal to or slightly higher than sodium in some of the samples collected in the June, July, and August (**Figure 2-9**).

2.3.3 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 12, July 10, August 21, and September 11. 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 2023 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 2023. These findings add to the multi-year dataset that shows effluent discharged to Meliadine Lake does not pose a direct risk to fish or invertebrate survival.

Chronic (Sublethal) Toxicity Testing

Effluent samples were collected from MEL-14 on June 12 and August 21 for quarterly sublethal toxicity testing with *L. minor* (duckweed). There were no effects to *L. minor* biomass or growth endpoints relative to the laboratory control treatment. This is the second consecutive year of no sublethal effects for effluent discharged to Meliadine Lake.

2.3.4 Loadings to Meliadine Lake

Loadings from CP1 to Meliadine Lake are calculated monthly (during discharge months) as per Part 2, Division 2, Section 20 of the MDMER (Government of Canada, 2022). 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 2023 were broadly similar to 2022 for most parameters. Since the Emergency Authorization and amendment to the Type A Water Licence in 2020, 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. Importantly, annual loadings to Meliadine Lake for all parameters are less than the peak observed in 2020.

2.4 Snow Core Monitoring Program

Snow core samples were collected on April 16, 2023 at five dustfall monitoring locations. The monitoring stations are shown in **Figure 1-2**. Station SNOCOR6 is located approximately 4.5 km southeast of Tiriganiaq Pit 1. 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 was assessed by comparing the snow chemistry results from the four stations close to the Mine against the background results from SNOCOR6. Off-site dust migration was qualitatively rated according to the magnitude of the difference between samples: negligible (< 2-times background); low (5 to 10-times background); moderate (10 to 20-times background), and high (> 20-times background). The snow core chemistry results are provided in **Table 2-7**. The total and dissolved concentrations of a few selected metals from 2020-2023 are shown in **Figure 2-12** and **Figure 2-13**.

Snow Pack Chemistry Results

The key findings from the 2023 snow core chemistry monitoring program are described below.

- Snow core chemistry results from SNOCOR7, SNOCOR Boundary, and SNOCOR5 in 2023 were within 2-times background (SNOCOR6). These results corroborate the results from 2021 and 2022 that showed aerial emissions and dust are not contributing to higher concentrations of metals and other parameters in the snow pack to the north or east of the Mine.
- Similar to previous years, the concentrations of several parameters at SNOCOR4 were elevated compared to background. In 2023, the following parameters were measured at concentrations greater than 20-times background: cobalt, nickel, silicon, and titanium (all unfiltered samples). Several other parameters were measured at concentrations greater than 10-times background.
- Aluminum was the only parameter where the dissolved concentration was greater than 5-times background. These results illustrate that metals are primarily associated with particulates when the snow samples melt. This is important, because dissolved metals tend to be more mobile in aquatic systems and more bioavailable for aquatic life[3].
- The chemistry results from SNOCOR4 provide a plausible explanation for the changes in water quality in Lake A8 and Lake B7 in recent years. Temporal trends for the Peninsula Lakes are discussed in **Section 4**.

[3] U.S. EPA Factsheet: https://www.epa.gov/system/files/documents/2022-01/parameter-factsheet_metals_508.pdf

Table 2-5 MEL-14 effluent chemistry results in 2023

Parameter	Units	Water Licence Limits		June				July			August	September				
		Max Grab	Monthly Mean	2023-06-12	2023-06-21	2023-06-25	2023-06-28	2023-07-03	2023-07-10	2023-07-17	2023-08-21	2023-09-03	2023-09-11	2023-09-18	2023-09-25	2023-09-27
Field Parameters																
pH (field)	pH units	6 | 9.5	6 | 9.5	7.3	7.3	6.64	7.06	7.13	7.27	7.52	6.62	7.15	7.51	8.15	7.58	7.32
Sp. Conductivity (field)	µS/cm	-	-	1451	1608	1598	1666	1842	1937	2017	2566	3163	3252	3555	3787	3829
Temperature	C	-	-	11.7	11.7	11.6	15	17.1	12	18.1	12.8	4.1	7.7	9.7	12	7.0
Conventional Parameters																
Conductivity (lab)	µS/cm	-	-	1400	1600	1600	1700	1800	2000	2100	2500	3000	3300	3500	3600	NA
Hardness (T)	mg/L	-	-	285	331	317	361	358	357	381	417	551	604	581	844	873
pH (lab)	pH units	-	-	7.31	7.6	7.52	7.44	7.51	7.69	7.8	7.3	7.42	7.86	8.15	7.61	7.59
Total Dissolved Solids	mg/L	4,500	3,500	790	945	995	1050	1160	1230	1310	1440	1880	1810	1890	2140	2270
Total Dissolved Solids (Calculated)	mg/L	-	-	730	790	830	880	910	1000	1100	1300	1500	1700	1900	2100	2100
Total Suspended Solids	mg/L	30	15	2	3	3	2	3	2	3	3	9	4	3	3	5
Major Ions and Nutrients																
Alkalinity, Total	mg/L	-	-	34	47	50	54	68	68	76	57	68	80	81	88	85
Chloride	mg/L	-	-	280	310	330	340	320	410	480	580	650	720	780	960	910
Sodium	mg/L			129	160	152	170	161	178	195	244	333	348	316	458	462
Sulphate	mg/L	-	-	150	150	160	170	180	180	190	210	250	300	310	340	330
Calcium	mg/L			79.7	90.1	86.9	98.6	101	97.9	105	111	147	160	158	226	225
Magnesium	mg/L			20.9	25.7	24.3	28	25.6	27.3	28.7	34.1	44.6	50	45.2	68.1	75.4
Potassium	mg/L			12.1	14.2	13.8	15.1	15.1	16	16.7	20.9	26.7	26.9	24.6	35.1	35.4
Ammonia (as N)	mg/L	18	14	0.33	0.16	0.14	0.23	0.41	0.24	0.19	0.16	0.68	0.65	0.43	0.28	0.23
Nitrate (as N)	mg/L	-	-	8.02	5.73	4.9	6.04	5.89	5.97	5.77	2.8	5.77	7.66	10.1	11.6	12
Total Phosphorus	mg/L	4	2	0.051	0.027	*< 0.02*	0.038	0.033	0.055	0.045	*< 0.02*	0.028	0.034	0.024	0.035	0.04
Unionized Ammonia (calculated)	mg/L	-	-	0.0017	0.00063	*< 0.00061*	0.00089	0.0022	0.0012	0.0022	*< 0.00061*	0.0014	0.0039	0.013	0.0028	0.00087
Metals (Unfiltered)																
Aluminum (T)	mg/L	3	2	0.335	0.423	0.333	0.228	0.252	0.232	0.288	0.249	0.866	0.34	0.339	0.45	0.511
Arsenic (T)	mg/L	0.6	0.3	0.00515	0.00498	0.00374	0.00383	0.00587	0.00398	0.00622	0.00467	0.00619	0.00536	0.00327	0.00582	0.00445
Cadmium (T)	mg/L	-		0.000013	0.000016	0.000014	0.000014	0.00002	0.000015	0.000017	*< 1e-05*	0.000011	0.000012	*< 2e-05*	*< 2e-05*	*< 2e-05*
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*	*< 0.002*	*< 0.002*
Cobalt (T)	mg/L	-		0.00111	0.00115	0.00107	0.00113	0.00109	0.00099	0.00097	0.00075	0.00104	0.00104	0.00083	0.0011	0.00109
Copper (T)	mg/L	0.4	0.2	0.00217	0.00231	0.00226	0.00233	0.00284	0.00254	0.00304	0.00245	0.00199	0.00234	0.0022	0.0024	0.0021

Table 2-5 MEL-14 effluent chemistry results in 2023

Parameter	Units	Water Licence Limits		June				July			August	September				
		Max Grab	Monthly Mean	2023-06-12	2023-06-21	2023-06-25	2023-06-28	2023-07-03	2023-07-10	2023-07-17	2023-08-21	2023-09-03	2023-09-11	2023-09-18	2023-09-25	2023-09-27
Iron (T)	mg/L	-		0.027	0.024	0.018	0.016	0.019	0.019	0.017	0.02	0.092	0.02	*< 0.02*	0.024	0.051
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*	*< 4e-04*	*< 4e-04*
Manganese (T)	mg/L	-		0.0279	0.0287	0.0381	0.0416	0.0555	0.0503	0.0336	0.0235	0.0725	0.0563	0.034	0.0737	0.0981
Mercury (T)	mg/L	-		*< 1e-05*	*< 1e-05*	*< 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	-		0.0044	0.0047	0.0049	0.0056	0.0048	0.0045	0.0051	0.0059	0.0062	0.0057	0.0046	0.0061	0.0065
Nickel (T)	mg/L	1	0.5	0.0037	0.0037	0.005	0.0038	0.0042	0.0037	0.0035	0.004	0.0055	0.0062	0.005	0.0065	0.006
Selenium (T)	mg/L	-		0.00064	0.00076	0.00071	0.00077	0.00074	0.00068	0.00069	0.00046	0.0006	0.00069	0.0007	0.00092	0.00096
Thallium (T)	mg/L	-		0.000016	0.00002	0.000019	0.000023	0.000024	0.000016	0.000023	0.000017	*< 1e-05*	0.000022	0.000021	0.000022	*< 2e-05*
Uranium (T)	mg/L	-		0.00033	0.00044	0.00023	0.0002	0.0008	0.00045	0.00116	0.00048	0.00121	0.00317	0.00228	0.00385	0.00307
Zinc (T)	mg/L	0.8	0.4	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.01*	*< 0.01*	*< 0.01*
Cyanide and Radium-226																
Cyanide (Total)	mg/L	1	0.5	0.00332	0.00175	0.00071	*< 5e-04*	0.00056	0.0007	0.00095	0.00137	0.00104	0.00082	0.00083	0.00092	0.00104
Radium-226	Bq/L	-		*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	0.007	*< 0.005*	*< 0.005*	0.006	*< 0.005*	0.027	0.007
Toxicity Tests																
Rainbow trout survival	LC50	-		>100	-	-	-	-	>100	-	>100	-	>100	-	-	-
D. magna survival	LC50	-		>100	-	-	-	-	>100	-	>100	-	>100	-	-	-
L. minor biomass	IC25	-		>97	-	-	-	-	-	-	>97	-	-	-	-	-
L. minor frond number	IC25	-		>97	-	-	-	-	-	-	>97	-	-	-	-	-

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.

Table 2-6. The fraction of total dissolved solids comprised of chloride in effluent samples from MEL-14 in 2023

Month and Day	Chloride	TDS (Measured)		TDS (Calculated)	
	mg/L	mg/L	% Cl	mg/L	% Cl
June-12	280	790	35%	730	38%
June-21	310	945	33%	790	39%
June-25	330	995	33%	830	40%
June-28	340	1,050	32%	880	39%
July-03	320	1,160	28%	910	35%
July-10	410	1,230	33%	1,000	41%
July-17	480	1,310	37%	1,100	44%
August-21	580	1,440	40%	1,300	45%
September-03	650	1,880	35%	1,500	43%
September-11	720	1,810	40%	1,700	42%
September-18	780	1,890	41%	1,900	41%
September-25	960	2,140	45%	2,100	46%
September-27	910	2,270	40%	2,100	43%

Figure 2-6. Total dissolved solids and constituent ions in end-of-pipe effluent at MEL-14, 2018-2023

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.

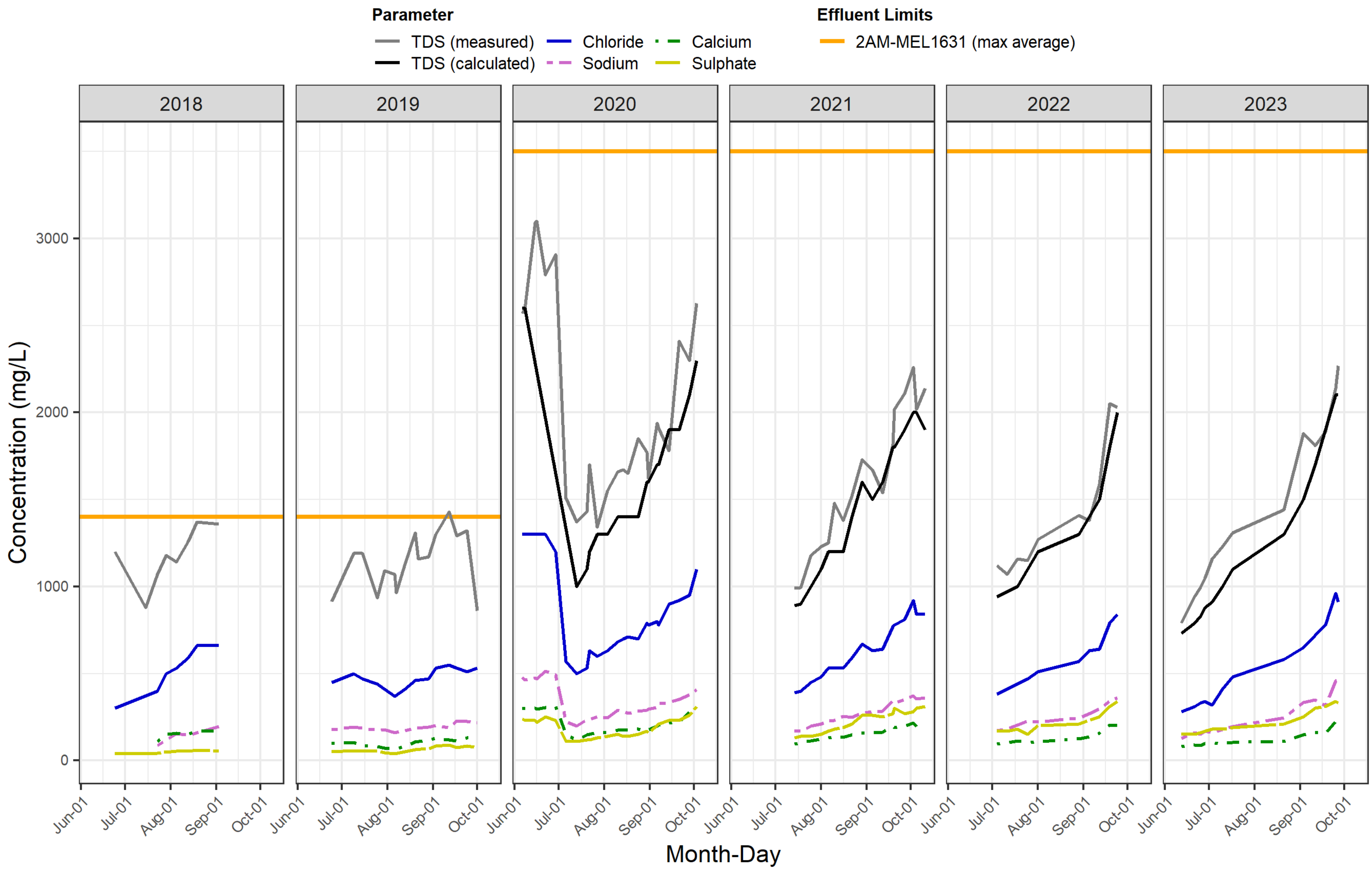


Figure 2-7. Concentrations of nutrients measured in end-of-pipe samples from MEL-14, 2018-2023

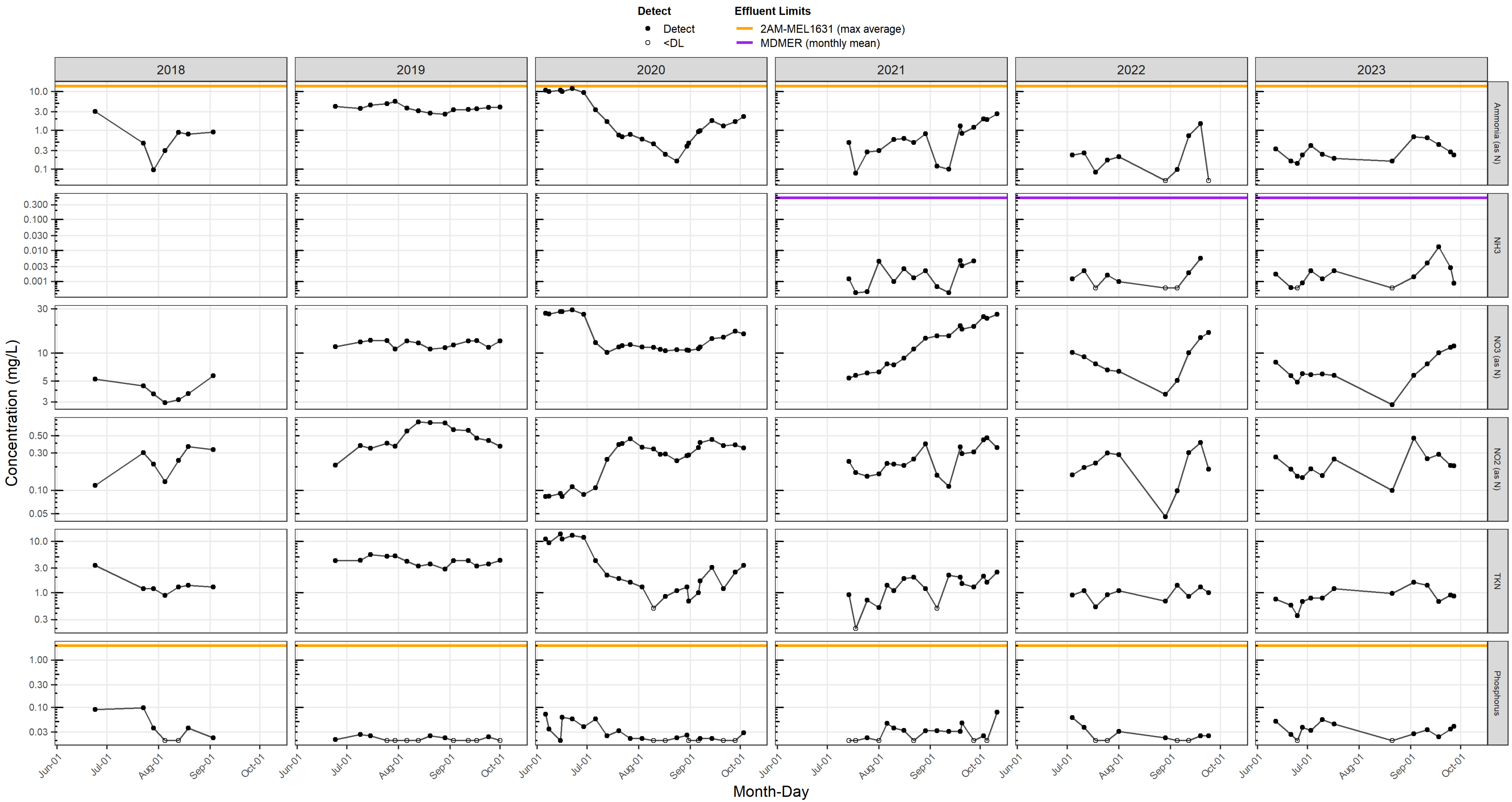


Figure 2-8. Concentrations of metals measured in end-of-pipe samples from MEL-14, 2018-2023

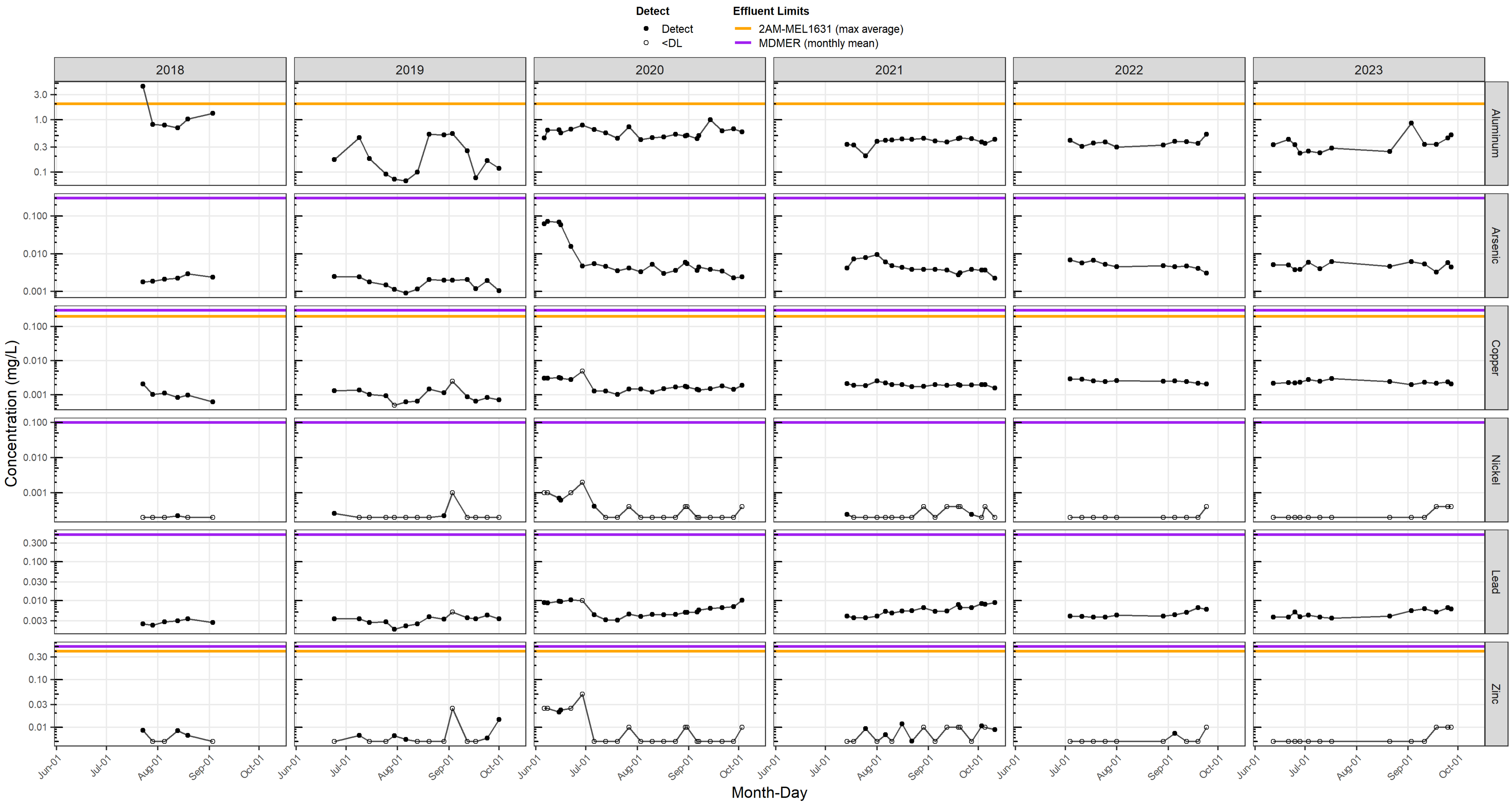


Figure 2-9. Percent composition of major ions in effluent from MEL-14

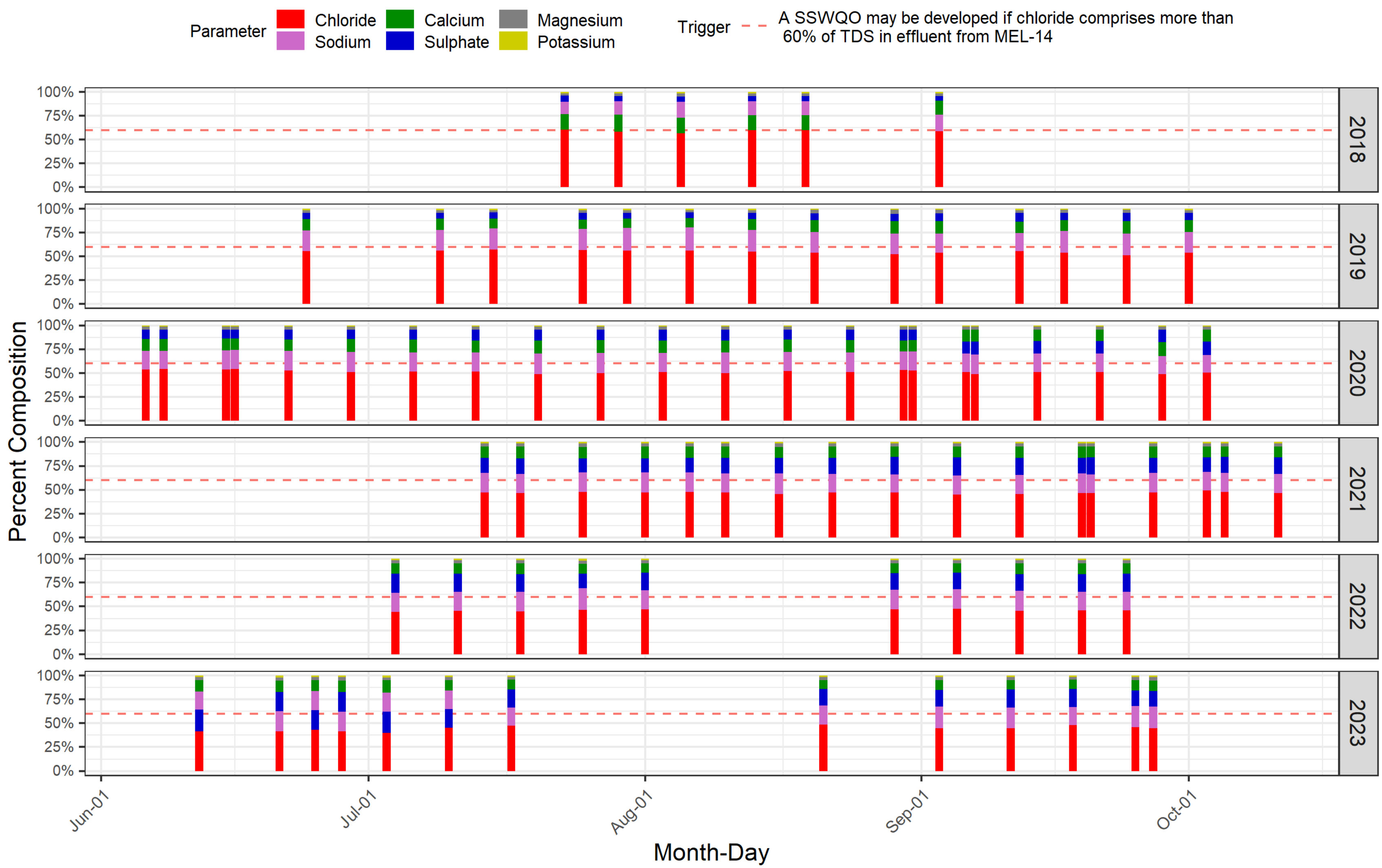


Figure 2-10. Annual loadings (kg) from CP1 to Meliadine Lake for selected parameters

Notes: The numbers above each bar indicate the percent contribution to the cumulative load (e.g., the annual load of chloride in 2023 accounts for 12% of the cumulative loading from 2018-2023).

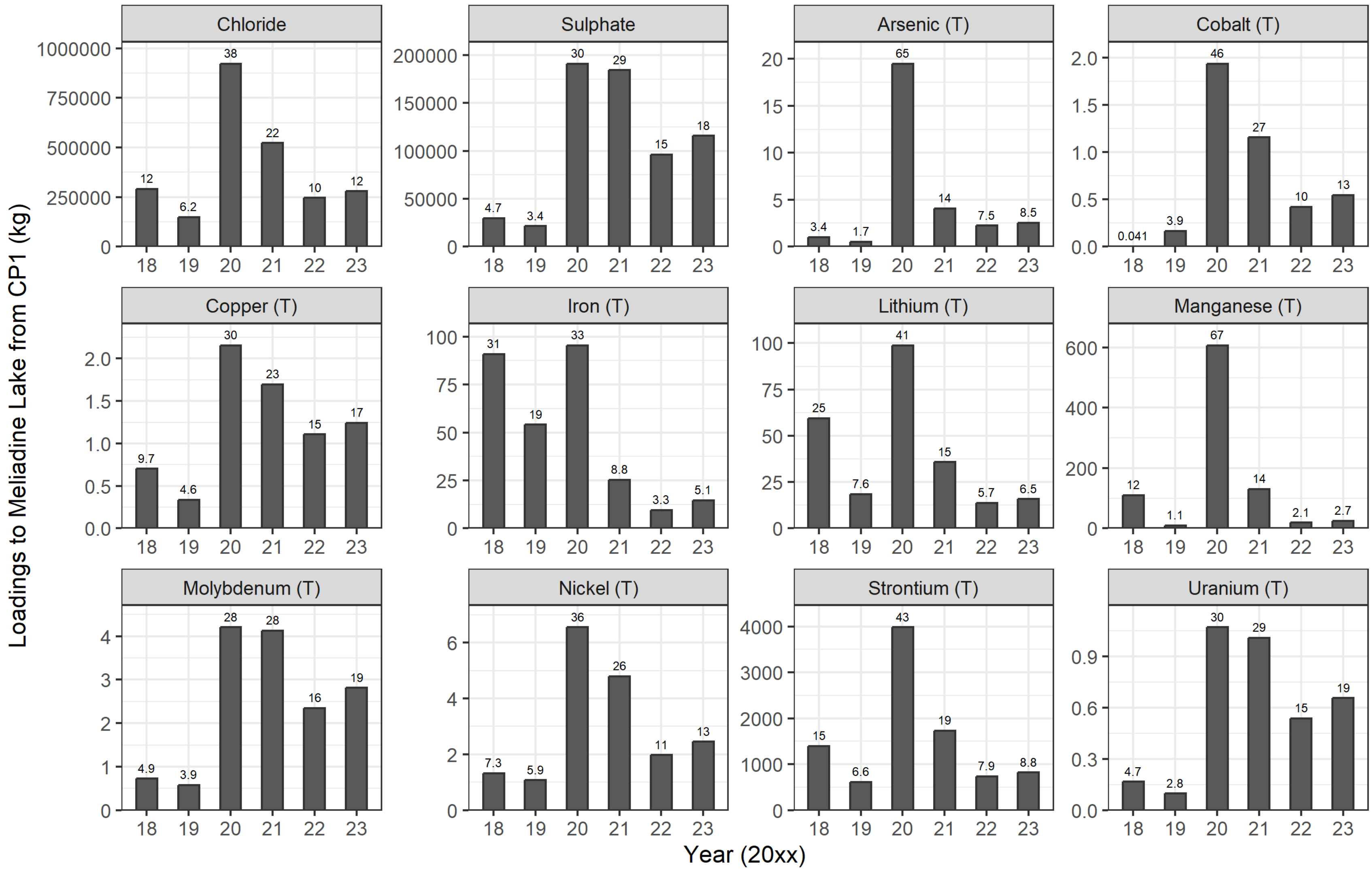


Figure 2-11. Sublethal toxicity test results for *Lemna minor* compared to measured concentrations of TDS in effluent from MEL-14

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 symbol indicates the results from 2023.

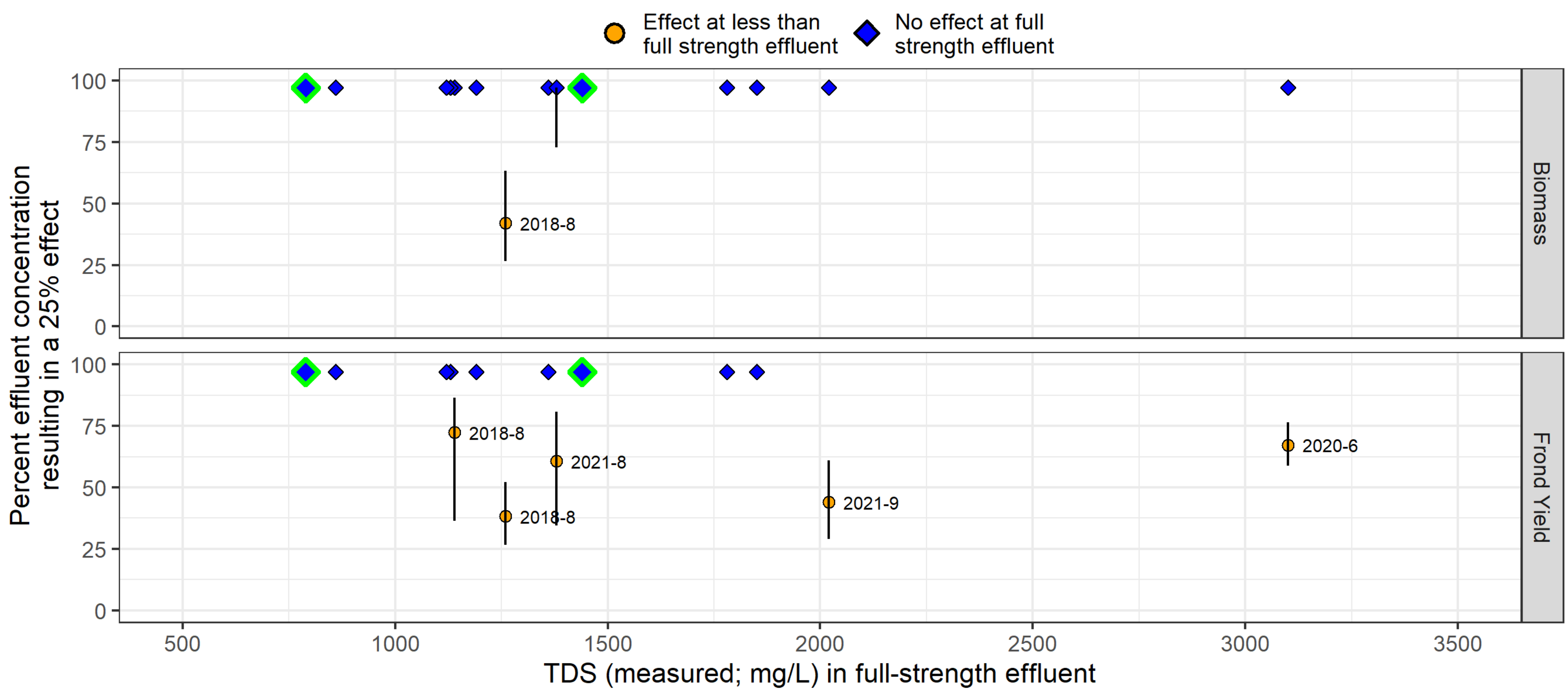


Table 2-7. Concentrations of parameters of interest in snow core samples in April 2023

Parameter	April 2023				
	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 (T)	7.33	1.73	6.07	2.3	77.8
Hardness (D)	3.96	1.12	3.36	1.2	***15***
Alkalinity, Bicarbonate	4.2	1.7	4.1	1.7	***18***
Alkalinity, Carbonate	*< 1*	*< 1*	*< 1*	*< 1*	*< 1*
pH (lab)	6.76	5.92	6.43	5.93	7.31
Alkalinity, Total	4.2	1.7	4.1	1.7	***18***
Conductivity (lab; µS/cm)	19	5.8	14	8.2	***65***
Total Dissolved Solids	*< 10*	*< 10*	10	10	***30***
Total Suspended Solids	47	14	45	26	930
Turbidity (NTU)	4.3	1.9	5	1.5	65
Organic Carbon (mg/L)					
Dissolved Organic Carbon	1.3	*< 0.4*	0.46	1.3	0.84
Total Organic Carbon	1.5	0.58	0.65	1.6	0.95
Major Ions (mg/L)					
Calcium (T)	1.94	0.405	1.66	0.516	18
Calcium (D)	1.28	0.332	1.17	0.325	***5.08***
Magnesium (T)	0.605	0.174	0.469	0.245	7.99
Magnesium (D)	0.184	0.071	0.108	0.095	***0.57***
Potassium (T)	0.264	0.062	0.181	0.2	2.74
Potassium (D)	0.128	*< 0.05*	0.064	0.145	***0.52***
Sodium (T)	1	0.283	0.427	0.689	***3.61***
Sodium (D)	1.01	0.289	0.419	0.652	***2.83***
Sulphate	*< 0.5*	*< 0.5*	*< 0.5*	*< 0.5*	***1.3***
Chloride	3.9	*< 1*	*< 1*	*< 1*	3.7
Total Metals (mg/L)					
Aluminum	0.749	0.227	0.856	0.322	12.6
Antimony	*< 0.0005*	*< 0.0005*	*< 0.0005*	*< 0.0005*	*< 0.0005*
Arsenic	0.0516	0.0042	0.0939	0.0137	0.302
Barium	0.0063	0.0018	0.0063	0.0032	0.104
Beryllium	*< 0.0001*	*< 0.0001*	*< 0.0001*	*< 0.0001*	***0.00023***
Bismuth	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*
Boron	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*
Cadmium	0.000021	*< 0.00001*	0.000026	*< 0.00001*	0.00014
Chromium	0.0019	*< 0.001*	0.002	*< 0.001*	0.0318
Cobalt	0.00032	*< 0.0002*	0.00031	*< 0.0002*	0.0102
Copper	0.00242	*< 0.0005*	0.00309	0.00149	0.025
Iron	2.22	0.52	2.77	0.835	26.6
Lead	0.0126	0.00117	0.0145	0.00313	***0.0578***
Lithium	*< 0.002*	*< 0.002*	*< 0.002*	*< 0.002*	0.0155
Manganese	0.0555	0.0069	0.024	0.0146	0.391
Molybdenum	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*
Nickel	0.0015	*< 0.001*	0.0014	*< 0.001*	0.0335
Selenium	*< 0.0001*	*< 0.0001*	*< 0.0001*	*< 0.0001*	0.00012
Silicon	0.75	0.24	0.87	0.32	17.1
Silver	*< 0.00002*	*< 0.00002*	*< 0.00002*	*< 0.00002*	0.000123
Strontium	0.0083	0.0023	0.0096	0.0027	0.0891
Sulphur	*< 3*	*< 3*	*< 3*	*< 3*	*< 3*
Thallium	*< 0.00001*	*< 0.00001*	*< 0.00001*	*< 0.00001*	0.00010
Tin	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*
Titanium	0.0114	*< 0.005*	0.016	0.0064	0.329
Uranium	*< 0.0001*	*< 0.0001*	*< 0.0001*	*< 0.0001*	0.0008
Vanadium	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	***0.0225***
Zinc	0.0062	*< 0.005*	0.0065	*< 0.005*	0.0514
Zirconium	0.00013	*< 0.0001*	*< 0.0001*	*< 0.0001*	0.00214

Table 2-7. Concentrations of parameters of interest in snow core samples in April 2023

Parameter	April 2023				
	Background	East of WRSF3	Emulsion Plant	North of Camp	North of Lake A8
	SNOCOR6	SNOCOR5	SNOCOR7	SNOCOR Boundary	SNOCOR4
Dissolved Metals (mg/L)					
Aluminum	0.0137	0.0058	0.0259	0.0086	0.254
Antimony	*< 0.0005*	*< 0.0005*	*< 0.0005*	*< 0.0005*	*< 0.0005*
Arsenic	0.0127	0.00065	0.0141	0.0062	***0.0513***
Barium	*< 0.001*	*< 0.001*	*< 0.001*	0.0011	0.002
Beryllium	*< 0.0001*	*< 0.0001*	*< 0.0001*	*< 0.0001*	*< 0.0001*
Bismuth	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*
Boron	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*	*< 0.05*
Cadmium	*< 0.00001*	*< 0.00001*	*< 0.00001*	*< 0.00001*	*< 0.00001*
Chromium	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*
Cobalt	*< 0.0002*	*< 0.0002*	*< 0.0002*	*< 0.0002*	*< 0.0002*
Copper	0.00058	*< 0.0002*	0.00028	0.00031	0.00038
Iron	0.0361	0.0093	0.0122	0.0287	0.02
Lead	0.00163	*< 0.0002*	0.00024	0.00035	*< 0.0002*
Lithium	*< 0.002*	*< 0.002*	*< 0.002*	*< 0.002*	*< 0.002*
Manganese	0.0134	0.004	0.008	0.0087	0.0026
Molybdenum	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*
Nickel	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*	*< 0.001*
Selenium	*< 0.0001*	*< 0.0001*	*< 0.0001*	*< 0.0001*	*< 0.0001*
Silicon	*< 0.1*	*< 0.1*	*< 0.1*	*< 0.1*	***0.35***
Silver	*< 0.00002*	*< 0.00002*	*< 0.00002*	*< 0.00002*	*< 0.00002*
Strontium	0.005	0.0018	0.0054	0.0016	***0.0217***
Sulphur	*< 3*	*< 3*	*< 3*	*< 3*	*< 3*
Thallium	*< 0.00001*	*< 0.00001*	*< 0.00001*	*< 0.00001*	*< 0.00001*
Tin	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*
Titanium	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*
Uranium	*< 0.0001*	*< 0.0001*	*< 0.0001*	*< 0.0001*	*< 0.0001*
Vanadium	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*
Zinc	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*
Zirconium	*< 0.0001*	*< 0.0001*	*< 0.0001*	*< 0.0001*	*< 0.0001*

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

Figure 2-12. Metals concentrations in snow core samples, 2020-2023

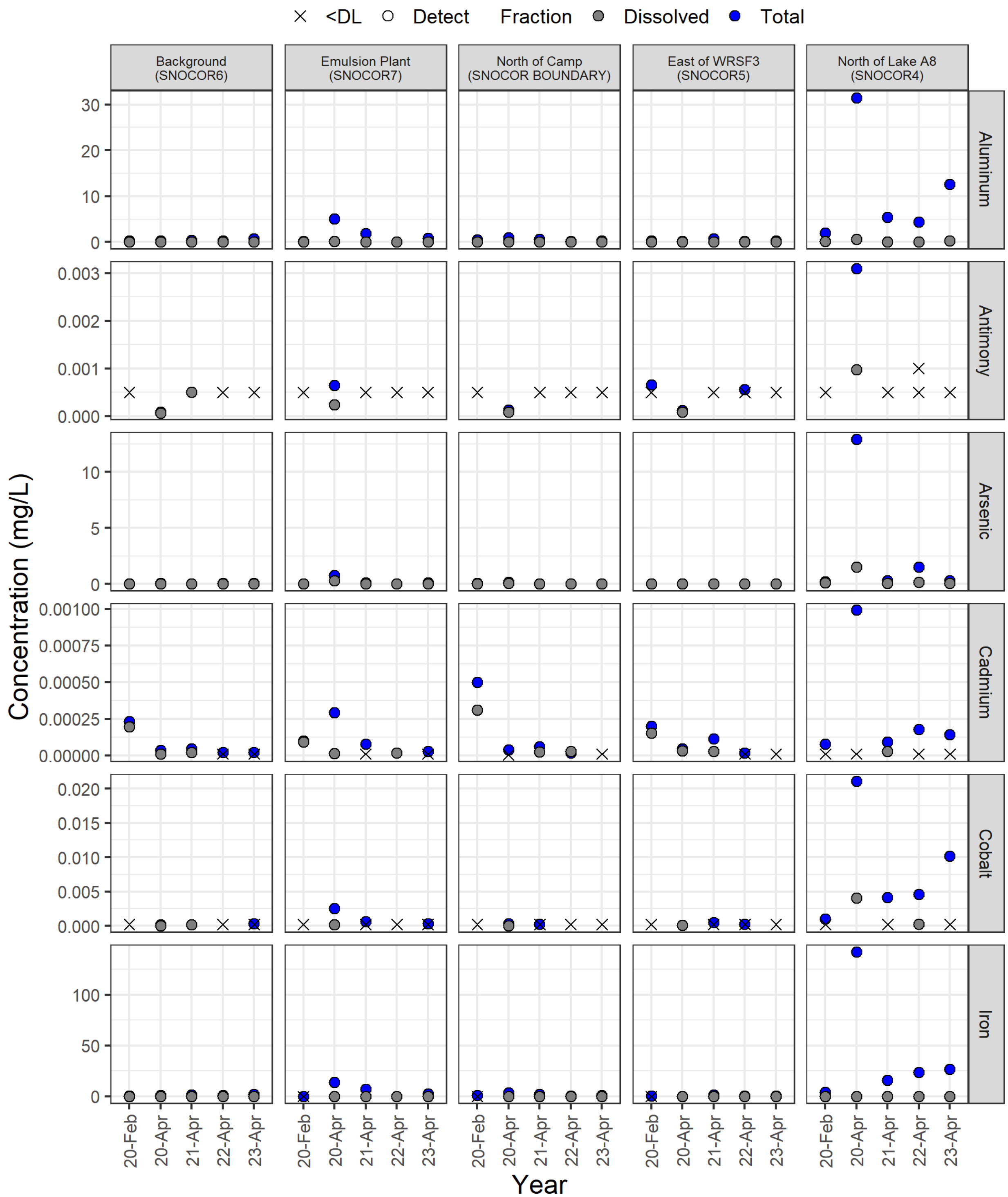
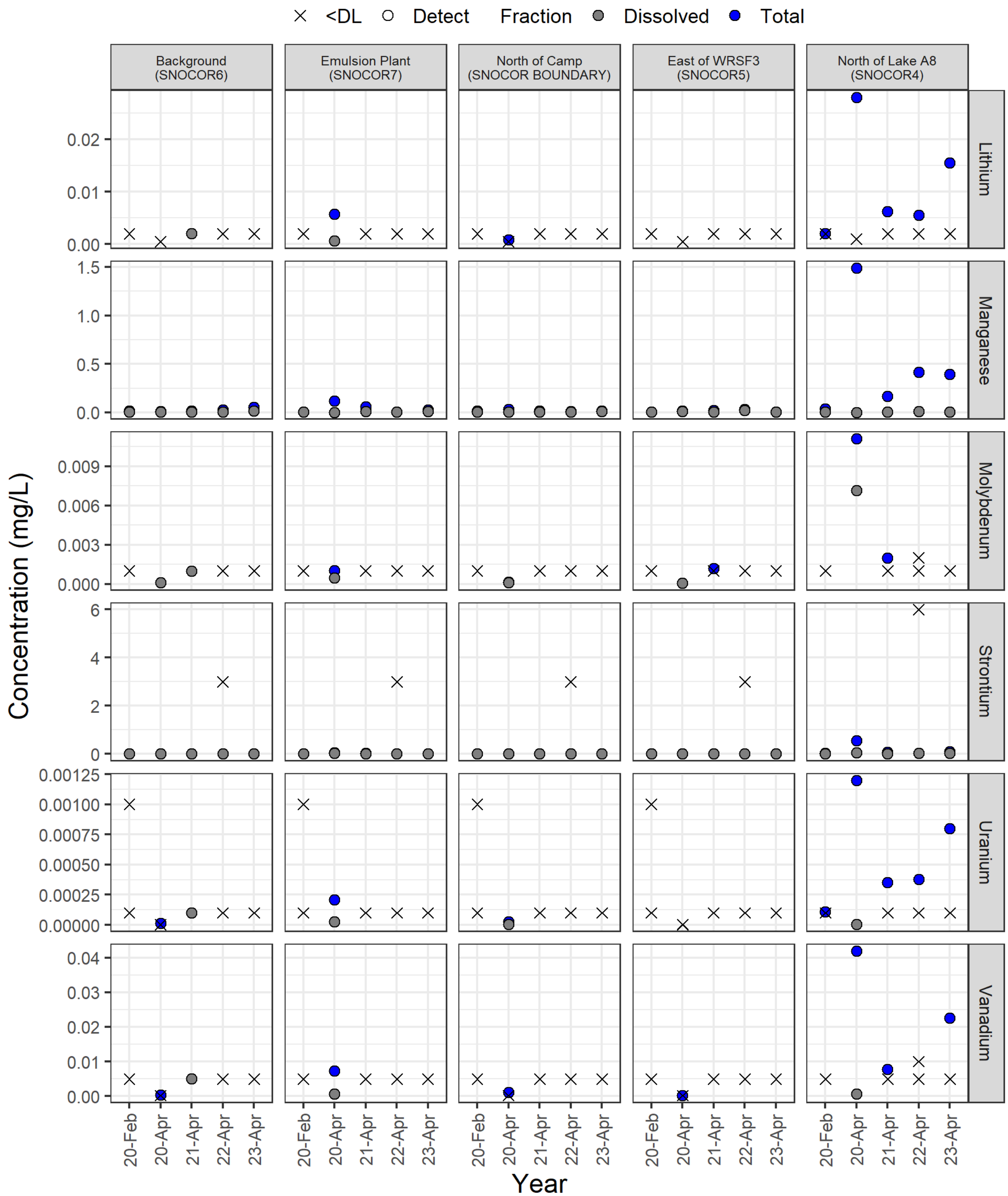


Figure 2-13. Metals concentrations in snow core samples, 2020-2023



3 MELIADINE LAKE WATER QUALITY

3.1 Introduction

This chapter presents the water quality results from Meliadine Lake in 2023. 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 2022 AEMP report (Azimuth, 2023). 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 during the open-water season when effluent is discharged to Meliadine Lake. 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 April at MEL-01 and MEL-02 as in previous years. Reference Area 1 (MEL-03) was added to the winter sampling event in 2023 to provide an estimate of background water chemistry during the winter.

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:

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

   This question was answered in **Section 2.3.2**. There were no exceedances of limits in the Water Licence in 2023.

2. *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**.

3. *Is water quality consistent with predictions outlined in the Final Environmental Impact Statement (FEIS) and less than AEMP Action Levels[4]?*

   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 2023 Water Quality Program

- There were no exceedances of the AEMP Action Levels linking to mining activities in 2023 and the concentrations of most parameters are well below their respective AEMP Action Levels. As in previous years, dissolved copper naturally exceeded the aquatic life water quality guidelines in a few samples at the exposure and reference areas. Absolute concentrations of copper have remained stable in Meliadine Lake compared to the baseline period.
- Effluent has contributed to higher concentrations of some major ions, nutrients, and metals in the East Basin of Meliadine Lake over time. The effect of effluent on water quality in other areas of the Meliadine Lake is difficult to distinguish compared to the confounding effects of natural variability and interannual climate variability. On-going water quality monitoring should help decipher the effect of effluent discharge vs precipitation on water quality in Meliadine Lake.
- TDS and chloride concentrations in the East Basin of Meliadine remain well below predictions in the 2014 FEIS (Agnico Eagle, 2014) and the hydrodynamic model (Tetra Tech, 2020).
- The 2023 water quality results from Meliadine Lake do not require additional management actions as per the Low Action Level assessment and AEMP Response Framework. The study design for the 2024 AEMP in Meliadine Lake will follow the same scope and schedule as the 2023 AEMP.

[4] 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**.

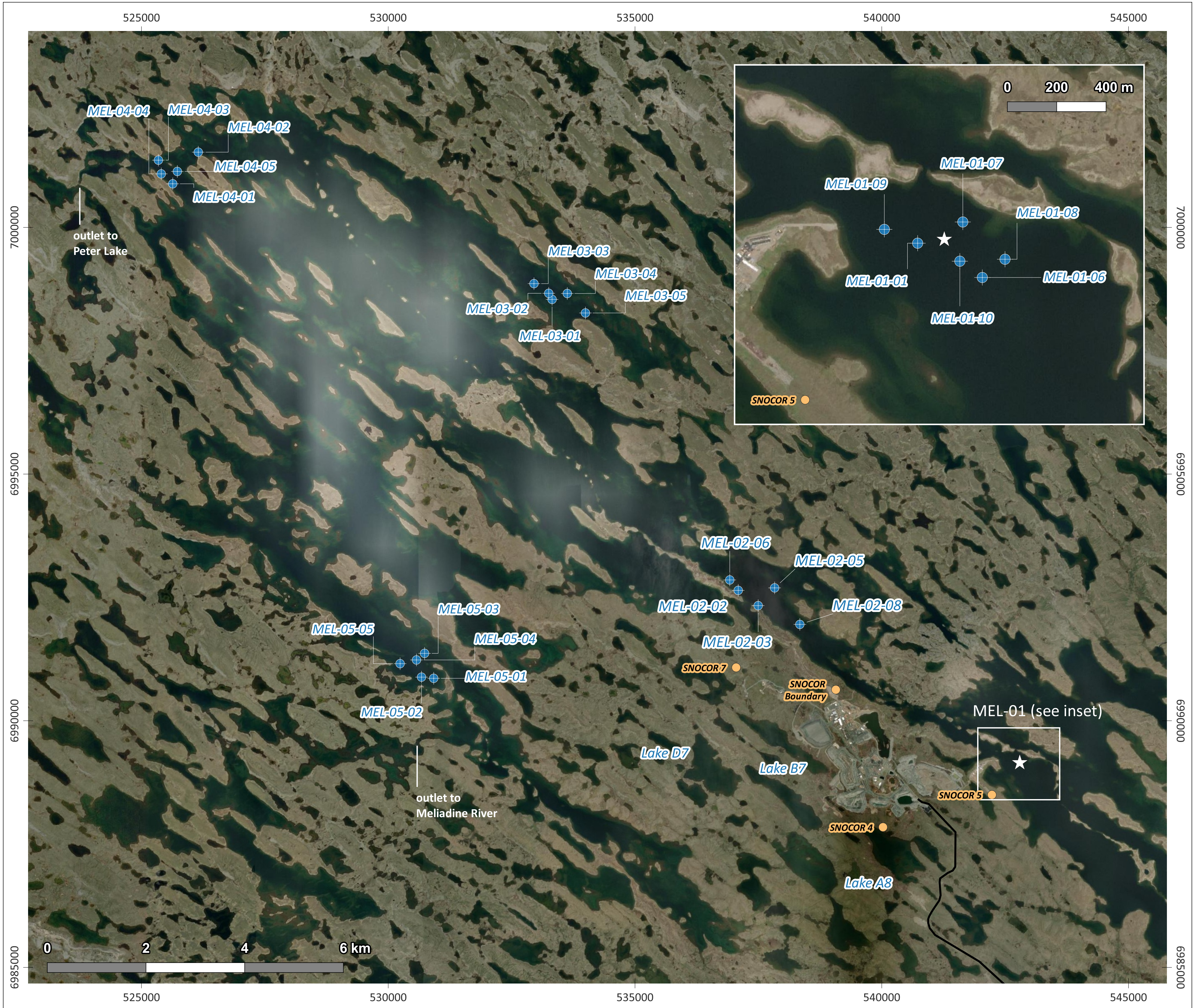


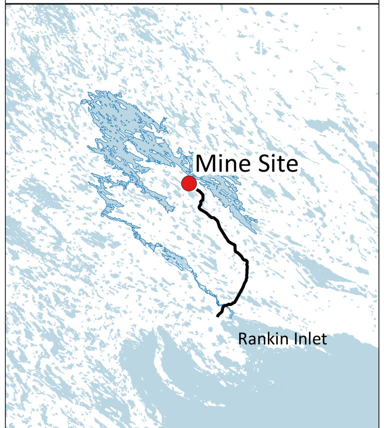
Figure 3-1
Meliadine Lake Water Quality Sampling Stations

Aquatic Effects Monitoring Program
2023 Annual Report

AZIMUTH

Date:	March 10, 2023
Datum:	NAD 83 UTM Zone 15N
Scale:	1:100,000 ; inset = 1:20,000
Software:	QGIS version 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

- CP1 Diffuser
- All weather access road
- AEMP Water Quality Station
- Snowpack Monitoring Station

Table 3-1. Meliadine Lake water sampling events in 2023

Area	Station ID	Depth[a]	Easting	Northing	Distance to the Diffuser	April	July	August	September
MEL-01 Near-field	MEL-01-01	9.4	542690	6989132	109 m	**April 1** LP, WQ	**July 16** LP, WQ	**August 22** LP, WQ, Phyto	**September 15** LP, WQ
	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	**April 2** LP, WQ	**July 15** LP, WQ	**August 17** LP, WQ, Phyto	**September 15** LP, WQ
	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	**April 3** LP, WQ	**July 15** LP, WQ	**August 18** LP, WQ, Phyto	**September 15** 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 18** 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 18** 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.
LP = limnology profile (temperature, dissolved oxygen, pH, and specific conductivity).
WQ = water chemistry.
Phyto = phytoplankton community survey and chlorophyll-a (results discussed in **Section 5**).

3.3 Methods

3.3.1 Field and Laboratory Procedures

Limnology measurements (temperature, dissolved oxygen, pH, and specific conductivity) were taken at 1 m depth intervals from the lake surface to within approximately 1 m of the sediment. 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. Bottles for chemistry analysis were pre-labelled before going into the field and handled (i.e., preserved and filtered) according to specifications provided by ALS Environmental. Water for dissolved organic carbon, dissolved nutrients, and dissolved metals were filtered using a syringe and 0.45 µm disc filter provided by ALS. A checklist is included with the field data sheet to verify the samples requiring filtration and to ensure preservation is handled correctly.

Water samples were sent to ALS Environmental in Winnipeg, MB. Analyses were conducted at the laboratory in Winnipeg, Edmonton, and Burnaby. The laboratory in Winnipeg arranges sample shipping to various ALS locations based on the analytical capabilities at these locations and the detection limits (DLs) for the project. ALS is an analytical laboratory accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA). The list of parameters included in the AEMP are provided in **Table 3-2**. Target DLs are provided in the appendices.

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

AEMP Water Quality Parameters
Station Information. Coordinates, depth, secchi depth (open-water), and ice thickness.
Field Parameters. Depth, pH, specific conductivity, dissolved oxygen, temperature, Secchi depth (open-water), and ice thickness.
Conventional Parameters and Major Ions. Bicarbonate alkalinity, chloride, carbonate alkalinity, turbidity, conductivity, hardness, calcium, potassium, magnesium, sodium, sulphate, pH, total alkalinity, total dissolved solids (TDS), and total suspended solids (TSS).
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.
Total and Dissolved metals. 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.
Other Parameters. Total cyanide, free cyanide, and weak acid dissociable (WAD) cyanide.

3.3.2 Quality Assurance and Quality Control

Water chemistry QA/QC involved following appropriate sampling procedures, collecting field duplicates and blanks, laboratory QC, and data analysis QA/QC procedures as outlined in the *AEMP Design Plan* (Azimuth, 2022). The QA/QC results for the 2023 AEMP water chemistry program are summarized in **Appendix A**. The key findings from the QA/QC assessment in 2023 are presented below:

- ***In-situ* profiles** –pH measurements at MEL-03-05 in August were between 6.14 to 6.38. pH in Meliadine Lake in the summer is typically slightly basic (7 to 7.5). There was no indication on the field datasheets that the water quality meter was malfunctioning. However, compared to the other profiles taken at MEL-03, the pH results for MEL-03-05 were flagged as unreliable.
- **Sample Integrity** –The lab did not report any lost or damaged bottles in 2023. 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.
- **Blanks** – Similar to previous years, there were a few parameters detected above their respective DLs in the blanks. The equipment blank (EB) samples had more detected parameters compared to the deionized water blank (DB) and travel blank (TB) samples. Close examination of the water quality data from 2023 indicated concentrations were consistent with previously-reported results, and potential for cross-contamination to bias the interpretation of the 2023 water quality data is unlikely.
- **Field Duplicates** – Ten duplicate samples were collected in 2023, equal to 13.2% duplicate sampling frequency (76 samples were collected in 2023). Of the 1,190 comparisons across the 10 duplicate samples in 2023, only 13 parameters (or ~1% of the duplicate results) exceeded the data quality objectives (DQOs[5]), indicating there was good precision between the field duplicate samples in 2023. 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

[5] 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.

Action Level concentrations (i.e., water quality guidelines) are typically an order of magnitude or higher than the DLs.

- **Anomalous Results Excluded from the Analyses** – TSS concentrations at MEL-03-01 and MEL-03-02 in the August sampling event were 92 and 74 mg/L, respectively. These results indicate the bottles were contaminated during sampling. For MEL-03-01, high turbidity required sample dilution prior to analysis, which resulted in elevated detection limits for metals (total and dissolved). Metals results from MEL-03-01 were removed from the dataset due to the high detection limits. Some of the results from MEL-03-02 were also flagged as anomalous based on results from the other three stations. Other results that were flagged as outliers and removed from the dataset are included in **Appendix A**.

3.3.3 Data Analysis

Water quality data for the Meliadine project are managed within the EQuIS database administered by Agnico Eagle. Water quality data are uploaded directly to EQuIS by partner laboratories. Data analysis involved screening the current year data against the AEMP Benchmarks and corresponding Action Levels, calculating summary statistics, comparing the current year data to normal range[6], investigating temporal and spatial trend (plots and statistics), and comparing the current data to relevant predictions.

Descriptive Statistics and Data Screening

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 2023; MEL-01 to MEL-05) are provided in **Appendix C2**. The normal range and action levels were also included to assess the current conditions relative to the baseline conditions and associated triggers. The individual samples from 2023 are provided in **Appendix C3**.

Spatial and Temporal Changes

Spatial and temporal trends were evaluated using the normal range, statistical comparisons (analysis of variance [ANOVA]), and plots.

[6] Normal range is the natural water quality conditions in Meliadine Lake using data collected during the baseline period (1995 to 2013) and chemistry data from the three reference areas collected to the end of 2020.

Normal Range

The first step in the spatial and temporal trend assessment involved identifying those parameters that exceeded the normal range of baseline/reference concentrations at MEL-01. The normal range assessment focuses on results from the open-water season (July, August, and September) when treated surface contact water is discharged to Meliadine Lake. The upper 90th percentile is used as the limit for determining whether current concentrations have changed relative to baseline/reference conditions. Parameters were considered outside the normal range if the average concentration during the open water period exceeded the 90th percentile of reference/baseline concentrations. The approach to calculating the normal range for water quality parameters was outlined in detail in the 2019 AEMP report (Azimuth, 2020).

Analysis of Variance

Water quality parameters that exceeded the normal range were carried forward for quantitative analysis of year-over-year differences within MEL-01, MEL-02, and MEL-03 using ANOVA and Tukey post-hoc pairwise comparisons (significant difference at $\alpha = 0.05$). This assessment focused on data from MEL-01, MEL-02, and MEL-03 because these three areas are sampled monthly during the open water season. The magnitude of year-to-year changes in water quality parameter within each area was calculated using the model estimates for each water quality parameter.

The normal range assessment and statistical analysis help to differentiate parameters that are elevated compared to baseline/reference but stable in recent years versus those parameters that show consistent year-over-year increases related to mining activities, wider regional patterns of change, or a combination of factors.

Comparison to Predicted Changes in Water Quality

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. 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*[7] 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.

The major inputs to the mixing model in the 2014 FEIS are outdated. Therefore, 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's report) that included the final diffuser design, updated bathymetry in the model domain, 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 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 current water quality compared to predictions in the 2014 FEIS and 2020 hydrodynamic model.

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 2023 (**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

Field-measured water quality parameters provide important "real-time" information on potential changes to water quality and are an important tool for assessing water quality in Meliadine Lake. Average results by area for temperature, dissolved oxygen, pH, and specific conductivity are shown in **Figure 3-2**. Individual conductivity profiles are shown in **Figure 3-3**.

Dissolved Oxygen, pH, and Temperature

Conditions in Meliadine Lake varied naturally in 2023 according to seasonal patterns of change reported in previous AEMP cycles (**Figure 3-2**). The lake was well oxygenated in the winter and open water

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

sampling events. Dissolved oxygen was higher under ice than near the bottom of the lake at MEL-01, MEL-02, and MEL-03 in April (13 to 17 mg/L). As the days become longer in late winter, increased sunlight can lead to increased primary productivity in the top layer of water near the ice, which in turn produces oxygen in the upper water column (Pernica et al., 2017). Dissolved oxygen levels were approximately 9 mg/L near the bottom of the lake at MEL-01 and MEL-03.

Field pH readings in 2023 were between 7.25 and 7.5 for most of the profiles. MEL-01 was closer to circumneutral in April (6.8 to 7.0). pH readings were also lower at MEL-03 in August. Average pH for MEL-03 shown in **Figure 3-2** was influenced by the profile at MEL-03-05 (6.14 to 6.38). There was no indication on the field datasheets that the probes were malfunctioning, but compared to other sampling events, these results are questionable. pH measurements from the other profiles at MEL-03 in August were in the range of 6.5 to 7.2.

Water temperatures vary between the sampling areas based on the timing of ice off and seasonal mixing patterns. Water temperatures typically vary by less than 2°C among the sampling areas within each sampling event. By mid-September, water temperature was uniform throughout the lake.

Conductivity

Conductivity, a measure of the electrical conductivity in water, is positively correlated with increases in major ions (e.g., TDS). In this respect, *in-situ* conductivity provides insight into effluent mixing in the East Basin. As expected, conductivity results were higher in MEL-01 than other study areas in each of the sampling events (**Figure 3-2**).

Under ice conductivity was higher in the winter compared to the open water sampling events because formation of ice leads to less water and therefore higher concentrations of dissolved salts. Under ice conductivity was in the range of 150 to 160 µS/cm at MEL-01, 120 to 140 µS/cm at MEL-02, and 110 to 120 µS/cm at MEL-03. Slightly higher conductivity readings were reported closer to the ice due to cyro-concentration. Conditions at MEL-01 appeared well-mixed in the late winter (**Figure 3-3**).

The effluent plume was detected at some of the MEL-01 stations during the July 16 sampling event (**Figure 3-3**). This was expected given the volume of water that was discharged from CP1 from early June to mid-July (**Figure 2-5**). Surface conductivity was in the range of 105-110 µS/cm at all six sampling locations. Conductivity readings were approximately 10-20 µS/cm higher at mid-depth and bottom profiles taken at MEL-01-01, MEL-01-07, MEL-01-09, and MEL-01-10. These results suggest the plume was migrating north and west of the diffuser in mid-July.

On August 22, conditions at MEL-01 were well-mixed except at MEL-01-01 (100 m west of the diffuser) (**Figure 3-3**). Discharge resumed on August 20, and the profile from MEL-01-01 indicates the plume was migrating west of the diffuser (**Figure 2-5**).

Conditions in MEL-01 were fully mixed on September 15 despite relatively higher discharge rates in early September to draw down water levels in CP1 before freeze-up. Heading into winter, conductivity was 115 µS/cm at MEL-01, 95 µS/cm at MEL-02, and 87 µS/cm at MEL-03.

3.4.2 Water Quality Screening Assessment

Descriptive statistics and results of the screening assessment are provided **Appendix C1**. Plots showing the concentrations of each parameter by area from 1997 to 2023 are provided in **Appendix C2**.

There were no exceedances of AEMP Action Levels in 2023 attributed to activities at the Mine. The concentrations of parameters of interest in 2023 represent a small percentage of their respective AEMP Action Levels (triggers) and Benchmarks (**Figure 3-4**).

Similar to previous years, a small number of samples naturally exceeded the aquatic life water quality guidelines for dissolved copper (ECCC, 2021). The exceedances in 2023 were at MEL-02 (n=1), MEL-03 (n=2), and MEL-04 (n=1) (**Figure 3-5**). The exceedance at MEL-02 was in sample MEL-02-06 in August (4.0 µg/L). This result was noticeably higher compared to the other four stations at MEL-02 (1.1 to 1.5 µg/L) and outside the range observed in Meliadine Lake (**Figure C2-53**). A description of the copper biotic ligand model (BLM) water quality guideline is provided in **Appendix C1**. Overall, exceedances of the AEMP Benchmark for copper are natural, transient, and low in magnitude.

Dissolved zinc exceeded the CCME water quality guideline at MEL-01-09 in August, but the dissolved concentration in this sample was 13.9 µg/L compared to 0.56 µg/L in the unfiltered (total) fraction. Dissolved zinc in three of the other samples from MEL-01 in August were below detection (0.5 µg/L). The results from MEL-01-09 was flagged as an outlier and not considered representative of current conditions.

Figure 3-2 Average temperature, dissolved oxygen, pH, and specific conductivity by month in 2023

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).

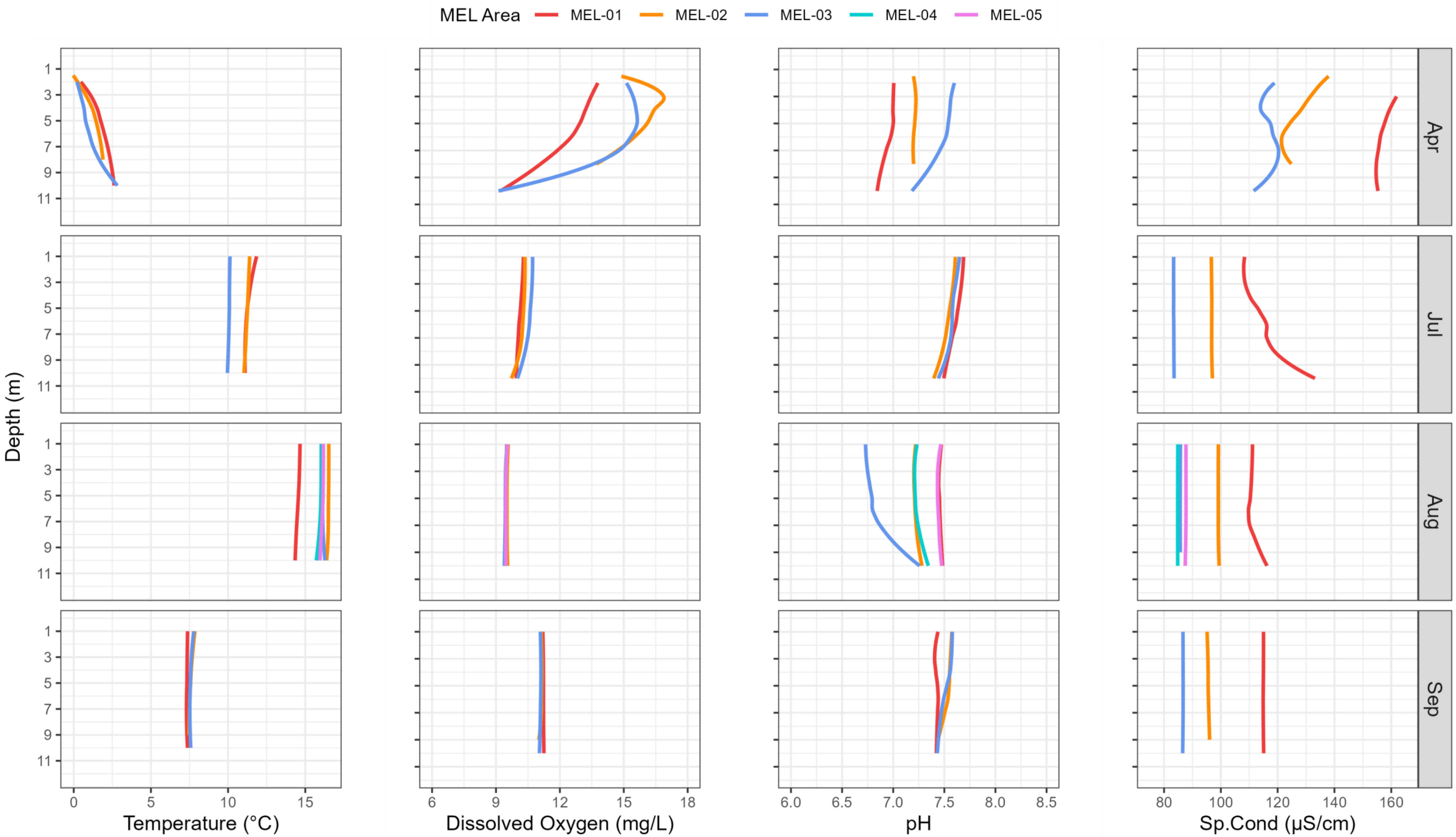


Figure 3-3 Specific conductivity (µS/cm) results from the 2023 limnology profiles

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

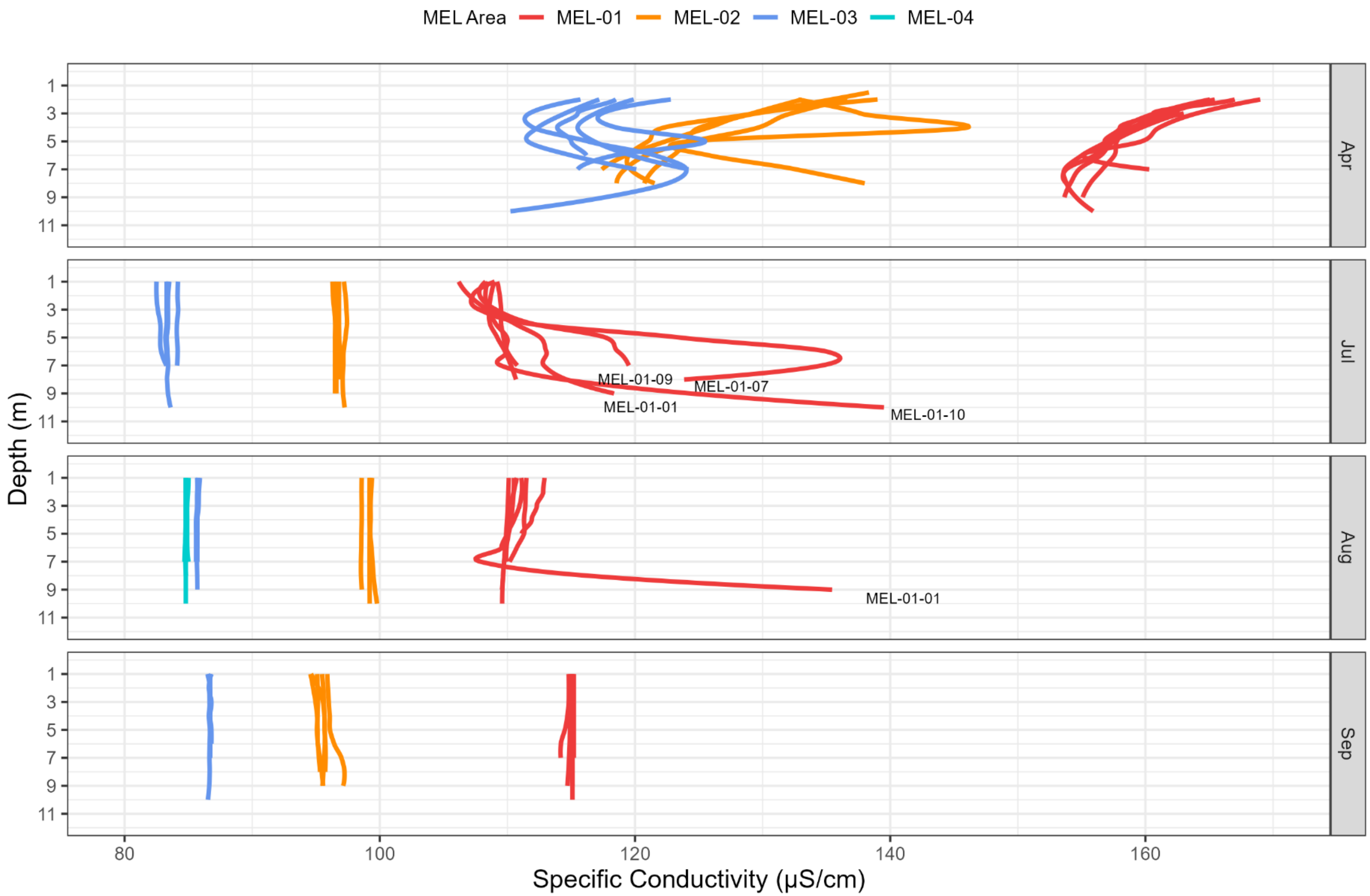


Figure 3-4. Water chemistry results from 2023 compared to the Normal Range, AEMP Action Levels, AEMP Benchmarks

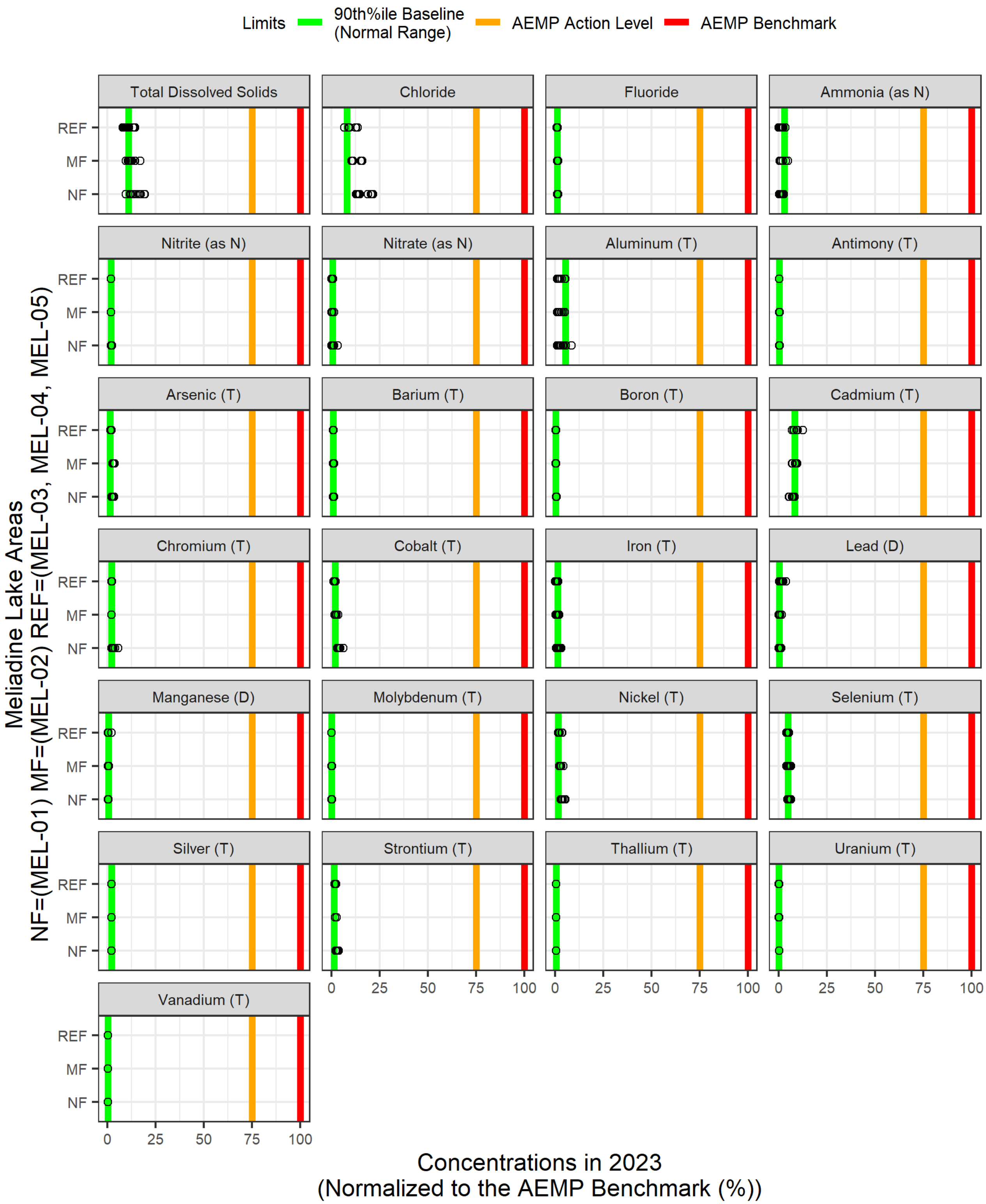
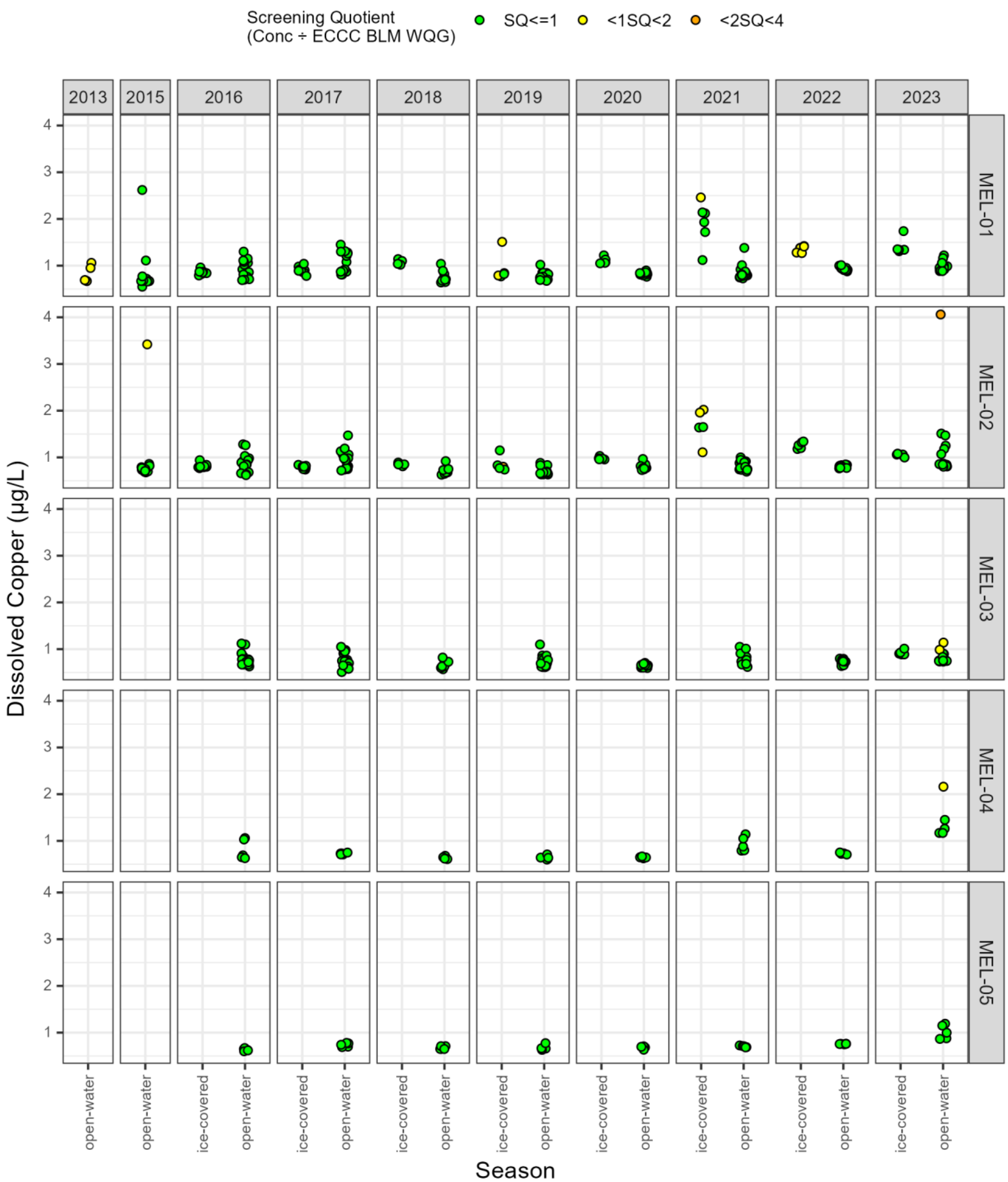


Figure 3-5. Copper concentrations in Meliadine Lake compared to the AEMP Benchmark

Notes: Screening quotients = concentration (µg/L) ÷ AEMP Benchmark (copper BLM; ECCC, 2021).



3.4.3 Spatial and Temporal Changes

The purpose of the temporal and spatial assessment is to understand the underlying cause of changes in water quality in Meliadine Lake. The potential for effluent to cause changes in water quality in the East Basin was predicted in the 2014 FEIS (Agnico Eagle, 2014) and the 2020 hydrodynamic model (Tetra Tech, 2020). What is not well understood is the effect of climate/weather patterns on changes in water quality in Meliadine Lake. In broad terms, 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). The AEMP was not designed to monitoring the effect of changes in climate on water quality in Meliadine Lake; however, climate data presented in **Section 2.2** are incorporated into the discussion to help understand if changes in water quality are related solely to mining activities or if other factors may be affecting temporal and spatial trends in Meliadine Lake.

The following step-wise approach was taken to focus the discussion on parameters that are increasing in Meliadine Lake.

Step 1: Identify parameters at MEL-01 that exceeded the normal range in 2023 (long-list)

In total, there were 28 parameters where the annual mean concentration exceeded the normal range (**Table 3-3**). Titanium exceeded the normal range (0.17 µg/L) based on the annual mean (0.21 µg/L) but not the median (0.10 µg/L). The annual mean concentration was influenced by one sample (1.6 µg/L at MEL-10-10 in July) that biased the annual mean (positively skewed data). There is no evidence that effluent is causing titanium concentrations to increase in Meliadine Lake. Among the remaining 27 parameters that exceeded the normal range at MEL-01 in 2023, 12 parameters had average concentrations that were >5% higher compared to 2022, 11 parameters were ≤5% higher than 2022, and 4 parameters were lower in 2023 compared to 2022 (**Table 3-4**).

Step 2: Identify parameters that have always exceeded the normal range at MEL-01

Some parameters at MEL-01 have always exceeded the normal range of baseline/reference conditions, which suggests water quality the East Basin was naturally different compared to other areas of Meliadine Lake before the Mine started discharging treated effluent in 2018. Therefore, parameters that have always exceeded the normal range but have remained stable in recent years were not carried forward in the discussion. The following parameters were dropped at this step of the analysis:

- reactive silica, cobalt, copper, iron, and molybdenum

The stable temporal trends for these parameters are illustrated in the condense temporal plots (**Section 3.6**) and supported by the ANOVA and Tukey post hoc comparisons in **Table 3-5**.

Step 3: Identify parameters that have increased in MEL-01 in recent years (short-list)

The short-list of parameters that have trended higher in Meliadine Lake compared to the baseline period were identified using ANOVA and Tukey post hoc comparisons supported by the condensed temporal plots. The short-list of parameters that were carried forward for discussion are:

- Major ions: chloride, calcium, magnesium, potassium, sodium, and sulphate. Concentrations of these major ions are also reflected in compound measures of water quality parameters, such as total alkalinity, conductivity, total dissolved solids (TDS), and hardness. As a result, measurements of major ions and compound water quality parameters can covary and follow similar trends and patterns of change.
- Total Kjeldahl nitrogen (TKN) and organic carbon (TOC and DOC).
- Metals: arsenic, barium, lithium, manganese, strontium, uranium.

Table 3-3. Normal Range assessment for Meliadine Lake in 2023

Parameter	Units	Detection Limits (min | max)	Normal Range	Average Concentration (July-Sept)				
				MEL-01	MEL-02	MEL-03	MEL-04	MEL-05
Conventional Parameters								
Conductivity (lab)	µS/cm	1.0	77.5	116	96.4	85.4	77.9	83.5
Hardness	mg/L	0.5	23.4	33.5	28.7	25.9	21.9	26.9
Total Dissolved Solids	mg/L	10	54	64	55.2	48.1	48.4	51.6
Total Dissolved Solids (Calculated)	mg/L	1.0	39.6	75.6	62.7	55.5	50.6	54.2
Major Ions								
Alkalinity, Total	mg/L	1.0	20.5	21	20.1	19.4	19.2	22.4
Calcium (T)	mg/L	0.01 | 0.02	7.33	10.2	8.9	8.27	7.82	8.17
Chloride	mg/L	0.1	9.56	16.6	13.1	11.1	10.4	11.1
Magnesium (T)	mg/L	0.004 | 0.01	1.18	1.88	1.52	1.4	1.29	1.31
Potassium (T)	mg/L	0.02 | 0.03	0.954	1.19	1.06	1.03	0.967	0.983
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	0.268	0.544	0.435	0.342	0.331	0.409
Sodium (T)	mg/L	0.02	4.85	8.24	6.39	5.55	5.19	5.22
Sulphate	mg/L	0.3	3.87	7.21	5.55	4.46	4.28	4.49
Nutrients & Organic Carbon								
Total Kjeldahl Nitrogen	mg/L	0.05	0.25	0.273	0.252	0.225	0.198	0.204
Dissolved Organic Carbon	mg/L	0.5	2.72	4.28	3.99	3.47	4.27	3.93
Total Organic Carbon	mg/L	0.5	3	4.2	3.83	3.17	3.99	3.93
Metals								
Arsenic (T)	ug/L	0.02	0.275	0.642	0.749	0.406	0.364	0.492
Barium (T)	ug/L	0.02	8.05	9.53	9.14	8.81	8.66	8.99
Cobalt (T)	ug/L	0.005	0.016	0.0295	0.0188	0.0151	0.015	0.0153
Copper (T)	ug/L	0.05	0.86	0.992	1.09	0.907	1.08	0.877
Iron (T)	ug/L	1.0	15	24.6	16.1	13.8	8.14	12.1
Lithium (T)	ug/L	0.5	0.72	1.11	*0.914*	*0.839*	*0.816*	*0.818*
Manganese (T)	ug/L	0.05	3.06	9.5	5.33	3.96	3.76	5
Molybdenum (T)	ug/L	0.05	0.107	0.145	0.107	*0.0929*	*0.089*	*0.0962*
Nickel (T)	ug/L	0.05	0.441	0.829	0.699	0.525	0.64	0.503
Strontium (T)	ug/L	0.02	36.1	59.2	48.5	42.4	40.8	41.7
Titanium (T)**	ug/L	0.05	0.17	0.208	-	0.136	-	-
Uranium (T)	ug/L	0.001	0.0164	0.0284	0.0216	0.0204	0.0178	0.0188
Copper (D)	ug/L	0.05	0.861	0.972	1.2	0.845	1.44	1.02

Notes:
Italicized numbers indicate the mean concentration was <2*DL.
"-" = annual mean not calculated because more the 50% of the values were < DL.
Titanium was not carried forward as a parameter of interest. The median concentration in 2023 was 0.1 µg/L, below the normal range.
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 3-4. Annual mean concentrations at MEL-01 for parameters that exceed the Normal Range in 2023

Parameter	Normal Range	Average Concentration at MEL-01 (Open-Water Season)										2023 Rank	% Change from		
		2013	2015	2016	2017	2018	2019	2020	2021	2022	2023		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	**1**	50%	80%	0%
Hardness	23.4	19.3	20	22.5	24.1	24.7	22.7	29.5	28.1	31.3	33.5	**1**	43%	74%	7%
Total Dissolved Solids	54	40.3	38	45.1	53.4	54.4	49.2	70.6	56.9	64.5	64	3	19%	59%	-1%
Total Dissolved Solids (Calculated)	39.6	NA	33.1	37	41.5	42.4	41	55.3	51.8	56.4	75.6	**1**	91%	128%	34%
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	2	2%	24%	-3%
Calcium (T)	7.33	6.17	6.36	7.22	7.85	7.77	7.16	8.79	8.4	9.56	10.2	**1**	39%	65%	7%
Chloride	9.56	7.57	8.6	9.35	10.6	12.7	11.9	17.8	16.2	16.2	16.6	2	74%	119%	2%
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**	59%	79%	5%
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**	25%	43%	0%
Reactive Silica (SiO2)	0.268	0.5	0.358	0.427	0.546	0.39	NA	0.333	0.357	0.399	0.544	2	103%	9%	36%
Sodium (T)	4.85	3.85	4.37	4.8	5.32	5.63	5.58	8.17	7.7	8.01	8.24	**1**	70%	114%	3%
Sulphate	3.87	3.27	3.6	4.02	4.73	4.23	4.31	5.68	5.8	6.43	7.21	**1**	86%	120%	12%
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	2	9%	32%	-13%
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	**1**	57%	60%	2%
Total Organic Carbon	3	2.77	2.94	2.69	3.28	3.15	2.85	3.44	3.4	3.92	4.2	**1**	40%	52%	7%
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	**1**	133%	53%	11%
Barium (T)	8.05	6.57	6.82	7.33	7.95	8.33	7.68	8.49	8.44	8.62	9.53	**1**	18%	45%	11%
Cobalt (T)	0.016	0.1	0.0207	0.025	0.0225	0.0244	0.0275	0.0302	0.0361	0.0269	0.0295	4	84%	-71%	10%
Copper (T)	0.86	1.15	0.706	0.77	0.984	0.832	0.806	0.848	1.07	0.949	0.992	3	15%	-14%	5%
Iron (T)	15	24	19.7	22.2	25.4	25.1	32.4	25.9	31.4	23.2	24.6	6	64%	3%	6%
Lithium (T)	0.72	0.712	0.624	0.928	0.696	1.51	1.12	1.53	1.28	1.18	1.11	6	54%	56%	-6%
Manganese (T)	3.06	3.37	5.63	7.27	5.85	5.97	9.33	8.32	9.46	7.3	9.5	**1**	210%	182%	30%
Molybdenum (T)	0.107	0.0968	0.0621	0.0565	0.0827	0.077	0.0766	0.155	0.437	0.138	0.145	3	36%	50%	5%
Nickel (T)	0.441	0.692	0.534	0.566	0.699	0.672	0.638	0.781	0.733	0.795	0.829	**1**	88%	20%	4%
Strontium (T)	36.1	29	29	32.6	37.3	50.7	45.4	67.1	58.5	59.4	59.2	3	64%	104%	0%
Titanium (T)	0.17														
Uranium (T)	0.0164	0.0166	0.0139	0.0148	0.0185	0.0174	0.0155	0.0189	0.0215	0.0265	0.0284	**1**	73%	71%	7%
Copper (D)	0.861	0.812	0.846	0.928	1.08	0.751	0.785	0.827	0.854	0.939	0.972	2	13%	20%	4%

Notes:

% Change from = the difference between the annual mean concentration in 2022 and the normal range or mean concentration in 2021 or 2013.

NA = TDS calculated was not reported in 2013.

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. Results of the ANOVA and pairwise comparisons for parameters of interest in Meliadine Lake

<table>
<tr><th rowspan="2">Parameter</th><th rowspan="2">Sampling Area</th><th colspan="10">ANOVA Model Estimates | Pairwise Statistical Differences Among Years | % Changes Relative to Previous Year</th></tr>
<tr><th>2013</th><th>2015</th><th>2016</th><th>2017</th><th>2018</th><th>2019</th><th>2020</th><th>2021</th><th>2022</th><th>2023</th></tr>
<tr><td colspan="12">Conventional Parameters</td></tr>
<tr><td rowspan="3">Conductivity (lab)</td><td>MEL-01</td><td>64.44 | b | →</td><td>68.943 | ab | +7%</td><td>74.067 | a | +7%</td><td>80.653 | c | +9%</td><td>86.25 | c | +7%</td><td>82.5 | c | −4%</td><td>108.7 | d | +32%</td><td>106.9 | d | −2%</td><td>115.6 | e | +8%</td><td>116.2 | e | <1%</td></tr>
<tr><td>MEL-02</td><td>-</td><td>70.527 | a | →</td><td>69.687 | a | −1%</td><td>74.607 | ab | +7%</td><td>76.82 | abc | +3%</td><td>80.2 | bc | +4%</td><td>84.1 | cd | +5%</td><td>88.8 | de | +6%</td><td>93.587 | ef | +5%</td><td>96.4 | f | +3%</td></tr>
<tr><td>MEL-03</td><td>-</td><td>-</td><td>66.907 | b | →</td><td>68.113 | ab | +2%</td><td>70.23 | abc | +3%</td><td>75.353 | cd | +7%</td><td>73.247 | acd | −3%</td><td>77.2 | d | +5%</td><td>86.4 | e | +12%</td><td>85.4 | e | −1%</td></tr>
<tr><td rowspan="3">Hardness</td><td>MEL-01</td><td>19.3 | a | →</td><td>19.95 | a | +3%</td><td>22.54 | b | +13%</td><td>24.107 | cd | +7%</td><td>24.74 | c | +3%</td><td>22.733 | bd | −8%</td><td>29.5 | e | +30%</td><td>28.0 | e | −5%</td><td>31.2 | f | +11%</td><td>33.4 | g | +7%</td></tr>
<tr><td>MEL-02</td><td>-</td><td>19.913 | b | →</td><td>21.313 | ab | +7%</td><td>22.087 | ac | +4%</td><td>21.456 | abc | −3%</td><td>23.193 | cd | +8%</td><td>24.313 | d | +5%</td><td>24.507 | d | <1%</td><td>26.5 | e | +8%</td><td>28.69 | f | +8%</td></tr>
<tr><td>MEL-03</td><td>-</td><td>-</td><td>20.5 | a | →</td><td>20.987 | a | +2%</td><td>22.65 | ab | +8%</td><td>21.667 | a | −4%</td><td>21.84 | a | <1%</td><td>22.293 | ab | +2%</td><td>24.387 | bc | +9%</td><td>25.927 | c | +6%</td></tr>
<tr><td rowspan="3">Total Dissolved Solids</td><td>MEL-01</td><td>40.26 | ac | →</td><td>37.964 | a | −6%</td><td>45.067 | abc | +19%</td><td>53.4 | bd | +18%</td><td>54.4 | bd | +2%</td><td>49.2 | bcd | −10%</td><td>70.6 | e | +44%</td><td>56.944 | df | −19%</td><td>64.5 | ef | +13%</td><td>64.028 | ef | <1%</td></tr>
<tr><td>MEL-02</td><td>-</td><td>38.653 | b | →</td><td>45.533 | ab | +18%</td><td>48.8 | ac | +7%</td><td>45.8 | ab | −6%</td><td>49.933 | ac | +9%</td><td>49.133 | ac | −2%</td><td>52.333 | ac | +6%</td><td>54.133 | c | +3%</td><td>55.187 | c | +2%</td></tr>
<tr><td>MEL-03</td><td>-</td><td>-</td><td>40.98 | a | →</td><td>41.067 | a | <1%</td><td>38.6 | a | −6%</td><td>63.667 | b | +65%</td><td>45.133 | a | −29%</td><td>47.867 | a | +6%</td><td>51.467 | ab | +8%</td><td>48.053 | a | −7%</td></tr>
<tr><td rowspan="3">Total Dissolved Solids (Calculated)</td><td>MEL-01</td><td>-</td><td>33.064 | f | →</td><td>36.953 | a | +12%</td><td>41.493 | b | +12%</td><td>42.42 | b | +2%</td><td>41.04 | b | −3%</td><td>55.3 | c | +35%</td><td>51.778 | d | −6%</td><td>56.406 | c | +9%</td><td>75.583 | e | +34%</td></tr>
<tr><td>MEL-02</td><td>-</td><td>33.847 | b | →</td><td>34.513 | ab | +2%</td><td>38.047 | ac | +10%</td><td>36.944 | ab | −3%</td><td>42.073 | cd | +14%</td><td>44.093 | d | +5%</td><td>42.807 | d | −3%</td><td>45.52 | d | +6%</td><td>62.68 | e | +38%</td></tr>
<tr><td>MEL-03</td><td>-</td><td>-</td><td>32.993 | b | →</td><td>34.707 | ab | +5%</td><td>35.63 | abc | +3%</td><td>37.473 | cd | +5%</td><td>38.667 | d | +3%</td><td>37.167 | acd | −4%</td><td>42.073 | e | +13%</td><td>55.52 | f | +32%</td></tr>
<tr><td colspan="12">Major Ions</td></tr>
<tr><td rowspan="3">Alkalinity, Total</td><td>MEL-01</td><td>16.92 | bc | →</td><td>14.114 | a | −17%</td><td>15.807 | b | +12%</td><td>17.293 | bc | +9%</td><td>16.13 | bc | −7%</td><td>16.487 | bc | +2%</td><td>19.52 | d | +18%</td><td>17.533 | c | −10%</td><td>21.728 | e | +24%</td><td>21.017 | e | −3%</td></tr>
<tr><td>MEL-02</td><td>-</td><td>14.887 | b | →</td><td>15.607 | ab | +5%</td><td>16.987 | ac | +9%</td><td>17.72 | cd | +4%</td><td>18.72 | de | +6%</td><td>20.267 | f | +8%</td><td>17.02 | ac | −16%</td><td>19.887 | ef | +17%</td><td>20.053 | ef | <1%</td></tr>
<tr><td>MEL-03</td><td>-</td><td>-</td><td>15.547 | b | →</td><td>16.113 | ab | +4%</td><td>16.97 | ab | +5%</td><td>17.207 | a | +1%</td><td>19.767 | c | +15%</td><td>17 | a | −14%</td><td>19.167 | c | +13%</td><td>19.353 | c | +1%</td></tr>
<tr><td rowspan="3">Calcium (T)</td><td>MEL-01</td><td>6.174 | a | →</td><td>6.356 | a | +3%</td><td>7.219 | b | +14%</td><td>7.854 | c | +9%</td><td>7.767 | c | −1%</td><td>7.159 | b | −8%</td><td>8.793 | d | +23%</td><td>8.404 | d | −4%</td><td>9.562 | e | +14%</td><td>10.154 | f | +6%</td></tr>
<tr><td>MEL-02</td><td>-</td><td>6.409 | e | →</td><td>6.945 | a | +8%</td><td>7.4 | b | +6%</td><td>7.435 | b | <1%</td><td>7.163 | ab | −4%</td><td>7.44 | b | +4%</td><td>7.538 | b | +1%</td><td>8.282 | c | +10%</td><td>8.896 | d | +7%</td></tr>
<tr><td>MEL-03</td><td>-</td><td>-</td><td>6.579 | b | →</td><td>6.851 | ab | +4%</td><td>6.774 | ab | −1%</td><td>6.79 | ab | <1%</td><td>6.798 | ab | <1%</td><td>6.983 | a | +3%</td><td>7.763 | c | +11%</td><td>8.266 | d | +6%</td></tr>
<tr><td rowspan="3">Chloride</td><td>MEL-01</td><td>7.568 | a | →</td><td>8.601 | a | +14%</td><td>9.354 | ab | +9%</td><td>10.627 | bc | +14%</td><td>12.69 | d | +19%</td><td>11.88 | cd | −6%</td><td>17.8 | e | +50%</td><td>16.222 | f | −9%</td><td>16.211 | f | <1%</td><td>16.567 | ef | +2%</td></tr>
<tr><td>MEL-02</td><td>-</td><td>8.821 | a | →</td><td>8.395 | a | −5%</td><td>9.376 | ab | +12%</td><td>9.372 | ab | <1%</td><td>10.885 | bc | +16%</td><td>11.927 | cd | +10%</td><td>12.167 | cd | +2%</td><td>12.021 | cd | −1%</td><td>13.12 | d | +9%</td></tr>
<tr><td>MEL-03</td><td>-</td><td>-</td><td>7.758 | b | →</td><td>8.228 | ab | +6%</td><td>8.347 | ab | +1%</td><td>9.447 | a | +13%</td><td>9.388 | a | <1%</td><td>9.334 | a | <1%</td><td>10.911 | c | +17%</td><td>11.107 | c | +2%</td></tr>
<tr><td rowspan="3">Magnesium (T)</td><td>MEL-01</td><td>1.048 | a | →</td><td>1.098 | a | +5%</td><td>1.23 | b | +12%</td><td>1.365 | c | +11%</td><td>1.386 | c | +2%</td><td>1.315 | bc | −5%</td><td>1.743 | d | +33%</td><td>1.633 | e | −6%</td><td>1.786 | df | +9%</td><td>1.881 | f | +5%</td></tr>
<tr><td>MEL-02</td><td>-</td><td>1.082 | a | →</td><td>1.134 | a | +5%</td><td>1.279 | bc | +13%</td><td>1.241 | ab | −3%</td><td>1.29 | bc | +4%</td><td>1.34 | bc | +4%</td><td>1.359 | bc | +1%</td><td>1.409 | cd | +4%</td><td>1.525 | d | +8%</td></tr>
<tr><td>MEL-03</td><td>-</td><td>-</td><td>1.073 | a | →</td><td>1.121 | a | +4%</td><td>1.133 | a | +1%</td><td>1.174 | a | +4%</td><td>1.16 | a | −1%</td><td>1.153 | a | <1%</td><td>1.295 | b | +12%</td><td>1.401 | b | +8%</td></tr>
<tr><td rowspan="3">Potassium (T)</td><td>MEL-01</td><td>0.83 | a | →</td><td>0.847 | a | +2%</td><td>0.886 | a | +5%</td><td>1.005 | b | +13%</td><td>0.979 | b | −3%</td><td>0.98 | b | <1%</td><td>1.157 | cd | +18%</td><td>1.116 | c | −4%</td><td>1.194 | d | +7%</td><td>1.195 | d | <1%</td></tr>
<tr><td>MEL-02</td><td>-</td><td>0.852 | a | →</td><td>0.875 | a | +3%</td><td>0.953 | b | +9%</td><td>0.951 | bc | <1%</td><td>0.979 | bcd | +3%</td><td>1.012 | cde | +3%</td><td>1.021 | de | <1%</td><td>1.057 | e | +4%</td><td>1.057 | e | <1%</td></tr>
<tr><td>MEL-03</td><td>-</td><td>-</td><td>0.849 | b | →</td><td>0.915 | a | +8%</td><td>0.886 | ab | −3%</td><td>0.927 | a | +5%</td><td>0.936 | a | <1%</td><td>0.942 | a | <1%</td><td>1.029 | c | +9%</td><td>1.028 | c | <1%</td></tr>
<tr><td rowspan="3">Sodium (T)</td><td>MEL-01</td><td>3.848 | a | →</td><td>4.366 | a | +13%</td><td>4.805 | ab | +10%</td><td>5.325 | bc | +11%</td><td>5.633 | bc | +6%</td><td>5.585 | c | <1%</td><td>8.167 | d | +46%</td><td>7.7 | d | −6%</td><td>8.014 | d | +4%</td><td>8.244 | d | +3%</td></tr>
<tr><td>MEL-02</td><td>-</td><td>4.37 | a | →</td><td>4.469 | a | +2%</td><td>4.771 | ab | +7%</td><td>4.936 | abc | +4%</td><td>5.71 | bcd | +16%</td><td>5.742 | cd | <1%</td><td>5.959 | cd | +4%</td><td>6.071 | d | +2%</td><td>6.391 | d | +5%</td></tr>
<tr><td>MEL-03</td><td>-</td><td>-</td><td>4.242 | b | →</td><td>4.356 | ab | +3%</td><td>4.386 | ab | <1%</td><td>5.007 | ac | +14%</td><td>4.743 | ab | −5%</td><td>4.75 | ab | <1%</td><td>5.596 | c | +18%</td><td>5.545 | c | <1%</td></tr>
<tr><td rowspan="3">Sulphate</td><td>MEL-01</td><td>3.268 | b | →</td><td>3.598 | ab | +10%</td><td>4.023 | abc | +12%</td><td>4.732 | d | +18%</td><td>4.225 | acd | −11%</td><td>4.309 | cd | +2%</td><td>5.677 | e | +32%</td><td>5.802 | e | +2%</td><td>6.434 | f | +11%</td><td>7.211 | g | +12%</td></tr>
<tr><td>MEL-02</td><td>-</td><td>3.665 | a | →</td><td>3.579 | a | −2%</td><td>4.065 | b | +14%</td><td>3.866 | ab | −5%</td><td>4.119 | bc | +7%</td><td>4.425 | cd | +7%</td><td>4.484 | d | +1%</td><td>4.636 | d | +3%</td><td>5.548 | e | +20%</td></tr>
<tr><td>MEL-03</td><td>-</td><td>-</td><td>3.251 | d | →</td><td>3.517 | a | +8%</td><td>3.528 | a | <1%</td><td>3.742 | a | +6%</td><td>3.747 | a | <1%</td><td>3.674 | a | −2%</td><td>4.021 | b | +10%</td><td>4.459 | c | +11%</td></tr>
</table>

Table 3-5. Results of the ANOVA and pairwise comparisons for parameters of interest in Meliadine Lake

Parameter	Sampling Area	ANOVA Model Estimates | Pairwise Statistical Differences Among Years | % Changes Relative to Previous Year									
		2013	2015	2016	2017	2018	2019	2020	2021	2022	2023
Nutrients & Organic Carbon											
Total Kjeldahl Nitrogen	MEL-01	0.207 | abcd | →	0.168 | ab | −19%	0.138 | a | −18%	0.221 | bc | +61%	0.233 | bcd | +6%	0.218 | bc | −6%	0.267 | cd | +22%	0.244 | cd | −9%	0.313 | d | +29%	0.273 | cd | −13%
	MEL-02	-	0.214 | bc | →	0.137 | a | −36%	0.17 | ab | +24%	0.233 | bc | +37%	0.2 | abc | −14%	0.264 | c | +32%	0.222 | bc | −16%	0.221 | bc | <1%	0.252 | c | +14%
	MEL-03	-	-	0.143 | a | →	0.158 | a | +10%	0.182 | abc | +15%	0.167 | ab | −8%	0.209 | bc | +25%	0.138 | a | −34%	0.224 | c | +62%	0.225 | c | <1%
Total Phosphorus	MEL-01	0.004 | a | →	0.006 | a | +74%	0.008 | a | +32%	0.007 | a | −23%	0.006 | a | −4%	0.006 | a | −1%	0.008 | a | +27%	0.007 | a | −7%	0.007 | a | −7%	0.006 | a | −12%
	MEL-02	-	0.005 | ab | →	0.005 | ab | −6%	0.005 | a | +15%	0.003 | b | −44%	0.004 | ab | +40%	0.006 | a | +36%	0.005 | a | −7%	0.004 | ab | −27%	0.004 | ab | +13%
	MEL-03	-	-	0.005 | b | →	0.005 | ab | −2%	0.003 | c | −39%	0.003 | ac | +14%	0.003 | abc | <1%	0.004 | abc | +21%	0.003 | ac | −20%	0.004 | abc | +22%
Dissolved Organic Carbon	MEL-01	2.676 | ab | →	2.881 | ab | +8%	2.69 | a | −7%	3.319 | cd | +23%	3.072 | bc | −7%	2.799 | ab | −9%	3.445 | d | +23%	3.474 | d | <1%	4.187 | e | +20%	4.285 | e | +2%
	MEL-02	-	2.739 | bc | →	2.399 | a | −12%	2.893 | b | +21%	2.725 | abc | −6%	2.518 | ac | −8%	2.985 | b | +18%	3.025 | b | +1%	3.819 | d | +26%	3.986 | d | +4%
	MEL-03	-	-	2.294 | ab | →	2.217 | a | −3%	2.346 | ab | +6%	2.206 | a | −6%	2.209 | a | <1%	2.633 | b | +19%	3.171 | c | +20%	3.469 | c | +9%
Total Organic Carbon	MEL-01	2.77 | ab | →	2.937 | ab | +6%	2.689 | a | −8%	3.281 | c | +22%	3.151 | bc | −4%	2.851 | ab | −10%	3.436 | c | +20%	3.398 | c | −1%	3.923 | d | +15%	4.197 | e | +7%
	MEL-02	-	2.619 | a | →	2.415 | a | −8%	2.967 | b | +23%	2.668 | ac | −10%	2.623 | a | −2%	3.059 | b | +17%	2.923 | bc | −4%	3.561 | d | +22%	3.825 | e | +7%
	MEL-03	-	-	2.269 | a | →	2.269 | a | <1%	2.309 | ab | +2%	2.345 | ab | +2%	2.154 | a | −8%	2.587 | b | +20%	2.905 | c | +12%	3.167 | c | +9%
Metals											
Arsenic (T)	MEL-01	0.42 | abd | →	0.338 | a | −19%	0.4 | ab | +18%	0.434 | b | +8%	0.385 | ab | −11%	0.398 | ab | +3%	0.523 | cd | +31%	0.524 | cd | <1%	0.576 | ce | +10%	0.642 | e | +11%
	MEL-02	-	0.244 | a | →	0.258 | a | +6%	0.266 | a | +3%	0.257 | a | −3%	0.296 | a | +15%	0.471 | b | +60%	0.56 | c | +19%	0.592 | c | +6%	0.749 | d | +27%
	MEL-03	-	-	0.198 | a | →	0.199 | a | <1%	0.196 | a | −1%	0.222 | a | +13%	0.271 | b | +22%	0.341 | c | +26%	0.333 | c | −2%	0.406 | d | +22%
Barium (T)	MEL-01	6.572 | a | →	6.821 | a | +4%	7.329 | b | +7%	7.949 | cd | +8%	8.328 | ce | +5%	7.676 | bd | −8%	8.494 | e | +11%	8.436 | e | <1%	8.62 | e | +2%	9.527 | f | +10%
	MEL-02	-	7.305 | b | →	7.662 | ab | +5%	7.761 | ac | +1%	8.15 | cd | +5%	8.046 | acd | −1%	8.32 | d | +3%	8.151 | cd | −2%	7.853 | ac | −4%	9.141 | e | +16%
	MEL-03	-	-	7.482 | bc | →	7.492 | abc | <1%	7.579 | abc | +1%	7.305 | b | −4%	7.766 | ac | +6%	7.815 | a | <1%	7.789 | ac | <1%	8.812 | d | +13%
Cobalt (T)	MEL-01	0.1 | c | →	0.021 | a | −79%	0.025 | a | +21%	0.023 | a | −10%	0.024 | ab | +8%	0.027 | ab | +13%	0.03 | ab | +10%	0.036 | b | +19%	0.027 | ab | −26%	0.029 | ab | +10%
	MEL-02	-	0.018 | a | →	0.014 | a | −22%	0.016 | a | +14%	0.018 | a | +11%	0.016 | a | −8%	0.018 | a | +9%	0.018 | a | +4%	0.014 | a | −26%	0.019 | a | +38%
	MEL-03	-	-	0.012 | acd | →	0.01 | a | −22%	0.017 | b | +73%	0.013 | cd | −22%	0.012 | acd | −4%	0.012 | ac | −6%	0.012 | ac | <1%	0.015 | bd | +30%
Copper (T)	MEL-01	1.148 | d | →	0.706 | a | −38%	0.77 | ab | +9%	0.984 | cd | +28%	0.832 | abc | −15%	0.806 | abc | −3%	0.848 | abc | +5%	1.067 | d | +26%	0.949 | bcd | −11%	0.992 | cd | +5%
	MEL-02	-	0.754 | a | →	0.789 | ab | +5%	0.934 | ab | +18%	0.727 | a | −22%	0.923 | ab | +27%	0.999 | ab | +8%	0.907 | ab | −9%	0.807 | ab | −11%	1.086 | b | +35%
	MEL-03	-	-	0.685 | a | →	0.795 | ab | +16%	0.708 | ab | −11%	0.98 | ab | +38%	0.676 | a | −31%	1.129 | b | +67%	0.747 | ab | −34%	0.907 | ab | +21%
Iron (T)	MEL-01	24 | ab | →	19.686 | a | −18%	22.227 | ab | +13%	25.367 | ab | +14%	25.07 | ab | −1%	32.433 | b | +29%	25.94 | ab | −20%	31.433 | b | +21%	23.167 | ab | −26%	24.606 | ab | +6%
	MEL-02	-	18.013 | ab | →	14.02 | ab | −22%	15.233 | ab | +9%	19.28 | ab | +27%	20.82 | a | +8%	17.633 | ab | −15%	15.667 | ab | −11%	11.14 | b | −29%	16.08 | ab | +44%
	MEL-03	-	-	12.32 | a | →	10.887 | a | −12%	14.97 | a | +38%	13.887 | a | −7%	12.88 | a | −7%	11.013 | a | −14%	10.027 | a | −9%	13.846 | a | +38%
Lithium (T)	MEL-01	0.712 | ac | →	0.624 | a | −12%	0.928 | bc | +49%	0.696 | a | −25%	1.507 | d | +116%	1.123 | be | −26%	1.532 | d | +36%	1.279 | e | −16%	1.178 | e | −8%	1.108 | be | −6%
	MEL-02	-	0.593 | c | →	0.793 | ab | +34%	0.628 | ac | −21%	0.819 | ab | +30%	0.852 | b | +4%	0.942 | b | +11%	0.949 | b | <1%	0.937 | b | −1%	0.914 | b | −2%
	MEL-03	-	-	0.534 | c | →	0.619 | ab | +16%	0.555 | ac | −10%	0.653 | b | +18%	0.679 | bd | +4%	0.742 | de | +9%	0.817 | ef | +10%	0.839 | f | +3%
Manganese (T)	MEL-01	3.374 | b | →	5.634 | ab | +67%	7.27 | ab | +29%	5.846 | ab | −20%	5.971 | ab | +2%	9.331 | ab | +56%	8.316 | ab | −11%	9.455 | a | +14%	7.301 | ab | −23%	9.501 | a | +30%
	MEL-02	-	3.586 | ac | →	4.785 | ab | +33%	4.271 | abc | −11%	4.218 | abc | −1%	4.247 | abc | <1%	3.941 | ac | −7%	3.905 | ac | <1%	3.107 | c | −20%	5.334 | b | +72%
	MEL-03	-	-	2.762 | a | →	2.261 | ab | −18%	2.8 | a | +24%	2.521 | ab | −10%	2.721 | a | +8%	2.512 | ab | −8%	1.9 | b | −24%	3.958 | c | +108%
Molybdenum (T)	MEL-01	0.097 | a | →	0.062 | a | −36%	0.056 | a | −9%	0.083 | a | +46%	0.077 | a | −7%	0.077 | a | <1%	0.155 | a | +103%	0.437 | a | +181%	0.138 | a | −68%	0.145 | a | +5%
	MEL-02	-	0.061 | a | →	0.056 | a | −8%	0.083 | a | +48%	0.08 | a | −4%	0.07 | a | −12%	0.47 | a | +574%	0.085 | a | −82%	0.125 | a | +47%	0.107 | a | −15%
	MEL-03	-	-	0.055 | a | →	0.073 | a | +32%	0.077 | a | +6%	0.07 | a | −8%	0.987 | a | +1304%	0.08 | a | −92%	0.087 | a | +10%	0.093 | a | +6%
Nickel (T)	MEL-01	0.692 | cde | →	0.534 | a | −23%	0.566 | ab | +6%	0.699 | cd | +23%	0.672 | cd | −4%	0.638 | bc | −5%	0.781 | ef | +22%	0.733 | de | −6%	0.795 | ef | +8%	0.829 | f | +4%
	MEL-02	-	0.503 | ac | →	0.479 | a | −5%	0.527 | abc | +10%	0.63 | bd | +20%	0.529 | abc | −16%	0.618 | bd | +17%	0.582 | bc | −6%	0.554 | abc | −5%	0.699 | d | +26%
	MEL-03	-	-	0.361 | b | →	0.406 | ab | +12%	0.497 | ac | +22%	0.388 | ab | −22%	0.422 | ab | +9%	0.428 | abc | +1%	0.429 | abc | <1%	0.525 | c | +22%

Table 3-5. Results of the ANOVA and pairwise comparisons for parameters of interest in Meliadine Lake

Parameter	Sampling Area	ANOVA Model Estimates | Pairwise Statistical Differences Among Years | % Changes Relative to Previous Year									
		2013	2015	2016	2017	2018	2019	2020	2021	2022	2023
Strontium (T)	MEL-01	28.98 | a | →	29.036 | a | <1%	32.58 | ab | +12%	37.3 | b | +14%	50.72 | c | +36%	45.353 | c | −11%	67.08 | d | +48%	58.467 | e | −13%	59.394 | e | +2%	59.222 | e | <1%
	MEL-02	-	28.993 | f | →	31.34 | a | +8%	35.473 | b | +13%	37.67 | bc | +6%	39.627 | c | +5%	43.54 | d | +10%	46.247 | e | +6%	46.673 | e | <1%	48.453 | e | +4%
	MEL-03	-	-	30.06 | a | →	31.373 | a | +4%	32.29 | ab | +3%	33.68 | bc | +4%	35.553 | cd | +6%	37.087 | d | +4%	41.387 | e | +12%	42.45 | e | +3%
Titanium (T)	MEL-01	10 | d | →	0.151 | ab | −98%	0.115 | ab | −24%	0.521 | c | +354%	0.173 | ab | −67%	0.354 | ac | +105%	0.114 | ab | −68%	0.335 | ac | +194%	0.084 | b | −75%	0.208 | ab | +149%
	MEL-02	-	0.281 | ab | →	0.1 | a | −64%	0.5 | b | +400%	0.102 | a | −80%	0.161 | a | +58%	0.078 | a | −52%	0.115 | a | +48%	0.052 | a | −54%	0.062 | a | +19%
	MEL-03	-	-	0.139 | b | →	0.5 | a | +261%	0.105 | b | −79%	0.209 | b | +99%	0.106 | b | −49%	0.089 | b | −16%	0.149 | b | +67%	0.136 | b | −9%
Uranium (T)	MEL-01	0.017 | abc | →	0.014 | a | −16%	0.015 | a | +6%	0.019 | bc | +25%	0.017 | ab | −6%	0.015 | ab | −11%	0.019 | bc | +22%	0.022 | c | +14%	0.026 | d | +23%	0.028 | d | +7%
	MEL-02	-	0.015 | a | →	0.015 | a | −4%	0.017 | ab | +14%	0.015 | a | −7%	0.015 | a | −2%	0.016 | a | +4%	0.016 | ab | +1%	0.018 | b | +15%	0.022 | c | +18%
	MEL-03	-	-	0.014 | a | →	0.015 | a | +6%	0.018 | ab | +17%	0.016 | a | −12%	0.014 | a | −9%	0.015 | a | +7%	0.018 | ab | +18%	0.02 | b | +14%
Copper (D)	MEL-01	0.812 | ab | →	0.846 | ab | +4%	0.928 | ab | +10%	1.077 | a | +16%	0.751 | b | −30%	0.785 | b | +4%	0.827 | b | +5%	0.854 | ab | +3%	0.939 | ab | +10%	0.972 | ab | +4%
	MEL-02	-	0.922 | ab | →	0.869 | ab | −6%	0.958 | ab | +10%	0.716 | ab | −25%	0.702 | a | −2%	0.789 | ab | +12%	0.83 | ab | +5%	0.809 | ab | −2%	1.204 | b | +49%
	MEL-03	-	-	0.792 | bc | →	0.767 | abc | −3%	0.67 | ab | −13%	0.737 | abc | +10%	0.645 | a | −12%	0.771 | abc | +20%	0.731 | abc | −5%	0.845 | c | +16%

Notes
Difference letters indicated statistically significant differences between years ($p < 0.05$).

Major Ions and Compound Water Quality Parameters

Major ions (dissolved salts) are the ionic compounds found in greatest abundance in freshwater systems. They include the cations (e.g., calcium, magnesium, potassium, and sodium) and the anions (e.g., chloride, bicarbonate, and sulphate). Concentrations of these major ions are also reflected in composite parameters: conductivity, hardness, total alkalinity, and total dissolved solids (TDS). As a result, measurements of major ions and compound water quality parameters can covary and follow similar trends and patterns of change. Temporal and spatial changes in major ions and compound water quality parameters are discussed below, supported by the statistical analyses and plots:

- Composite parameters (conductivity, hardness, total alkalinity, and TDS): **Figure 3-6**
- Major cations (calcium, magnesium, potassium, and sodium): **Figure 3-7**
- Major anions (chloride and sulphate): **Figure 3-8**

Major ions have trended higher at MEL-01 dating back to 2016, but the biggest changes occurred between 2019 and 2020 (**Figure 3-6**). Since 2020, the concentrations of calcium, magnesium, and sulphate at MEL-01 have continued to increase year-over-year while chloride, sodium, and potassium have remained relative stable. The pattern of change is generally that same at MEL-02 and MEL-03, but more gradual compared to MEL-01 (i.e., no large step increase between 2019 and 2020). Annual loadings shown in **Figure 2-10** suggest effluent is the leading cause of the temporal trend for sulphate at MEL-01 since 2020. The relative stable pattern for chloride since 2020 matches lower total loadings in recent years compared to 2020 (**Figure 2-10**).

Effluent has contributed to an increase in the concentration of major ions in the East Basin, but the gradual increase observed for some major ions at reference area MEL-03 suggests natural climate variability may also be responsible. As mentioned in **Section 2.2**, the area experienced an unusually high rainfall in July and August 2019, which likely led to substantial runoff from the surrounding tundra based on the large volume of surface contact water that was discharged in June and July 2020. One of the well-know effects of climate change in northern regions is an increase the depth of the active layer (the top layer of the permafrost that thaws annually). Researchers studying the effects of climate change on water quality in northern latitude lakes have hypothesized a deeper active layer would expose mineral soils and contribute to higher concentrations of major ions (e.g. calcium, magnesium, sulphate) (Frey & McClelland, 2009; Vonk et al., 2015). The temporal trends at MEL-03 align with this hypothesis.

Figure 3-6. Spatial and temporal changes in conductivity, hardness, total alkalinity, and total dissolved solids in Meliadine Lake from 2013 to 2023

Note: ANOVA results (model fits ± 95% confidence intervals) are shown along with pairwise comparisons from Tukey post hot 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.

The measured TDS results from MEL-03 in 2019 were flagged by the laboratory as being anomalous. They were retained in the dataset but are not considered representative of conditions in the reference area in 2019.

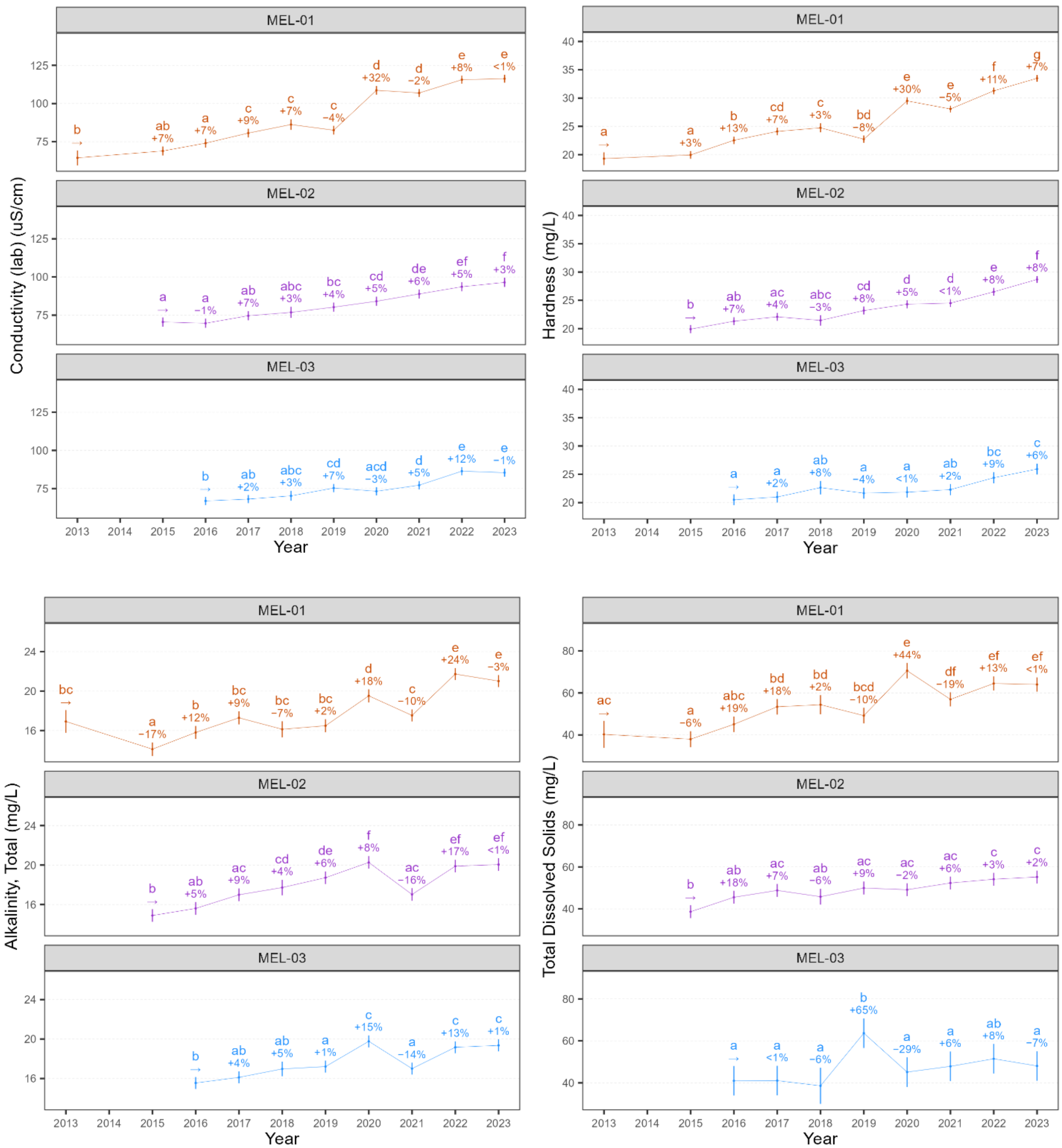


Figure 3-7. Spatial and temporal changes in major cations (Ca, Mg, K, Na) in Meliadine Lake from 2013 to 2023

Note: ANOVA results (model fits ± 95% confidence intervals) are shown along with pairwise comparisons from Tukey post hot 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.

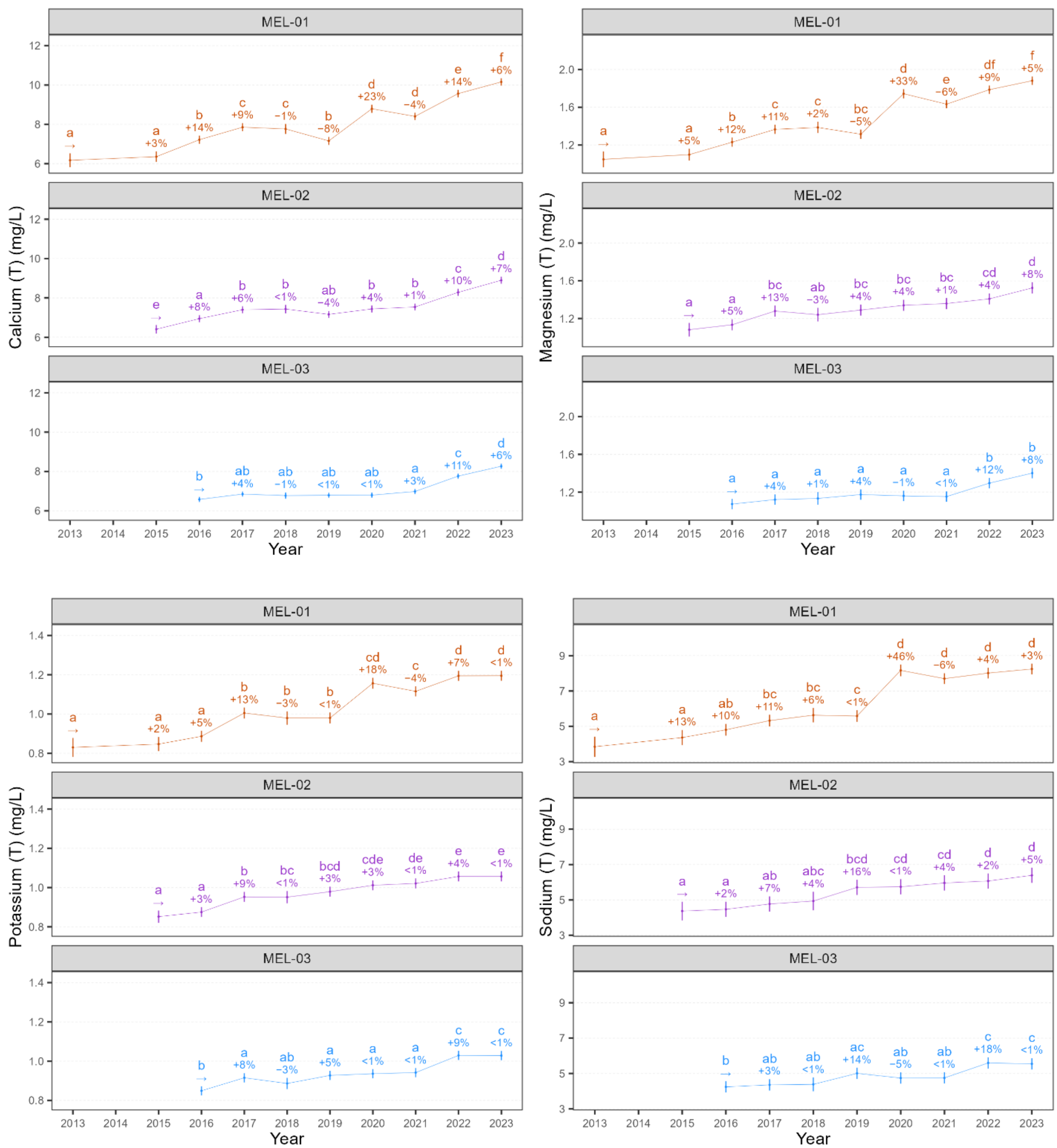
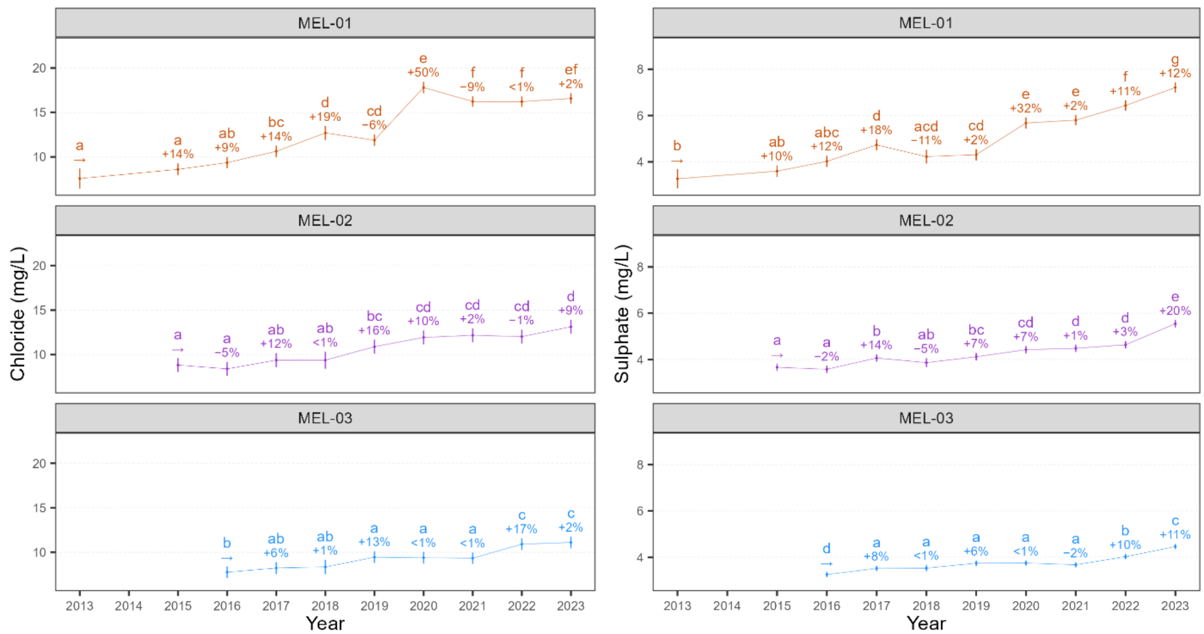


Figure 3-8. Spatial and temporal changes in chloride and sulphate in Meliadine Lake from 2013 to 2023

Note: ANOVA results (model fits ± 95% confidence intervals) are shown along with pairwise comparisons from Tukey post hot 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.



Nutrients & Organic Carbon

Temporal and spatial changes in key nutrients and organic carbon components are discussed below, with a focus on results from statistical analyses (ANOVA and Tukey post hoc test at alpha = 0.05) performed using parameters that exceeded the normal range in 2023. These parameters included Total Kjeldahl Nitrogen (TKN; the sum of organic nitrogen and ammonia) and organic carbon (total and dissolved). Total phosphorus is also included in the discussion because of questions around natural versus mining-related differences in primary productivity between the East Basin of Meliadine Lake compared to MEL-02 and the reference areas.

TKN was flagged as a parameter of interest based on the normal range assessment at MEL-01. Looking at the condensed temporal plot (**Figure 3-15**), TKN concentrations have increased in a similar pattern in the East Basin and at the reference areas throughout the pre-construction, construction, and operations phase. At MEL-01, the concentration exceeded the normal range in 2023, but concentrations were on average 13% lower in 2023 compared to 2022. At MEL-02, TKN concentrations trended higher in 2023 (14% increase compared to 2022). In MEL-03, 2023 results remained largely unchanged compared to 2022. While recent measurements (2022-2023) are still higher than those measured during early years

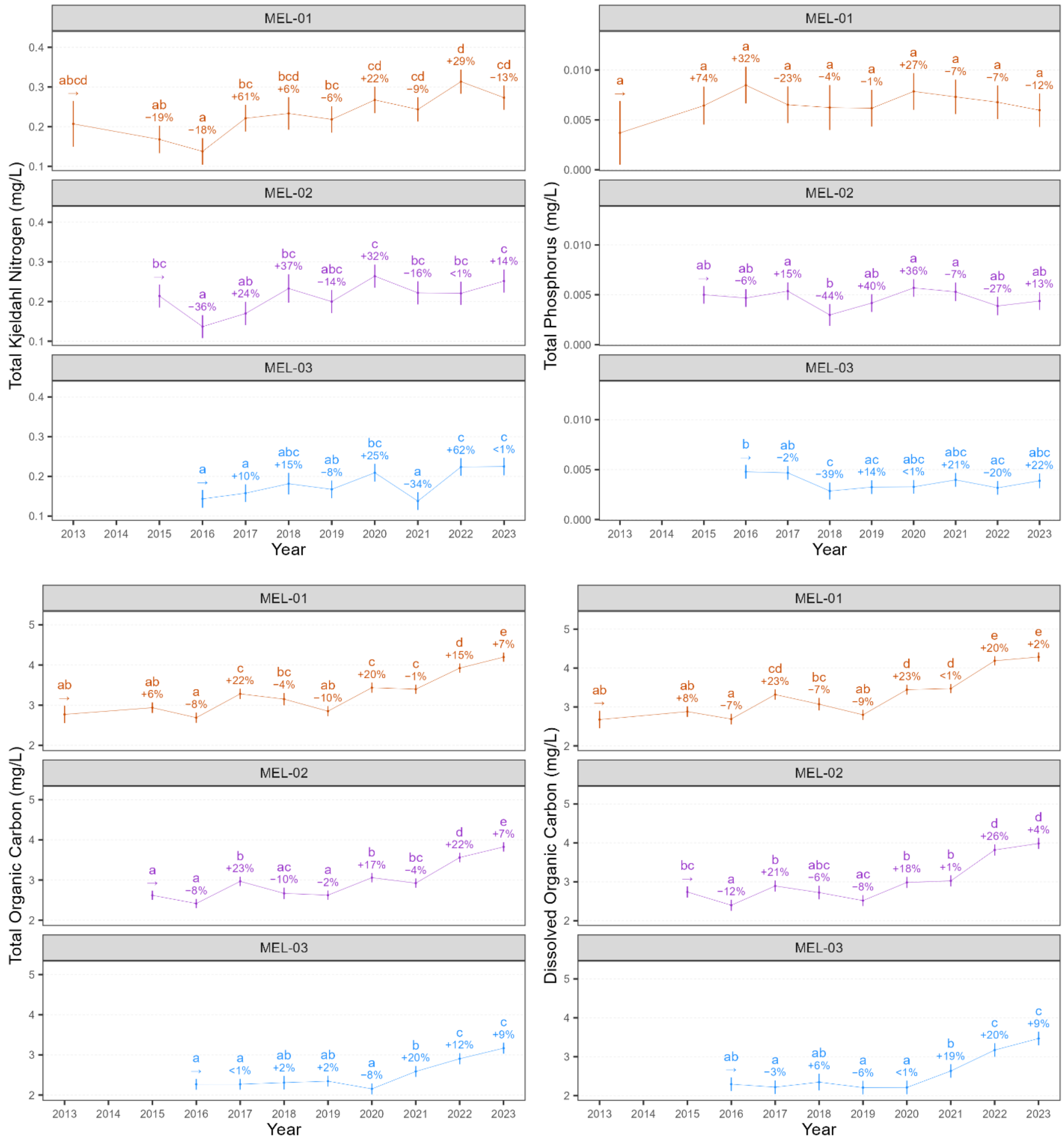
(2013-2015), concentrations of TKN appear to be stable in Meliadine Lake, with no statistical differences among recent sampling events.

Total organic carbon (TOC) and dissolved organic carbon (DOC) concentrations have trended higher throughout Meliadine Lake, particularly since 2019. The temporal trend is evident in **Figure 3-9**, and the magnitude of the increase for TOC and DOC from 2021 to 2023 was between 20 and 30 %. In general, TOC concentrations have gone up by roughly 1-1.5 mg/L at MEL-01, MEL-02, and MEL-03 compared to baseline. Mining activities do not appear to be a leading cause of the increase in organic carbon in Meliadine Lake based on the concentration of organic carbon in MEL-14 and loadings from CP1 compared to the volume of the East Basin. Since 2018, the cumulative load of organic carbon to Meliadine Lake was 30,000 kg (see **Figure B2-18**). Conservatively assuming that the entire 30,000 kg mass of TOC from 2018 to 2023 stayed in the surface water of East Basin (98,851,000 m^3), the concentration of TOC in the East Basin would have increased by approximately 0.3 mg/L since 2018. Effluent may be a minor source of organic carbon to Meliadine Lake, but the primary cause of the observed increase in TOC is most likely wider climatic trends leading to deepening of the active layer and increased runoff from the tundra.

Total phosphorus concentrations have decreased year-over-year at MEL-01 since 2020. In 2023, the annual mean concentration of phosphorus at MEL-01 during the open water period decreased by 12% compared to 2022. Concentrations at MEL-02 and MEL-03 have remained stable throughout the monitoring period (**Figure 3-9**). The downward trend in total phosphorus at MEL-01 demonstrates that the Water Management Plan has been effective at decreasing phosphorus loadings to Meliadine Lake.

Figure 3-9. Spatial and temporal changes in phosphorus and organic carbon in Meliadine Lake (2013 to 2023).

Note: ANOVA results (model fits ± 95% confidence intervals) are shown along with pairwise comparisons from Tukey post hot 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.



Metals

The discussion below focuses on temporal and spatial trends for metals that exceeded the normal range in 2023 and where concentrations were trending higher in 2023 compared to 2022 (supported by the ANOVA and pairwise comparisons in **Table 3-5**).

The following metals have increased in recent years: arsenic, barium, lithium, manganese, strontium, and uranium. Some of these parameters appear to be trending higher (e.g., arsenic and uranium) while other parameters appear to have stabilized since 2019 (e.g., lithium and strontium) (**Figure 3-10**). The concentrations of arsenic, barium, and uranium increased at MEL-01 in 2023 compared to 2022 and the differences were statistically significant ($p<0.05$). On average, the concentrations of these metals at MEL-01 increased between 7 and 11 % in 2023 compared to 2022. The same temporal trend was observed at MEL-02 and MEL-03 and the magnitude of increases were generally higher compared to MEL-01. For example, arsenic concentrations increased 27 % at MEL-02 and 22 % at MEL-03 between 2022 and 2023 whereas the concentration at MEL-01 increased 11 %. Manganese was also higher in 2023 compared to 2022 at all three areas and the differences were statistically significant for MEL-02 and MEL-03.

Strontium concentrations at MEL-01 increased by nearly 50% between 2019 and 2020. Since 2020, concentrations appear to have stabilized. Downstream at MEL-02, the temporal trend has been more gradual, which may indicate a lag as effluent slowly mixes beyond MEL-01.

Temporal trends for lithium at MEL-01 closely match loadings from CP1 to Meliadine Lake. The increasing temporal trend for lithium started between 2017 and 2018, coinciding with the first year of discharge to Meliadine Lake. On average, lithium concentrations at MEL-01 increased by 116% between 2017 and 2018. From 2018 to 2019, concentrations decreased by 26% as less water was discharged to Meliadine Lake. Lithium concentrations peaked again in 2020 along with several other parameters. However, there has been an overall downward trend since 2021 that broadly aligns with lower concentrations of lithium in effluent and corresponding reductions in annual loadings between 2021 and 2023 (**Figure B2-31**).

Based on the available data, it is not possible to say conclusively whether effluent or climate-related factors are the leading cause of the observed increase in the concentration of some metals since 2018. The timing and magnitude of the increases for arsenic and uranium appear more closely aligned with effluent as the source, although regional trends are like a contributing factor. Manganese and barium show more gradual lake-wide changes that appear decoupled from any effluent related pattern. The underlying cause of the changes in water quality are an uncertainty in the AEMP. However, the magnitude of the increases for these parameters of interest represents a small fraction of the guidelines for protection of aquatic life and human health.

Figure 3-10. Spatial and temporal changes in arsenic, barium, lithium, manganese, strontium, and uranium (2013 to 2023)

Note: ANOVA results (model fits ± 95% confidence intervals) are shown along with pairwise comparisons from Tukey post hot 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.

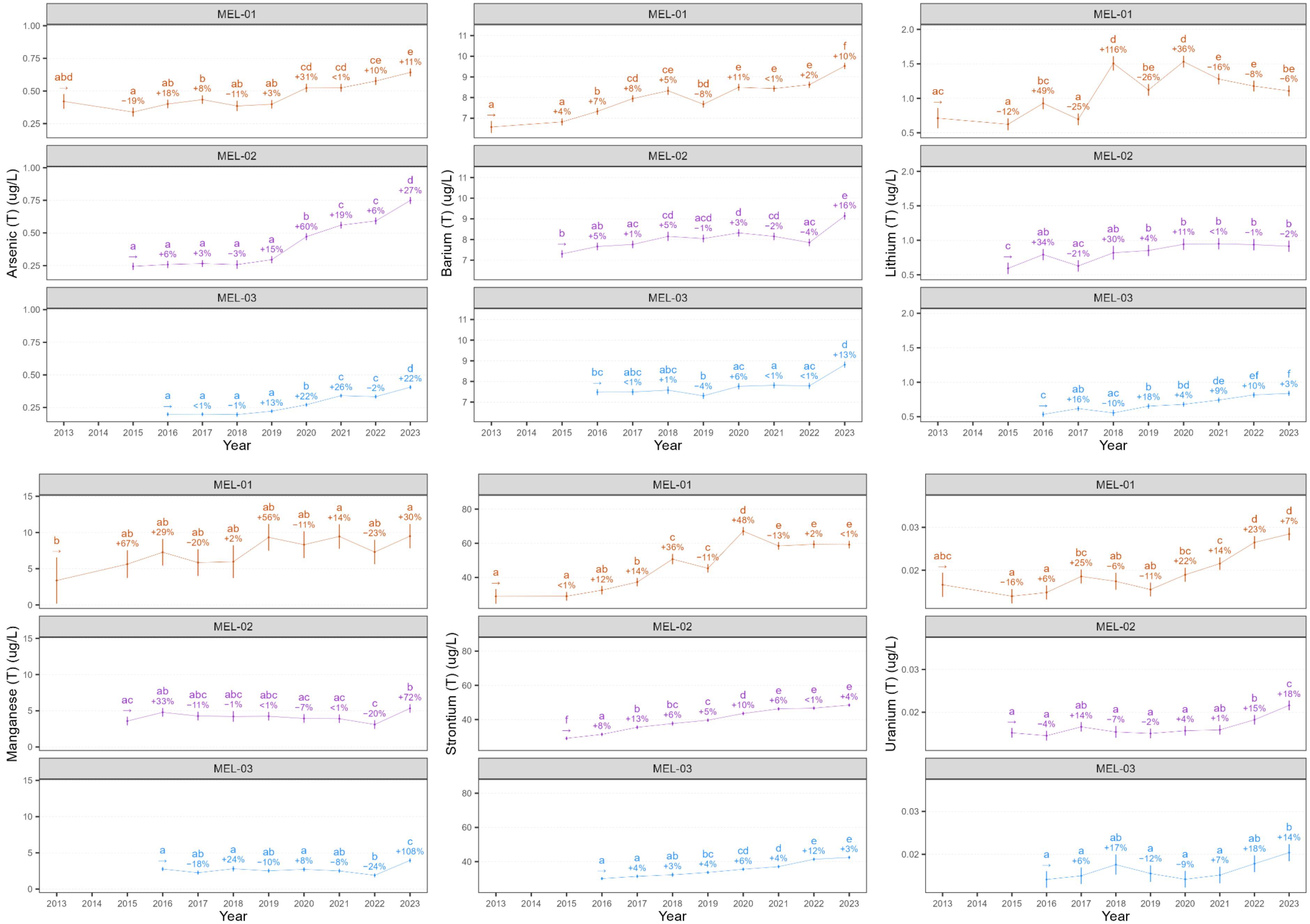
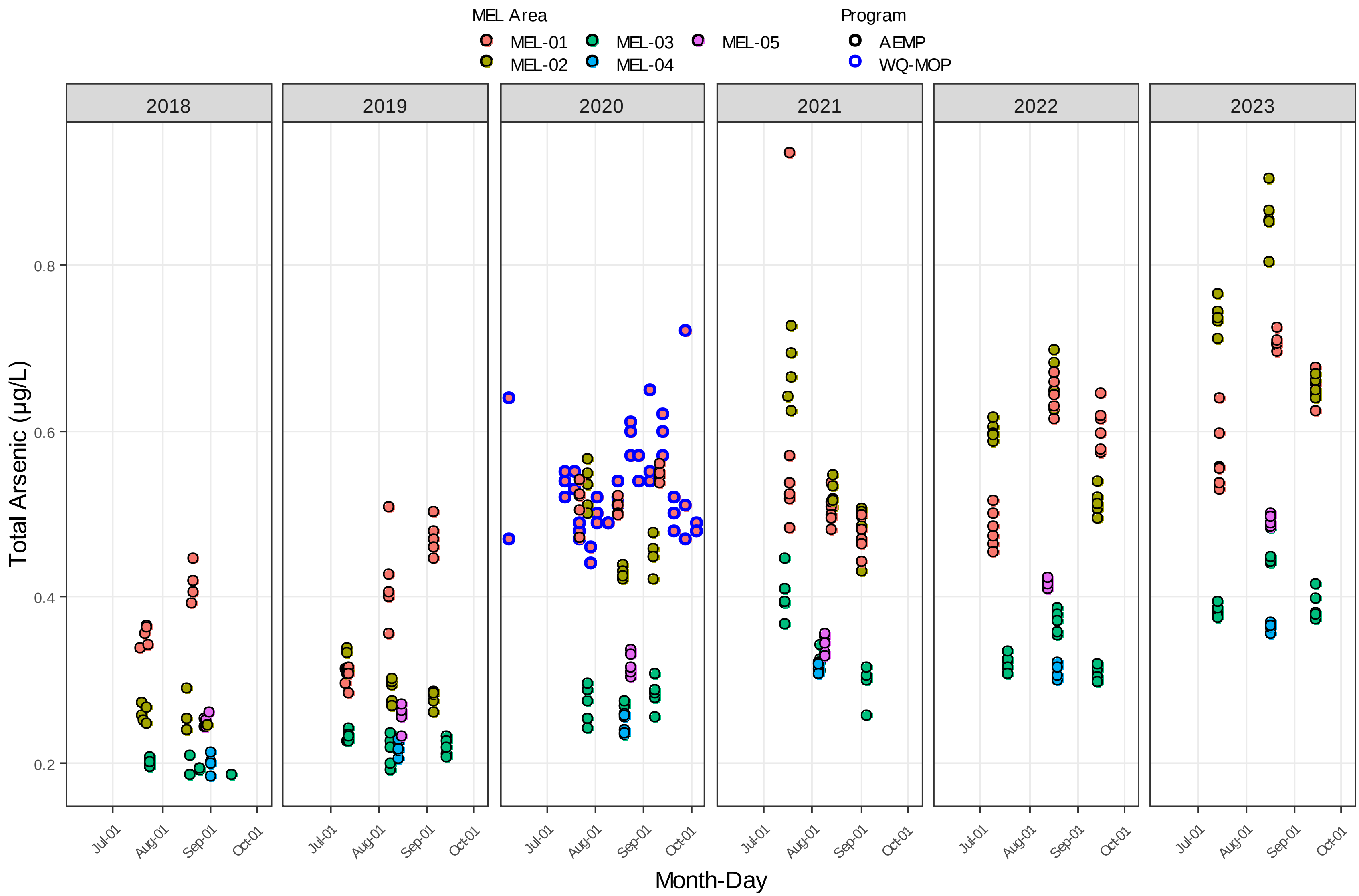


Figure 3-11. Temporal trends for arsenic from July to September, 2018-2023



3.4.4 Comparison to Water Quality Predictions

The prediction for TDS and chloride in the 2014 FEIS (Agnico Eagle, 2014) and the 2020 hydrodynamic model are shown in **Figure 3-12** and **Figure 3-13**, respectively.

Total Dissolved Solids

The Tetra Tech model predicted TDS would increase more rapidly than the far-field mixing model in the 2014 FEIS. The Tetra Tech base case[8] model predicted maximum TDS concentrations at the edge of the mixing zone would increase from 89 mg/L in 2020 to 153 mg/L in 2021. From 2022 to 2028, a relatively modest increase in TDS of 17 mg/L was predicted. The 2014 FEIS predicted a more gradual increase in TDS from early through late operations, with peak TDS of 176 mg/L occurring around 2030 before gradually decreasing as the Mine transitions from operations to closure. The timing of mine development in the 2014 FEIS is slightly different than the current life of the mine based on development of the Tiriganiaq deposit.

Monthly mean concentrations of TDS at MEL-01 in July, August, and September 2023 were 70 mg/L, 57 mg/L, and 65 mg/L, respectively. The East Basin has shown capacity to assimilate major ions from CP1 and TDS has increased gradually, as predicted in the 2014 FEIS, as opposed to the rapid increase that was predicted in the Tetra Tech model (**Figure 3-12**). The discrepancy between the modelled and observed increase in TDS is due to the combined effect of less effluent and lower concentrations of TDS in effluent. TDS concentrations in weekly samples from MEL-14 in 2023 ranged between 780 mg/L in July to approximately 2,200 mg/L in September (Figure 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

Chloride concentrations in the 18 samples collected at MEL-01 in July, August, and September 2023 ranged from 15 mg/L to 18 mg/L. Current concentrations are approximately 50% lower than the predicted concentration of 38 mg/L at the edge of the mixing zone in 2023 assuming median effluent concentrations and average dilution (Tetra Tech, 2020) (**Figure 3-13**).

[8] The base case scenario used estimates for mean precipitation. The wet year scenario corresponds to wet conditions applied to years 2021, 2025 and 2026, with year 2025 corresponding to a 100-year return period precipitation (Golder, August 2020). Other years present an average trend in terms of precipitation.

Figure 3-12. Predicted versus measured concentrations of Total Dissolved Solids (calculated; 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 the NF area as part of the AEMP.

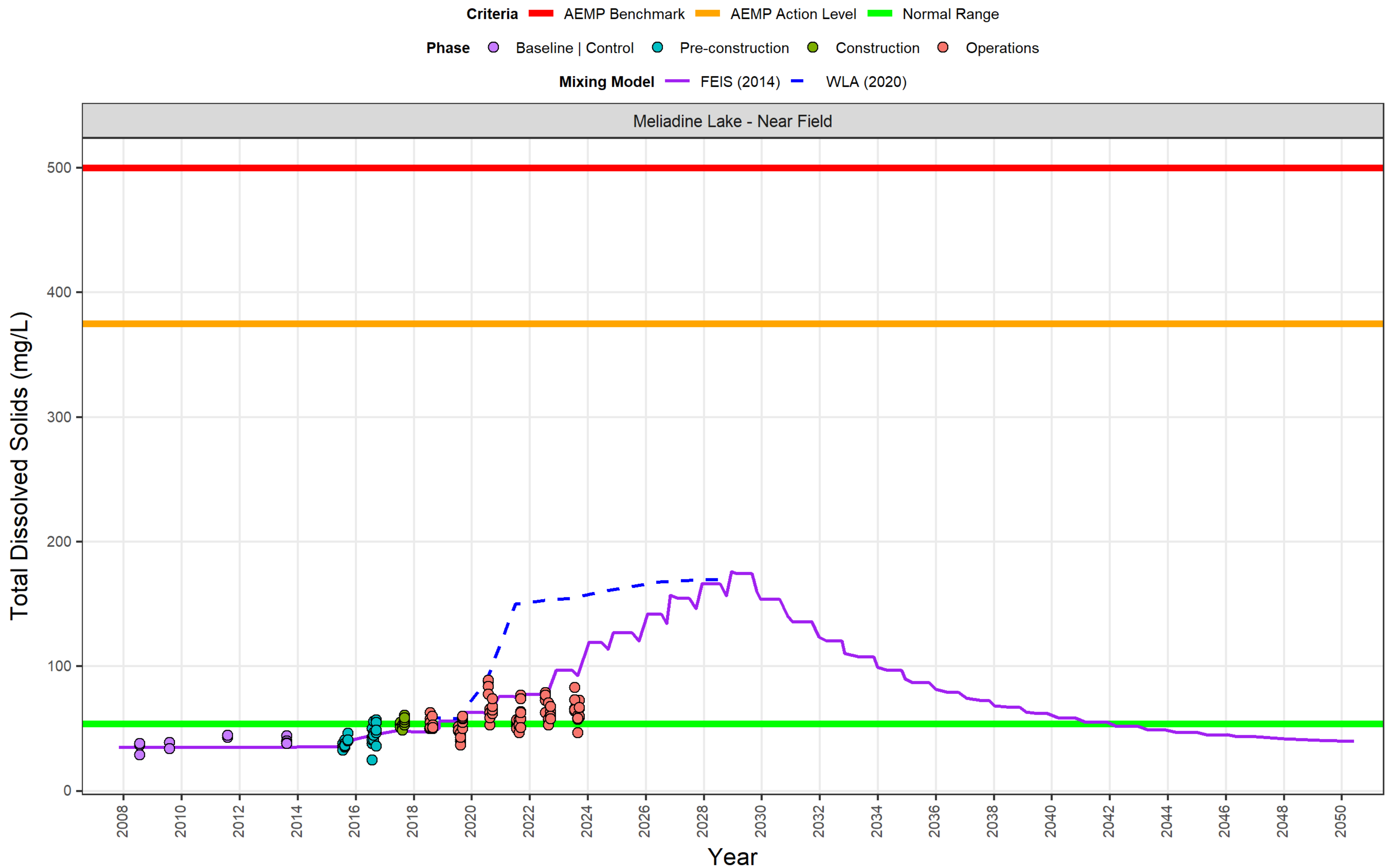
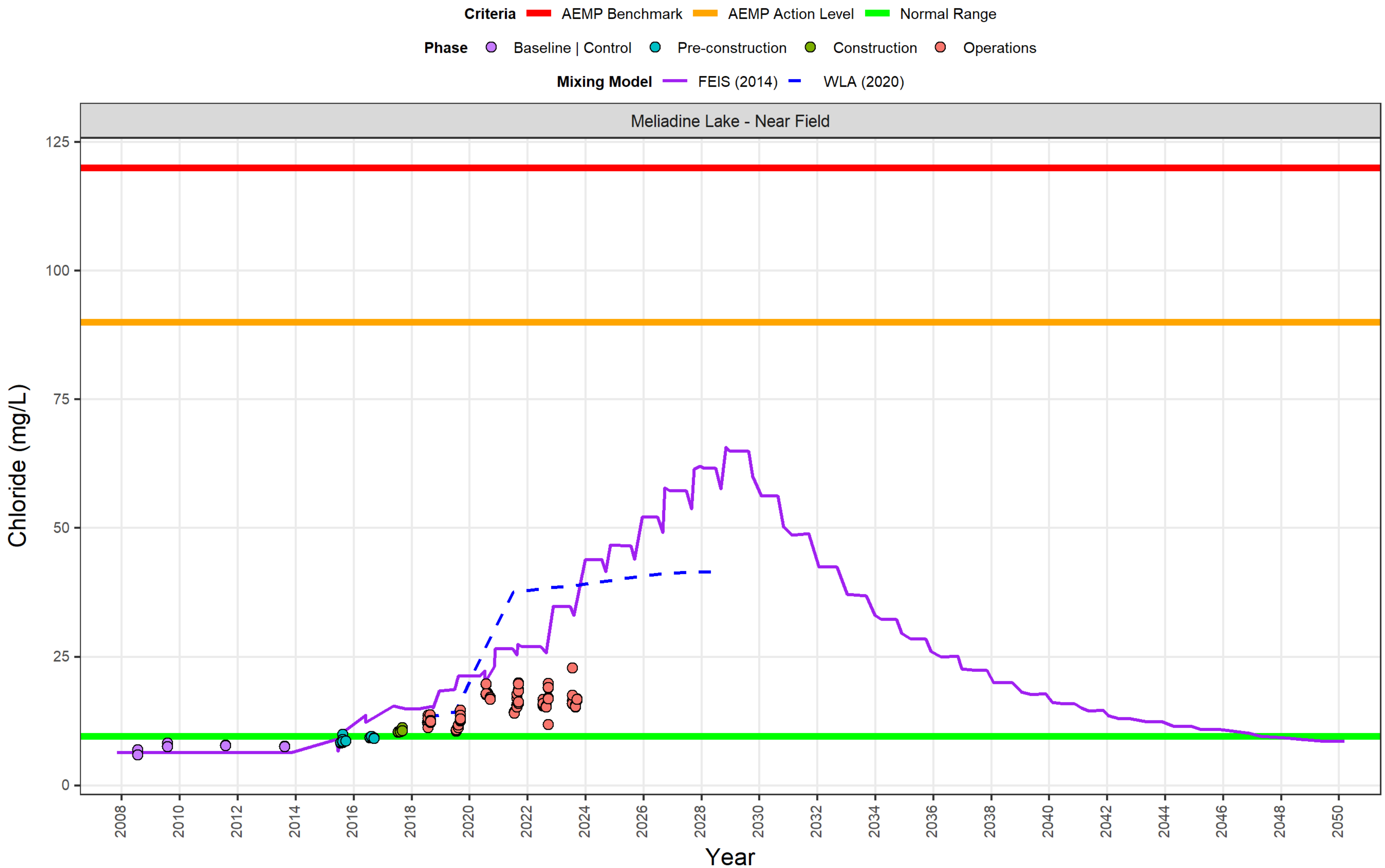


Figure 3-13. Predicted versus measured concentrations of chloride (mg/L) in the East Basin of Meliadine Lake

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 the NF area as part of the AEMP.



3.5 Conclusions

Results of the 2023 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 6.1**.

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 2023 (**Section 2.3.2**).

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

Concentrations have increased for some water quality parameters over time in the East Basin. These parameters include major ions and compound parameters (magnesium, sulfate, calcium, and hardness), Nutrients and organic carbon (TKN, TOC, and DOC), and metals (arsenic, barium, and uranium). Changes can be seen dating back to early years (e.g., 2015) when there was no discharge of treated effluent by the mine and also in the mid-field and far-field area. Effluent is likely a contributing factor for some of the changes in water quality observed in the East Basin and the potential effect of effluent on water quality outside the East Basin is difficult to account for because of the confounding effects of natural variability among the basins. Results to date suggest that natural factors, such as increased runoff associated with permafrost thaw and unusually high precipitation in the past (2019-2020), are contributing to changes in water quality parameters throughout the lake. On-going water quality monitoring should help provide a better understanding of the potential causes for changes in water quality in Meliadine Lake.

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)[9]. *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. The TDS and chloride results from 2023 are well below predicted concentrations. Furthermore, the water quality screening assessment showed that current water quality is well below

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

guidelines developed to protect aquatic life and human health. In short, *minor* changes in water quality have occurred, consistent with what was predicted in the FEIS.

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 3-14. Concentrations of TDS and constituent ions (Ca, Mg, K, Na, Cl, SO_4) since 2013

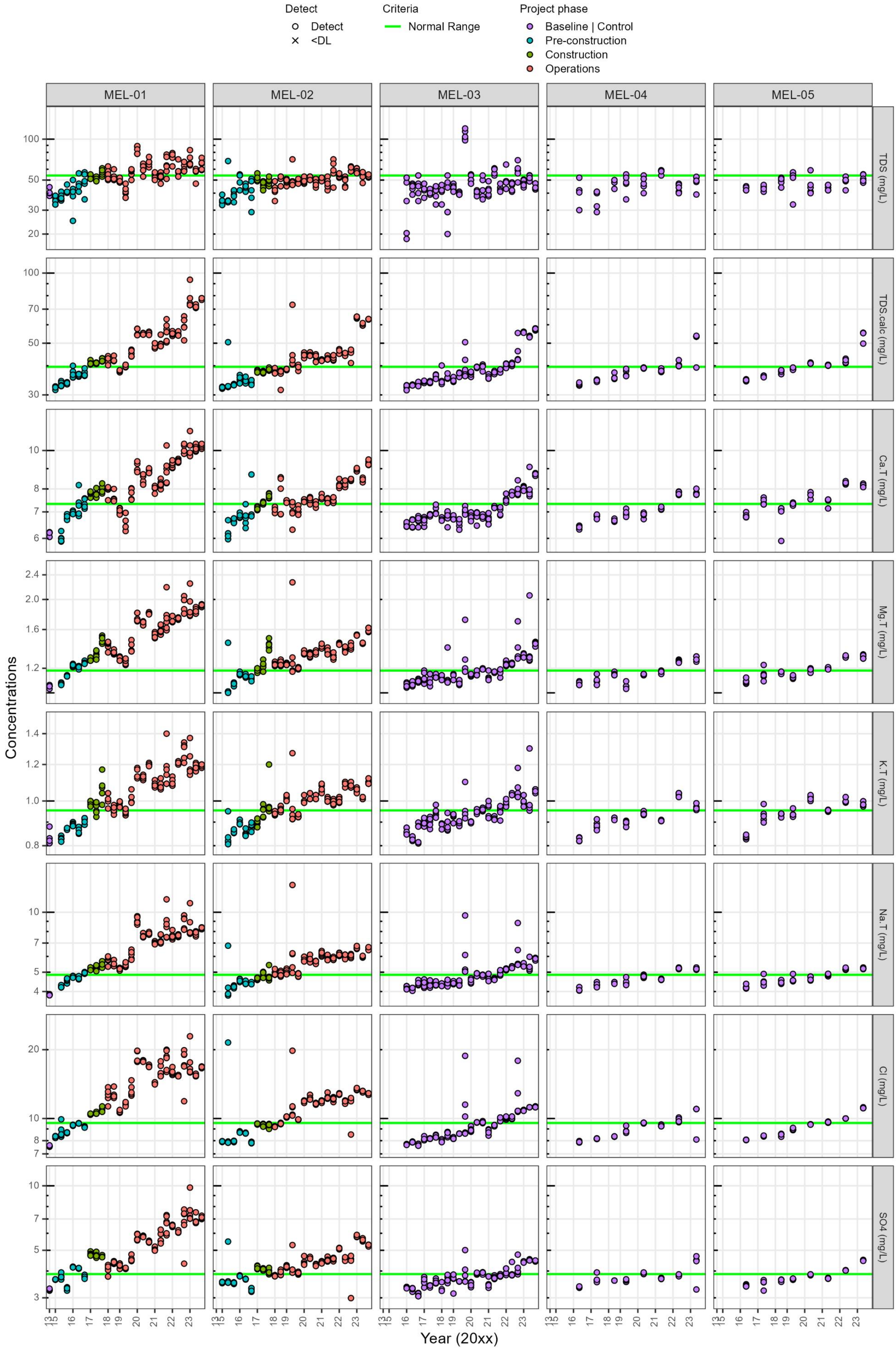


Figure 3-15. Conductivity, hardness, and concentrations of selected nutrients since 2013

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).

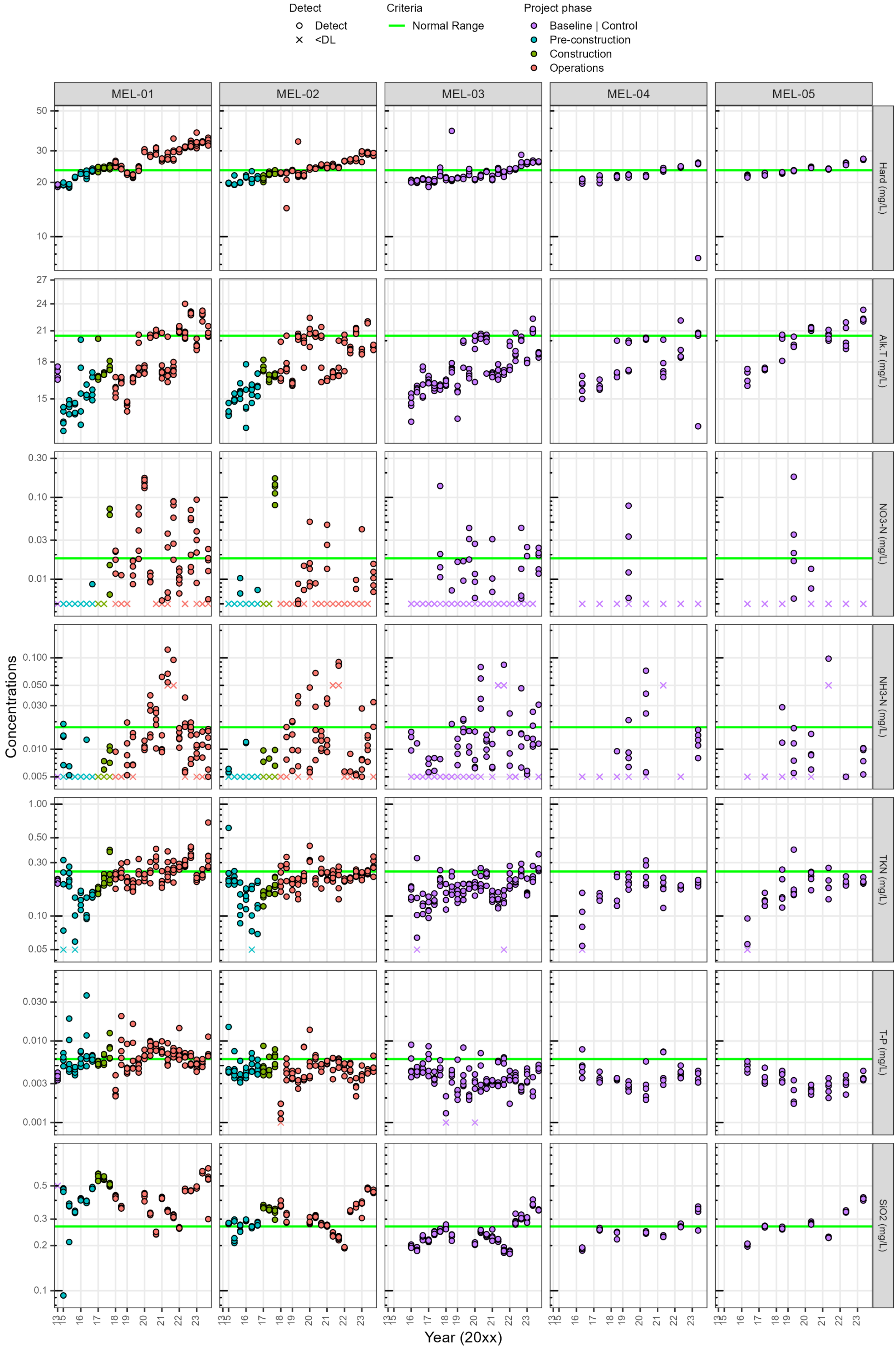


Figure 3-16. Concentrations of aluminum, arsenic, barium, and boron since 2013

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

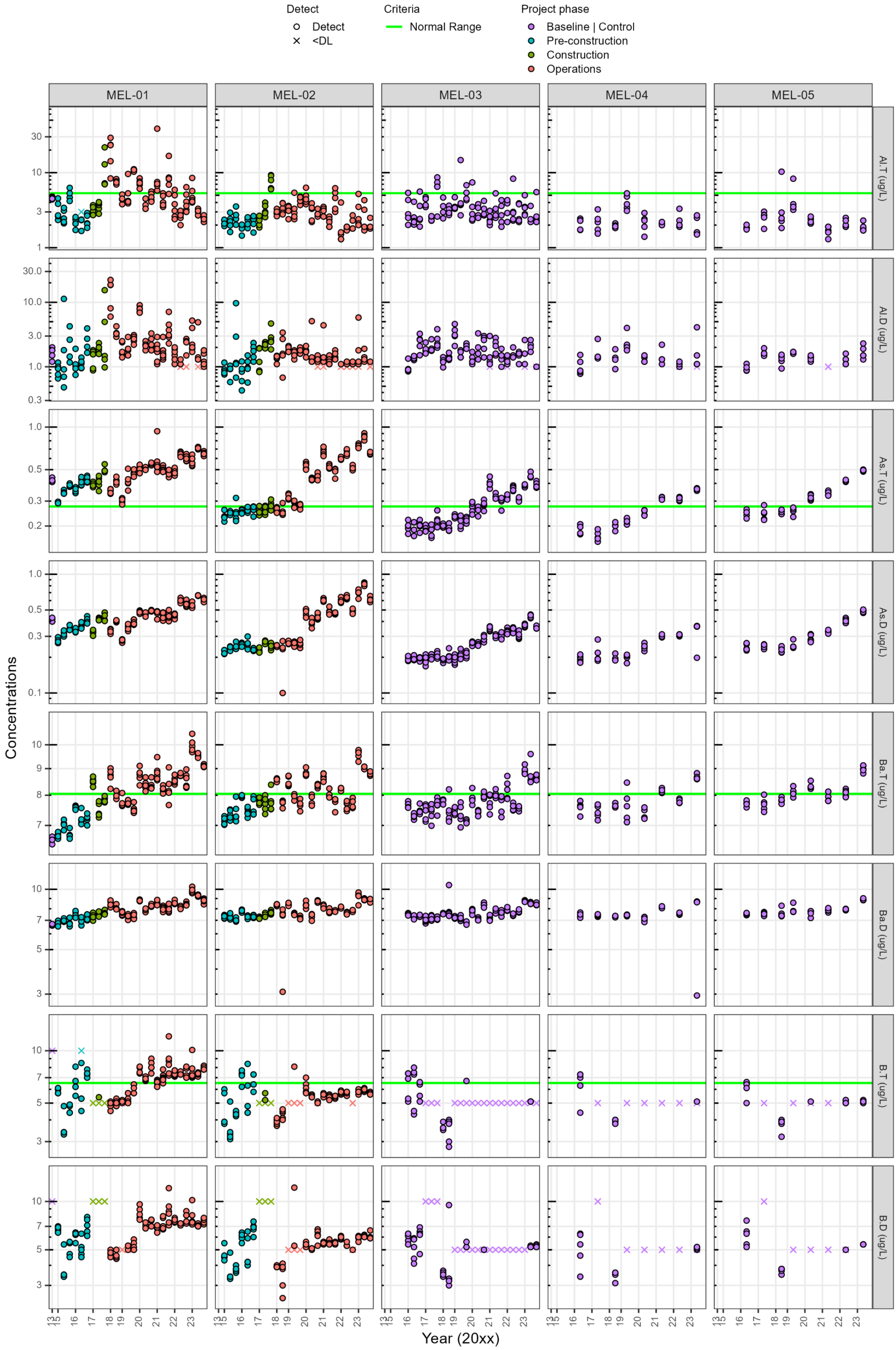


Figure 3-17. Concentrations of cobalt, copper, iron, and lead since 2013

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

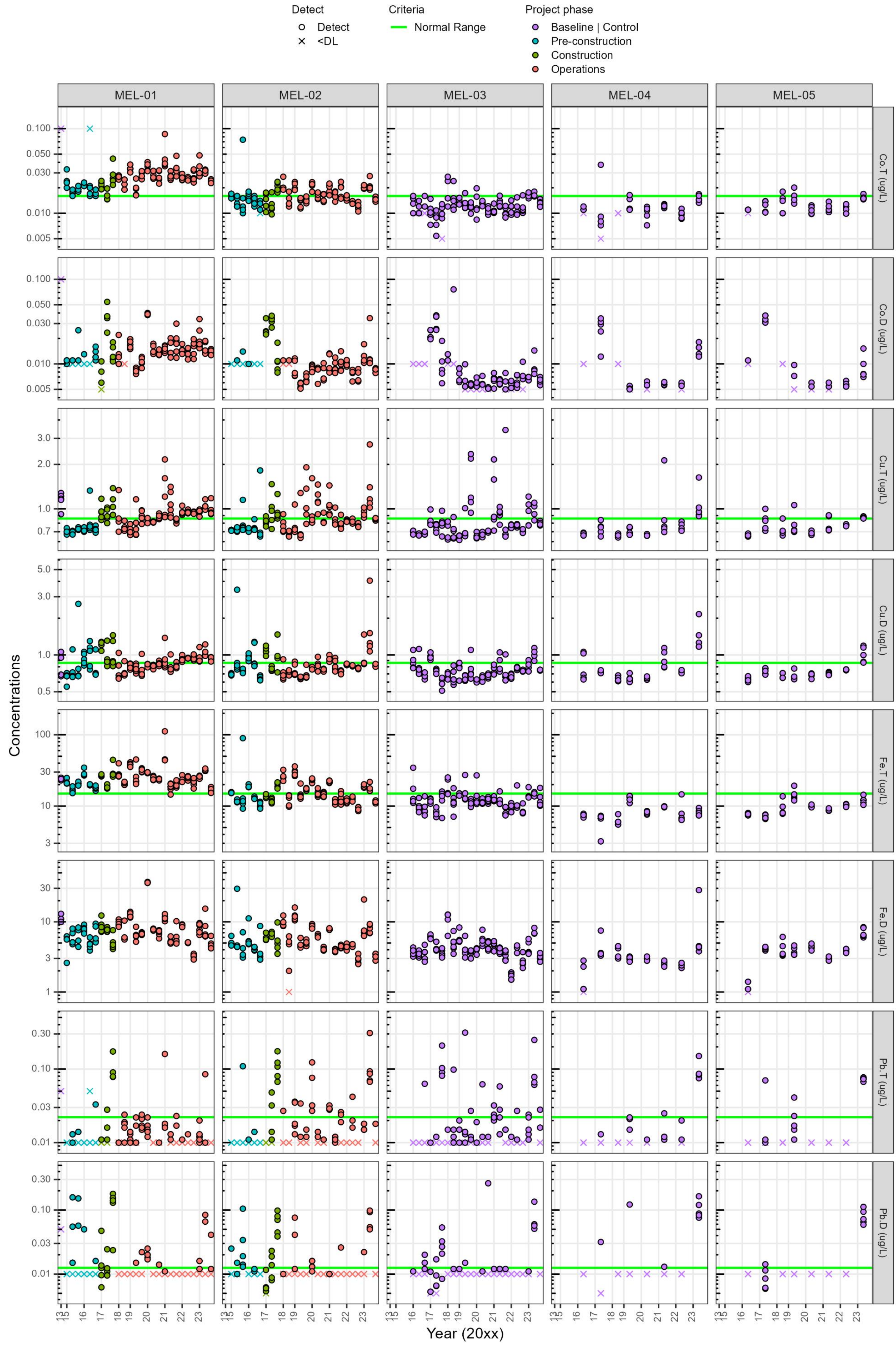


Figure 3-18. Concentrations of lithium, manganese, molybdenum, and nickel since 2013

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

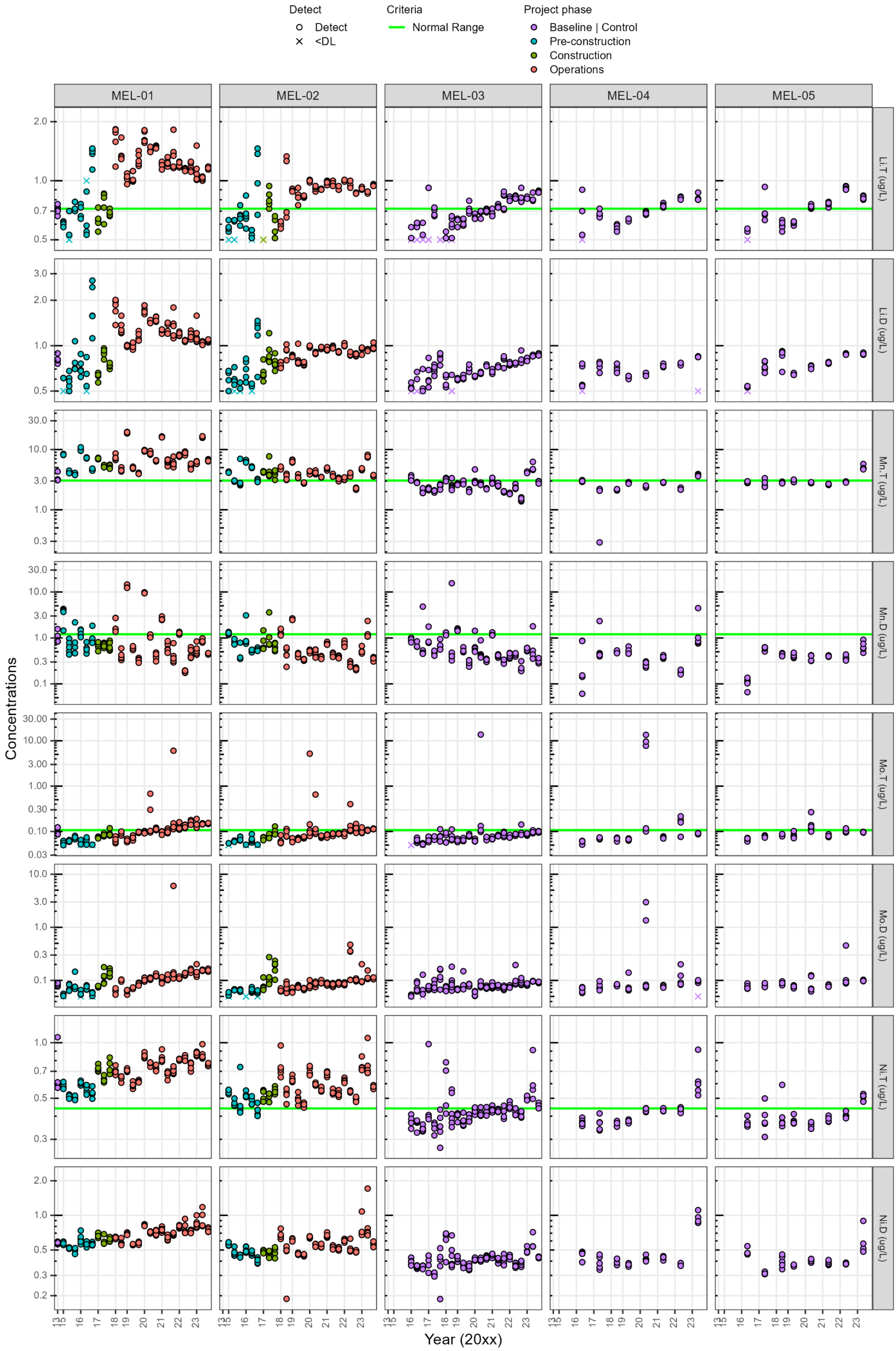
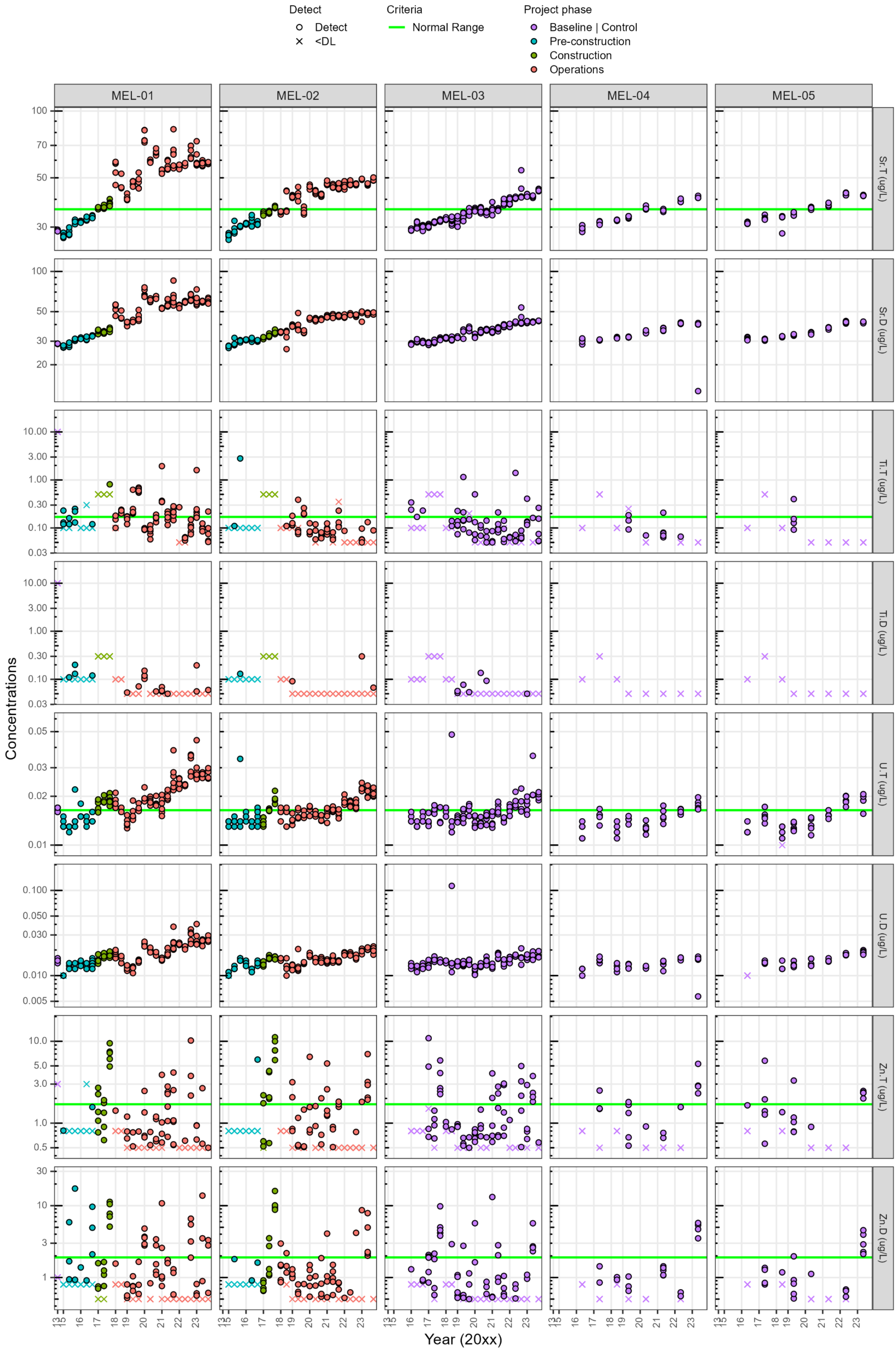


Figure 3-19. Concentrations of strontium, titanium, uranium, and zinc since 2013

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



4 PENINSULA LAKES WATER QUALITY

4.1 Introduction

The Peninsula Lakes water quality monitoring program is completed annually to determine if dust, aerial emissions, and alterations to the local hydrology are impacting water quality in small lakes near the Mine. The cumulative effect of these “non-point source discharges” are evaluated based on water quality in Lake A8, Lake B7, and Lake D7. Lake A8 is located south of Tiriganiaq Pit 1, Lake B7 is located next to the TSF, and Lake D7 is located southwest of Lake B7 in a separate watershed. Water quality data from Lake D7 helps define the spatial extent of changes in water quality caused by the Mine.

Surface water samples were collected in July and August as per the *AEMP Design Plan*. A third sampling event was completed at Lake B7 in early October. The purpose of this sampling event was to verify the increasing temporal pattern that was observed for arsenic in July and August.

Objectives and Key Questions

The Peninsula Lakes water quality program has four objectives, as stated in the *AEMP Design Plan* (Azimuth, 2022):

- Determine if water quality in lakes close to the Mine is changing,
- 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 approach to meeting these objectives is centered around answering the following key questions: *1) Has water quality in the exposure areas changed over time relative to baseline conditions, and 2) are concentrations greater than AEMP Action Levels?*

4.2 Findings from the 2023 Peninsula Lakes Water Quality Program

- Construction and operation of the Mine has contributed to changes in water quality in Lake A8 and Lake B7. Parameters that show the clearest link to mining-related effects are major ions, sulphate, arsenic, and barium
- No exceedances of AEMP Action Levels were reported in any of the samples collected from Lake D7 or Lake A8 in 2023. Arsenic exceeded the AEMP Action Level in Lake B7 in August 2023. Follow-up monitoring was competed in October, and concentrations had decreased from roughly 20 µg/L to

10 µg/L. Off-site migration of dust in the winter of 2019/2020 was likely the main source of arsenic to Lake B7 and Lake A8. Year-over-year increases in arsenic are likely caused by internal mobilization of arsenic from the sediment to the surface water and not on-going external loadings from uncontrolled deposition of dust from the Mine.

- There is no evidence that mining activities have caused changes in water quality in Lake D7. Some parameters have increased compared to baseline, but the underlying cause is likely natural variability and interannual climate variability.

4.3 Methods

4.3.1 Study Areas and Sample Collection

In-situ water quality measurements (temperature, dissolved oxygen (% and mg/L), pH, and specific conductivity) were recorded at the three fixed sampling stations in each lake. Measurements were recorded at discrete intervals just below the surface and every 0.5 m through the water column. The bottom profile was taken within 0.5 m of the sediment water interface.

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 2023

Area	Station ID	Depths	UTM (zone 15V)		Sampling Dates		
		Total	Easting	Northing	July	August	October
Lake B7	B7-01	1.0	538631	6989096	July 16	August 19	October 14
	B7-02	1.7	538195	6989436			
	B7-03	1.7	537713	6989798			
Lake A8	A8-01	2.3	540007	6987659	July 17	August 19	Not required
	A8-02	2.2	540211	6987204			
	A8-03	1.7	540925	6987421			
Lake D7	D7-01	1.7	536390	6989340	July 17	August 21	Not required
	D7-02	1.7	536567	6988868			
	D7-03	1.8	536852	6988689			

Notes:
[a] Total depths are reported as the average if the station was sampled more than once (Golder, 2018).

4.3.2 Data Analysis

Water Quality Screening Assessment

The AEMP Benchmarks are the effects thresholds meant to protect aquatic life and drinking water quality for the Project. AEMP Benchmarks and corresponding Action Levels apply equally at Meliadine and the Peninsula Lakes except for sulphate, lead, cadmium, cobalt, copper, manganese, and zinc.

Aquatic life guidelines for these parameters vary according to site-specific water quality characteristics, resulting in lake-specific, and in some cases, sample specific guidelines. The phosphorus benchmark of 0.01 mg/L for oligotrophic status is not used in the Peninsula Lakes study because samples collected during the baseline period often exceeded the 0.01 mg/L limit for oligotrophic conditions.

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.

The normal range of baseline conditions for Lake A8, Lake B7, and Lake D7 were 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). Parameters where the annual mean/median concentration that *exceeded* the normal range were carried forward for closer examination.

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 in the A, B, and D watersheds on the peninsula[10]. The original Project Certificate No.006 included development of deposits that require dewatering of Lake A8 and nearby Lake A6. Based on the expectation that Lake A8 would be dewatered to make way for development of other deposits south of Tiriganiaq, water quality predictions were developed for the baseline phase (pre-development) and post-closure phases (after the lake is flooded) for Lake A8, but not for constructions and operations. The mine plan in the 2014 FEIS also included dewatering of Lake B7 to accommodate the TSF. For this reason, water quality predictions were not developed for Lake B7.

[10] 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.

For waterbodies that were included in the water quality model for the construction and operations period, changes to water quality were predicted to occur due to diversion of water, alteration of the watershed size and contributing areas, natural hydrological processes, evaporation, and aerial deposition of particulate matter (modelled as TSS), nutrients from blasting activities, and metals (modelled by individual parameters).Water quality was predicted to change in waterbodies closest to the Mine, but for most water quality parameters, these changes were predicted to be *minor*. *Minor* changes, in the context of the FEIS, are defined as an increase from baseline but less than guidelines for the protection of aquatic life, drinking water quality, and SSWQO. During operations, water quality was predicted to meet MMER (now MDMER) discharge limits at all CPs on site, except for arsenic in CP3 during operations, which receives runoff from the TSF. Arsenic infiltration and seepage are minimized by dewatering (dry stacking) the tailings and subsequent freezing (Agnico Eagle, 2015).

4.4 Results and Discussion

4.4.1 Field-Measured Water Quality Parameters

This section summarizes results from the 2023 *in-situ* water quality profiles compared to profiles that were taken from 2015-2022 (AEMP period). Temporal plots are used to support the discussion. Average surface water temperatures in each lake from 2015 to 2023 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 and shallow with an average depth of approximately 1.5 m and most areas are less than 2 m deep (Appendix SD7-2 of the 2014 FEIS). Areas less than 2 m deep likely freeze to the bottom by late winter. Areas that are not frozen likely exhibit naturally low oxygen levels.

When the ice comes of these lakes, typically in late May or early June, wind and wave action contribute to well-mixed conditions throughout the lakes with no evidence of stratification based on the profiles collected since 2015 or baseline data 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 2023 were within the range observed in previous years (see the red dots in **Figure 4-1**). 2022 is the exception. On average, surface water temperatures in July and August 2022 were 2 to 3 °C warmer compared to other years. This is directly related to higher air temperatures recorded in June, July, and August (**Table 2-1**). Interannual variability in surface water temperatures can have an effect on the concentrations of some parameters, notably arsenic, iron, and manganese. This is discussed in more detail in the water quality assessment for Lake B7.

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 2023 when pH decreased from approximately 8 in July and August to 7.5 in October (**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 in recent years coinciding with construction of the Mine and operations. In Lake A8, the increasing temporal trend for conductivity appeared between 2015 and 2016 (**Figure 4-2**). The timing of the increase is plausibly linked to surface activities in the A watershed. Conductivity in Lake A8 peaked at roughly 280 to 300 µS/cm in 2016 and 2017, but by July 2018 conductivity had dropped to 200 µS/cm. Above average precipitation in May and June 2018 (**Table 2-1**) may have contributed to dilution during spring freshet. The temporal trend for Lake B7 and Lake D7 supports this conclusion.

Conductivity in Lake B7 has increased steadily since 2019, coinciding with the start of production at the Mine and construction of the TSF and WRSF1. Between 2019 and 2023, conductivity in Lake B7 has approximately doubled, from 130-150 µS/cm in 2018 to 275-300 in 2023 (**Figure 4-1**). The spatial extent of changes in conductivity do not extend to southwest toward Lake D7. Specific conductivity at Lake D7 in 2023 was similar to previous years (130-150 µS/cm).

Figure 4-1. Average surface water temperatures at the Peninsula Lakes, 2015-2023

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.

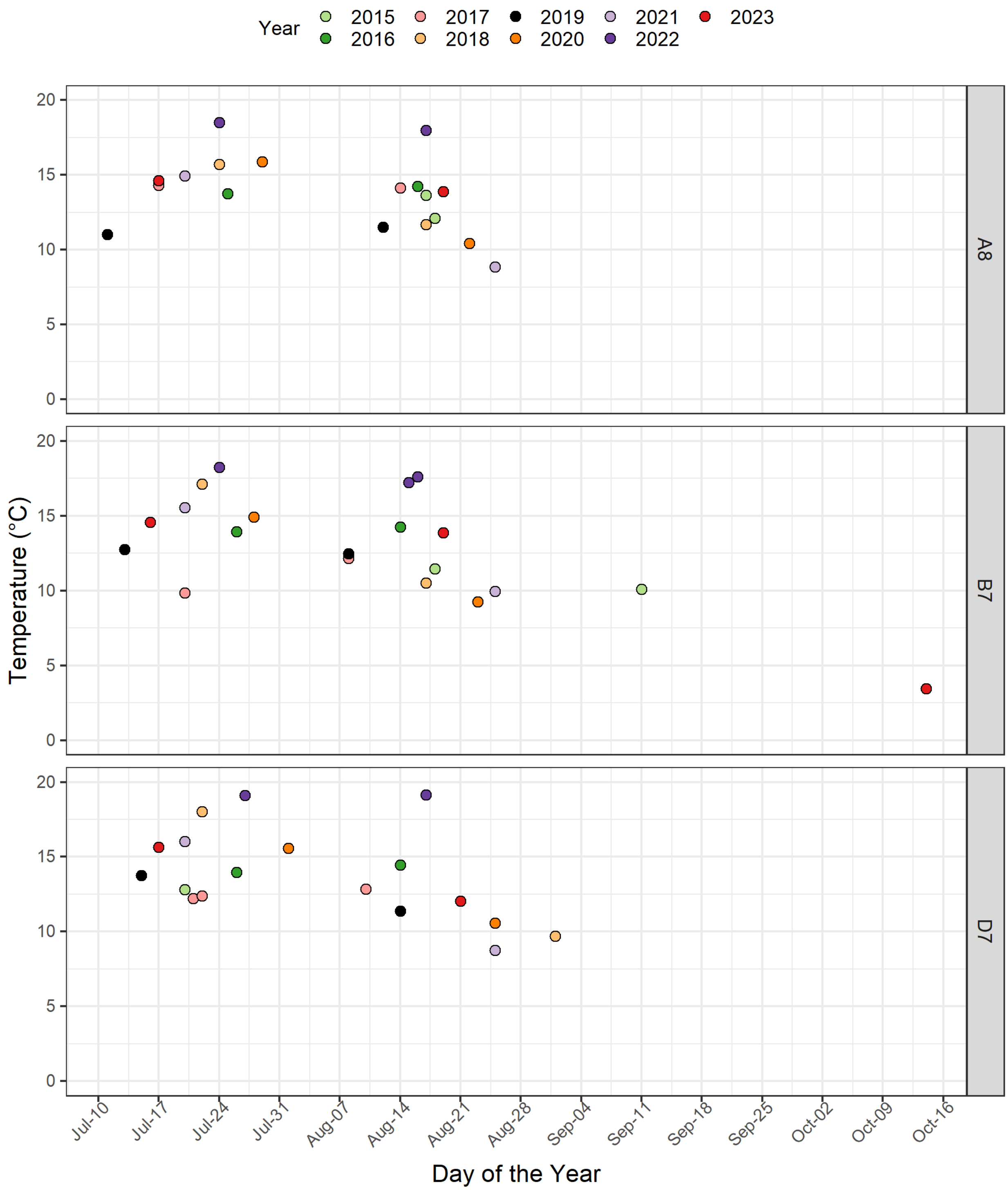
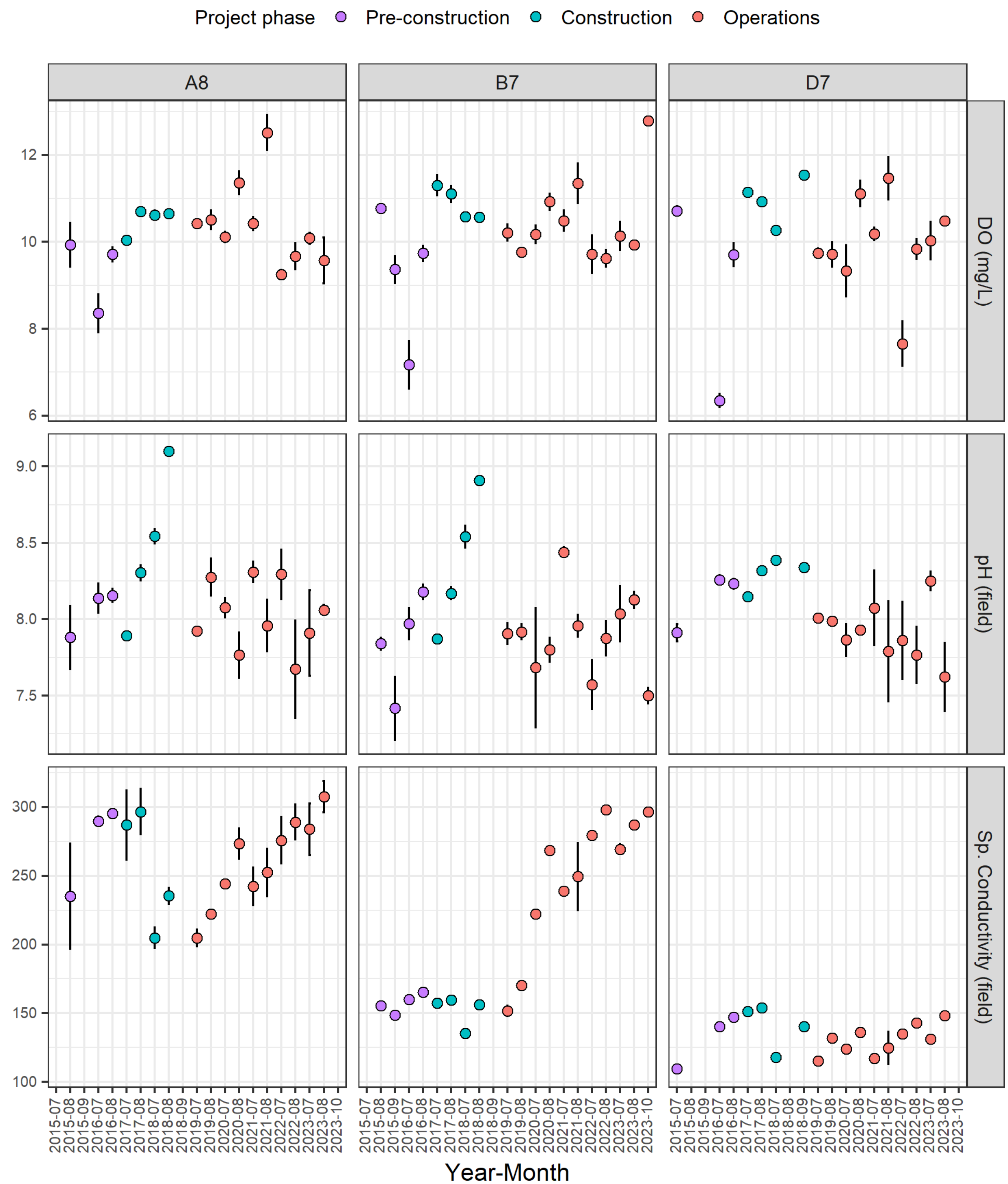


Figure 4-2. *In-situ* water quality at the Peninsula Lakes, 2015-2023

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 2023. The normal range screening results for each lake are provided in the following tables and corresponding figures.

- Lake D7: **Table 4-2** and **Figure 4-3**
- Lake A8: **Table 4-3** and **Figure 4-4**
- Lake B7: **Table 4-4** and **Figure 4-5**

The screening tables include those parameters where at least one sample exceeded the normal range in 2023. Parameters where the annual mean concentration exceeded the normal range were carried forward for plotting. Supplemental plots for the various major ions, nutrients, and metals in are provided in **Section 4.6**.

Overview of Natural versus Mining-Related Changes in Water Quality

As mentioned in the introduction, Lake A8 and Lake B7 are located adjacent to major infrastructure, and changes in water quality are expected due to the cumulative effect of aerial emissions, dust, and changes in the hydrology in the A and B watersheds. Predictions were not derived for either of these lakes during operations because the lakes were scheduled to be dewatered to accommodate development of the Pump and Wesmeg deposits. Lake D7 is in a watershed that is not directly impacted by the Mine, and the water quality results from Lake D7 provide important insight into regional background changes in water quality caused by natural variability and climate-related processes. Spatial and temporal trends for parameters of interest are plotted in **Figure 4-6**. to show divergent trends among the different lakes.

Mining activities have contributed to higher concentrations of some major ions (calcium, sodium, chloride, sulphate), arsenic, and barium in Lake A8 and Lake B7 since 2019. This conclusion is based on divergent trends in Lake A8 and Lake B7 compared to Lake D7 since 2019/2020 (**Figure 4-6**). Unusually high rainfall likely contributed to some of the observed changes in water quality in the Peninsula Lakes. However, the snow core chemistry data from SNOCOR4 (north of Lake A8) in April 2020 suggest off-site migration of dust in the winter of 2019/2020 was likely a significant source of major ions, arsenic, and barium to Lake A8 and Lake B7 (**Figure 2-12** and **Figure 2-13**).

Based on the snow core chemistry data from other locations around the Mine, the effect of off-site migration of dust is localized to Lake A8 and Lake B7 and limited to a small number of parameters. Other metals were elevated in SNOCOR4 in April 2023 compared to the reference station, including aluminum, cobalt, copper, uranium, and vanadium (**Figure 2-12** and **Figure 2-13**). However, the effect of dust on water quality was transient and minor compared to background changes in water quality, based on the temporal trends at Lake D7 (**Figure 4-6**). Since 2019, most of the metals have followed a similar temporal trend among the three lakes, implying natural variability and climate-related factors are primarily responsible for the observed temporal trends.

Arsenic in Lake B7

Additional mitigation efforts were implemented in 2021 to minimize the off-site migration of dust from the TSF during the winter. These efforts appear to have been effective, based on the concentrations of most parameters in Lake B7 and Lake A8 within the range of background at Lake D7. However, some major cations, sulphate, arsenic, and barium have continued to increase in Lake A8 and Lake B7 and the temporal pattern has diverged from Lake D7. The divergent trend is most apparent for arsenic in Lake B7. On average, arsenic concentration in Lake B7 increased by approximately 10-fold between 2019 and 2023. In mid-July 2023, arsenic concentrations in Lake B7 ranged from 12.9 to 15.6 µg/L and by mid-August concentrations had increased to 19.0 and 23.4 µg/L. All three samples collected in August exceeded the AEMP Action Level of 18.8 µg/L. After reviewing the results from the August sampling event, Agnico Eagle conducted a third sampling event on October 14 to determine if concentrations were stable, increasing, or decreasing in the lead up to winter. Arsenic concentrations in the three October samples were 9.6, 9.9, and 10.2 µg/L.

Arsenic mobility in aquatic systems is a complex process that varies with pH, redox potential, microbial activity, accumulation by algae, and interactions with iron, sulfur, and organic matter (Hussain et al., 2019). These biogeochemical processes also vary seasonally in northern latitude lakes in response to changes in hydrology, surface water and sediment temperatures, ice cover, and phytoplankton-mediated uptake (Palmer et al., 2021). The substantial decrease in arsenic observed in Lake B7 between August and October was likely due to co-precipitation with iron oxy-hydroxides. Low iron concentrations during the October sampling event corroborate this conclusion (**Figure 4-7**). After the ice comes off Lake B7 and Lake A8 in the late spring, changes in pH, redox, and temperature may contribute to remobilization of arsenic from the sediment to the water column. A recent study in Puget Sound, WA found that seasonal temperature increases at the sediment-water interface of small (0.12 km^2), shallow (2.6 m) lake led to increased microbial activity, which in turn promoted reductive dissolution of arsenic from iron oxyhydroxides. The overall effect was remobilization of arsenic from sediment to the water column (Barrett et al., 2019).

Based on the available data, and considering information in primary literature on arsenic mobilization in aquatic systems, sediment is likely a significant source of arsenic to the surface water in Lake B7 and Lake A8.

4.5 Conclusions

Results of the 2023 water quality monitoring program for the Peninsula Lakes are summarized below. The Low Action Level assessment for the Peninsula Lakes is presented in **Section 6.2**.

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. Water quality data from Lake D7 suggest that most parameters have increased due to the combined effect of natural variability and climate-related factors (e.g., earlier freshet, higher summer temperatures, variable and extreme precipitation).

Mining activities likely contributed to some of the observed increase in TDS, sulphate, arsenic, and barium at Lake B7 and Lake A8 since 2019. Off-site migration of dust is the most likely source of metals and other parameters to Lake B7 and Lake A8. Based on the results from the snow chemistry monitoring program, efforts to minimize off-site migration of dust resulted in lower concentrations of metals to the snow pack in recent years.

Key Question: Are concentrations greater than AEMP Action Levels?

Based on the annual mean, there were no exceedances of the AEMP Action Levels in any of the lakes in 2023. There is some uncertainty about whether the biogeochemical processes responsible for arsenic cycling in Lake B7 and Lake A8 have peaked or if concentrations will continue to trend higher.

Table 4-2. Lake D7 water quality screening assessment, 2023

Parameter	Detection Limit	Screening Criteria				Summary Statistics for Lake D7 in 2023							
		Normal Range	FEIS	Benchmark	Action Level	N	N<DL	Mean	Median	SD	SE	Min	Max
Conventional Parameters, Nutrients, Organic Carbon (µg/L)													
Total Dissolved Solids (Calculated)	1	81	-	500	375	6	0	**91.9**	92	4.98	2.03	87.1	96.8
Total Suspended Solids	1	2	5.1	-	-	6	1	1.77	2.05	0.659	0.269	1	2.2
Alkalinity, Total	1	55	83	-	-	6	0	50.9	50.8	5.54	2.26	45.5	57
Calcium (T)	0.01	17	36	-	-	6	0	16.5	16.4	1.09	0.443	15.4	17.6
Fluoride	0.02	0.05	0.036	2.8	2.1	6	0	0.049	0.049	0.0038	0.0016	0.045	0.052
Reactive Silica (SiO2)	0.01 | 0.1	0.28	-	-	-	6	0	**0.39**	0.39	0.185	0.076	0.22	0.57
Ammonia (as N)	0.005	0.009	0.086	0.141	0.106	6	0	**0.017**	0.016	0.0080	0.0033	0.0092	0.0324
Nitrate (as N)	0.005	0.005	1.2	2.9	2.17	6	3	-	0.0061	-	-	0.005	0.021
Dissolved Organic Carbon	0.5	5.1	-	-	-	6	0	**5.49**	5.5	1.05	0.428	4.01	6.65
Metals (µg/L)													
Aluminum (T)	1	6.7	37	100	75	6	0	**7.57**	6.75	2.88	1.17	4.7	12.9
Arsenic (T)	0.02	1.2	1.3	25	18.8	6	0	**1.57**	1.63	0.122	0.0499	1.41	1.68
Barium (T)	0.02	17	34	1000	750	6	0	**17.2**	17.2	0.366	0.149	16.7	17.6
Cadmium (T)	0.005	0.005	0.071	0.0928	0.0696	6	5	-	0.005	-	-	0.005	0.0069
Cobalt (T)	0.005	0.05	0.33	0.781	0.586	6	0	**0.051**	0.0509	0.00552	0.00225	0.0443	0.0573
Copper (T)	0.05	1	2.1	2	1.5	6	0	**1.05**	1.07	0.0574	0.0235	0.953	1.11
Lead (T)	0.01	0.02	0.14	5	3.75	6	0	**0.0393**	0.0225	0.045	0.0184	0.012	0.129
Manganese (T)	0.05	13	67	120	90	6	0	10.5	10.4	2.76	1.13	7.47	14.4
Molybdenum (T)	0.05	0.48	0.61	73	54.8	6	0	**0.63**	0.63	0.12	0.050	0.52	0.75
Nickel (T)	0.05	0.75	2.3	25	18.8	6	0	**0.76**	0.77	0.045	0.018	0.71	0.81
Strontium (T)	0.02	83	162	2500	1880	6	0	81.1	81	5.96	2.43	75.1	87
Tin (T)	0.02	0.05	0.21	-	-	6	0	0.045	0.037	0.020	0.0080	0.029	0.082
Titanium (T)	0.05	0.34	2.38	-	-	6	0	**0.36**	0.30	0.18	0.075	0.19	0.70
Vanadium (T)	0.05	0.07	0.71	120	90	6	0	**0.086**	0.085	0.0097	0.0040	0.074	0.10
Zinc (T)	0.5	2	5.8	-	-	6	3	-	0.795	-	-	0.5	5.5

Notes:

"-"mean, SD, and SE were not calculated if >50% of the samples were below the detection limit.

Bold values indicate the mean concentration is greater than the upper limit of the normal range.

Gray highlighted cells indicate the mean concentration exceeds the FEIS prediction (Agnico Eagle, 2014).

Figure 4-3. Lake D7 – temporal trends for parameters that exceeded the normal range in 2023

Notes: Data are shown as the annual mean ± 1 SD.

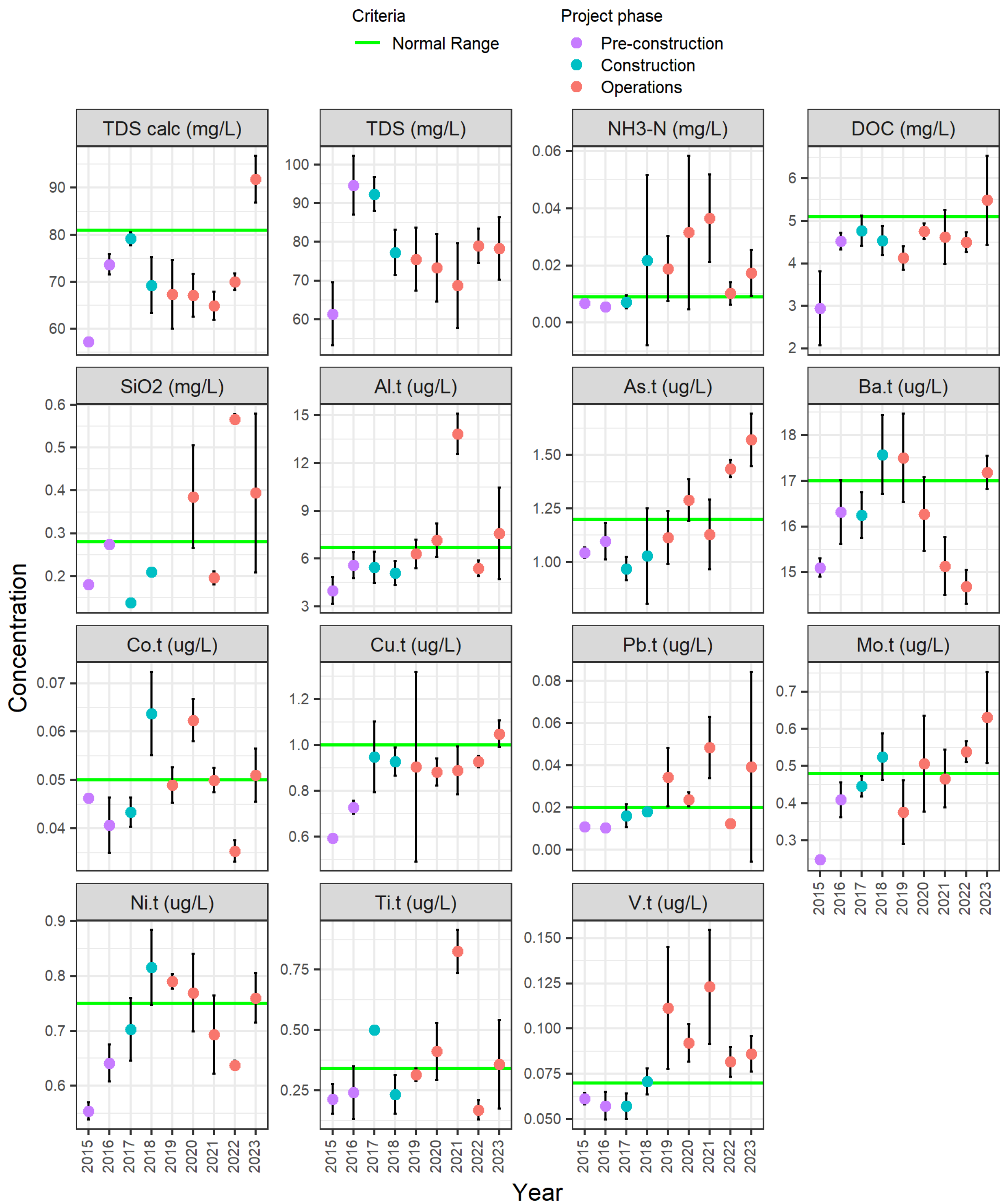


Table 4-3. Lake A8 water quality screening assessment, 2023

Parameter	Detection Limit	Screening Criteria				Summary Statistics for Lake A8 in 2023							
		Normal Range	FEIS	Benchmark	Action Level	N	N<DL	Mean	Median	SD	SE	Min	Max
Major Ions, Nutrients, and Organic Carbon (mg/L)													
Total Dissolved Solids (Calculated)	1	152	-	500	375	6	0	**188**	189	12.5	5.1	166	200
Calcium (T)	0.01	40	47	-	-	6	0	37.2	36.9	2.8	1.14	33	41.2
Fluoride	0.02	0.04	0.038	2.8	2.1	6	0	**0.0418**	0.041	0.00325	0.00133	0.039	0.046
Magnesium (T)	0.004	5.6	6.9	-	-	6	0	5.08	5.06	0.42	0.172	4.45	5.65
Potassium (T)	0.02	2.5	2.3	-	-	6	0	2.23	2.2	0.255	0.104	1.83	2.56
Reactive Silica (SiO2)	0.01 | 0.1	1.3	-	-	-	6	0	0.845	0.78	0.662	0.27	0.226	1.81
Sodium (T)	0.02	8.4	8.3	-	-	6	0	**11.6**	11.9	1.5	0.612	9.14	13.2
Sulphate	0.3	9.3	11.6	218	164	6	0	**13.7**	14.2	1.65	0.674	11.2	15.2
Ammonia (as N)	0.005	0.011	0.118	0.141	0.106	6	0	**0.0122**	0.0119	0.00231	0.000941	0.0094	0.0154
Nitrate (as N)	0.005	0.015	0.2	2.9	2.17	6	3	-	0.00605	-	-	0.005	0.0178
Dissolved Organic Carbon	0.5	4.9	-	-	-	6	0	**5.92**	5.84	1.21	0.495	4.62	7.57
Total Organic Carbon	0.5	4.7	-	-	-	6	0	**5.3**	5.1	1.2	0.489	4.12	7.33
Metals (µg/L)													
Aluminum (T)	1	3	4.6	100	75	6	0	**3.63**	3.45	0.944	0.385	2.5	5
Arsenic (T)	0.02	2.4	1.7	25	18.8	6	0	**9.75**	8.75	4.19	1.71	4.74	14.8
Boron (T)	5	5	27	1500	1120	6	1	**6.98**	7.9	2.7	1.1	5	9.4
Cobalt (T)	0.005	0.05	0.24	1.04	0.78	6	0	0.0454	0.0445	0.00508	0.00207	0.0397	0.0533
Copper (T)	0.05	0.89	2.7	2.47	1.85	6	0	**0.906**	0.891	0.0505	0.0206	0.854	1
Iron (T)	1	67	96	1060	795	6	0	**67.3**	69.8	21.3	8.68	41.9	88.9
Lead (T)	0.01	0.03	2	5	3.75	6	0	**0.0433**	0.046	0.0104	0.00424	0.029	0.056
Lithium (T)	0.5	10	5.3	-	-	6	0	9.12	9.68	1.23	0.5	7.03	10.1
Manganese (T)	0.05	13	30	120	90	6	0	11.5	12.2	3.25	1.32	7.67	15.6
Molybdenum (T)	0.05	0.22	0.59	73	54.8	6	0	**0.405**	0.404	0.0617	0.0252	0.308	0.478
Nickel (T)	0.05	0.92	2.3	99.2	74.4	6	0	0.821	0.802	0.0928	0.0379	0.728	0.966
Strontium (T)	0.02	273	101	2500	1880	6	0	243	246	25.9	10.6	202	276
Uranium (T)	0.001	0.054	0.061	15	11.2	6	0	**0.0831**	0.0852	0.0113	0.00461	0.0696	0.096

Notes:

"-"mean, SD, and SE were not calculated if >50% of the samples were below the detection limit.

Bold values indicate the mean concentration is greater than the upper limit of the normal range.

Gray highlighted cells indicate the mean concentration exceeds the predicted concentration (median) in the 2014 FEIS (Agnico Eagle, 2014). No predictions were developed for the operations phase because Lake A8 was scheduled to be dewatered in the 2014 FEIS.

Figure 4-4. Lake A8 – temporal trends for parameters that exceeded the normal range in 2023

Notes: Data are shown as the annual mean ± 1 SD.

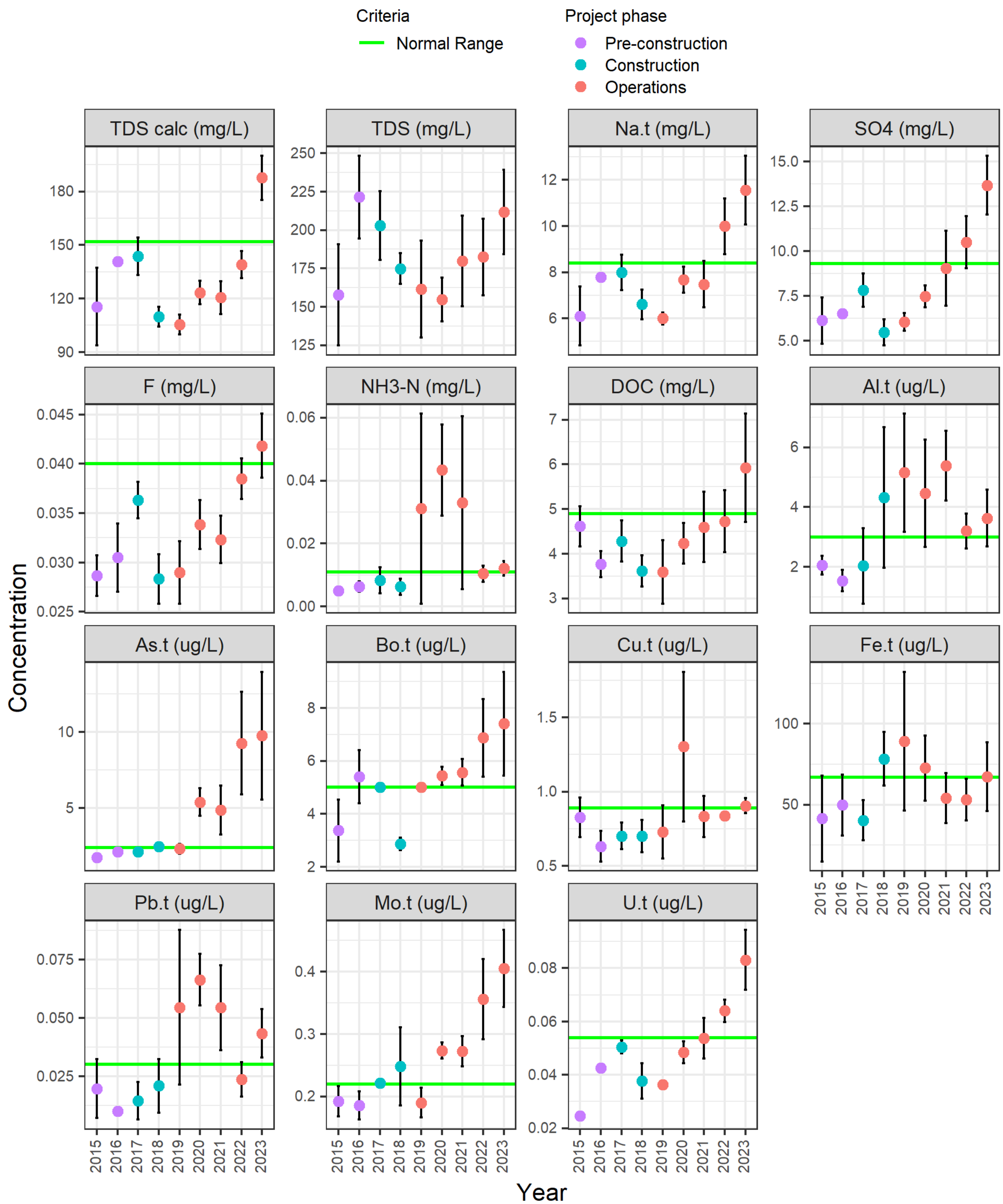


Table 4-4. Lake B7 water quality screening assessment, 2023

Parameter	Detection Limit	Screening Criteria			Summary Statistics for Lake B7 in 2023							
		Normal Range	Benchmark	Action Level	N	N<DL	Mean	Median	SD	SE	Min	Max
Major Ions, Nutrients, and Organic Carbon (mg/L)												
Total Dissolved Solids (Calculated)	1	171	500	375	9	0	**183**	183	10.5	3.5	170	197
Turbidity (lab)	0.1	0.69	-	-	9	0	0.563	0.47	0.16	0.0533	0.4	0.87
Calcium (T)	0.01	39	-	-	9	0	37.8	38.3	1.01	0.337	36.4	39.2
Chloride	0.1	25	120	90	9	0	**44.4**	44.0	2.16	0.719	41.8	47.2
Fluoride	0.02	0.04	2.8	2.1	9	0	**0.040**	0.041	0.00206	0.000687	0.038	0.043
Sodium (T)	0.02	7.5	-	-	9	0	**10.1**	10.1	0.301	0.1	9.64	10.5
Sulphate	0.3	6	218	164	9	0	**12.3**	12.2	0.801	0.267	11.4	13.4
Ammonia (as N)	0.005	0.025	0.197	0.148	9	0	0.0239	0.0204	0.0112	0.00374	0.0141	0.0481
Nitrate (as N)	0.005	0.005	2.9	2.17	9	5	-	0.005	-	-	0.005	0.0116
Dissolved Organic Carbon	0.5	5.5	-	-	9	0	**6.43**	6.27	1.04	0.345	5.13	7.81
Metals (µg/L)												
Antimony (T)	0.02	0.02	6	4.5	9	0	**0.044**	0.045	0.0028	0.000928	0.038	0.046
Arsenic (T)	0.02	1.8	25	18.8	9	0	**14.9**	13.8	4.94	1.65	9.64	23.4
Barium (T)	0.02	20	1000	750	9	0	**29.1**	28.7	1.11	0.369	28.1	31.5
Cobalt (T)	0.005	0.05	1.02	0.765	9	0	**0.065**	0.067	0.021	0.007	0.038	0.088
Iron (T)	1	103	1060	795	9	0	68.7	66.6	30.1	10	37.8	132
Lead (T)	0.01	0.08	5	3.75	9	0	0.0696	0.069	0.0193	0.00644	0.04	0.104
Lithium (T)	0.5	7.5	-	-	9	0	**17.1**	17.4	0.671	0.224	16.2	18
Manganese (T)	0.05	8.6	120	90	9	0	**10.1**	10.7	6.06	2.02	3.28	22.4
Molybdenum (T)	0.05	0.24	73	54.8	9	0	**0.372**	0.365	0.0279	0.0093	0.342	0.414
Selenium (T)	0.04	0.04	1	0.75	9	0	**0.050**	0.049	0.0049	0.0016	0.044	0.058
Strontium (T)	0.02	155	2500	1880	9	0	**313**	312	9.75	3.25	301	326
Thallium (T)	0.005	0.005	0.8	0.6	9	5	-	0.005	-	-	0.005	0.0068
Tin (T)	0.02	0.05	-	-	9	1	**0.033**	0.033	0.014	0.00467	0.02	0.062
Uranium (T)	0.001	0.03	15	11.2	9	0	**0.0812**	0.0819	0.00279	0.000931	0.0752	0.0844

Notes:

"-"mean, SD, and SE were not calculated if >50% of the samples were below the detection limit.

Bold values indicate the mean concentration is greater than the upper limit of the normal range.

Gray highlighted cells indicate the mean concentration exceeds the FEIS prediction (Agnico Eagle, 2014).

Orange highlighted cells indicate arsenic concentrations exceeded the AEMP Action Level in 2023.

Figure 4-5. Lake B7 – temporal trends for parameters that exceeded the normal range in 2023

Notes: Data are shown as the annual mean ± 1 SD.

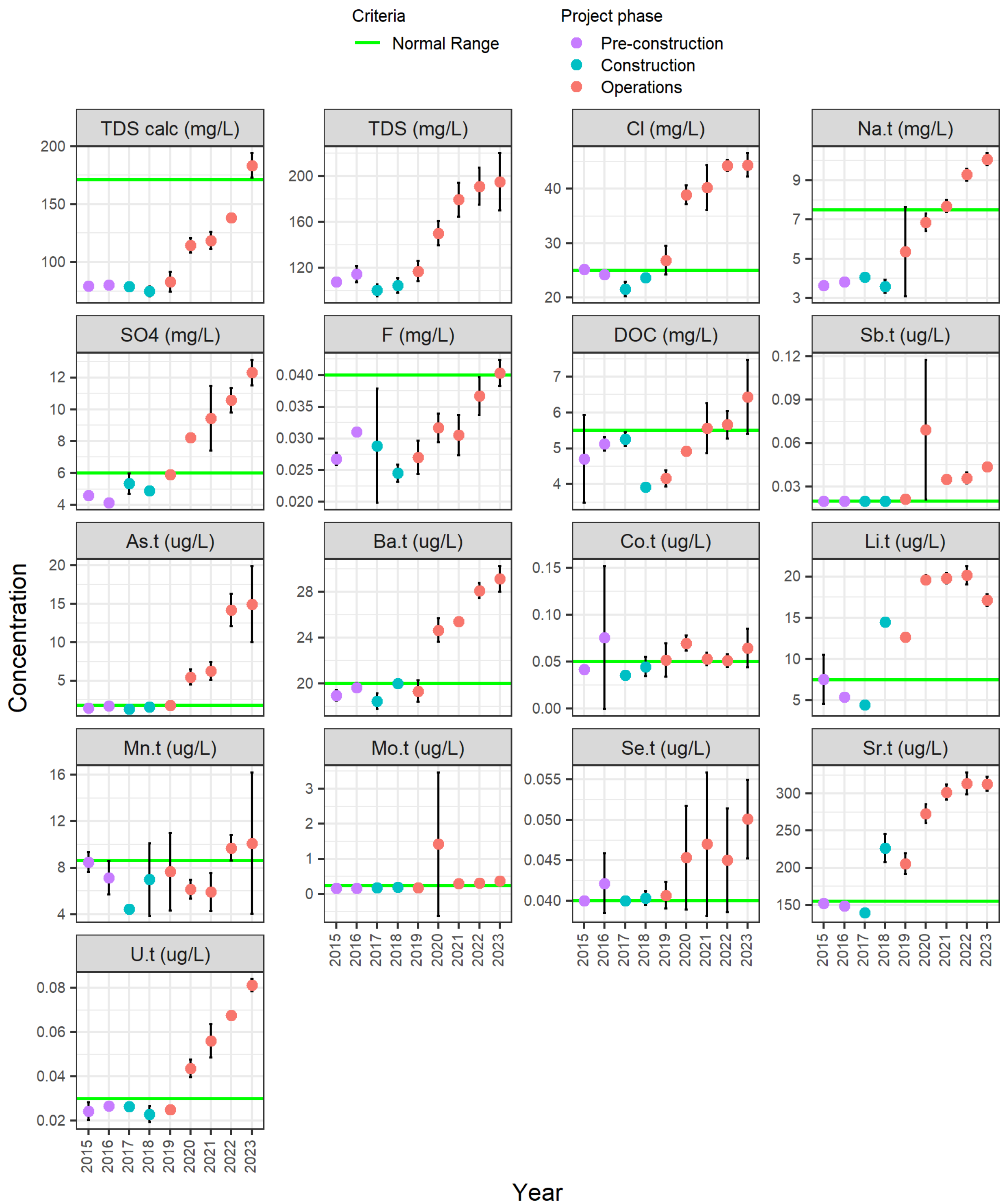


Figure 4-6. Temporal trends for key parameters of interest in the Peninsula Lakes since 2015

Notes: Data are shown as the annual mean ± 1 SD (error bars). Points are jittered to avoid overplotting.
The large standard deviation for molybdenum in Lake B7 in 2020 is due to two samples from July with concentrations greater than 5 µg/L.

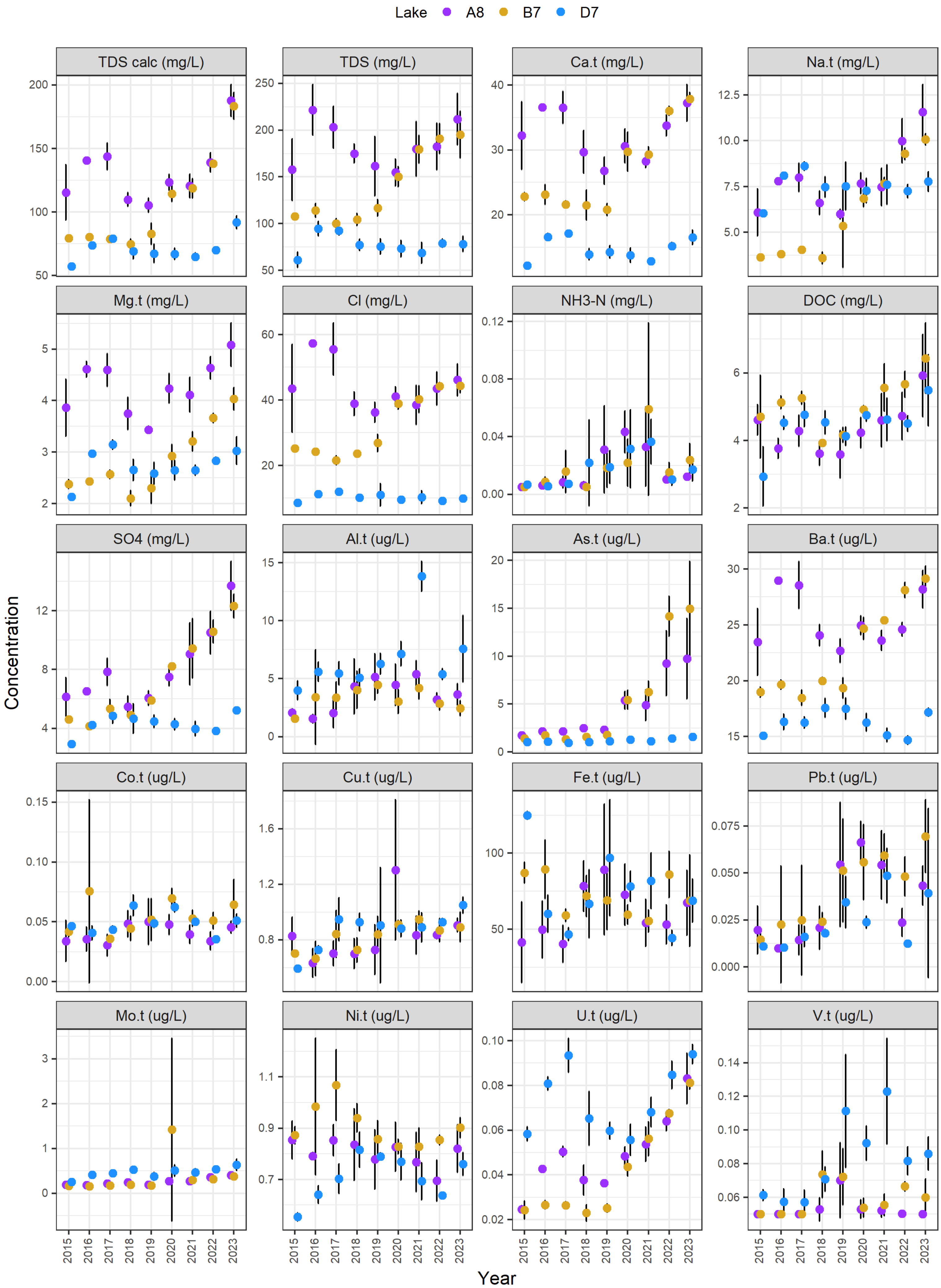
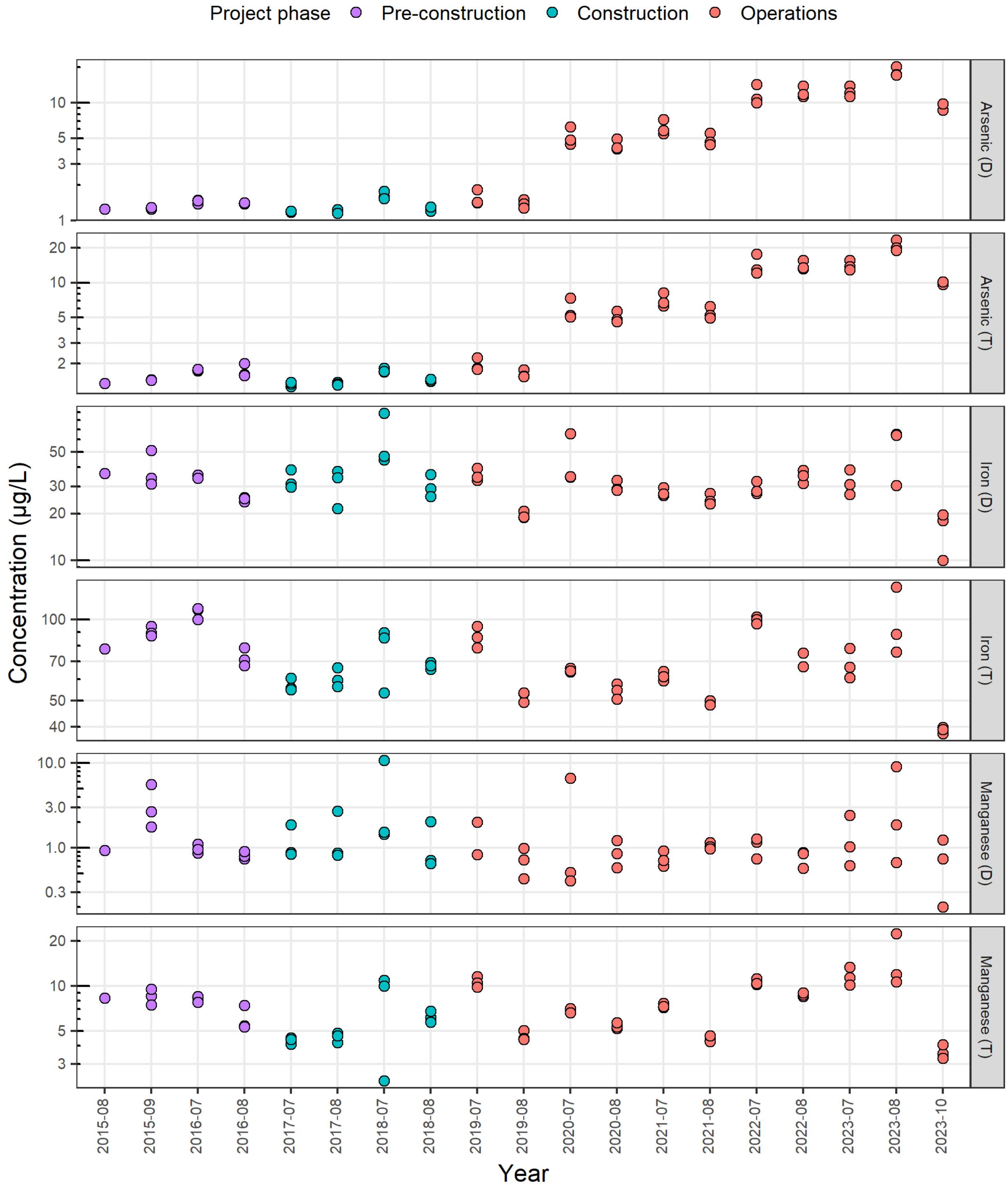


Figure 4-7. Temporal trends for arsenic, iron, and manganese in Lake B7



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

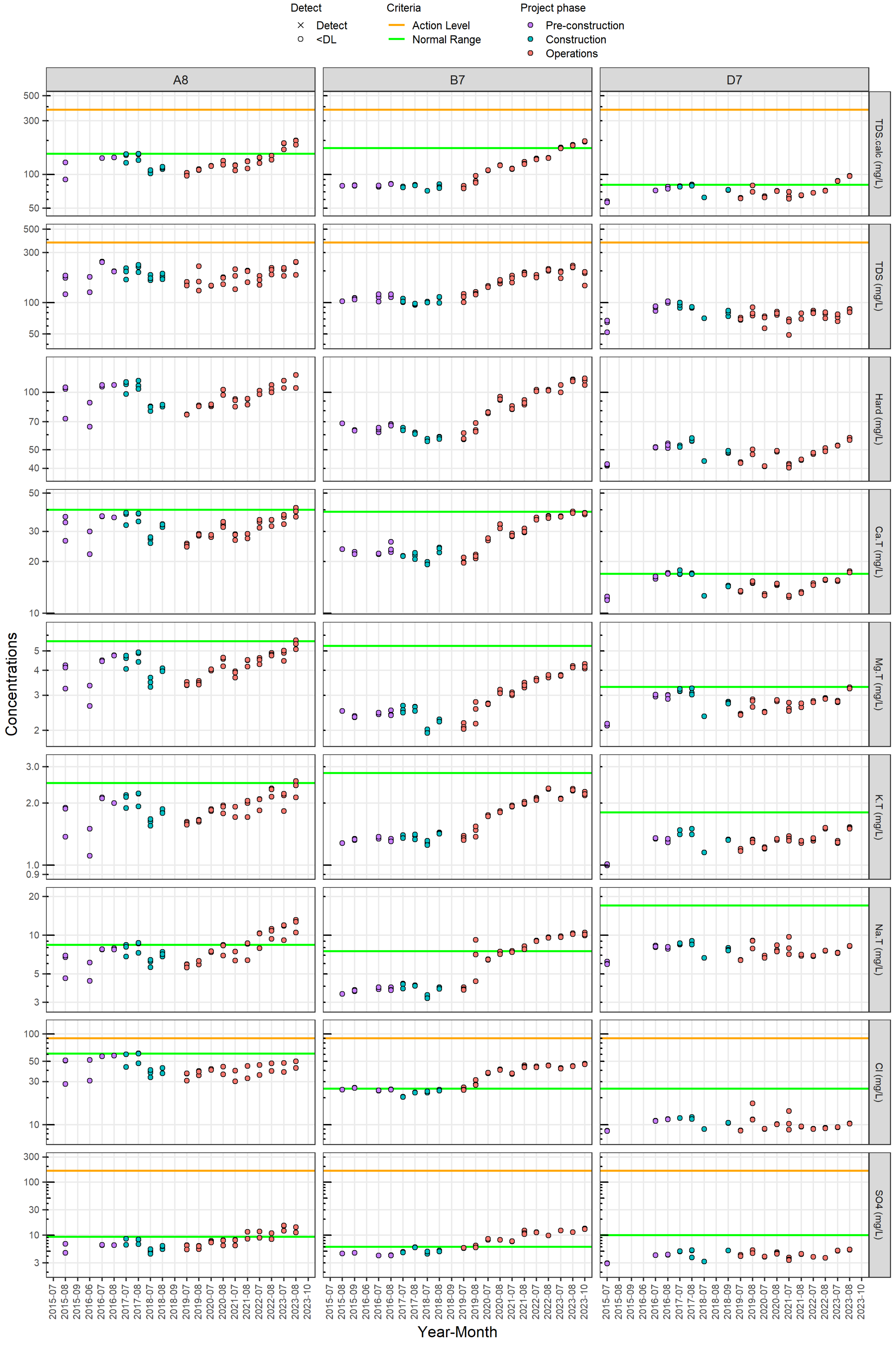


Figure 4-9. Conductivity, alkalinity, and the concentration of selected nutrients in the Peninsula Lakes since 2015

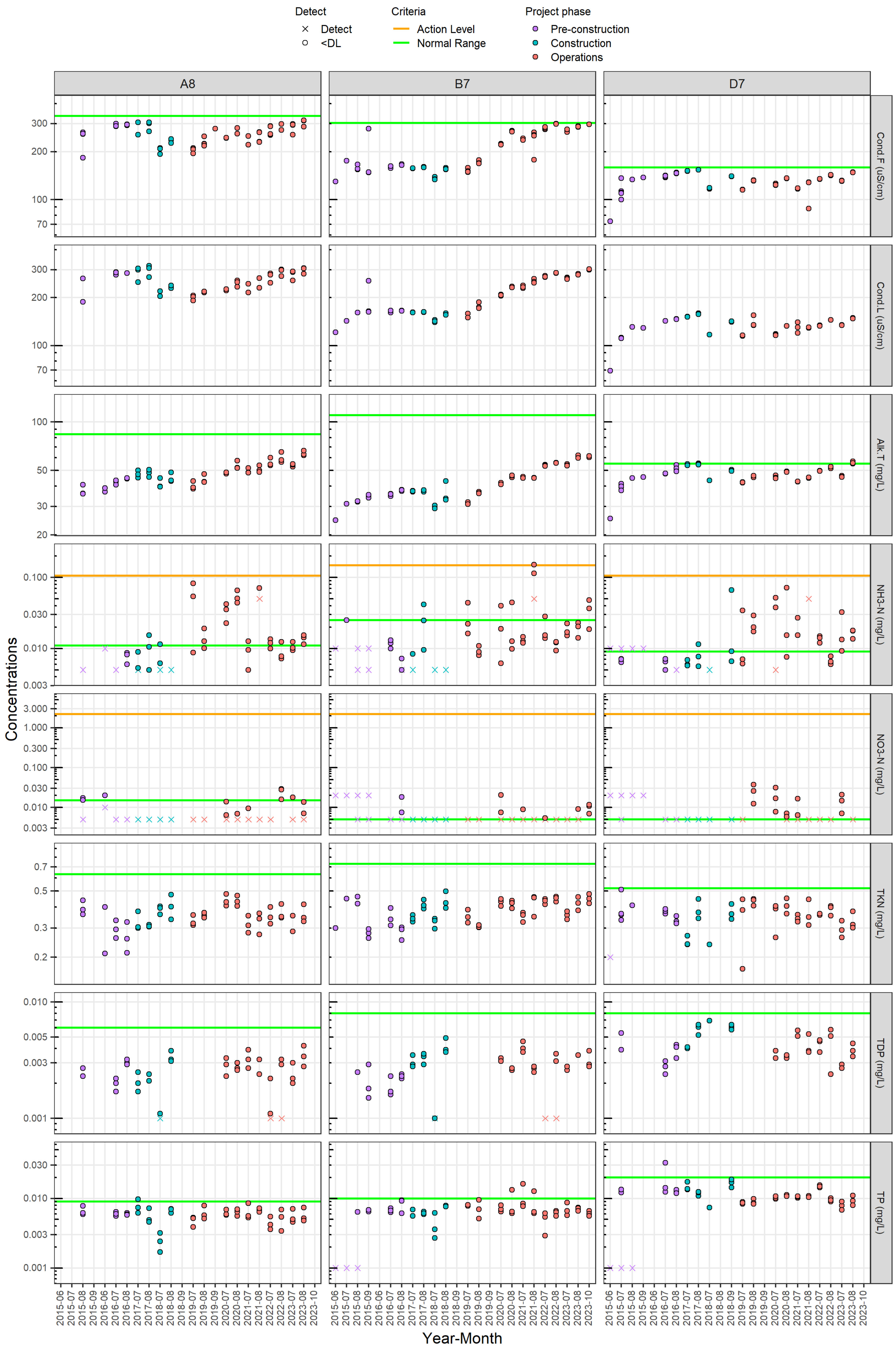


Figure 4-10. Aluminum, arsenic, barium, and boron concentrations in the Peninsula Lakes since 2015

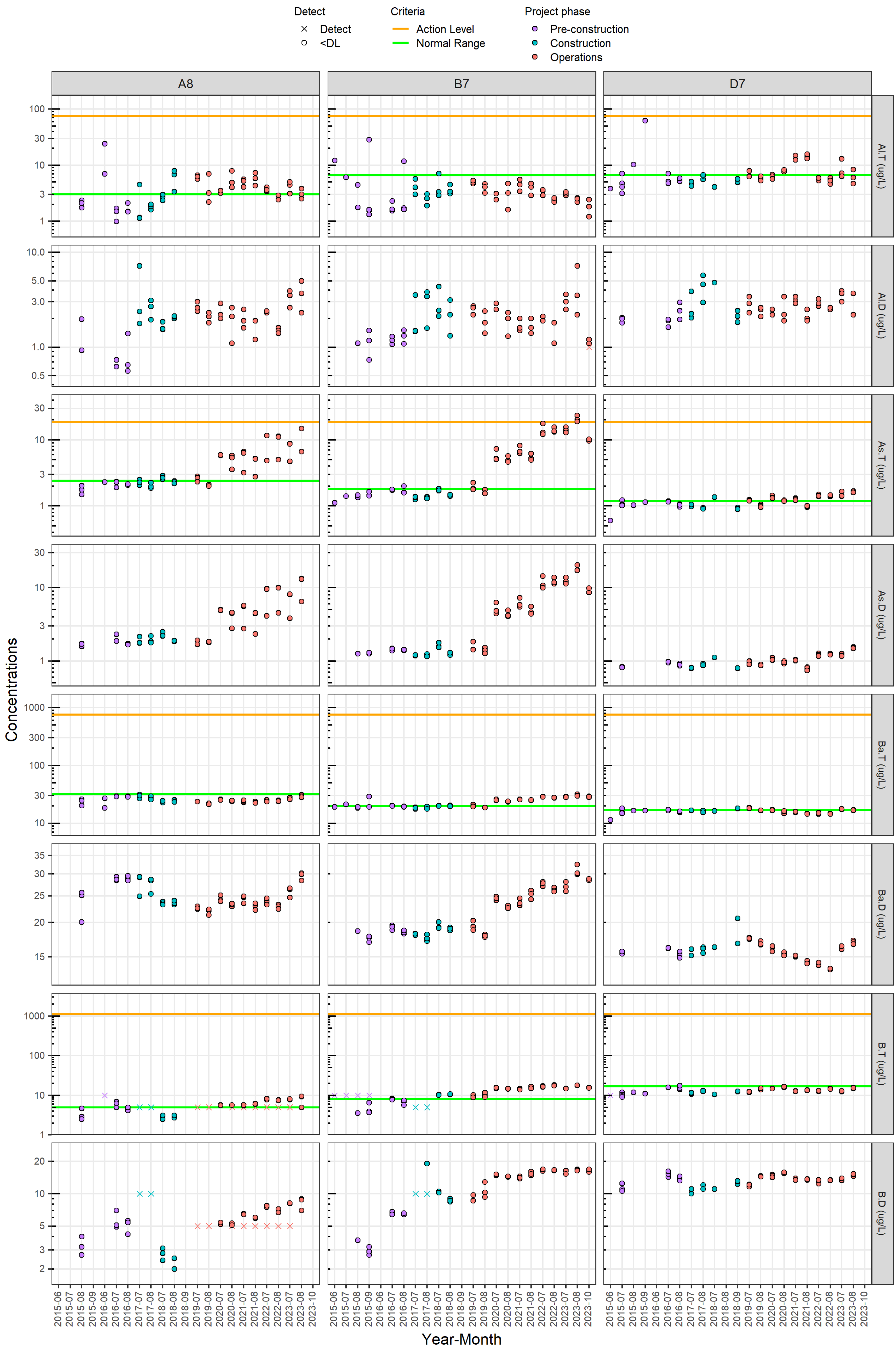


Figure 4-11. Cobalt, copper, iron, and lead concentrations in the Peninsula Lakes since 2015

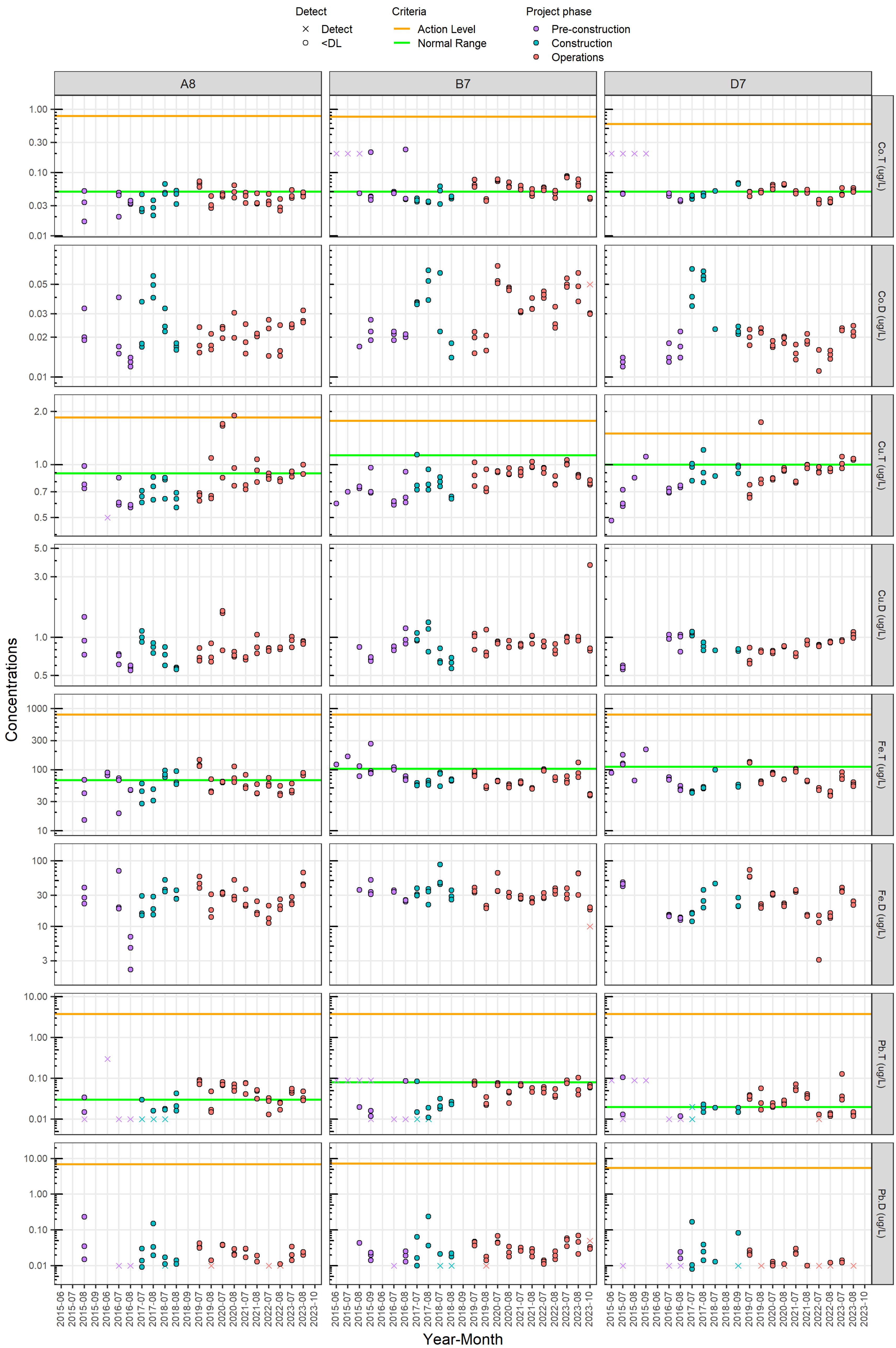


Figure 4-12. Lithium, manganese, molybdenum, and nickel concentrations in the Peninsula Lakes since 2015

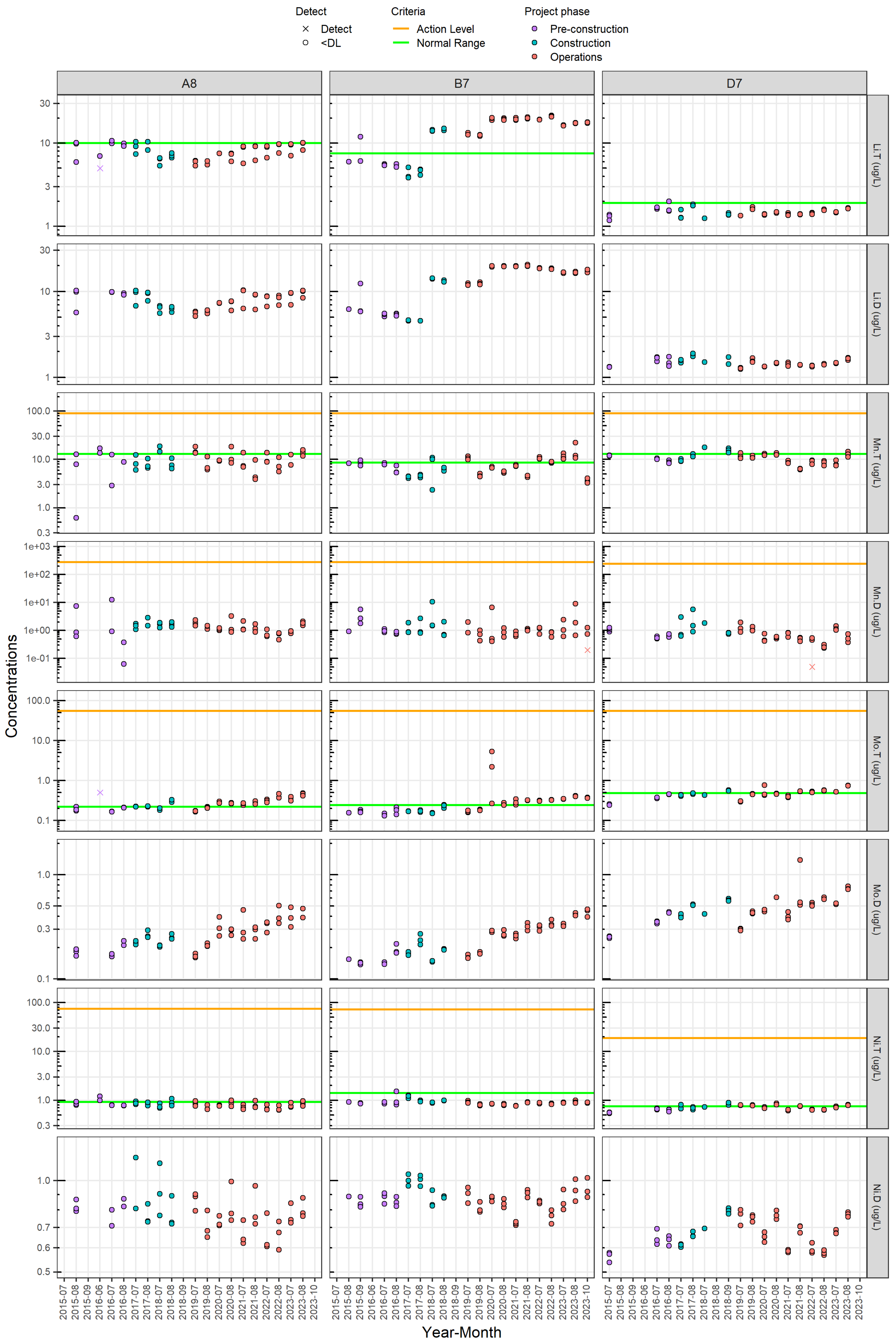
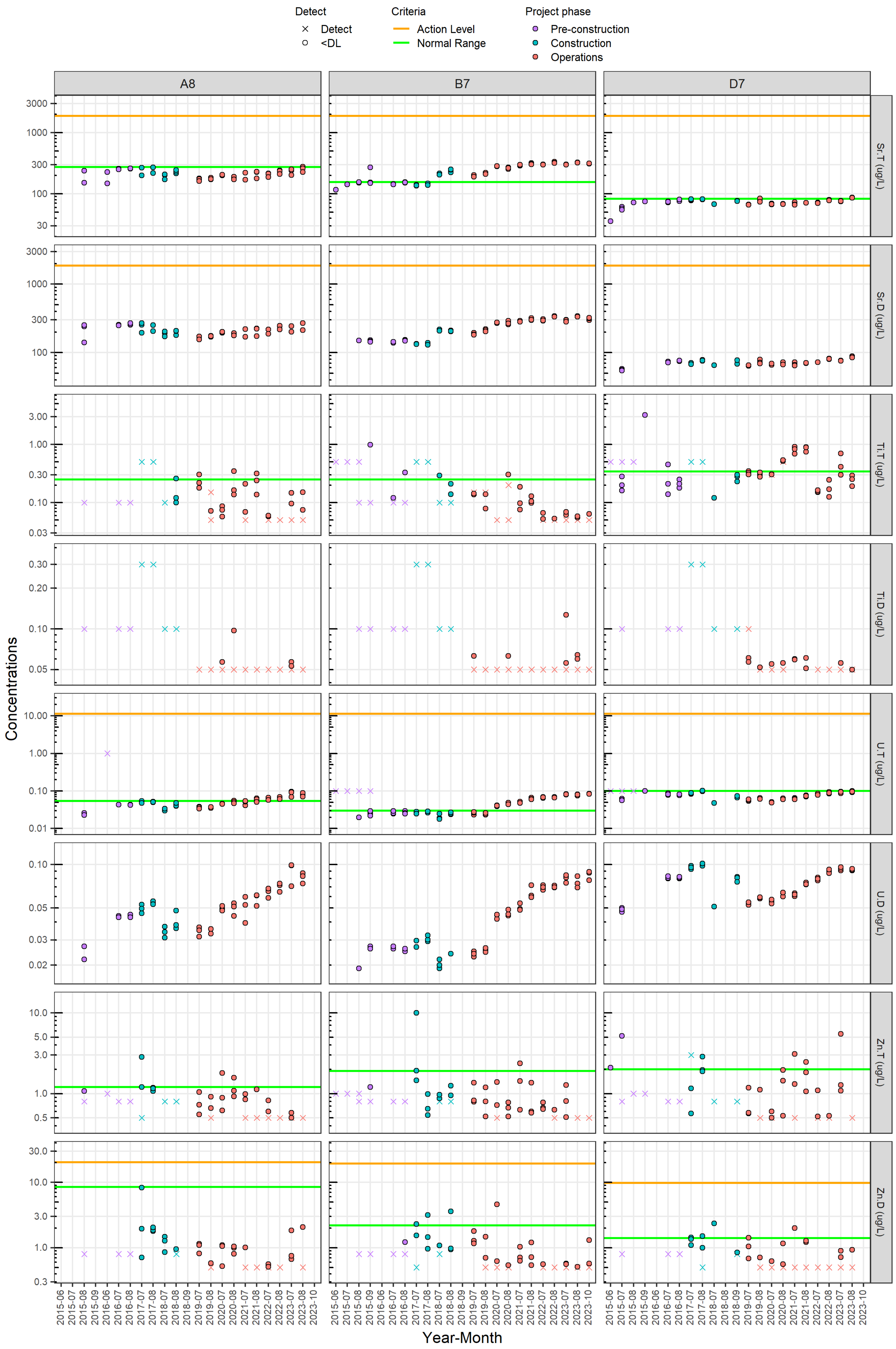


Figure 4-13. Strontium, titanium, uranium, and zinc concentrations in the Peninsula Lakes since 2015



5 PHYTOPLANKTON COMMUNITY

5.1 Introduction

This chapter presents findings of the August 2023 phytoplankton study in Meliadine Lake. Sampling areas and stations are collocated with the water quality monitoring stations shown in **Figure 3-1**.

Phytoplankton, or algae, are a diverse group of primary producers that exist freely in the water column, converting sunlight to chemical energy via the photosynthetic pigment chlorophyll-a. Phytoplankton populations and their subsequent photosynthetic productivity will fluctuate due to several factors, most of which are related to seasonal changes. During the open water period, when light levels and temperature are their highest, nutrient availability is likely the most important factor driving phytoplankton growth and populations (Wetzel, 2001). Chlorophyll-a, the primary pigment used by phytoplankton for photosynthesis, is often measured in water to estimate the primary productivity of lakes. However, the relationship between the concentration of chlorophyll-a and the total amount of phytoplankton is variable and can be influenced by factors such as trophic status, community composition, light availability, and water chemistry (Desortova, 1981; Felip and Catalan, 2000, Kasprzak et al., 2008). Therefore, a more direct measurement of primary productivity is phytoplankton biomass, or the weight of all the algae per unit of water (mg/m^3).

Phytoplankton respond quickly to environmental fluctuations, making them useful indicators of lake ecosystem changes caused by various stressors (Filiz et al., 2020). Phytoplankton monitoring for the AEMP has provided insight into the structure and function of the phytoplankton community in Meliadine Lake as the Mine transitioned from the pre-construction phase (2015) to operations. Furthermore, as the only biological monitoring program conducted annually under the AEMP, the phytoplankton study provides important information on the health of the aquatic environment in Meliadine Lake in years when fish and benthic invertebrate studies aren't completed as part of the 3-year AEMP and EEM cycle.

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:

1. Spatial and temporal patterns in nutrient concentrations. Increased nutrient loads to Meliadine Lake could result in the stimulation of phytoplankton productivity.

2. 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.
3. 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.
4. Assess 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 2023 Phytoplankton Study

- Phosphorus concentrations continue to trend lower in 2023 compared to the pre-construction and construction phase.
- Chlorophyll-a concentrations at MEL-01 (near-field [NF] and MEL-02 (mid-field [MF]) continued the increasing trend seen since 2018. Chlorophyll-a concentrations at reference locations were approximately 1 µg/L and within the range observed in previous years. The increasing temporal trend for chlorophyll-a at the NF and MF areas was not correlated with nitrogen or phosphorus concentrations in surface water. 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 higher in 2023 than 2022 at the NF area but lower than 2015-2018 and below peak biomass observed in 2019 and 2021. Phytoplankton biomass in the NF area is typically higher than the MF and reference areas, indicating the East Basin of Meliadine Lake may be naturally more productive than the other areas of Meliadine Lake.
- Multivariate analysis indicated that the NF phytoplankton community was structurally different from the communities in the MF and reference areas, and that the community composition in all areas was slightly different than in 2022. The Bray-Curtis dissimilarity index calculations supported the interpretation that the phytoplankton community at the NF area is structurally different than the MF and reference 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 natural local or regional factor.
- Routine monitoring of phytoplankton community and chlorophyll-a is recommended in 2024 to verify that discharge of effluent to Meliadine Lake is not causing changes in primary productivity or significant changes in the structure of the phytoplankton community. Phytoplankton community

monitoring will be supplemented by benthic invertebrate, fish, and sediment monitoring during the upcoming 2024 cycle of the AEMP which will aid in the evaluation of potential mining-related impacts to the aquatic environment.

5.3 Methods

Sample Collection

The 2023 phytoplankton sampling program was completed in August as per the methods outlined in the *AEMP Design Plan* (Azimuth, 2022). 2023 marks the nineth consecutive year of monitoring in Meliadine Lake. The phytoplankton study was conducted in parallel with the AEMP water chemistry sampling program and involved sampling water for taxonomy (biomass, richness, and density) and chlorophyll-a. Sampling areas and stations are shown in **Figure 3-1**. Coordinates are listed in **Table 3-1**.

Secchi depth was also recorded to provide another line of evidence when assessing relationships between nutrient concentrations and primary productivity endpoints. The annual mean and standard error of the Secchi depth readings in each area are provided in **Table 5-1**.

Table 5-1 Secchi depth from the open-water sampling events in 2023

Area	Secchi Depth (m)	
	Mean	Standard Error
MEL-01	5.8	0.3
MEL-02	6.1	0.1
MEL-03	7.6	0.2
MEL-04	7.8	0.3
MEL-05	8.1	0.0

Phytoplankton Taxonomy

Phytoplankton taxonomic identification was conducted by certified taxonomists at Plankton R Us Inc. (Winnipeg, MB). Phytoplankton were identified and enumerated using the appropriate keys and procedures listed below:

1. Standard taxonomic keys were used and provided with the final counts.
2. Sub-samples (approximately 100 mL) were dispensed into Utermohl-type settling chambers and allowed to settle for a 24-hour period.
3. Each sub-sample was first scanned at increasing magnification under an inverted microscope.
4. All organisms encountered were identified to the lowest possible taxonomic level.

5. Once the identifications were made, the counts are completed. At least 20 random fields were counted until a total count of at least 100 was made for the dominant species if possible.
6. The data was then enumerated by total cell count (cells/mL):

$$Cells\ mL^{-1} = \mathrm{N} \times \left(\frac{A_t}{A_c}\right) \times \left(\frac{1}{V}\right)$$

Where:
A_t= the area of the settling chamber (mm^2),
A_c= the area of the chamber counted (mm^2),
N= the number of units (cells) counted of a specific species, and
V= the volume settled.

7. Cell counts were converted to wet weight biomass (mg/m^3) by estimating cell volume. Estimates of cell volume for each species were obtained by measurements of up to 50 cells of an individual species and applying the geometric formula best fitted to the shape of the cell (Vollenweider, 1968; Rott, 1981). A specific gravity of 1 was assumed for cellular mass.

Chlorophyll-a

Chlorophyll-a analysis was carried out at the University of Alberta according to the standard method *Determination of Chlorophyll-a in Water by Fluorometry* (Welschmeyer, 1994). The analytical procedure involved extraction, filtration, and fluorometric analysis (Shimadzu RF-1501 Spectrofluorophotometer). Chlorophyll-a concentrations were calculated based on 500 mL of water filtered for each sample.

5.4 Data Analysis

Summary statistics and data analyses were conducted using R version 4.2.1 (R Core Team, 2022). Phytoplankton metrics (biomass, density, and taxa richness) for individual taxa were summed across all taxa (i.e., total of all organisms) and across major taxa groups (i.e., dinoflagellates, diatoms, cyanophytes, cryptophytes, chrysophytes, chlorophytes, and euglenophytes). Nutrient results from the water quality section were merged with the phytoplankton and chlorophyll-a results to investigate nutrient-productivity relationships.

Temporal and Spatial Trends

Time series plots organized by sampling area were used to highlight spatial and temporal patterns in nutrients, chlorophyll-a, and phytoplankton metrics. Phytoplankton populations grow and shrink seasonally, meaning species richness, biomass, and density are expected to vary annually, in response to regional climate patterns, and spatially in response to basin-specific factors such as morphology, timing of ice-off, and nutrient status. A fundamental premise of the temporal and spatial trend assessment was that the phytoplankton community in the various areas of Meliadine Lake will vary from year-to-year, but the NF, MF, and reference area communities should follow the same pattern of change each year. If, however, the phytoplankton community at the NF and MF areas diverges from previous years and from the reference areas, it may indicate water quality is influencing the structure of the community.

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, Simpson's evenness index, and Bray-Curtis dissimilarity) to compare the diversity of species, evenness of distribution of species, and species composition.

As in previous years, non-metric multidimensional scaling (nMDS) analysis was used to explore potential differences in the phytoplankton community among areas and over time. nMDS is an ordination method that takes multidimensional taxonomic data (e.g., biomass for each taxon for each phytoplankton sample) and collapses the information into two or three dimensions that capture major patterns of variation in the underlying data. Azimuth follows a nMDS approach based on the reference condition approach (RCA) outlined 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 unimpaired conditions in terms of a variety of biological attributes. Patterns in reference area phytoplankton community structure are examined first, to determine the range of reference conditions. Patterns in community structure at the NF (MEL-01) and MF (MEL-02) areas are explored in the context of the results for the reference areas. In the 2021 AEMP report, nMDS was performed using the biomass and richness of major taxa groups as the inputs. Starting in 2022, analysis was performed on using the biomass data for all commonly observed individual taxa.

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

- Step 1: Biomass data were compiled for all individual samples collected in August from 2013 to 2023. 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: 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: 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.

In the future, other statistical approaches may be implemented on a case-by-case basis to supplement the RCA analyses if the underlying data supports a more detailed investigation of spatial and temporal trends.

Trophic Status

Trophic status is a means of classifying estimated productivity of a lake based on concentrations of key nutrients and chlorophyll-a, and on water transparency. The three main categories of productivity are:

- Oligotrophic (low nutrients, low productivity),
- Mesotrophic (intermediate productivity), and
- Eutrophic (high nutrients, high productivity).

Three parameters are used in the classification of trophic status: total phosphorus, chlorophyll-a, and water transparency. Phosphorus is the primary nutrient used in trophic status indexes because it often limits primary productivity in freshwater systems. Chlorophyll-a is the primary pigment used for photosynthesis in phytoplankton and is used as a surrogate measure of primary production. Water transparency, measured with a Secchi disk, is also used as a coarse indicator of phytoplankton biomass.

Three trophic status indices are included in the assessment as summarized below.

- Vollenweider (1968) – A general classification scheme based on ranges of TP, chlorophyll-a and Secchi depth (**Table 5-2**).
- CCME (2004) – A total phosphorus-specific scheme using trigger ranges (**Table 5-3**).
- Carlson (1977) – Independent index scores for TP, chlorophyll-a and Secchi depth (**Table 5-4**), calculated as follows:

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

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

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

Table 5-2. 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 5-3. 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 5-4. Trophic status index and general trophic classifications for lakes (Carlson, 1977).

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

Notes:
Reference = Carlson, 1977.

The trophic status index (TSI; Carlson, 1977) can be a helpful tool to describe the trophic status of a lake and is useful for monitoring potential spatial or temporal differences in trophic status across locations in Meliadine Lake and/or monitoring years in the AEMP program. TSI is commonly used as a surrogate for direct measurement of phytoplankton communities in studies where such data is not available such as in water quality monitoring programs. In the AEMP, phytoplankton community data is collected every year and therefore the TSI is best used as a supporting piece of information that aids in the interpretation of other measures of productivity such as phytoplankton density and biomass. The TSI calculations outlined in Carlson (1977; **Table 5-4**) were used in this report to support the interpretation of the other lines of evidence relevant to the phytoplankton community.

5.5 Quality Assurance and Quality Control

Phytoplankton and chlorophyll-a QA/QC followed the general approach outlined in the AEMP Design Plan. The phytoplankton QA/QC program includes field duplicates, laboratory duplicates, and blanks for chlorophyll-a. Details of the QA/QC program are provided in **Appendix A** and summarized below.

- *Field Duplicates* – Three field duplicates were collected for phytoplankton taxonomy and chlorophyll-a in 2023, DUP-MEL-AUG-01 associated with MEL-03-03, DUP-MEL-AUG-02 associated with MEL-01-06 and DUP-MEL-AUG-03 associated with MEL-05-01. The data quality objective (DQO) for field duplicates is a relative percent difference (RPD) less than 50% between the sample and duplicate. The DQO was met for chlorophyll-a, total biomass, and total density in all sample-duplicate pairs.
- *Laboratory Duplicates* – Laboratory QC for phytoplankton samples included three randomly selected replicate subsamples (from MEL-01-07, MEL-03-01, MEL-04-02). The relative percent difference between each of the three sample and laboratory duplicate pairs was less than the RPD DDQ of 25%.
- *Field Blanks* – Three field blank samples were analyzed for chlorophyll-a and all three registered below detection limit of 0.04 µg/L (**Appendix E2**).

All the laboratory results used in analysis and reporting were screened in a manner similar to the water quality data. A review of the data entry involved an independent party checking a minimum of 10% of the data for completeness, data entry errors, transcription errors, and invalid data.

The QA/QC results indicate the phytoplankton and chlorophyll-a data from 2023 are accurate and reliable for assessing changes in primary productivity in Meliadine Lake.

5.6 Results and Discussion

5.6.1 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.

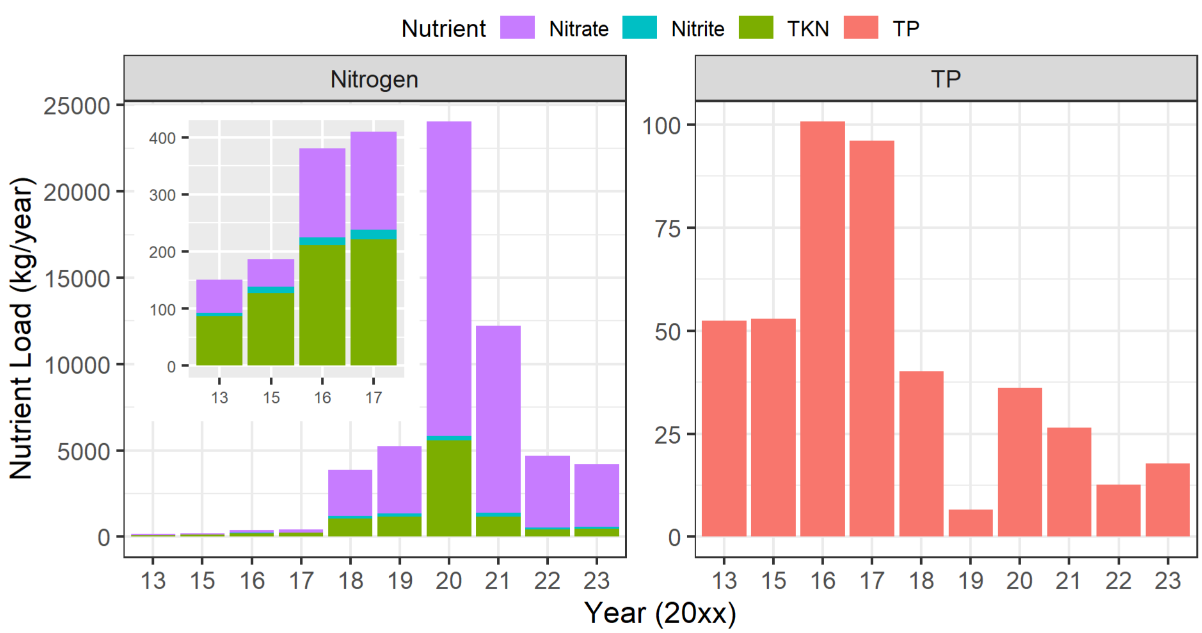
Site	AEMP Area	Date	Density (No. cells/L)	Biomass (mg/m^3)	Richness (No. taxa/site)
ML-E	MEL-01	19 Jul 97	2,008,000	529	56
		17 Aug 97	3,844,000	636	65
		17 Jul 98	2,593,000	1,887	75
		4 Sep 98	4,933,000	1,362	78
ML-S	MEL-05	20 Jul 97	1,863,000	627	73
		16 Aug 97	1,871,000	437	63
		25 Jul 98	3,736,000	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

5.6.2 Nutrient Loading to Meliadine Lake

Loadings are calculated each month based on the average monthly concentration measured in samples from MEL-14 and the total volume of effluent discharged to Meliadine Lake. The monthly loadings for key nutrients (e.g., nitrate [NO_3], nitrite [NO_2], total Kjeldahl nitrogen [TKN] [11], 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**.

Annual loadings of nitrogen and phosphorus to Meliadine Lake in 2023 were similar to 2022 and roughly 80% less than the peak loadings observed in 2020 (for nitrogen) and 2016/2017 (for phosphorus) (**Figure 5-1**). Since the main camp sewage treatment plant started operating in 2018, phosphorus concentrations in effluent samples from MEL-14 have remained relatively stable (typically between 20 mg/L and 60 mg/L) (**Figure 2-7**). Phosphorus loadings vary from year to year based mainly on the volume of water discharged to Meliadine Lake. Nitrogen loadings to Meliadine Lake have decreased primarily because of lower concentrations in the effluent stream in 2022 and 2023 compared to 2020 and 2021.

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



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

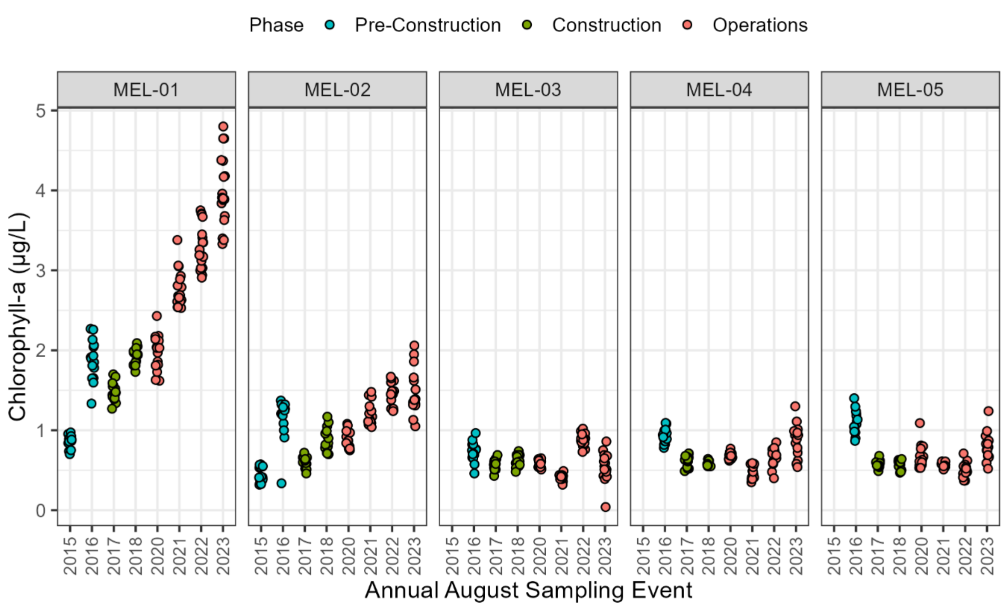
5.6.3 Chlorophyll-a

Chlorophyll-a concentrations from 2015 to 2023 are shown in **Figure 5-2**. The mean and standard deviation by area and year are provided in **Table 5-6**. Chlorophyll-a concentrations have showed the same general year-over-year pattern of increase at MEL-01 and MEL-02 since 2021. From 2016 to 2020, chlorophyll-a concentrations at MEL-01 averaged between 1.5 to 2.0 µg/L. Downstream at MEL-02, concentrations were typically less than 1 µg/L lower at MEL-02. Chlorophyll-a started to trend higher at MEL-01 in 2021, and on average concentrations have increased approximately 0.75 µg/L per year since then. In 2023, the average chlorophyll-a concentration at MEL-01 was 4.0 µg/L in 2023[12] (range = 3.3 to 4.8 µg/L). At the MF area (MEL-02), the average chlorophyll-a concentration was 1.5 µg/L in 2023, which is the same as observed in 2022. However, chlorophyll-a concentrations of up to 2.1 µg/L were measured in individual replicates collected from MEL-02 in 2023, which is higher than previously observed at this location.

Chlorophyll-a concentrations in the reference areas have remained stable since 2016 (**Table 5-6**; **Figure 5-2**). In 2023, the average chlorophyll-a concentration was 0.54 µg/L at MEL-03, 0.88 µg/L at MEL-04, and 0.79 µg/L at MEL-05.

Figure 5-2 Chlorophyll-a Concentrations (µg/L) in Meliadine Lake since 2015

Notes: Triplicate samples are collected at each area/station replicate in August.



[12] An AEMP Benchmark for chlorophyll-a of 4.5 µg/L was included in early AEMP reports based on an evaluation of chlorophyll-a and trophic status by DDMI (2013). The AEMP Benchmark was not carried forward in Version 2 of the *AEMP Design Plan* (Azimuth, 2022) because phytoplankton taxonomy is a more relevant endpoint for assessing nutrient enrichment.

Table 5-6. Chlorophyll-a (µg/L; mean ± 1SD) in Meliadine Lake since 2015

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

Notes:
"-"indicates the phytoplankton study was not completed in these areas in 2015.

5.6.4 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.

Results for the phytoplankton community are presented as follows:

- Mean phytoplankton biomass from 2013 to 2023 are presented in **Table 5-7**.
- Summary statistics for major taxa group biomass and density for samples collected in 2023 are presented in **Table 5-8**.
- Per-sample richness, biomass, and density are shown in **Figure 5-3**.
- Major taxa richness, biomass, and density are shown in **Figure 5-4** (absolute values) and **Figure 5-5** (percent).
- Simpson's diversity index, Simpson's evenness index, and Bray-Curtis dissimilarity index are shown in **Figure 5-6.**Results of the multivariate analyses of community structure using nMDS are shown in **Figure 5-7** and **Figure 5-8.**
- Summary statistics for richness, biomass, and density across all years are provided in **Appendix E1**.

Biomass

Phytoplankton biomass has been consistently higher at MEL-01 compared to MEL-02 and the reference areas since 2015 (**Table 5-7**). The same spatial pattern was evident in 2023, but there was no indication that biomass is trending higher year-over-year (**Figure 5-3**). Phytoplankton biomass has also been quite variable at MEL-01, especially since 2019. As mentioned in the introduction, phytoplankton productivity can respond quickly to natural and anthropogenic changes. Notable increases in August biomass measurements were observed between 2013 and 2015, 2018 and 2019, and 2020 and 2021 and the timing of the increase in each of these years coincided with unusually high rainfall in the region. Since 1981, cumulative rain ranked 1st in 2019, 2nd in 2015, 6th in 2021, and 7th in 2014. Increased precipitation associated with interannual climate variability and associated runoff can lead to higher concentrations of major ions, organic carbon, and micronutrients. These climate-related changes in water quality can remove certain constraints on phytoplankton productivity (Pokrovsky et al., 2021). Unless the inputs are ongoing, the effects on productivity would be temporary. This was the case in 2020, 2022, and 2023 which were much drier years, and biomass at MEL-01 was similar to MEL-02 and the reference areas (**Figure 5-3**). The factors driving this spatial pattern are discussed in **Section 5.6.5**.

Table 5-7. Phytoplankton biomass (mg/m^3; mean ± 1SD) in Meliadine Lake since 2015

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

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 2015-2023 should be made with caution.

The mean biomass observed at MEL-02 in 2023 was the lowest observed since 2015. Mean biomass at the reference areas was higher in 2023 than in 2022, but within the range of values observed in the past few years. The divergent pattern in biomass among the NF, MF, and reference areas is discussed below.

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 2023, relative to total community biomass, chrysophytes comprised between 27% (MEL-05) to 61% (MEL-01) (**Table 5-8**, **Figure 5-5**). The next most common major taxa by biomass were cryptophytes, dinoflagellates, diatoms, and chlorophytes (green algae; **Figure 5-4, Figure 5-5**). Cryptophytes accounted for only 9% of the total biomass at MEL-01 but represented 21% of the biomass at MEL-02 and 17% to 29% of the biomass at the reference areas. Chlorophytes also accounted for a smaller proportion of the total biomass at MEL-01 (3%) compared to MEL-02 and the reference areas (6% to 15%; **Figure 5-5**). Overall, the relative proportion of total biomass in each major taxa group in 2023 was consistent with results observed in 2015 to 2022 and similar to other studies on phytoplankton community assemblages in northern latitude lakes (Bergström et al., 2021).

Since 2015, annual variability in total phytoplankton biomass in Meliadine Lake has primarily been driven by variability in chrysophyte biomass. However, in 2023, despite decreases in chrysophyte biomass in the reference areas, total biomass increased. The increased total biomass in the reference areas in 2023 relative to 2022 was primarily related to higher cryptophyte biomass, which was also observed at MEL-01 and MEL-02. In 2023, the cryptophyte species *Rhodomonas minuta* Skuja was the dominant species in terms of biomass in 8 of the 26 replicates collected (31%) and in the top five species in terms of biomass in 22 of 26 replicates (85%; **Table E1-2**). In contrast, *Rhodomonas minuta* Skuja was in the top five species in terms of biomass in only 1 of the 26 replicates collected in each of 2021 and 2022. The dominant taxa in most phytoplankton samples in 2021 and 2022 were chrysophytes in the genera *Dinobryon* and *Chrysochomulina* and the dinoflagellate genus *Peridinium* (**Table E1-2**). 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). Together, these attributes explain the dominance of these genera in terms of total phytoplankton biomass as shown in **Figure 5-4**.

Cyanobacteria comprised less than 1% of the total phytoplankton biomass at the study areas in 2023 (**Table 5-8**). 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 5-4**). 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 2023 phytoplankton richness was higher in all areas of Meliadine Lake than in 2022, but was within the range of values previously observed at each area. The increase in richness in 2023 compared to 2022 accompanied a corresponding increase in biomass at all locations except MEL-02, where biomass decreased in 2023 despite the increase in richness.

Chrysophytes were the most diverse major taxa group at all locations except for reference area MEL-05 in 2023; the number of unique chrysophyte taxa ranged from 9 at MEL-04 and MEL-05 to 16 at MEL-01

(**Figure 5-4**). Chlorophytes and diatoms were also well represented in terms of the number of taxa; chlorophytes were the most diverse major taxa group at MEL-05. 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 (**Figure 5-5**). Subtle shifts in species dominance are part of natural succession patterns that phytoplankton communities undergo in response to a variety of physical (e.g., climactic), 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.

Table 5-8 Phytoplankton biomass (mg/m³) and density (cells/L) by major taxa in 2023

Notes: Chloro = chlorophytes; Chryso = chrysophytes; Crypto = cryptophytes; Dino = dinoflagellates; Cyano = cyanobacteria
Euglenophytes were also considered as a major taxa group, but accounted for <1% of the biomass and density in all samples and were therefore not included in this summary table.

Area	Sample ID	Biomass (mg/m³)							Density (cells/L)						
		Chloro	Chryso	Diatoms	Crypto	Dino	Cyano	Total	Chloro	Chryso	Diatoms	Crypto	Dino	Cyano	Total
MEL-01	MEL-0101	11	256	41	26	37	1	372	288,760	3,117,488	175,880	99,792	6,400	29,136	3,717,456
	MEL-0106	9	182	16	34	56	0	296	324,280	2,983,176	166,496	157,264	10,000	800	3,642,016
	MEL-0107	5	190	21	9	40	3	268	188,784	2,183,368	179,096	37,920	6,000	87,008	2,682,176
	MEL-0108	4	119	51	36	52	1	261	138,296	1,740,944	1,381,976	184,400	10,600	1,000	3,457,216
	MEL-0109	7	146	17	19	51	1	241	245,456	1,943,896	221,384	84,024	9,400	43,704	2,547,864
	MEL-0110	9	183	13	40	60	0	307	195,368	2,77,2840	99,824	179,616	10,600	800	3,259,248
	Average	**3%**	**61%**	**9%**	**9%**	**17%**	**<1%**	**291**	**7%**	**76%**	**11%**	**4%**	**<1%**	**1%**	**3,217,663**
MEL-02	MEL-0202	15	28	17	26	27	0	113	577,120	518,248	189,032	139,296	4,400	200	1,428,296
	MEL-0203	16	32	13	22	18	0	102	561,352	611,040	112,408	92,008	3,600	600	1,381,008
	MEL-0205	14	47	14	11	31	2	119	732,768	840,928	199,400	52,288	5,600	30,936	1,861,920
	MEL-0206	17	40	16	32	20	0	125	1,157,824	978,224	113,008	176,816	3,800	400	2,430,072
	MEL-0208	15	22	18	31	35	1	121	826,760	338,848	122,176	155,864	6,400	1,600	145,1648
	Average	**13%**	**29%**	**13%**	**21%**	**23%**	**1%**	**116**	**45%**	**38%**	**9%**	**7%**	**<1%**	**<1%**	**1,710,588**
MEL-03	MEL-0301	9	91	6	25	29	0	160	331,864	1,107,136	31,152	146,280	6,600	0	1,623,032
	MEL-0302	10	61	11	24	47	0	152	618,024	783,256	22,368	105,576	9,800	0	1,539,024
	MEL-0303	12	57	9	31	17	0	126	380,952	985,208	99,192	188,784	3,800	0	1,657,936
	MEL-0304	9	99	17	28	23	0	176	403,704	1,056,248	202,568	160,648	5,200	0	1,828,368
	MEL-0305	10	49	14	13	22	0	109	482,128	797,624	105,376	40,720	5,200	200	1,431,248
	Average	**7%**	**49%**	**8%**	**17%**	**19%**	**<1%**	**145**	**28%**	**58%**	**6%**	**8%**	**<1%**	**<1%**	**1,615,922**
MEL-04	MEL-0401	11	65	14	24	31	0	145	496,496	862,080	148,880	126,728	6,400	0	1,640,584
	MEL-0402	6	43	8	25	16	0	98	438,624	926,736	127,528	120,544	3,800	0	1,617,232
	MEL-0403	11	81	15	24	8	0	139	719,200	775,872	139,112	119,544	1,800	0	1,755,528
	MEL-0404	5	112	13	53	15	0	199	330,864	1,602,232	99,192	261,440	3,200	0	2,296,928
	MEL-0405	6	61	8	64	15	0	154	331,264	1,107,136	33,536	365,600	3,400	400	1,841,336
	Average	**6%**	**49%**	**8%**	**26%**	**12%**	**<1%**	**147**	**26%**	**57%**	**6%**	**11%**	**<1%**	**<1%**	**1,830,322**
MEL-05	MEL-0501	22	40	16	51	24	0	152	1,236,248	711,216	128,728	293,760	5,600	0	2,375,552
	MEL-0502	35	22	11	47	24	0	140	776,872	431,040	104,176	232,704	5,200	600	1,550,592
	MEL-0503	28	27	28	27	29	5	144	1,387,112	452,792	60,104	101,992	5,600	57,672	2,065,272
	MEL-0504	12	52	11	56	29	0	160	532,616	933,920	97,992	304,144	6,000	0	1,874,672
	MEL-0505	14	62	26	38	17	0	157	705,032	625,008	98,392	175,232	3,400	200	1,607,264
	Average	**15%**	**27%**	**12%**	**29%**	**17%**	**1%**	**150**	**48%**	**34%**	**5%**	**12%**	**<1**	**1%**	**1,894,670**

Figure 5-3 Phytoplankton richness, biomass (mg/m³), and density (cells/L), 2013-2023

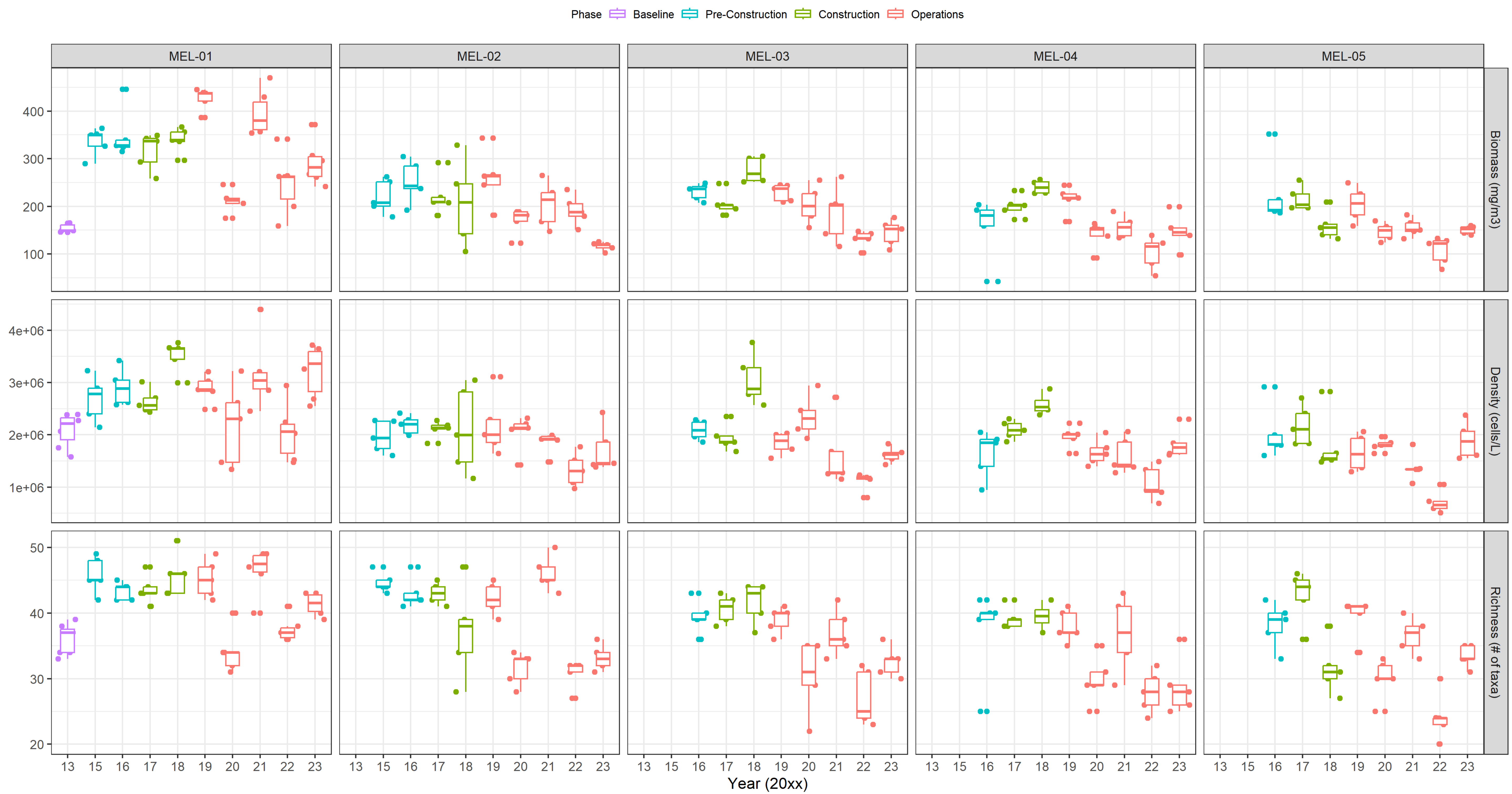


Figure 5-4. Mean phytoplankton richness, biomass (mg/m³), and density (cells/L) by major taxa, 2013-2023

Notes: Major taxa group endpoints (richness, biomass, and density) for each area-year are based on the average (arithmetic mean) of the individual replicates.
Euglenophytes were also considered as a major taxa group, but accounted for <1% of the biomass and density in all samples and were therefore not included in this summary figure

Figure 5-5. Relative richness, biomass (mg/m³), and density (cells/L) by major taxa, 2013-2023

Notes: Major taxa richness, biomass, and density shown as the proportion of the total based on the average for each area/year.
Euglenophytes were also considered as a major taxa group, but accounted for <1% of the biomass and density in all samples and were therefore not included in this summary figure

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 2023, mean SDI ranged from 0.86 at reference location MEL-04 to 0.93 at the NF location MEL-01 (**Figure 5-6**; middle panel). Given that the highest observed diversity was at the NF area MEL-01, 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 2023, mean SEI ranged from 0.26 at reference location MEL-03 to 0.36 at NF area MEL-01 and MF area MEL-02 (**Figure 5-6**; bottom panel). Given that the highest observed evenness was at the NF and MF areas, 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 2023, mean BCI ranged from 0.24 at reference location MEL-03 to 0.53 at NF area MEL-01 (**Figure 5-6**; 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 on more detail in the following section.

Multivariate Analyses

Finer patterns in community structure across sampling areas and years were explored using multivariate non-metric multidimensional scaling (nMDS) analysis[13]. 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 (0.24) 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 5.4**.

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

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

panel of **Figure 5-7**. 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 5-7**. The ordination results are also shown by year in **Figure 5-8** 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 5-8** 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. With the exception of 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 5-8**). 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 5-8**. No major taxa were significantly positively correlated with nMDS Axis 1[14]. Chrysophyte richness and biomass were most strongly negatively correlated with nMDS Axis 1. Chrysophyte biomass accounted for an average of 61% of the biomass at MEL-01 but only 27% to 49% of the biomass in the MF and reference areas.
- **Axis 2** – In 2023, 5 of 6 replicates collected from MEL-01 had positive Axis 2 scores and are therefore ordinated in the top half of the plot in the 2023 panel of **Figure 5-8**. Conversely, most replicates from MEL-02 and the reference areas in 2023 had negative Axis 2 scores and are ordinated in the bottom half. Dinoflagellate richness and biomass were the two metrics most strongly positively correlated with nMDS Axis 2. Dinoflagellates accounted for a similar proportion of the total biomass in each station, but total biomass was highest at MEL-01 and therefore dinoflagellate biomass was highest at MEL-01 (**Table 5-8**). Cryptophyte biomass and richness were the metrics most strongly negatively correlated with nMDS Axis 2. As previously mentioned, the

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

cryptophyte *Rhodomonas minuta* Skuja was one of the most dominant taxa in terms of biomass at MEL-02 and the reference areas in 2023. Cryptophytes accounted for 21% of the biomass at MEL-02 and 17% to 29% of the biomass at the reference areas compared to 9% of the biomass at MEL-01. These differences are evident in the 2023 panel of **Figure 5-8**.

Differences in the community composition are interpreted using the ordination plots in two ways: 1) by comparing the absolute position of each point relative to the probability ellipses, and 2) by comparing the location of each point relative to other areas for a given year. For example, the position of the NF and MF areas relative to one another and to the reference areas varies among years.

The key messages from the nMDS analysis are as follows:

- Community composition is subject to influence from regional factors year to year. Over time, variability among the NF, MF, and reference areas has increased, as indicated by the increasing spread of the points in 2020 to 2023 shown in **Figure 5-8**.
- Although the community composition may shift lake-wide from year to year, the MF and reference areas tend to follow a similar pattern of change.
- In most years, the composition of the phytoplankton community at MEL-01 followed a similar pattern as the reference areas. The composition of the phytoplankton community at MEL-01 has diverged from MEL-02 and the reference areas in 2020, 2022, and 2023. 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 fell outside of the ellipse representing the 99th percentile of the baseline and reference community. In 2022 and 2023, MEL-01 samples tended to have higher nMDS Axis 2 scores and lower Axis 1 scores than the MF and reference samples. However, the 2013 baseline results for MEL-01 (the only area sampled that year) also had low values on nMDS Axis 2 and were largely outside the 90th percentile ellipse, suggesting that differences in phytoplankton community composition in the East Basin may be due, at least in part, to factors unrelated to mining.

Discharge of effluent to the East Basin was predicted to cause a corresponding increase in nitrogen concentrations and 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, but so far it is unclear whether the differences in the phytoplankton community observed at MEL-01 in 2020, 2022, and 2023 were caused primarily by effluent or interannual variability in precipitation patterns. 2020, 2022, and 2023 had variable effluent discharge and nutrient loadings (**Figure 5-1**), which implies that factor(s) other than effluent have contributed to the variability in the phytoplankton community at MEL-01 in recent years.

Figure 5-6. Bray-Curtis Dissimilarity, Simpson's Diversity, and Simpson's Evenness, 2013-2023

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

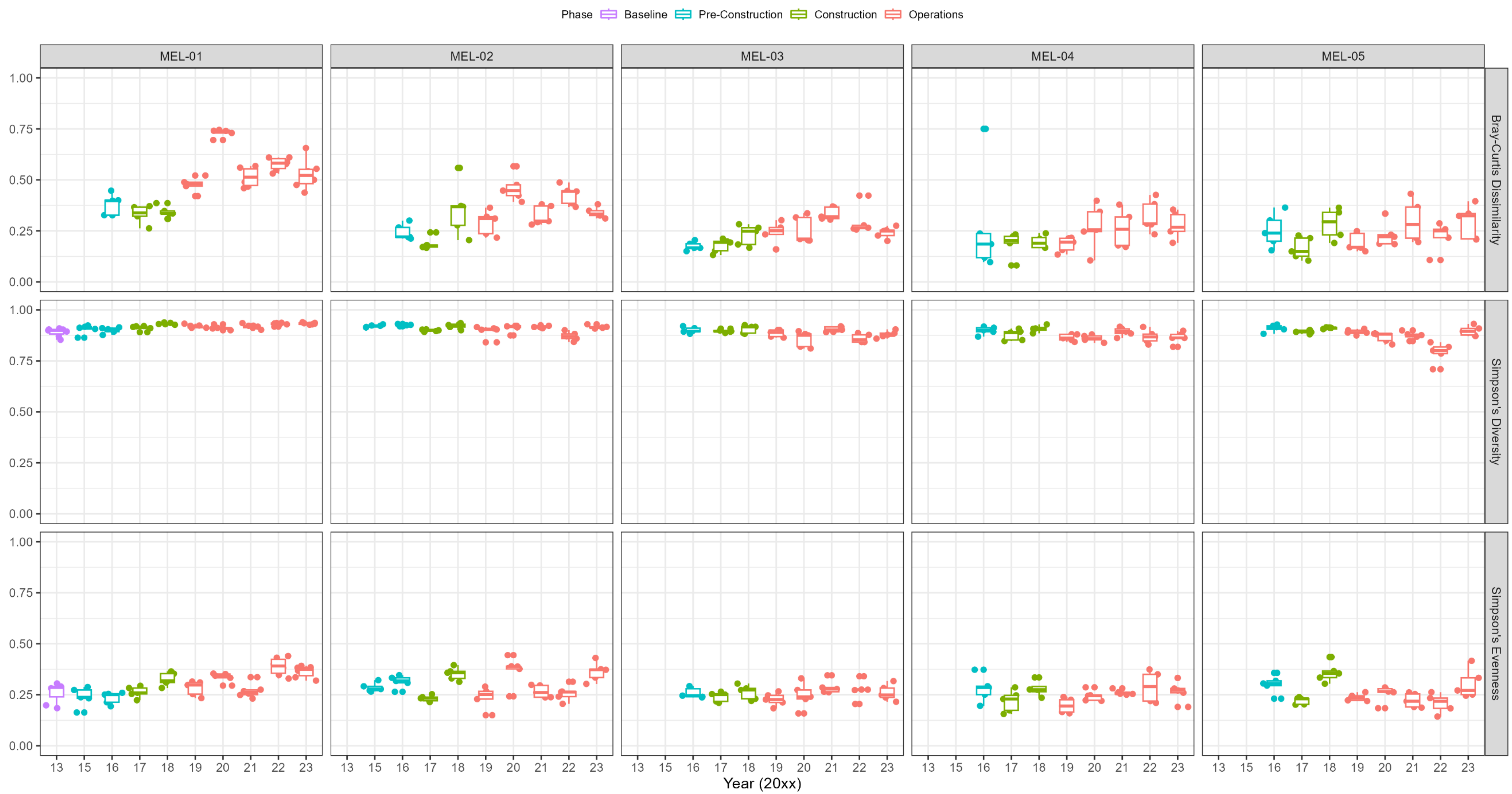


Figure 5-7. Ordination of the reference and exposure area phytoplankton results by phase and location for Meliadine Lake.

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.
2023 data is plotted separately for ease of comparison but is part of the operations phase

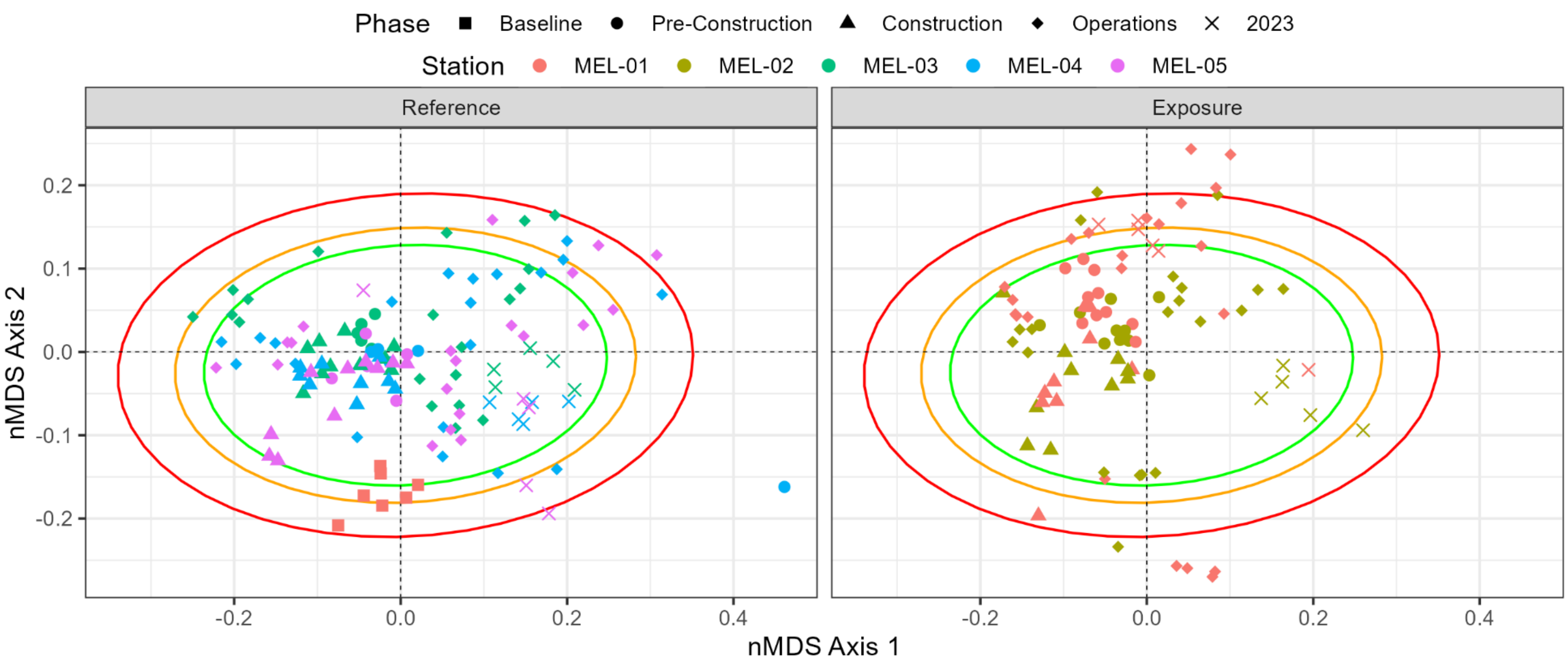
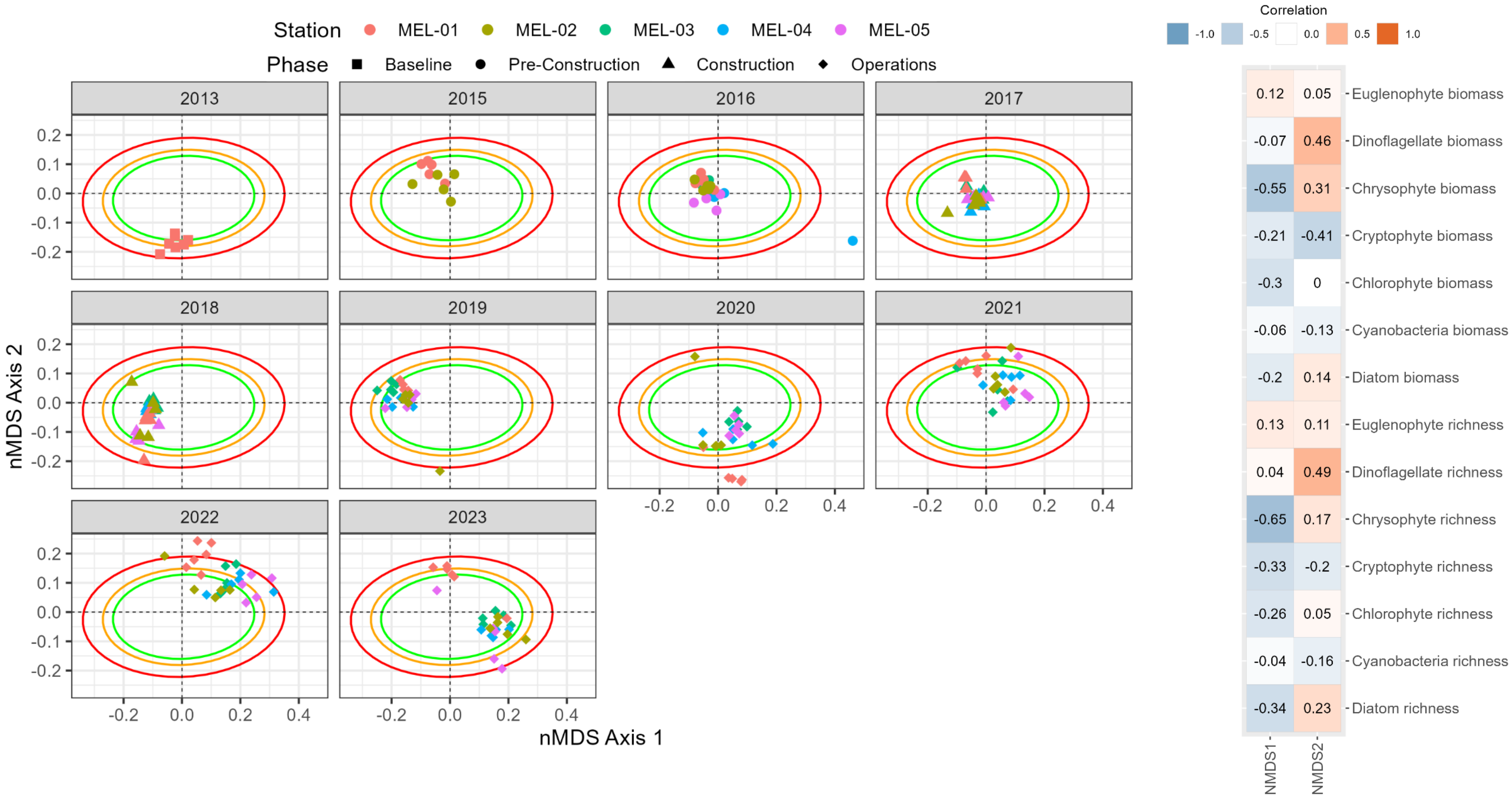


Figure 5-8. Non-metric multidimensional scaling (nMDS) results showing ordination of the phytoplankton results by year and location for Meliadine Lake.

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 ($p < 0.05$).



5.6.5 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 is used as a key indicator; the relationship between the two is shown by year in **Figure 5-9**. In general, there is a positive relationship within each year based primarily on the results from MEL-01. However, the increasing temporal trend for chlorophyll-a at MEL-01 in the last three years is not associated with progressively higher total biomass (**Figure 5-10**). Divergent patterns of change for biomass and chlorophyll-a were also evident at MEL-02 (lower biomass in 2023 and higher chlorophyll-a). These results imply that the relative amount of the photosynthetic pigment per unit biomass is increasing for the phytoplankton communities at MEL-01 and MEL-02 but not at the reference areas. As discussed in **Section 5.1**, 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).

Felip and Catalan (2000) found that in an oligotrophic lake system, the seasonal chlorophyll-a maximum in the water column was associated with a phytoplankton community dominated by flagellated chrysophytes. As previously discussed, the phytoplankton community at MEL-01 contains a higher total amount and relative proportion of chrysophytes than MEL-02 and the reference areas. In addition, on average 3 of the 5 most dominant species by biomass in replicates from MEL-01 in 2023 were flagellated chrysophytes, compared to an average of 1 of 5 at MEL-02 and the reference areas. Therefore, one possible explanation for the increase in chlorophyll-a per unit of phytoplankton biomass is that the community has a higher proportion of flagellated chrysophytes. If a similar increase in chlorophyll-a without a corresponding increase in phytoplankton biomass is observed again in the 2024 sampling program, this explanation will be given further consideration.

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 5-11**) and for MEL-01 only (**Figure 5-12**). 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 5-11**). 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 5-11**) and between chlorophyll-a and DOC when looking specifically at the results for MEL-01 (**Figure 5-12**). 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 a change 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 2023 concentrations of DOC in reference areas MEL-04 and MEL-05 were comparable to those measured at MEL-01 and therefore the increase in DOC alone is likely not sufficient to explain the increase in chlorophyll-a at MEL-01. In the AEMP, light availability is primarily measured in the field using Secchi depth, which is discussed further in the following section.

Figure 5-9. Relationship between chlorophyll-a and phytoplankton biomass for Meliadine Lake by year, 2015 through 2023

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.

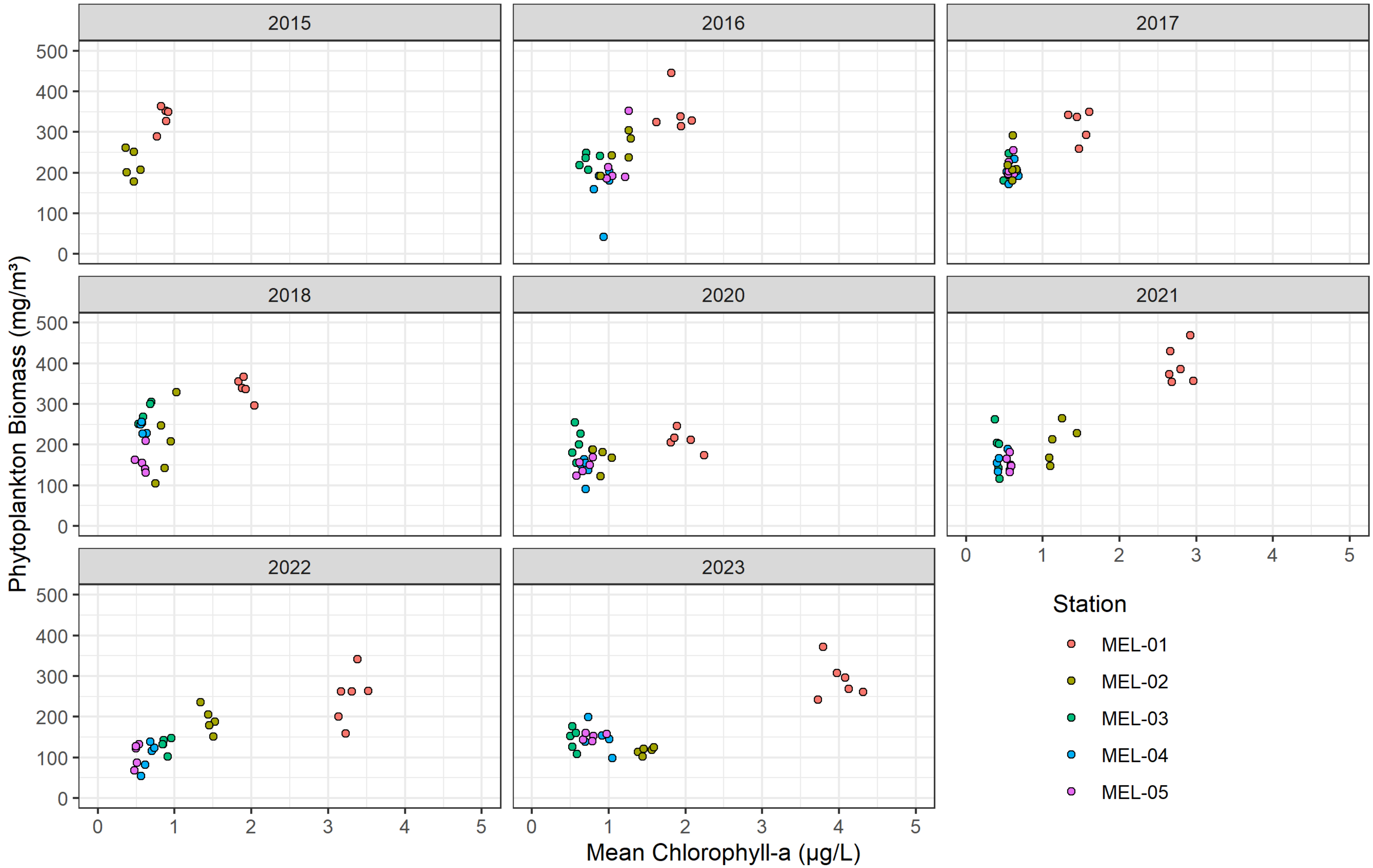


Figure 5-10. Relationship between chlorophyll-a and phytoplankton biomass for Meliadine Lake by monitoring location, 2015 through 2023

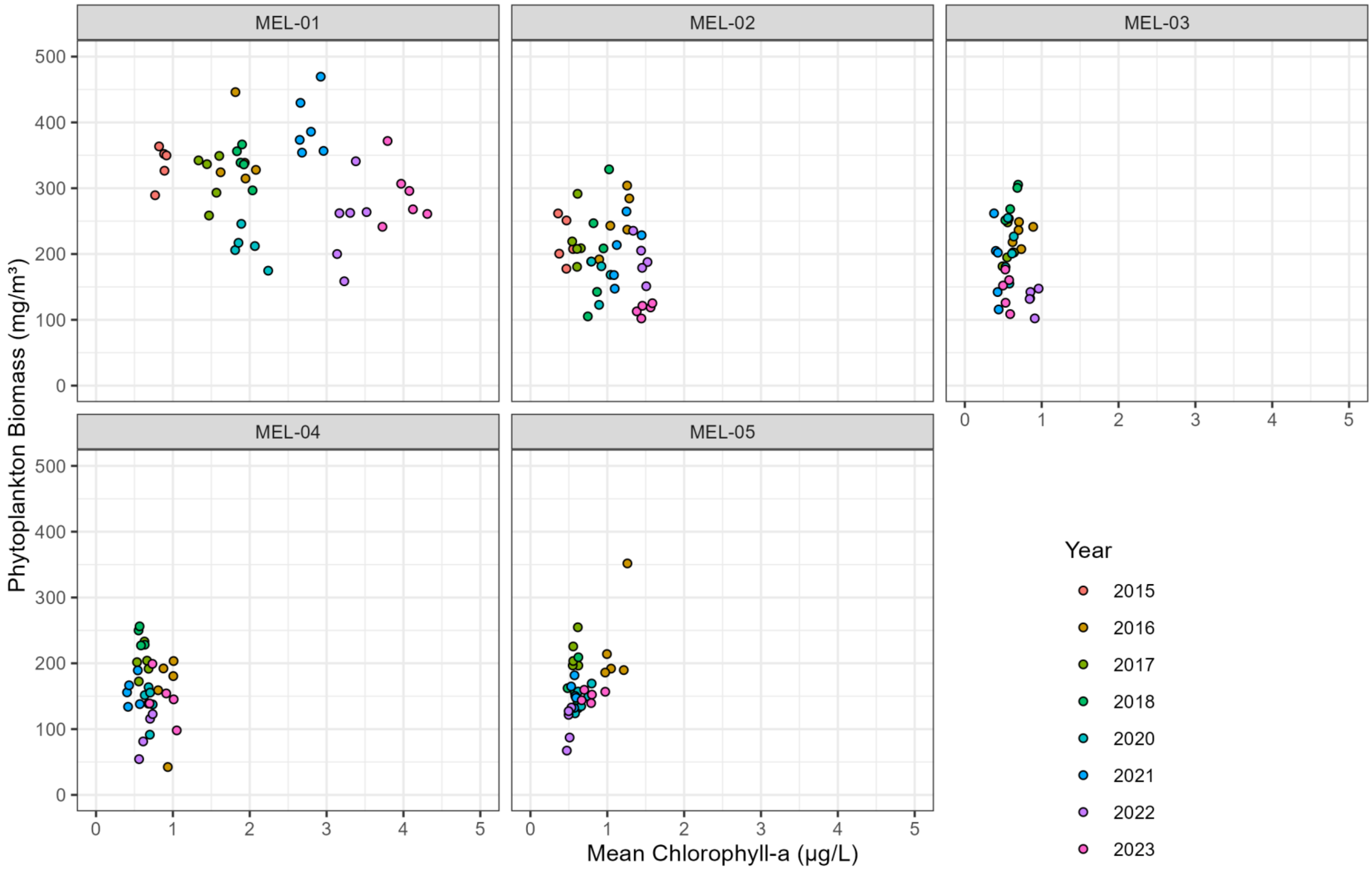


Figure 5-11. Relationship between nutrient concentrations (DOC, nitrogen, and phosphorus) and phytoplankton biomass and chlorophyll-a in Meliadine Lake, 2013-2023

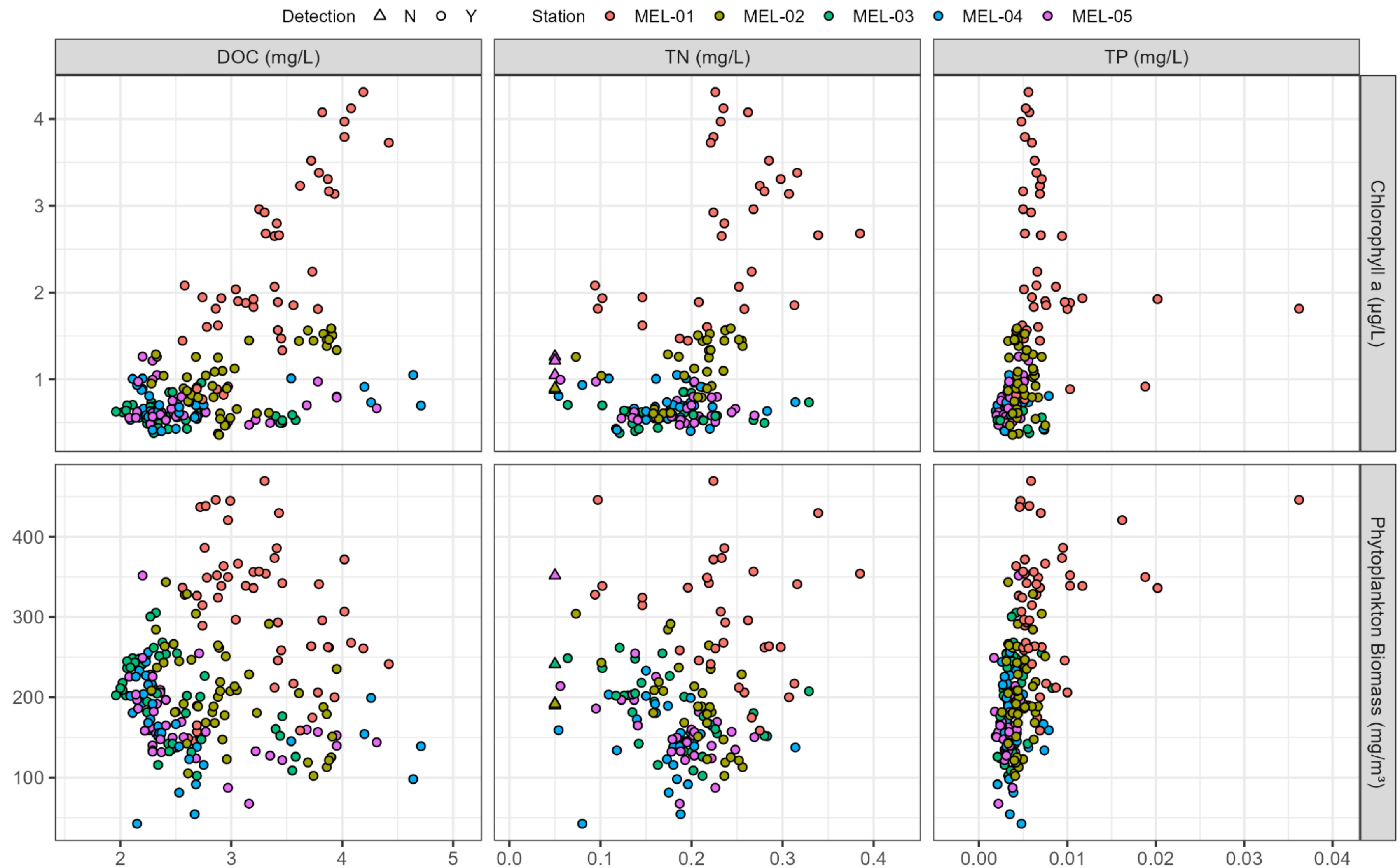
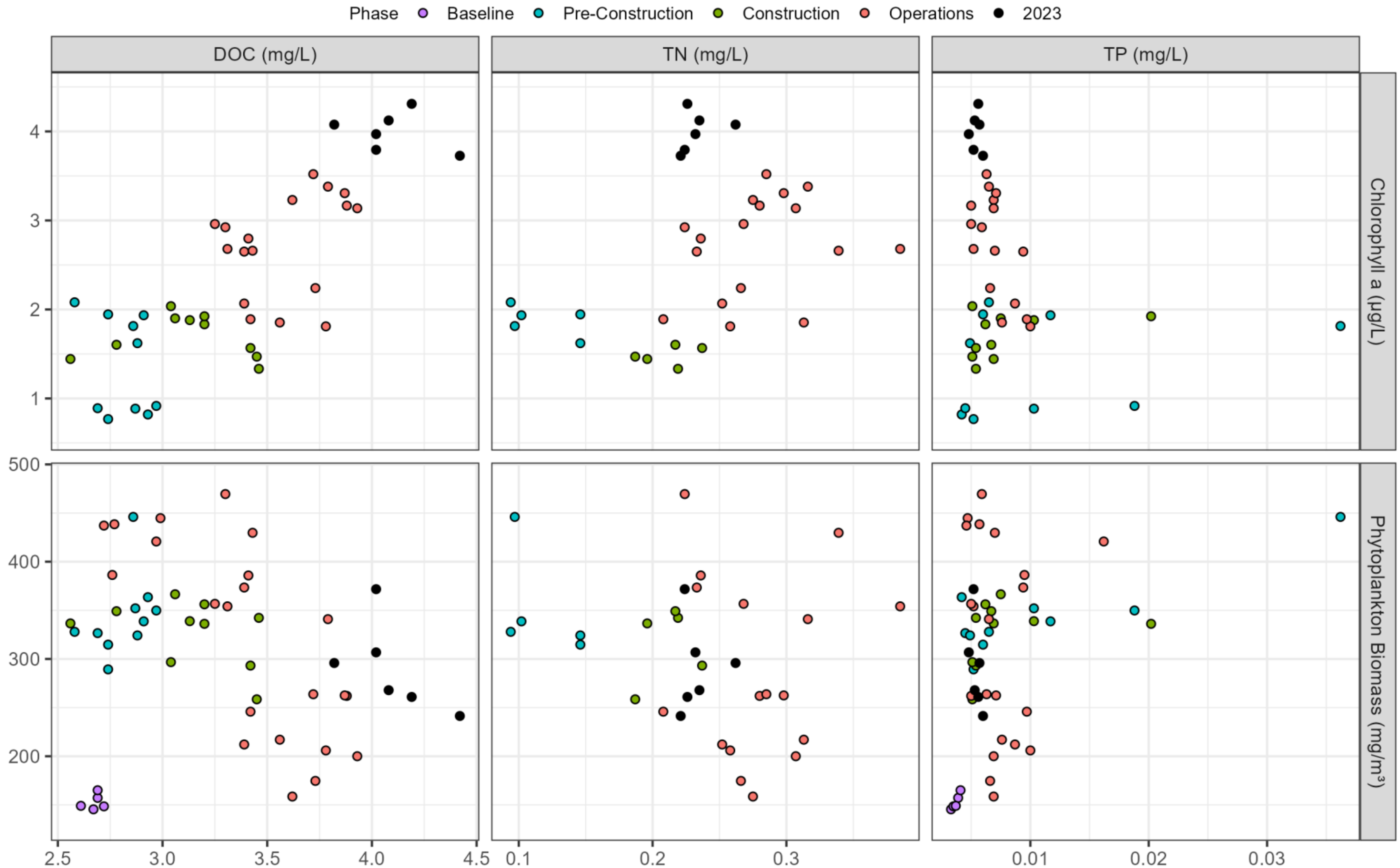


Figure 5-12. Relationship between nutrient concentrations (DOC, nitrogen, and phosphorus) and phytoplankton biomass and chlorophyll-a at the near-field area (MEL-01), 2013-2023

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

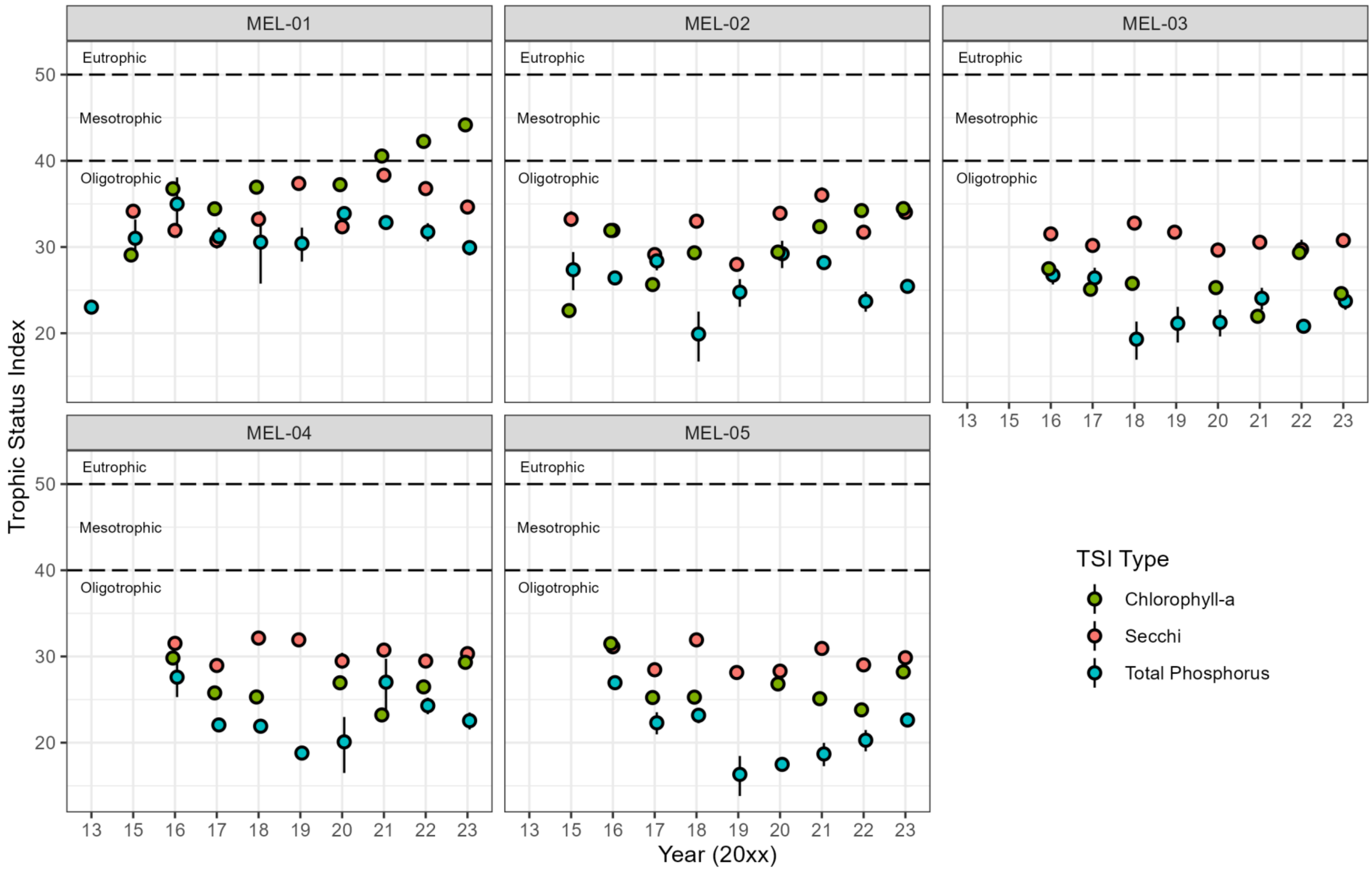


5.6.6 Trophic Status Index

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 5-13**. 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 the MF and reference areas. As expected, based on the trend of increasing chlorophyll-a in the last several years (see **Section 5.6.3**), the chlorophyll-a TSI increased again in 2023, remaining above the value of 40 which marks the transition from oligotrophic to mesotrophic (Carlson, 1977). However, the mean calculated TSIs for both Secchi depth and total phosphorus at MEL-01 in 2023 were less than 40 and have decreased for the past two years in a row. These results are consistent with the divergent patterns in biomass and chlorophyll-a as measures of productivity in the NF area and may reflect a community shift at MEL-01 towards species with higher chlorophyll-a content or an increase in chlorophyll-a per phytoplankton over time. Based on all three TSI endpoints, the trophic status of Meliadine Lake remains oligotrophic.

Figure 5-13. Trophic Status Index values for Meliadine Lake, 2013 through 2023

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



5.7 Conclusions

Conclusions for the 2023 phytoplankton study are summarized below in the context of the key question stated in **Section 5.1**. The phytoplankton results are incorporated into the Low Action Level assessment in **Section 6.1**.

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

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. The shift in the phytoplankton community aligns with predictions in the FEIS. However, it is uncertain if the underlying cause of the shift in the community is related to effluent or interannual climate variability.

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, trended higher at MEL-01 and MEL-02 in 2023, showing a rise since 2020. The divergent trends for chlorophyll-a and total biomass suggests that the amount of chlorophyll-a per unit phytoplankton biomass may be increasing. Based on the available data, the underlying cause may be related to water clarity or a shift 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. Overall, results from the 2023 phytoplankton study demonstrate that despite higher loadings of nitrogen coinciding with effluent discharge in 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

The FEIS (Agnico Eagle, 2014) predicted the concentration of nitrogen would increase in the East Basin of Meliadine Lake, which in turn *could* result in a shift in phytoplankton community structure. Only a minor change in the structure of the phytoplankton community was predicted compared to baseline conditions and phytoplankton productivity was predicted to remain similar to baseline. The multivariate analysis of individual taxa biomass showed that the community at MEL-02 was similar to the reference areas in most years but that the community at MEL-01 differed in several years (2020, 2022, and 2023). However, these three years had variable effluent discharge and nutrient loadings characteristics suggesting that factor(s) other than mining effluent likely contributed to the differences in phytoplankton community.

6 RESPONSE FRAMEWORK AND LOW ACTION LEVEL ASSESSMENT

The AEMP Response Framework links monitoring results to management actions to ensure activities at the Mine do not adversely impact water quality for aquatic life, human consumption, and the useability of the fishery in Meliadine Lake. The goal is to identify changes and implement follow-up actions before adverse effects are observed. Follow-up actions may be as straightforward as routine monitoring as per the *AEMP Design Plan*, or targeted sampling or additional studies to understand the spatial extent or ecological significance of changes in water quality or effects on aquatic life. In rare circumstances, if the cause/source is linked to mining activities, the Mine may implement mitigation measures to address the source before completing verification sampling or targeted studies.

The Low Action Level assessment integrates results from the various monitoring components to determine if a change has occurred that warrants further investigation. The assessment criteria are specific to each monitoring component. For water chemistry, the assessment includes comparisons to baseline and/or reference data (e.g., normal range assessment), water quality guidelines (i.e., AEMP Benchmarks and Action Levels), and statistical comparisons. Potential effects on aquatic communities are evaluated by comparing results from the exposure and reference with a focus on the magnitude and direction of change within and between areas.

6.1 Low Action Level Assessment for Meliadine Lake

The Low Action Levels for Meliadine Lake were updated in Version 2 of the *AEMP Design Plan* (Azimuth, 2022). Discharge of effluent to Meliadine Lake is the most likely pathway for changes in water quality and effects to aquatic life. Because effluent contains metals and nutrients, two impact hypotheses were developed, *toxicological impairment* and *nutrient enrichment*. Results presented in **Section 2** (source characterization), **Section 3** (Meliadine Lake water quality), and **Section 5** (phytoplankton study) are summarized below according to the Low Action Level criteria in the *AEMP Design Plan*.

Toxicological Impairment

The Low Action Level assessment for toxicological impairment is summarized in **Table 6-1**.

The long-term water quality monitoring program in Meliadine Lake indicates some parameters have increased in the East Basin compared to baseline/reference conditions. However, the concentrations for all parameters of interest remain below guidelines for protection of aquatic life and the guidelines for drinking water quality. Furthermore, concentrations of TDS and chloride at MEL-01 are below predictions in the 2014 FEIS and in the hydrodynamic water quality model that was prepared for the Water Licence Amendment Application in 2020.

Taxonomic richness, biomass, and diversity indices at MEL-01 were within the range of baseline conditions. Furthermore, the results form the quarterly sublethal toxicity tests with *L. minor* (duckweed) and the water quality screening assessment corroborate that current conditions in Meliadine Lake support a functionally diverse phytoplankton community.

Based on the assessment criteria in **Table 6-1**, the Low Action Level for toxicological impairment was not exceeded in 2023.

Nutrient Enrichment

The Low Action Level assessment for nutrient enrichment is summarized in **Table 6-2**.

The results of the 2023 phytoplankton study confirmed that the East Basin is naturally more productive than other areas of Meliadine Lake. Phytoplankton biomass naturally varies year-to-year, but biomass estimates for MEL-01 in August 2023 were within the range observed in previous years. It is unclear what factor(s) are responsible for naturally-higher biomass is in the East Basin compared to other areas of Meliadine Lake. The morphology of the East Basin, timing of ice off, and/or differences in water quality (natural or climate-related) are some of the factors that may contribute to within-lake variability for phytoplankton biomass.

Chlorophyll-a (an indirect measure of primary productivity) has increased year-over-year at MEL-01. Since 2015, chlorophyll-a has increased by roughly 4-fold at MEL-01 (from 1 µg/L to 4 µg/L). The same increasing temporal trend for chlorophyll-a was apparent at MEL-02, but the magnitude of the increase was less. Chlorophyll-a concentrations at the reference areas have remained stable at just under 1 µg/L since 2016 (the first year of monitoring). Chlorophyll-a and biomass are not correlated. The factor(s) contributing to divergent trends for chlorophyll-a and biomass at MEL-01 are unknown. What is known, is that phosphorus concentrations have trended lower in recent years. In 2023, the average total phosphorus concentration during the open water season was nearly identical to the normal range for Meliadine Lake (0.006 mg/L) and below the AEMP Action Level of 0.0075 mg/L (75 % of the CCME water quality guideline for oligotrophic classification).

Based on all the assessment criteria in **Table 6-2**, the Low Action Level for nutrient enrichment was not exceeded in 2023.

Table 6-1. Meliadine Lake – Low Action Level Assessment for Toxicological Impairment (from the *AEMP Design Plan* [Azimuth, 2022])

Monitoring Component	Assessment	Criteria for Exceedance of the Low Action Level	Summary of Results from 2023
Water Quality	End of Pipe Toxicity	1) Confirmed sublethal toxic effects on test organisms other than fish in end-of-pipe samples[a]	• There were no acute effects to Rainbow Trout or *D. magna* in the weekly effluent toxicity tests in 2023. • There were no effects to *L. minor* frond yield or dry weight biomass in the quarterly sublethal tests in 2023. No effects were observed in the sublethal test conducted in 2022. • **The Low Action Level was not exceeded for end-of-pipe toxicity.**
	Aquatic Life	1) Near-field mean above the normal range, 2) Statistically significant higher concentrations at MEL-01 compared to reference, and 3) Near-field mean exceeds 75% of an AEMP Benchmark (aka the AEMP Action Level)	• Several parameters exceeded the normal range of baseline/reference conditions in 2023. • The concentrations of most parameters of interest are higher in the East Basin compared to the reference areas. • There were no mining-related exceedances of the AEMP Action Levels in 2023. Current concentrations for most parameters are less than 10 % of the AEMP Action Level (**Figure 3-4**). • **The Low Action Level was not exceeded for aquatic life.**
	Water is Safe for Human Consumption	1) Statistically significant higher concentrations at MEL-01 compared to reference, and 2) Drinking water parameters in exposure area above 75% of Health Canada's human health drinking water quality guideline (maximum acceptable concentration)	• There were no exceedances of Health Canada's drinking water guidelines in 2023 (see **Appendix C3**). • **The Low Action Level was not exceeded for human consumption.**
Phytoplankton Community	Aquatic Life	1) Phytoplankton community metrics MEL-01 outside the range of baseline/reference conditions, and 2) Change in direction and magnitude that is indicative of toxicological impairment (i.e., lower richness, diversity, biomass)	• There was no evidence of toxicological impairment to the phytoplankton community in 2023 based on biomass, richness, and diversity indices. This conclusion is supported by two lines of evidence (1) no effects to *L. minor* in the quarterly sublethal toxicity tests with full-strength effluent from MEL-14 and (2) no exceedances of water quality guidelines for the protection of aquatic life. • **The Low Action Level was not exceeded for toxicological effects to the phytoplankton community.**

Notes
[a] Under MDMER, the Mine is required to complete quarterly sublethal toxicity testing on the most sensitive test species. *Lemna minor* (duckweed) is the most sensitive test species based on sublethal toxicity tests.

Table 6-2. Meliadine Lake – Low Action Level Assessment for Nutrient Enrichment (from the *AEMP Design Plan* [Azimuth, 2022])

Monitoring Component	Assessment	Criteria for the Low Action Level Assessment	Summary of Results from 2023
Water Quality	Aquatic Life	1) Concentrations of total phosphorus (TP) at MEL-01 above the normal range, supported by temporal trends, 2) Statistically significant difference for TP between MEL-01 and reference areas, and 3) Average TP concentration at MEL-01 that exceeds 75 % of AEMP Benchmark	• The average concentration of TP at MEL-01 in 2023 was 0.006 mg/L, equal to the normal range of baseline and reference conditions (0.006 mg/L) and less than the AEMP Action Level (0.0075 mg/L). • TP concentrations at MEL-01 continued to trend downward in 2023, coinciding with lower annual loadings to Meliadine Lake. • **The Low Action Level was not exceeded based on total phosphorus concentrations in MEL-01.**
Phytoplankton	Aquatic Life	1) Near-field mean for total phytoplankton biomass above the upper bound of the normal range, and 2) Change in direction and magnitude indicative of nutrient enrichment (i.e., divergent trend for phytoplankton biomass)	• Phytoplankton biomass is naturally higher at MEL-01 compared to the other areas of Meliadine Lake, but results from 2023 were within the range of previous years. • Chlorophyll-a concentrations are trending higher at MEL-01 compared to other areas. The divergent temporal trend for chlorophyll-a at MEL-01 compared to MEL-02 and the reference areas may indicate a subtle shift in the structure of the phytoplankton community. • The results from the 2023 AEMP align with the following predictions in the 2014 FEIS: (1) subtle changes to the phytoplankton community could occur, but (2) biomass would remain within the range of baseline/background. • **The Low Action Level was not exceeded for nutrient enrichment based on the available lines of evidence from the phytoplankton community monitoring program.**

6.2 Peninsula Lakes Water Quality

Low Action Levels were not developed for the Peninsula Lakes. However, the results from the Peninsula Lakes water quality monitoring program are evaluated similarly to the Meliadine Lake water quality data to determine if follow-up studies or mitigation is required to address non-point source discharges.

Water quality in Lake A8 and Lake B7 has changed coinciding with the construction of the Mine, including the placement of tailings within the TSF and development of Tiriganiaq Pits 1 and 2. The fact that water quality has changed in both of these lakes is not surprising given their proximity to the Mine. The spatial extent of changes in water quality does not extend to Lake D7. Some parameters have increased in Lake D7 compared to baseline, for example DOC, but the gradual temporal trends point to interannual climate variability as the main cause.

Several parameters were detected above baseline in 2023, but sulphate and arsenic stand out as mining-related. The initial source for both parameters was likely dust that migrated off-site and accumulated in the snowpack in the winter of 2020. Metals and other parameters associated with particulates in the snowpack were likely transported to Lake A8 and Lake B7 during freshet.

Efforts to control off-site migration of dust have resulted in lower concentrations for all key parameters of interest at the snow chemistry monitoring station located at the north end of Lake A8. However, sulphate and arsenic concentrations have continued to trend higher in recent years. Sulphate concentrations are well below the aquatic life guideline in both lakes, but the three samples collected from Lake B7 in August 2023 exceeded the AEMP Action Level of 18.8 µg/L. The maximum concentration was 23.4 µg/L, marginally below the SSWQO of 25 µg/L. A third sampling event was completed in mid-October, and arsenic concentrations had decreased to approximately 10 µg/L. The 2-fold decrease in arsenic between August and October is consistent with co-precipitation with iron oxyhydroxides. These data suggest sediments in Lake B7 and Lake A8 may be an important sink and source of metals that originally migrated off-site in 2020.

The water quality monitoring data from Lake D7 demonstrates that the spatial extent of mining-related changes to water quality are localized to Lake A8 and Lake B7. Agnico Eagle will continue to implement best practices as per the Dust Management Plan to mitigate the potential effects of off-site migration of dust on the small lakes adjacent to the Mine.

6.3 Scope of the 2024 AEMP

The scope of the 2024 AEMP includes the following components:

- Water quality monitoring in Meliadine Lake (same as previous years)
- Phytoplankton community sampling (same as previous years)
- Benthic invertebrate community and sediment chemistry monitoring (repeat of the 2021 AEMP)
- Threespine Stickleback population study (lethal survey)
- Lake Trout population study (lethal survey)
- Fish tissue chemistry (Threespine Stickleback [carcass] and Lake Trout [muscle])

When the AEMP was designed in 2015, one of the objectives was to create a harmonized program that satisfied monitoring requirements for the Water Licence and MDMER. To meet this objective, the proposed fish population studies for the Cycle 3 EEM program will be adopted for the 2024 AEMP. The study design for the Cycle 3 EEM was submitted to ECCC in mid-February and is currently under review (Azimuth and Portt, 2024). The Threespine Stickleback study is a repeat of the 2021 AEMP, but the study will target parasitized fish instead of unparasitized fish. Conclusions about potential effluent-related effects to Threespine Stickleback were the same for the parasitized and unparasitized populations. The incidence of parasitism is between 60 and 80 %, so targeting parasitized fish will mean fewer fish are sacrificed to achieve the target sample size. The Lake Trout study is a repeat of the Cycle 2 EEM program. Lake Trout will be collected from MEL-01 and two external reference lakes: Peter Lake and Atulik Lake. Some of the Threespine Stickleback carcasses will be submitted for metals analysis. Lake Trout muscle samples will be also be submitted for metals analysis to determine if the Mine is affecting the useability of the fishery.

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APPENDICES

Appendix A

Quality Assurance / Quality Control Methods and Results

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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.

An overview of the QA/QC methods for the water quality and phytoplankton community monitoring programs are provided herein. A more detailed overview of the QA/QC procedures for the water quality monitoring program are provided in the *AEMP Design Plan* (Azimuth, 2022).

A.2 WATER CHEMISTRY

A.2.1 Field Methods

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 (BC MOE, 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 analysed 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.2.2 Laboratory Methods

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. For full discussion of the RPD calculation, see **Section A.2.1**. 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.

The lowest available detection limits (DL) were specified for all the chemical analyses for the Meliadine AEMP water quality program. A shift in DLs for any given water quality parameter was reviewed, and the laboratory asked to explain the change in DLs. Changes in DLs by the laboratory could limit the ability to compare results across samples. Any changes in DLs that resulted in the DL being close to the result (i.e., less half the result) for any given parameter was flagged for further scrutiny.

Dissolved concentrations of nutrients and metals were compared to their corresponding total concentrations. If the dissolved concentration exceeded the corresponding total concentration, the parameter was re-analyzed by ALS. If the dissolved concentration after re-analysis was still 20% greater than the corresponding total concentration and both concentrations were greater than 10-times the DL the dissolved concentration was flagged.

A.2.3 Results and Discussion

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**.

Sample Shipping and Handling

No sample integrity observations were identified for the water chemistry samples collected in April, July, August, and September. The temperatures measured inside the coolers were 13°C in April, 23°C in July, 20-22°C in August, and 16°C in September. The target temperature for samples arriving at ALS is between 5°C and 10°C. The list of parameters that exceeded the recommended hold-times were similar to previous years. In most cases, the samples arrived at the lab within 14-days of sampling.

Laboratory QC Results

ALS provides a thorough account of their QC assessment in each COA that is issued[1]. These results are provided in **Table A-1**. The various components of the QC assessment are provided to help make informed decisions when interpreting the data. The QC program is comprised of four main elements:

- **Laboratory Duplicates** – there were no exceedances of DQOs for the laboratory duplicate samples, except for dissolved organic carbon in August samples.
- **Method blanks (MB)** – A small number of parameters were detected the MB samples in 2023: alkalinity and conductivity in August and phosphorous (total and dissolved) in September. The MB exceedances are inconsequential for interpreting the water quality results.
- **Matrix Spike (MS)** – MS recovery is periodically flagged in the QC assessment due to high concentrations of some parameters in the sample. These instances are typically associated with parameters such as major cations (e.g., calcium, magnesium, etc.) or certain metals with detected results above the DL (i.e., strontium). Reactive silica (reactive as SiO_2) is another parameter that is prone to interferences in MS recovery. ALS does not flag MS recovery due to high background concentrations as DQO exceedances.
- **Laboratory Control Samples (LCS)** – there were no exceedances of DQOs for the laboratory control samples in 2023.

Blanks

The table below summarizes the number of parameters detected in each of the blanks that were submitted for analysis in 2023. Travel blanks were not available for the April but will be included in the next AEMP sampling. Full details of results for blank samples are provided in **Table A-2**.

Similar to previous years, there were parameters detected in the blanks in each sampling event. The TB and DI blanks had the fewest number of exceedances. For parameters that were detected, the concentrations were less than 10-times the DL. The EB samples had more detected parameters compared to the DI and TB samples. The EB sample in August had 16 parameters where the concentrations were greater than 10-times the DL.

[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.

Prior to the first sampling event in April 2024, additional instruction will be provided to the technicians on how to properly collect the DI and EB samples to minimize the potential for cross-contamination between samples.

Summary of parameters detected in blank samples in 2023

Event and Blank	Count	Count <DL	Count >DL	Parameters > 10*DL
April				
FB	124	119	5	0
DI	122*	117	5	0
EB	122*	92	30	2
July				
DI	124	121	3	0
EB	124	106	18	0
TB	124	121	3	0
August				
DI	124	117	7	0
EB	124	72	52	16
TB	124	120	4	0
September				
DI	124	111	13	0
EB	124	107	17	5
TB	124	122	2	0

Notes:
Dissolved and total mercury were not collected in the DI and EB samples in April.

Field Duplicates

One field duplicate is collected for approximately every 10 samples. Ten duplicate samples were collected in 2023. Two duplicates were collected in April, three duplicates were collected in July, three duplicates were collected in August, and two duplicates were collected in September (**Table A-3** to **Table A-6**). There were 1,190 comparisons across the 10 duplicate samples in 2023, of which only 18 cases failed to pass data quality objectives. Of the 18 instances where the DQO was not met, only 6 occurred with the concentrations were greater than 5-times the DL.

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.

Parameters that exceeded the DQOs for the field duplicates in 2023

Event	Sample ID	Duplicate	Parameters that exceeded DQOs	DQO based on[a]
April	MEL-01-10	DUP-01	TSS	DIFF
			Lead (Pb)-Total	DIFF
July	MEL-03-04	DUP-1	Copper (Cu)-Total	RPD
			Tin (Sn)-Total	DIFF
			Mercury, dissolved	DIFF
	MEL-01-09	DUP-2	Mercury, total	DIFF
	D7-01	DUP-3	TSS	DIFF
			Ammonia	DIFF
			Lead, total	RPD
			Titanium, total	RPD
			Tin, dissolved	DIFF
August	MEL-03-03	DUP-1	Phosphorus, total	DIFF
			Total Organic Carbon	RPD
			Lead, total	RPD
			Titanium (Ti)-Total	DIFF
			Zinc (Zn)-Total	DIFF
September	MEL-01-06	DUP-2	Turbidity	DIFF
			Silicate (as SiO2)	RPD

Notes:

[a] RPD DQO is <30% difference between duplicate samples (applicable when concentrations are > 5-times DL)
DIFF DQO is a difference between duplicate samples of < 2-times the DL

Anomalous Results Flagged as Outliers

As part of the QC assessment, results from each sampling event were compared to data collected at other replicate stations to determine if there were outliers than should be excluded from the dataset. Data flagged as outliers in Meliadine Lake are listed in **Table A-7**.

Two samples at MEL-03 in August accounted for 98 of the 124 data points that were omitted from the dataset for Meliadine Lake in 2023. The samples collected at MEL-03-01 and MEL-03-02 in August had unusually high concentrations of TSS (74 mg/L at MEL-03-01 and 92 mg/L at MEL-03-02). The detection limits for total metals at MEL-03-01 were increased because of high turbidity. The field notes did not indicate anything unusual about conditions in this area of Meliadine Lake in mid-August. The anomalously high TSS results suggest the metals bottles were contaminated with sediment during collection.

Because of uncertainty around the potential for cross-contamination, the total and dissolved metals data from MEL-03-01 were excluded from the dataset. TSS, turbidity, and phosphorus results were also flagged as outliers when compared to the other replicate samples collected at MEL-03 in August. A few parameters were also flagged as outliers for MEL-03-02, but the concentrations of most metals were within the range of the other three samples collected at MEL-03.

Summary of parameters identified as outliers in each sampling event

April		July		August		September	
Station	**Parameter**	**Station**	**Parameter**	**Station**	**Parameter**	**Station**	**Parameter**
MEL-01-01	Copper (t, d)	MEL-01-01	Thorium (t)	MEL-01-09	Tin (d)	MEL-01-07	Turbidity
MEL-01-07	Tin (d)	MEL-01-09	Thorium (t)	MEL-03-01	TSS, turbidity, phosphorus, metals (t, d)	MEL-03-02	Aluminum (t)
MEL-01-08	Cadmium (t, d), tungsten (t)	MEL-02-05	Tin (t)	MEL-03-02	TSS, turbidity, phosphorus, aluminum (t), cesium (t), chromium (t), cobalt (t), iron (t), lanthanum (t), titanium (t), and vanadium (t)	MEL-03-04	Aluminum (d)
MEL-02-05	Molybdenum (d)	MEL-02-06	Tungsten (d), vanadium (d), zirconium (d)	MEL-04-01	Chromium (d), cobalt (d), nickel (d), zinc (d)		
MEL-02-08	Silver (t, d)	MEL-02-08	Zirconium (t)				
MEL-03-01	Tin (d)	MEL-03-04	Tin (t)				
Total	**10**		**8**		**103**		**3**

There were some anomalous results for dissolved metals at B7-03 in the October sampling compared to B7-01 and B7-02 (**Table A-8**). For example, dissolved copper was 225 µg/L at B7-03 compared to 0.8 and 3.7 µg/L at B7-01 and B7-02. Extra water was collected for this sampling event. A second set of samples from B7-03 were submitted for analysis of total and dissolved metals to confirm the results. The second set of results confirmed that the total and dissolved metals results from the initial set of samples were contaminated. The metals results from the second batch of samples at B7-03 were retained in the database.

A.3 PHYTOPLANKTON

A.3.1 Field Methods

Water samples for phytoplankton and chlorophyll-a were collected during the August 2023 sampling event. Samples were collected as depth-integrated samples every 2 m from below the surface to within 1 m of the sediment. 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 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 phytoplankton taxonomy samples were stored in dark containers at room temperature.

Field Duplicates

Duplicate results from the phytoplankton and chlorophyll-a analyses are discussed below.

Phytoplankton - Three field duplicate phytoplankton samples were collected during the August sampling event: DUP-MEL-AUG-01 at MEL-03-03, DUP-MEL-AUG-02 at MEL-01-06 and DUP-MEL-AUG-03 at MEL-05-01. Duplicate samples were submitted *blind* to the laboratory to assess the precision of the sample collection process and to help determine the representativeness of the samples. RPDs were calculated by comparing the original sample and the duplicate result for total density and total biomass. RPD values were also calculated for the major taxa groups, but these results are not relied on for QC purposes because of the tendency for small differences in abundance/biomass between the original and the duplicate to cause large differences in the RPD. For field duplicates, an RPD of 50% for total density and biomass concentrations is considered acceptable.

Chlorophyll-a – Three field duplicate chlorophyll-a samples were collected in 2023 at the same locations as the phytoplankton taxonomy field duplicate samples. The DQO for chlorophyll-a duplicates is an RPD less than 50%.

Field Blank

Chlorophyll-a – A set of field blanks consisting of DI water filtered through regular sampling equipment was included in samples delivered to the laboratory. The DQO for chlorophyll-a blanks is concentrations less than the detection limit (<0.04 µg/L).

A.3.2 Laboratory Methods

Chlorophyll-a is analyzed at the University of Alberta Biogeochemical Analytical Service Laboratory (BASL).

Taxonomic analysis of phytoplankton is completed by David Findlay at Plankton-R-Us Inc. Three samples were randomly selected as laboratory duplicates in 2023. The laboratory replicate is a new aliquot (10 mL) from the sample jar and is counted from the start in the same manner as the original aliquot (10 mL) taken from the jar. The DQO for the laboratory duplicates is an RPD of less than 25% for total density and biomass.

A.3.3 Results and Discussion

Sample Shipping and Handling

Samples collected for chlorophyll-a analysis arrived at the laboratory thawed and at room temperature, despite being shipped in coolers full of ice packs. Keeping samples frozen, particularly during summer months is a recurring challenge for this program given the logistics of shipping samples from Nunavut to the respective laboratories in a timely fashion. Based on previous conversations with the laboratory manager at the U of A, thawing is not expected to significantly affect the quality of the chlorophyll-a results (Mingsheng Ma, pers. comm. October 21, 2022).

The phytoplankton samples for taxonomy analysis arrived at Plankton R Us (Winnipeg) without any sample integrity concerns.

Field and Laboratory Duplicates and Blanks

Results of the RPD analysis for phytoplankton field and laboratory duplicates, as well as chlorophyll-a field duplicates are presented in **Table A-9**, **Table A-10** and **Table A-11** respectively. These results are discussed below:

Phytoplankton Duplicates – The DQOs were met for all three field duplicate samples for total biomass and density (**Table A-9**) and for the laboratory duplicates (**Table A-10**).

Chlorophyll-a Duplicates– All of the field duplicate RPDs for chlorophyll-a concentrations met the DQOs (RPD < 50%) (**Table A-11**).

Chlorophyll-a Blanks– Chlorophyll-a was less than the laboratory detection limits (<0.04 µg/L) for all field blanks three field blanks.

QA/QC TABLES

Table A-1. Laboratory QA/QC summary for water samples analyzed at ALS Environmental in 2023

Event	Lab Work Order Number	Samples	Date Sampled	Date Received	Sample Integrity Observations	Temperature (°C)	Hold-time Exceedances	Data Qualifiers for Water Samples			Adjusted Detection Limits (mg/L unless stated otherwise)			Laboratory QC Samples: Laboratory Duplicates		Method Blanks		Matrix Spike		Laboratory Control Samples	
								Qualifier	Sample ID	Parameters	Parameters	Target DL	Actual DL	Parameters	Qualifier	Parameters	Qualifier	Parameters	Qualifier	Parameters	Qualifier
April	WP2304940	MEL-01, MEL-02, MEL-03, Blanks and Duplicates	April 1-3, 2023	14-Apr	None	13.1		DTC	MEL-02-05 & -06	Mo (D)	NO3 + NO2	0.005	0.0224	None	-	None	-	None	-	None	-
July	WP2317105	MEL-02	July 15, 2023	27-Jul	None	23.0	pH, Turb,TSS, TDS, Alk, NO3, NO2, Diss O-PO4, CN, TOC, and DOC.	DTC	MEL-02-06	Cu (D), Mo (D), Ni (D), Sn (D), Ti (D), Zn (D), Zr (D)	NO3 + NO2 TN (D)	0.0050 0.020	0.0051 0.191	None	-	None	-	None	-	None	-
	WP2317108	Lakes A8 and D7	July 17, 2023	27-Jul	None	23.0	pH, Turb,TSS, TDS, Alk, NO3, NO2, Diss O-PO4, and CN.	DTC	A8-03	Zn (D)	NO3 + NO2 TN (D)	0.0050 0.020	0.0178 0.304	None	-	None	-	None	-	None	-
	WP2317112	Lake B7	July 16, 2023	27-Jul	None	23.0	pH, Turb,TSS, TDS, Alk, NO3, NO2, Diss O-PO4, and CN.	DTMF	B7-03	Ti (D)	NO3 + NO2 TN (D) Si	0.0050 0.020 0.010	0.0051 0.356-0.379 0.704-0.715	None	-	None	-	None	-	None	-
	WP2317114	Blanks and Duplicates	July 15-17, 2023	27-Jul	None	23.0	pH, Turb,TSS, TDS, Alk, NO3, NO2, Diss O-PO4, and CN.	None	-	-	NO3 + NO2 TN (D)	0.0050 0.020	0.0051-0.0202 0.050-0.231	None	-	None	-	None	-	None	-
	WP2317117	MEL-03	July 15, 2023	27-Jul	None	23.0	pH, Turb,TSS, TDS, Alk, NO3, NO2, Diss O-PO4, and CN.	None	-	-	NO3 + NO2 TN (D)	0.0050 0.020	0.0051-0.0247 0.168-0.190	None	-	None	-	None	-	None	-
	WP2317119	MEL-01	July 16, 2023	27-Jul	None	23.0	pH, Turb,TSS, TDS, Alk, NO3, NO2, Diss O-PO4, CN and THg (D).	None	-	-	NO3 + NO2 TN (D)	0.0050 0.020	0.0051-0.0384 0.225-0.323	None	-	None	-	None	-	None	-
August	WP2320729	MEL-02 and MEL-03	August 17-18, 2023	24-Aug	None	20.1	pH, Turb, NO3, NO2, and Diss O-PO4.	DTC DTMF	MEL-02-02 and -06. MEL-03-02, -03, and -04	Cr (D), Co (D), Ni (D), Sn (D), Zn (D)	NO3 + NO2 TN (D)	0.0050 0.020	<0.0051 0.198-0.235	None	-	Alka and Cond	B	None	-	None	-
	WP2320734	MEL-04 and MEL-05	August 18, 2023	24-Aug	None	20.0	pH, Turb, NO3, NO2, and Diss O-PO4.	DTC DTMF	MEL-04-01, -02, -03, -04 and -05. MEL-05-02, -03 and -05.	Cr (D), Co (D), Cu (D), Fe (D), PB (D), Ni (D), Sn (D), Zn (D)	NO3 + NO2 TN (D)	0.0050 0.020	<0.0051 0.139-0.219	None	-	Alka and Cond	B	None	-	None	-
	WP2320997	Blanks and Duplicates	August 18-22, 2023	28-Aug	None	22.1	pH, Turb,TSS, TDS, Alk, NO3, NO2, Diss O-PO4, and CN.	DTS	EB-AUG-01	Sn (D), Ti (D)	NO3 + NO2 TN (D) Si	0.0050 0.020 0.010	<0.0051 0.195-0.231 0.631-1.550	DOC	DUP	None	-	None	-	None	-
	WP2320999	MEL-01	August 22, 2023	28-Aug	None	22.1	pH, Turb, NO3, NO2, and Diss O-PO4.	DTS	MEL-01-01, -06, -08, -09 and -10	Pb (D), Ni (D), Sn (D), Zn (D), Zr (D)	NO3 + NO2 TN (D) Si	0.0050 0.020 0.010	<0.0051 0.050-0.371 0.606-0.627	DOC	DUP	None	-	None	-	None	-
	WP2321003	Lakes A8, B7, and D7	August 19-21, 2023	28-Aug	None	22.0	pH, Turb,TSS, TDS, Alk, NO3, NO2, Diss O-PO4, and CN.	DTS	A8-01, B7-02, D7-01	Zn (D), Al (D), Sn (D), Zr (D)	NO3 + NO2 TN (D) Si	0.0050 0.020 0.010	0.0051-0.0136 0.248-0.423 0.550-1.58	None	-	None	-	None	-	None	-
September	WP2323948	MEL-02 and MEL-03	September 15, 2023	21-Sep	None	16.0	pH, Turb, NO3, NO2, Diss O-PO4	DTS	MEL-03-04	Al (D)	NO3 + NO2 TN (D) Si	0.0050 0.020 0.010	0.007-0.0242 0.286-0.371 0.471	None	-	TP and TP (D)	B	None	-	None	-
	WP2323951	Blanks and Duplicates	September 15-21, 2023	21-Sep	None	16.0	pH, Turb, NO3, NO2, Diss O-PO4	DTS	DUP-MEL-SEP-02	Sn (D)	NO3 + NO2 TN (D) Si	0.0050 0.020 0.010	0.0051-0.0181 <0.050-0.342 0.300-0.654	None	-	TP and TP (D)	B	None	-	None	-
	WP2323956	MEL-01	September 15, 2023	21-Sep	None	16.0	pH, Turb, NO3, NO2, Diss O-PO4	DTS	MEL-01-08, -09, and -10	Pb (D), Sn (D), Zr (D)	NO3 + NO2 TN (D) Si	0.0050 0.020 0.010	<0.0051-0.0234 0.354-0.403 0.577	None	-	TP and TP (D)	B	None	-	None	-

Data and Laboratory QC qualifiers:

B = Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
CNP = Cyanide test sample appears to have been preserved, but pH was <10 at time of testing. Results may be biased low, particularly for Free CN species.
DLA = Detection Limit adjusted for required dilution.
DLB = Detection Limit Raised: Analyte detected at comparable level in method blank.
DLCI = Detection Limit Raised: Chromatographic interference due to co-elution.
DLDS = Detection Limit Raised: Dilution required due to high dissolved solids / electrical conductivity.
DLHM = Detection Limit Adjusted: Sample has high moisture content.
DLM = Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity)
DLQ = Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.
DTC = Dissolved concentration exceeds total. Results were confirmed by re-analysis.
DTMF = Dissolved concentration exceeds total for field-filtered samples. Metallic contaminants may have been introduced to dissolved sample during field filtration.
DUP-H = Duplicate results outside ALS DQO, due to sample heterogeneity.
DUP = Exceedance of the laboratory DQO for an unrelated submission.
HTD = Hold time exceeded for re-analysis or dilution, but initial testing was conducted within hold time.
HTP = Sample preparation or preservation hold time was exceeded.
MB-LOR = Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level.
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
MS-B = Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Table A-2. Laboratory detection limits and blanks (travel, de-ionized, and equipment), Meliadine AEMP, 2023

Parameter	Month	April DLs	April			July DLs	July			August DLs	August			September DLs	September		
	Client Sample ID		FB-WINTER-01	DI-WINTER-01	EB-WINTER-01		DI-JUL-01	EB-JUL-01	TB-JUL-01		DI-AUG-01	EB-AUG-01	TB-AUG-01		DI-SEPT-01	EB-SEPT-01	TB-SEPT-01
	Date Sampled		01-Apr-2023	01-Apr-2023	01-Apr-2023		2023-07-17	2023-07-17	2023-07-17		2023-08-18	2023-08-18	2023-08-18		15-Sep-2023	15-Sep-2023	21-Sep-2023
	ALS Sample ID		WP2304940-020	WP2304940-021	WP2304940-019		WP2317114-004	WP2317114-005	WP2317114-006		WP2320997-005	WP2320997-006	WP2320997-007		WP2323951-003	WP2323951-004	WP2323951-005
	Units		Water	Water	Water		Water	Water	Water		Water	Water	Water		Water	Water	Water
Physical Tests (Water)																	
Conductivity	µS/cm	1	**1.5**	<1.0	**1.2**	1	<1.0	**1.1**	<1.0	1	<1.0	59.4	<1.0	1	<1.0	<1.0	<1.0
Acidity (as CaCO3)	mg/L	2	<2.0	<2.0	<2.0	2	<2.0	<2.0	<2.0	2	<2.0	<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	<1.0	1	<1.0	12.6	<1.0	1	<1.0	<1.0	<1.0
Alkalinity, carbonate (as CO3)	mg/L	1	<1.0	<1.0	<1.0	1	<1.0	<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	<1.0	1	<1.0	<1.0	<1.0	1	<1.0	<1.0	<1.0
Alkalinity, total (as CaCO3)	mg/L	2	<2.0	<2.0	<2.0	2	<1.0	<1.0	<1.0	2	<1.0	**12.6**	<1.0	2	<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	<0.50	0.5	<0.50	<0.50	<0.50	0.5	<0.50	<0.50	<0.50
Solids, total dissolved [TDS]	mg/L	3	**4.7**	<3.0	<3.0	3	<3.0	<3.0	<3.0	3	<3.0	45.4	<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	<1.0	1	<1.0	38.6	<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	<1.0	1	**1.3**	**1**	<1.0	1	<1.0	<1.0	<1.0
Turbidity	NTU	0.1	<0.10	<0.10	**0.13**	0.1	<0.10	**0.15**	<0.10	0.1	<0.10	**0.25**	<0.10	0.1	<0.10	**0.14**	<0.10
pH	pH units	0.1	5.62	5.48	5.55	0.1	5.42	5.66	5.35	0.1	5.42	7.28	5.44	0.1	5.33	5.39	5.3
Anions and Nutrients (Water)																	
Ammonia, total (as N)	mg/L	0.005	<0.0050	**0.0064**	<0.0050	0.005	<0.0050	**0.0075**	**0.0138**	0.005	**0.0076**	<0.0050	**0.0118**	0.005	**0.0309**	**0.0218**	<0.0050
Bromide	mg/L	0.1	<0.10	<0.10	<0.10	0.1	<0.10	<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	<0.10	0.1	<0.10	7.64	<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	<0.020	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	<0.050	0.05	<0.050	**0.199**	<0.050	0.05	<0.050	<0.050	<0.050
Kjeldahl nitrogen, total [TKN]	mg/L	0.05	<0.050	<0.050	<0.050	0.05	<0.050	<0.050	<0.050	0.05	<0.050	<0.050	<0.050	0.05	<0.050	<0.050	<0.050
Nitrate (as N)	mg/L	0.005	<0.0050	<0.0050	**0.0056**	0.005	<0.0050	<0.0050	<0.0050	0.005	<0.0050	**0.0089**	<0.0050	0.005	<0.0050	**0.0116**	<0.0050
Nitrate + Nitrite (as N)	mg/L	0.005	<0.0224	<0.0224	<0.0224	0.005	<0.0051	<0.0051	<0.0051	0.005	<0.0051	**0.0089**	<0.0051	0.005	<0.0051	**0.0116**	<0.0051
Nitrite (as N)	mg/L	0.001	<0.0010	<0.0010	<0.0010	0.001	<0.0010	<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	<0.055	<0.055	<0.055	0.05	<0.050	<0.050	<0.050	0.05	<0.050	<0.050	<0.050	0.05	<0.050	<0.050	<0.050
Nitrogen, total dissolved	mg/L	0.02	<0.055	<0.055	<0.055	0.02	<0.050	<0.050	<0.050	0.02	<0.050	0.208	<0.050	0.02	<0.050	<0.050	<0.050
Phosphate, ortho-, dissolved (as P)	mg/L	0.001	<0.0010	<0.0010	<0.0010	0.001	<0.0010	<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	<0.0010	0.001	<0.0010	<0.0010	<0.0010	0.001	<0.0010	**0.0031**	<0.0010	0.001	<0.0010	<0.0010	<0.0010
Phosphorus, total dissolved	mg/L	0.001	<0.0010	<0.0010	<0.0010	0.001	<0.0010	<0.0010	<0.0010	0.001	<0.0010	**0.002**	<0.0010	0.001	<0.0010	<0.0010	<0.0010
Silicate (as SiO2)		0.01	**0.03**	<0.010	<0.010	0.01	<0.010	<0.010	<0.010	0.01	<0.010	0.26	<0.010	0.01	<0.010	**0.044**	<0.010
Sulfate (as SO4)	mg/L	0.3	<0.30	<0.30	<0.30	0.3	<0.30	<0.30	<0.30	0.3	<0.30	3.09	<0.30	0.3	<0.30	<0.30	<0.30

Table A-2. Laboratory detection limits and blanks (travel, de-ionized, and equipment), Meliadine AEMP, 2023

	Month	April				July				August				September			
	Client Sample ID	April DLs	FB-WINTER-01	DI-WINTER-01	EB-WINTER-01	July DLs	DI-JUL-01	EB-JUL-01	TB-JUL-01	August DLs	DI-AUG-01	EB-AUG-01	TB-AUG-01	September DLs	DI-SEPT-01	EB-SEPT-01	TB-SEPT-01
	Date Sampled		01-Apr-2023	01-Apr-2023	01-Apr-2023		2023-07-17	2023-07-17	2023-07-17		2023-08-18	2023-08-18	2023-08-18		15-Sep-2023	15-Sep-2023	21-Sep-2023
	ALS Sample ID		WP2304940-020	WP2304940-021	WP2304940-019		WP2317114-004	WP2317114-005	WP2317114-006		WP2320997-005	WP2320997-006	WP2320997-007		WP2323951-003	WP2323951-004	WP2323951-005
Parameter	**Units**		Water	Water	Water		Water	Water	Water		Water	Water	Water		Water	Water	Water
Cyanides																	
Cyanide, Weak Acid Diss	mg/L	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*
Cyanide, Total	mg/L	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*
Cyanide, Free	mg/L	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*
Organic / Inorganic Carbon																	
Dissolved Organic Carbon	mg/L	0.5	**0.54**	**0.85**	**0.66**	0.5	*<0.50*	*<0.50*	*<0.50*	0.5	**1.23**	**3.49**	**1.73**	0.5	*<0.50*	*<0.50*	*<0.50*
Total Organic Carbon	mg/L	0.5	**0.51**	*<0.50*	*<0.50*	0.5	*<0.50*	*<0.50*	*<0.50*	0.5	**1.33**	**3.59**	**1.31**	0.5	*<0.50*	*<0.50*	*<0.50*
Total Mercury																	
Mercury, total	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	-	-	-	0.000005	-	-	-	0.000005	-	-	-
Mercury, total	ng/L	0.1	*<0.10*	-	-	0.1	**0.17**	**0.14**	*<0.10*	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*	*<0.0010*	0.001	*<0.0010*	*<0.0010*	*<0.0010*	0.001	*<0.0010*	**0.0016**	*<0.0010*	0.001	**0.0015**	*<0.0010*	*<0.0010*
Antimony, total	mg/L	0.00002	*<0.000020*	*<0.000020*	*<0.000020*	0.00002	*<0.000020*	*<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*	**0.000033**	0.00002	*<0.000020*	**0.000073**	*<0.000020*	0.00002	*<0.000020*	**0.000026**	*<0.000020*	0.00002	*<0.000020*	*<0.000020*	*<0.000020*
Barium, total	mg/L	0.00002	*<0.000020*	**0.000045**	**0.000126**	0.00002	*<0.000020*	**0.000079**	*<0.000020*	0.00002	*<0.000020*	**0.000133**	*<0.000020*	0.00002	**0.000061**	0.00907	*<0.000020*
Beryllium, total	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<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*	*<0.0000050*	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*	*<0.0050*	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*	*<0.0000050*	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*	**0.083**	0.01	*<0.010*	**0.013**	*<0.010*	0.01	*<0.010*	**0.087**	*<0.010*	0.01	**0.078**	9.85	*<0.010*
Cesium, total	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	*<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*	*<0.00010*	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*	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	*<0.0000050*	**0.0000066**	*<0.0000050*	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*
Copper, total	mg/L	0.00005	*<0.000050*	*<0.000050*	0.00118	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	0.000519	*<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*	*<0.000050*	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*	**0.0017**	0.001	*<0.0010*	**0.002**	*<0.0010*	0.001	*<0.0010*	**0.0062**	*<0.0010*	0.001	**0.0026**	*<0.0010*	*<0.0010*
Lanthanum, total	mg/L	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<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*	**0.000018**	0.00001	*<0.000010*	**0.000012**	*<0.000010*	0.00001	*<0.000010*	**0.000094**	*<0.000010*	0.00001	**0.000017**	*<0.000010*	*<0.000010*
Lithium, total	mg/L	0.0005	*<0.00050*	*<0.00050*	*<0.00050*	0.0005	*<0.00050*	*<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*	**0.0068**	0.004	*<0.0040*	*<0.0040*	*<0.0040*	0.004	*<0.0040*	**0.0095**	*<0.0040*	0.004	*<0.0040*	*<0.0040*	*<0.0040*
Manganese, total	mg/L	0.00005	*<0.000050*	*<0.000050*	**0.000112**	0.00005	*<0.000050*	**0.000087**	*<0.000050*	0.00005	*<0.000050*	**0.000316**	*<0.000050*	0.00005	**0.000051**	0.00663	*<0.000050*
Molybdenum, total	mg/L	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	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*	**0.000065**	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	0.00312	*<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*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	*<0.00010*	0.0001	*<0.00010*	*<0.00010*	*<0.00010*

Table A-2. Laboratory detection limits and blanks (travel, de-ionized, and equipment), Meliadine AEMP, 2023

	Month		April				July				August				September		
	Client Sample ID	April DLs	FB-WINTER-01	DI-WINTER-01	EB-WINTER-01	July DLs	DI-JUL-01	EB-JUL-01	TB-JUL-01	August DLs	DI-AUG-01	EB-AUG-01	TB-AUG-01	September DLs	DI-SEPT-01	EB-SEPT-01	TB-SEPT-01
	Date Sampled		01-Apr-2023	01-Apr-2023	01-Apr-2023		2023-07-17	2023-07-17	2023-07-17		2023-08-18	2023-08-18	2023-08-18		15-Sep-2023	15-Sep-2023	21-Sep-2023
	ALS Sample ID		WP2304940-020	WP2304940-021	WP2304940-019		WP2317114-004	WP2317114-005	WP2317114-006		WP2320997-005	WP2320997-006	WP2320997-007		WP2323951-003	WP2323951-004	WP2323951-005
Parameter	**Units**		Water	Water	Water		Water	Water	Water		Water	Water	Water		Water	Water	Water
Phosphorus, total	mg/L	0.05	<0.050	<0.050	<0.050	0.05	<0.050	<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	<0.020	0.02	<0.020	<0.020	<0.020	0.02	**0.055**	<0.020	<0.020
Rhenium, total	mg/L	0.000005	<0.0000050	<0.0000050	<0.0000050	0.000005	<0.0000050	<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	**0.0000126**	0.000005	<0.0000050	<0.0000050	<0.0000050	0.000005	<0.0000050	**0.0000136**	<0.0000050	0.000005	**0.0000088**	0.00151	<0.0000050
Selenium, total	mg/L	0.00004	<0.000040	<0.000040	<0.000040	0.00004	<0.000040	<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	<0.050	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	<0.0000050	0.000005	<0.0000050	<0.0000050	<0.0000050	0.000005	<0.0000050	<0.0000050	<0.0000050
Sulfur, total	mg/L	0.5	<0.50	<0.50	<0.50	0.5	<0.50	<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	<0.00010	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	<0.000020	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	<0.0000050	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	<0.0000050	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	**0.000047**	0.00002	<0.000020	**0.000063**	<0.000020	0.00002	<0.000020	<0.000020	<0.000020	0.00002	**0.000127**	**0.000052**	<0.000020
Titanium, total	mg/L	0.00005	<0.000050	<0.000050	**0.000101**	0.00005	<0.000050	<0.000050	<0.000050	0.00005	<0.000050	**0.000097**	<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	<0.000010	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	<0.0000010	0.000001	<0.0000010	**0.0000012**	<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	<0.000050	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	<0.000010	0.00001	<0.000010	**0.000015**	<0.000010	0.00001	<0.000010	<0.000010	<0.000010
Zinc, total	mg/L	0.0005	<0.00050	<0.00050	**0.00115**	0.0005	<0.00050	<0.00050	<0.00050	0.0005	<0.00050	0.0185	<0.00050	0.0005	**0.00172**	<0.00050	<0.00050
Zirconium, total	mg/L	0.00001	<0.000010	<0.000010	<0.000010	0.00001	<0.000010	<0.000010	<0.000010	0.00001	<0.000010	<0.000010	<0.000010	0.00001	<0.000010	<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	<0.0010	0.001	<0.0010	**0.0026**	<0.0010	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	<0.000020	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	<0.000020	0.00002	<0.000020	<0.000020	<0.000020	0.00002	<0.000020	<0.000020	<0.000020
Barium, dissolved	mg/L	0.00002	<0.000020	<0.000020	**0.000069**	0.00002	**0.000065**	**0.000041**	<0.000020	0.00002	<0.000020	**0.000171**	<0.000020	0.00002	<0.000020	**0.000034**	<0.000020
Beryllium, dissolved	mg/L	0.000005	<0.0000050	<0.0000050	<0.0000050	0.000005	<0.0000050	<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	<0.0000050	0.000005	<0.0000050	<0.0000050	<0.0000050	0.000005	<0.0000050	<0.0000050	<0.0000050
Boron, dissolved	mg/L	0.005	<0.0050	<0.0050	<0.0050	0.005	<0.0050	<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	<0.0000050	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	**0.059**	0.01	<0.010	**0.022**	<0.010	0.01	<0.010	0.1	<0.010	0.01	**0.015**	**0.032**	<0.010
Cesium, dissolved	mg/L	0.000005	<0.0000050	<0.0000050	<0.0000050	0.000005	<0.0000050	<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	<0.00010	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	<0.0000050	0.000005	<0.0000050	<0.0000050	<0.0000050	0.000005	<0.0000050	**0.0000061**	<0.0000050	0.000005	<0.0000050	<0.0000050	<0.0000050
Copper, dissolved	mg/L	0.00005	<0.000050	<0.000050	**0.000443**	0.00005	<0.000050	<0.000050	<0.000050	0.00005	<0.000050	0.000571	<0.000050	0.00005	<0.000050	**0.00009**	<0.000050

Table A-2. Laboratory detection limits and blanks (travel, de-ionized, and equipment), Meliadine AEMP, 2023

	Month	April				July				August				September			
	Client Sample ID	April DLs	FB-WINTER-01	DI-WINTER-01	EB-WINTER-01	July DLs	DI-JUL-01	EB-JUL-01	TB-JUL-01	August DLs	DI-AUG-01	EB-AUG-01	TB-AUG-01	September DLs	DI-SEPT-01	EB-SEPT-01	TB-SEPT-01
	Date Sampled		01-Apr-2023	01-Apr-2023	01-Apr-2023		2023-07-17	2023-07-17	2023-07-17		2023-08-18	2023-08-18	2023-08-18		15-Sep-2023	15-Sep-2023	21-Sep-2023
	ALS Sample ID		WP2304940-020	WP2304940-021	WP2304940-019		WP2317114-004	WP2317114-005	WP2317114-006		WP2320997-005	WP2320997-006	WP2320997-007		WP2323951-003	WP2323951-004	WP2323951-005
Parameter	**Units**		Water	Water	Water		Water	Water	Water		Water	Water	Water		Water	Water	Water
Gallium, dissolved	mg/L	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<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*	*<0.0010*	0.001	*<0.0010*	**0.0067**	*<0.0010*	0.001	*<0.0010*	*<0.0010*	**0.0016**
Lanthanum, dissolved	mg/L	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	0.00001	*<0.000010*	*<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*	*<0.000010*	0.00001	*<0.000010*	**0.000084**	*<0.000010*	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*	*<0.00050*	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*	**0.0068**	0.004	*<0.0040*	*<0.0040*	*<0.0040*	0.004	*<0.0040*	**0.0153**	*<0.0040*	0.004	*<0.0040*	*<0.0040*	*<0.0040*
Manganese, dissolved	mg/L	0.00005	*<0.000050*	*<0.000050*	**0.000058**	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	**0.000235**	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*
Mercury, dissolved	mg/L	0.000005	*<0.0000050*	*<0.0000050*	*<0.0000050*	0.000005	-	-	-	0.000005	-	-	-	0.000005	-	-	-
Mercury, dissolved	ng/L	0.1	*<0.10*	-	-	0.1	*<0.10*	**0.16**	**0.10**	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*	*<0.000050*	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*	**0.000059**	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	0.00289	*<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*	*<0.00010*	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*	*<0.050*	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*	*<0.020*	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*	*<0.0000050*	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*	**0.0000102**	0.000005	*<0.0000050*	**0.0000054**	*<0.0000050*	0.000005	*<0.0000050*	**0.0000168**	*<0.0000050*	0.000005	*<0.0000050*	**0.0000072**	*<0.0000050*
Selenium, dissolved	mg/L	0.00004	*<0.000040*	*<0.000040*	*<0.000040*	0.00004	*<0.000040*	*<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*	*<0.050*	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*	*<0.0000050*	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*	**0.039**	0.02	*<0.020*	*<0.020*	*<0.020*	0.02	*<0.020*	**0.035**	*<0.020*	0.02	*<0.020*	*<0.020*	*<0.020*
Strontium, dissolved	mg/L	0.00002	*<0.000020*	**0.000044**	0.000334	0.00002	*<0.000020*	**0.000076**	*<0.000020*	0.00002	**0.000041**	0.000547	*<0.000020*	0.00002	*<0.000020*	**0.000062**	*<0.000020*
Sulfur, dissolved	mg/L	0.5	*<0.50*	*<0.50*	*<0.50*	0.5	*<0.50*	*<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*	*<0.00010*	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*	*<0.000020*	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*	*<0.0000050*	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*	*<0.0000050*	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*	**0.000035**	0.00002	**0.00002**	**0.000027**	**0.000028**	0.00002	**0.000031**	**0.000044**	**0.00002**	0.00002	*<0.000020*	**0.000026**	**0.000023**
Titanium, dissolved	mg/L	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	0.00005	*<0.000050*	**0.000299**	*<0.000050*	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*	*<0.000010*	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*	*<0.0000010*	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*	*<0.000050*	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*	*<0.000010*	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*	**0.00087**	0.0005	*<0.00050*	*<0.00050*	*<0.00050*	0.0005	*<0.00050*	0.0165	*<0.00050*	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*	*<0.000010*	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. Water quality field duplicate results for Meliadine AEMP – April 2023

Month	Units	April DLs	Relative Percent Difference DQOs		April DUP-1 (MEL-01-10)					April DUP-2 (MEL-02-08)				
Station					MEL-01-10	DUP-01	**Field Dup Method [a]**	**Result [b] (RPD or Diff)**	**Outcome**	MEL-02-08	DUP-02	**Field Dup Method [a]**	**Result [b] (RPD or Diff)**	**Outcome**
Date Sampled					01-Apr-2023	01-Apr-2023				02-Apr-2023	02-Apr-2023			
ALS Sample ID			**Lab**	**Field**	WP2304940-017	WP2304940-018				WP2304940-003	WP2304940-006			
Parameter					Water	Water				Water	Water			
Physical Tests														
Conductivity	µS/cm	1.0	10	15	183	183	RPD	0	Pass RPD	145	147	RPD	-1.4	Pass RPD
Acidity (as CaCO3)	mg/L	2.0		40	2.6	3.1	DIFF	-0.5	Pass Diff	2.9	*<2.0*	*<DL*	*<DL*	*<DL*
Alkalinity, bicarbonate (as CaCO3)	mg/L	1.0		40	32.7	33.1	RPD	-1.2	Pass RPD	28.7	29.4	RPD	-2.4	Pass RPD
Alkalinity, bicarbonate (as HCO3)	mg/L	1.0		40	39.9	40.4	RPD	-1.2	Pass RPD	35	35.9	RPD	-2.5	Pass RPD
Alkalinity, carbonate (as CO3)	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, carbonate (as CaCO3)	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, hydroxide (as CaCO3)	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, hydroxide (as OH)	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, phenolphthalein (as CaCO3)	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	2.0		40	32.7	33.1	RPD	-1.2	Pass RPD	28.7	29.4	RPD	-2.4	Pass RPD
Hardness (as CaCO3), dissolved	mg/L	0.50		40	52.4	53.5	RPD	-2.1	Pass RPD	37	38.2	RPD	-3.2	Pass RPD
Solids, total dissolved [TDS]	mg/L	3.0		40	94.7	86.3	RPD	9.3	Pass RPD	71.3	77.7	RPD	-8.6	Pass RPD
Solids, total dissolved [TDS], calculated	mg/L	1.0		40	119	119	RPD	0	Pass RPD	94.2	95.6	RPD	-1.5	Pass RPD
Solids, total suspended [TSS]	mg/L	1.0		40	1.5	5.6	DIFF	-4.1	Fail	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Turbidity	NTU	0.10	15	23	0.34	0.33	DIFF	0.01	Pass Diff	0.23	0.27	DIFF	-0.04	Pass Diff
pH	pH units	0.10		40	7.2	7.2	RPD	0	Pass RPD	7.4	7.4	RPD	0	Pass RPD
Anions and Nutrients (Water)														
Ammonia, total (as N)	mg/L	0.0050	20	30	0.027	0.026	RPD	3.8	Pass RPD	0.033	0.031	RPD	6.9	Pass RPD
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	26.1	26	RPD	0.4	Pass RPD	18.7	18.9	RPD	-1.1	Pass RPD
Fluoride	mg/L	0.020	20	30	0.047	0.047	DIFF	0	Pass Diff	0.043	0.043	DIFF	0	Pass Diff
Kjeldahl nitrogen, dissolved [DKN]	mg/L	0.050	20	30	0.38	0.33	RPD	14.6	Pass RPD	0.29	0.27	RPD	6.4	Pass RPD
Kjeldahl nitrogen, total [TKN]	mg/L	0.050	20	30	0.40	0.36	RPD	10.6	Pass RPD	0.30	0.31	RPD	-2.9	Pass RPD
Nitrate (as N)	mg/L	0.0050	20	30	0.022	0.023	DIFF	-0.0004	Pass Diff	0.014	0.011	DIFF	0.0029	Pass Diff
Nitrate + Nitrite (as N)	mg/L	0.0050	20	30	*<0.0224*	0.023	*<DL*	*<DL*	*<DL*	*<0.0224*	*<0.0224*	*<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	0.42	0.38	RPD	9.7	Pass RPD	0.30	0.31	RPD	-2.9	Pass RPD
Nitrogen, total dissolved	mg/L	0.020	20	30	0.40	0.35	RPD	13.4	Pass RPD	0.29	0.27	RPD	6.4	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	0.0067	0.0069	RPD	-2.9	Pass RPD	0.0051	0.0047	DIFF	0.0004	Pass Diff
Phosphorus, total dissolved	mg/L	0.0010	20	30	0.0038	0.0041	DIFF	-0.0003	Pass Diff	0.0022	0.0025	DIFF	-0.0003	Pass Diff
Silicate (as SiO2)	mg/L	0.010	20	30	0.89	0.87	RPD	1.5	Pass RPD	0.63	0.61	RPD	4	Pass RPD
Sulfate (as SO4)	mg/L	0.30	20	30	11.1	11.1	RPD	0	Pass RPD	7.7	7.8	RPD	-1.5	Pass RPD
Cyanides														
Cyanide, Weak Acid Diss	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, Free	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	5.6	5.8	RPD	-2.5	Pass RPD	4.4	4.2	RPD	4.4	Pass RPD
Total Organic Carbon	mg/L	0.50	20	30	6.2	5.9	RPD	4.6	Pass RPD	5.1	4.4	RPD	15.1	Pass RPD
Mercury, total														

Table A-3. Water quality field duplicate results for Meliadine AEMP – April 2023

Month	Units	April DLs	Relative Percent Difference DQOs		April DUP-1 (MEL-01-10)					April DUP-2 (MEL-02-08)				
Station					MEL-01-10	DUP-01	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-02-08	DUP-02	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					01-Apr-2023	01-Apr-2023				02-Apr-2023	02-Apr-2023			
ALS Sample ID			Lab	Field	WP2304940-017	WP2304940-018				WP2304940-003	WP2304940-006			
Parameter					Water	Water				Water	Water			
Mercury, total	mg/L	0.000005	20	30			DIFF	0	Pass Diff		<0.0000050	<DL	<DL	<DL
Mercury, total	ng/L	0.1	20	30	7.61	6.83	RPD	10.8	Pass RPD	4.25	<5.0	<DL	<DL	<DL
Total Metals														
Aluminum	mg/L	0.0010	20	30	0.0016	0.0015	DIFF	0.0001	Pass Diff	0.0016	0.0022	DIFF	-0.0006	Pass Diff
Antimony	mg/L	0.000020	20	30	0.000025	0.000025	DIFF	0	Pass Diff	0.000026	0.000024	DIFF	0.000002	Pass Diff
Arsenic	mg/L	0.000020	20	30	0.00079	0.00078	RPD	1.4	Pass RPD	0.00076	0.00083	RPD	-8.8	Pass RPD
Barium	mg/L	0.000020	20	30	0.015	0.015	RPD	-2	Pass RPD	0.014	0.014	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	0.012	0.012	DIFF	-0.0002	Pass Diff	0.0092	0.0093	DIFF	-1E-04	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	16.7	16.5	RPD	1.2	Pass RPD	13.5	13.3	RPD	1.5	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000010	0.000010	DIFF	-3E-07	Pass Diff	0.000011	0.000011	DIFF	-0.0000004	Pass Diff
Chromium	mg/L	0.00010	20	30	0.00016	<0.00010	<DL	<DL	<DL	<0.00010	<0.00010	<DL	<DL	<DL
Cobalt	mg/L	0.000005	20	30	0.000024	0.000025	DIFF	-9E-07	Pass Diff	0.000015	0.000017	DIFF	-0.0000019	Pass Diff
Copper	mg/L	0.000050	20	30	0.0014	0.0014	RPD	0	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
Iron	mg/L	0.0010	20	30	0.0077	0.0073	RPD	5.3	Pass RPD	0.0066	0.0083	RPD	-22.8	Pass RPD
Lanthanum	mg/L	0.000010	20	30	0.000027	0.000027	DIFF	0	Pass Diff	0.000020	0.000021	DIFF	-1E-06	Pass Diff
Lead	mg/L	0.000010	20	30	0.00033	0.000037	DIFF	0.000289	Fail	0.000046	0.000061	DIFF	-0.000015	Pass Diff
Lithium	mg/L	0.00050	20	30	0.0018	0.0018	DIFF	-0.00001	Pass Diff	0.0015	0.0014	DIFF	4E-05	Pass Diff
Magnesium	mg/L	0.0040	20	30	3.1	3.1	RPD	-1.6	Pass RPD	2.4	2.4	RPD	0.4	Pass RPD
Manganese	mg/L	0.000050	20	30	0.0019	0.0019	RPD	1.6	Pass RPD	0.0011	0.0011	RPD	-2.8	Pass RPD
Molybdenum	mg/L	0.000050	20	30	0.00020	0.00020	DIFF	-4E-06	Pass Diff	0.00015	0.00022	DIFF	-0.000066	Pass Diff
Niobium	mg/L	0.000050	20	30	0.0012	0.0012	RPD	0.8	Pass RPD	0.00085	0.00082	RPD	3.5	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	2.0	1.9	RPD	1	Pass RPD	1.7	1.6	RPD	1.2	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	0.0024	0.0024	RPD	0.8	Pass RPD	0.0022	0.0021	RPD	1.9	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000063	0.000064	DIFF	-1E-06	Pass Diff	0.000058	0.000051	DIFF	0.000007	Pass Diff
Silicon	mg/L	0.050	20	30	0.39	0.39	RPD	-0.5	Pass RPD	0.28	0.28	RPD	-2.2	Pass RPD
Silver	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	0.000015	0.000016	DIFF	-0.0000004	Pass Diff
Sodium	mg/L	0.020	20	30	13.7	13.4	RPD	2.2	Pass RPD	9.9	9.6	RPD	2.5	Pass RPD
Strontium	mg/L	0.000020	20	30	0.095	0.094	RPD	0.4	Pass RPD	0.070	0.070	RPD	0.7	Pass RPD
Sulfur	mg/L	0.50	20	30	3.8	3.9	RPD	-1.6	Pass RPD	2.6	2.7	RPD	-3	Pass RPD
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	<0.000020	<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	0.000068	<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	0.000029	0.000030	RPD	-3.4	Pass RPD	0.000022	0.000024	RPD	-7.9	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

Table A-3. Water quality field duplicate results for Meliadine AEMP – April 2023

Month	Units	April DLs	Relative Percent Difference DQOs		April DUP-1 (MEL-01-10)					April DUP-2 (MEL-02-08)				
Station					MEL-01-10	DUP-01	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-02-08	DUP-02	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					01-Apr-2023	01-Apr-2023				02-Apr-2023	02-Apr-2023			
ALS Sample ID			Lab	Field	WP2304940-017	WP2304940-018				WP2304940-003	WP2304940-006			
Parameter					Water	Water				Water	Water			
Zinc	mg/L	0.00050	20	30	0.0019	0.0016	DIFF	0.00032	Pass Diff	0.0038	0.0036	RPD	5.7	Pass RPD
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	<0.0010	0.0012	<DL	<DL	<DL	<0.0010	<0.0010	<DL	<DL	<DL
Antimony	mg/L	0.000020	20	30	0.000026	0.000025	DIFF	1E-06	Pass Diff	0.000021	0.000022	DIFF	-0.000001	Pass Diff
Arsenic	mg/L	0.000020	20	30	0.00073	0.00073	RPD	0.4	Pass RPD	0.00068	0.00071	RPD	-3.9	Pass RPD
Barium	mg/L	0.000020	20	30	0.015	0.015	RPD	0	Pass RPD	0.013	0.013	RPD	-1.6	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	0.012	0.012	DIFF	1E-04	Pass Diff	0.0084	0.0088	DIFF	-0.0004	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	16	16.4	RPD	-2.5	Pass RPD	11.6	12	RPD	-3.4	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000011	0.000011	DIFF	-3E-07	Pass Diff	0.000011	0.000012	DIFF	-0.0000007	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	0.000021	0.000023	DIFF	-0.0000016	Pass Diff	0.000012	0.000012	DIFF	-8E-07	Pass Diff
Copper	mg/L	0.000050	20	30	0.0014	0.0014	RPD	-2.9	Pass RPD	0.0011	0.0011	RPD	-5.4	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	0.0033	0.0031	DIFF	0.0002	Pass Diff	0.0026	0.0025	DIFF	1E-04	Pass Diff
Lanthanum	mg/L	0.000010	20	30	0.000024	0.000024	DIFF	0	Pass Diff	0.000017	0.000018	DIFF	-0.000001	Pass Diff
Lead	mg/L	0.000010	20	30	0.000016	0.000016	DIFF	0	Pass Diff	0.000016	0.000016	DIFF	0	Pass Diff
Lithium	mg/L	0.00050	20	30	0.0018	0.0018	DIFF	0	Pass Diff	0.0013	0.0013	DIFF	-3E-05	Pass Diff
Magnesium	mg/L	0.0040	20	30	3.0	3.1	RPD	-1	Pass RPD	1.9	2.0	RPD	-3.5	Pass RPD
Manganese	mg/L	0.000050	20	30	0.00041	0.00041	RPD	0.7	Pass RPD	0.00024	0.00025	DIFF	-9E-06	Pass Diff
Mercury	mg/L	0.000005	20	30			DIFF	0	Pass Diff		<0.0000050	<DL	<DL	<DL
Mercury	ng/L	0.10	20	30	1.9	1.8	RPD	7.2	Pass RPD	3.2	na[c]	-	-	-
Molybdenum	mg/L	0.000050	20	30	0.00020	0.00020	DIFF	2E-06	Pass Diff	0.00013	0.00014	DIFF	-3E-06	Pass Diff
Nickel	mg/L	0.000050	20	30	0.0012	0.0012	RPD	-1.6	Pass RPD	0.00071	0.00075	RPD	-5.3	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	1.9	1.9	RPD	-2.1	Pass RPD	1.5	1.5	RPD	-2.7	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	-0.9	Pass RPD	0.0020	0.0020	RPD	-3	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000066	0.000060	DIFF	0.000006	Pass Diff	0.000067	0.000054	DIFF	0.000013	Pass Diff
Silicon	mg/L	0.050	20	30	0.39	0.39	RPD	-1.3	Pass RPD	0.26	0.29	RPD	-8	Pass RPD
Silver	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL	0.000010	0.000011	DIFF	-5E-07	Pass Diff
Sodium	mg/L	0.020	20	30	12.8	13.3	RPD	-3.8	Pass RPD	8.0	8.3	RPD	-3.2	Pass RPD
Strontium	mg/L	0.000020	20	30	0.090	0.093	RPD	-2.8	Pass RPD	0.064	0.065	RPD	-1.6	Pass RPD
Sulfur	mg/L	0.50	20	30	3.8	3.8	RPD	0.3	Pass RPD	2.5	2.8	DIFF	-0.28	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	<0.000020	<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	0.000030	0.000029	RPD	5.8	Pass RPD	0.000018	0.000022	RPD	-19.3	Pass RPD

Table A-3. Water quality field duplicate results for Meliadine AEMP – April 2023

Month	Units	April DLs	Relative Percent Difference DQOs		April DUP-1 (MEL-01-10)					April DUP-2 (MEL-02-08)				
Station					MEL-01-10	DUP-01	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-02-08	DUP-02	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					01-Apr-2023	01-Apr-2023				02-Apr-2023	02-Apr-2023			
ALS Sample ID			Lab	Field	WP2304940-017	WP2304940-018				WP2304940-003	WP2304940-006			
Parameter					Water	Water				Water	Water			
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*	0.000013	*<DL*	*<DL*	*<DL*	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Zinc	mg/L	0.00050	20	30	0.0015	0.0015	DIFF	3E-05	Pass Diff	0.0032	0.0033	RPD	-2.1	Pass RPD
Zirconium	mg/L	0.000010		40	*<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
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.

[c] na = not analyzed; dissolved mercury was not analyzed for some samples due to a shortage of bottles for low-level analysis.

Table A-4. Water quality field duplicate results for Meliadine AEMP – July 2023

Month	Units	July DLs	Relative Percent Difference DQOs		July DUP-1 (MEL-03-04)					July DUP-2 (MEL-01-09)				
Station					MEL-03-04	DUP-1	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-01-09	DUP-2	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-07-15	2023-07-15				2023-07-16	2023-07-16			
ALS Sample ID			Lab	Field	WP2317117-004	WP2317114-001				WP2317119-005	WP2317114-002			
Parameter					Water	Water				Water	Water			
Physical Tests														
Conductivity	µS/cm	1.0	10	15	86	85.2	RPD	0.9	Pass RPD	112	111	RPD	0.9	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 (as CaCO3)	mg/L	1.0		40	18.2	18	RPD	1.1	Pass RPD	19.1	19.1	RPD	0	Pass RPD
Alkalinity, bicarbonate (as HCO3)	mg/L	1.0		40			DIFF	0	Pass Diff			DIFF	0	Pass Diff
Alkalinity, carbonate (as CO3)	mg/L	1.0		40			DIFF	0	Pass Diff			DIFF	0	Pass Diff
Alkalinity, carbonate (as CaCO3)	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, hydroxide (as CaCO3)	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, hydroxide (as OH)	mg/L	1.0		40			DIFF	0	Pass Diff			DIFF	0	Pass Diff
Alkalinity, phenolphthalein (as CaCO3)	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	2.0		40	18.2	18	RPD	1.1	Pass RPD	19.1	19.1	RPD	0	Pass RPD
Hardness (as CaCO3), dissolved	mg/L	0.50		40	25.4	25.9	RPD	-1.9	Pass RPD	32.9	31.4	RPD	4.7	Pass RPD
Solids, total dissolved [TDS]	mg/L	3.0		40	46.8	50.8	RPD	-8.2	Pass RPD	65.4	64.1	RPD	2	Pass RPD
Solids, total dissolved [TDS], calculated	mg/L	1.0		40	55.9	55.4	RPD	0.9	Pass RPD	72.8	72.2	RPD	0.8	Pass RPD
Solids, total suspended [TSS]	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	1.0	*<1.0*	*<DL*	*<DL*	*<DL*
Turbidity	NTU	0.10	15	23	0.27	0.26	DIFF	0.01	Pass Diff	0.46	0.34	DIFF	0.12	Pass Diff
pH	pH units	0.10		40	7.5	7.4	RPD	0.5	Pass RPD	7.5	7.4	RPD	0.9	Pass RPD
Anions and Nutrients (Water)														
Ammonia, total (as N)	mg/L	0.0050	20	30	0.0053	*<0.0050*	*<DL*	*<DL*	*<DL*	0.011	0.0056	DIFF	0.0055	Pass Diff
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	10.9	10.7	RPD	1.9	Pass RPD	16	16	RPD	0	Pass RPD
Fluoride	mg/L	0.020	20	30	0.028	0.029	DIFF	-0.001	Pass Diff	0.029	0.029	DIFF	0	Pass Diff
Kjeldahl nitrogen, dissolved [DKN]	mg/L	0.050	20	30	0.17	0.18	DIFF	-0.006	Pass Diff	0.20	0.21	DIFF	-0.007	Pass Diff
Kjeldahl nitrogen, total [TKN]	mg/L	0.050	20	30	0.16	0.17	DIFF	-0.013	Pass Diff	0.21	0.23	DIFF	-0.016	Pass Diff
Nitrate (as N)	mg/L	0.0050	20	30	0.019	*<0.0050*	*<DL*	*<DL*	*<DL*	0.021	0.020	DIFF	0.001	Pass Diff
Nitrate + Nitrite (as N)	mg/L	0.0050	20	30	0.019	*<0.0051*	*<DL*	*<DL*	*<DL*	0.021	0.020	DIFF	0.001	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	0.18	0.17	DIFF	0.006	Pass Diff	0.23	0.25	DIFF	-0.015	Pass Diff
Nitrogen, total dissolved	mg/L	0.020	20	30	0.19	0.18	RPD	7.2	Pass RPD	0.23	0.23	RPD	-2.6	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	0.0032	0.0035	DIFF	-0.0003	Pass Diff	0.0053	0.0040	DIFF	0.0013	Pass Diff
Phosphorus, total dissolved	mg/L	0.0010	20	30	0.0017	0.0017	DIFF	0	Pass Diff	0.0018	0.0016	DIFF	0.0002	Pass Diff
Silicate (as SiO2)	mg/L	0.010	20	30	0.31	0.32	RPD	-3.5	Pass RPD	0.48	0.48	RPD	-0.6	Pass RPD
Sulfate (as SO4)	mg/L	0.30	20	30	4.4	4.4	RPD	0.2	Pass RPD	7.0	7.1	RPD	-0.3	Pass RPD
Cyanides														
Cyanide, Weak Acid Diss	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, Free	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	3.6	2.8	RPD	24.8	Pass RPD	4.5	3.8	RPD	15.7	Pass RPD
Total Organic Carbon	mg/L	0.50	20	30	3.3	2.9	RPD	12.8	Pass RPD	3.8	3.8	RPD	0.8	Pass RPD

Table A-4. Water quality field duplicate results for Meliadine AEMP – July 2023

Month	Units	July DLs	Relative Percent Difference DQOs		July DUP-1 (MEL-03-04)					July DUP-2 (MEL-01-09)				
Station					MEL-03-04	DUP-1	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-01-09	DUP-2	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-07-15	2023-07-15				2023-07-16	2023-07-16			
ALS Sample ID			Lab	Field	WP2317117-004	WP2317114-001				WP2317119-005	WP2317114-002			
Parameter					Water	Water				Water	Water			
Mercury, total														
Mercury, total	ng/L	0.1	20	30	0.44	0.52	DIFF	-0.08	Pass Diff		0.65	DIFF	-0.65	Fail
Total Metals														
Aluminum	mg/L	0.0010	20	30	0.0034	0.0024	DIFF	0.001	Pass Diff	0.0041	0.0037	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
Arsenic	mg/L	0.000020	20	30	0.00039	0.00037	RPD	4.5	Pass RPD	0.00056	0.00055	RPD	0.2	Pass RPD
Barium	mg/L	0.000020	20	30	0.0092	0.0089	RPD	3.4	Pass RPD	0.0098	0.0095	RPD	2.7	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	<0.0050	0.0050	<DL	<DL	<DL	0.0072	0.0082	DIFF	-0.001	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	8.1	8.3	RPD	-3.2	Pass RPD	9.9	9.8	RPD	1	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000009	0.000009	DIFF	-8E-07	Pass Diff	0.000008	0.000007	DIFF	0.0000002	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	0.000016	0.000016	DIFF	3E-07	Pass Diff	0.000030	0.000027	RPD	8.8	Pass RPD
Copper	mg/L	0.000050	20	30	0.0012	0.00083	RPD	37	Fail	0.00096	0.00091	RPD	5	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	0.013	0.013	RPD	3.9	Pass RPD	0.024	0.023	RPD	4.2	Pass RPD
Lanthanum	mg/L	0.000010	20	30	0.000022	0.000019	DIFF	0.000003	Pass Diff	0.000029	0.000031	DIFF	-0.000002	Pass Diff
Lead	mg/L	0.000010	20	30	0.000024	0.000013	DIFF	0.000011	Pass Diff	0.000013	<0.000010	<DL	<DL	<DL
Lithium	mg/L	0.00050	20	30	0.00083	0.00083	DIFF	0	Pass Diff	0.0010	0.0013	DIFF	-0.00023	Pass Diff
Magnesium	mg/L	0.0040	20	30	1.3	1.3	RPD	0.8	Pass RPD	1.8	1.8	RPD	3.4	Pass RPD
Manganese	mg/L	0.000050	20	30	0.0043	0.0043	RPD	-0.7	Pass RPD	0.0058	0.0058	RPD	0.7	Pass RPD
Molybdenum	mg/L	0.000050	20	30	0.000085	0.000085	DIFF	0	Pass Diff	0.00012	0.00012	DIFF	0.000005	Pass Diff
Niobium	mg/L	0.000050	20	30	0.00052	0.00050	RPD	3.1	Pass RPD	0.00086	0.00085	RPD	1.3	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	1.00	1.0	RPD	-0.1	Pass RPD	1.2	1.1	RPD	2.6	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	0.0014	0.0014	RPD	-2.9	Pass RPD	0.0015	0.0015	RPD	-2.6	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000040	0.000046	DIFF	-0.000006	Pass Diff	0.000046	0.000047	DIFF	-1E-06	Pass Diff
Silicon	mg/L	0.050	20	30	0.15	0.16	DIFF	-0.008	Pass Diff	0.23	0.24	DIFF	-0.01	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	5.6	5.6	RPD	-0.2	Pass RPD	7.9	7.8	RPD	0.8	Pass RPD
Strontium	mg/L	0.000020	20	30	0.042	0.043	RPD	-0.9	Pass RPD	0.058	0.056	RPD	2.6	Pass RPD
Sulfur	mg/L	0.50	20	30	1.6	1.6	DIFF	-0.02	Pass Diff	2.6	2.6	RPD	1.9	Pass RPD
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	0.000008	0.000009	DIFF	-0.0000018	Pass Diff
Tin	mg/L	0.000020	20	30	0.00010	0.000054	DIFF	0.000046	Fail	0.000032	0.000024	DIFF	0.000008	Pass Diff
Titanium	mg/L	0.000050	20	30	0.00012	0.000090	DIFF	0.000026	Pass Diff	0.00016	0.00016	DIFF	0.000009	Pass Diff
Tungsten	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL	<0.000010	<0.000010	<DL	<DL	<DL

Table A-4. Water quality field duplicate results for Meliadine AEMP – July 2023

Month	Units	July DLs	Relative Percent Difference DQOs		July DUP-1 (MEL-03-04)					July DUP-2 (MEL-01-09)				
Station					MEL-03-04	DUP-1	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-01-09	DUP-2	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-07-15	2023-07-15				2023-07-16	2023-07-16			
ALS Sample ID			Lab	Field	WP2317117-004	WP2317114-001				WP2317119-005	WP2317114-002			
Parameter					Water	Water				Water	Water			
Uranium	mg/L	0.000001	20	30	0.000015	0.000017	RPD	-12.2	Pass RPD	0.000027	0.000025	RPD	10	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	0.000012	0.000011	DIFF	0.000001	Pass Diff
Zinc	mg/L	0.00050	20	30	0.0029	<0.00050	<DL	<DL	<DL	0.00063	<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
Dissolved Metals														
Aluminum	mg/L	0.0010	20	30	<0.0010	0.0018	<DL	<DL	<DL	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
Arsenic	mg/L	0.000020	20	30	0.00036	0.00037	RPD	-1.9	Pass RPD	0.00052	0.00053	RPD	-1	Pass RPD
Barium	mg/L	0.000020	20	30	0.0087	0.0088	RPD	-1.8	Pass RPD	0.0097	0.0096	RPD	1.8	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
Boron	mg/L	0.0050	20	30	<0.0050	<0.0050	<DL	<DL	<DL	0.0074	0.0073	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	8.0	8.2	RPD	-2	Pass RPD	10.1	9.7	RPD	4.5	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000008	0.000009	DIFF	-0.0000005	Pass Diff	0.000008	0.000007	DIFF	0.0000003	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	0.000006	0.000007	DIFF	-0.0000005	Pass Diff	0.000017	0.000016	DIFF	9E-07	Pass Diff
Copper	mg/L	0.000050	20	30	0.00091	0.00077	RPD	16.2	Pass RPD	0.00096	0.00096	RPD	-0.6	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	0.0035	0.0041	DIFF	-0.0006	Pass Diff	0.0071	0.0069	RPD	2.9	Pass RPD
Lanthanum	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL	0.000013	0.000012	DIFF	1E-06	Pass Diff
Lead	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL	0.000012	<0.000010	<DL	<DL	<DL
Lithium	mg/L	0.00050	20	30	0.00083	0.00082	DIFF	0.00001	Pass Diff	0.0011	0.0011	DIFF	2E-05	Pass Diff
Magnesium	mg/L	0.0040	20	30	1.3	1.3	RPD	-0.7	Pass RPD	1.9	1.8	RPD	4.9	Pass RPD
Manganese	mg/L	0.000050	20	30	0.00054	0.00059	RPD	-7.6	Pass RPD	0.00052	0.00052	RPD	-0.8	Pass RPD
Mercury	mg/L	0.000005	20	30			DIFF	0	Pass Diff			DIFF	0	Pass Diff
Mercury	ng/L	0.10	20	30	0.25	0.49	DIFF	-0.24	Fail	<0.50	0.32	<DL	<DL	<DL
Molybdenum	mg/L	0.000050	20	30	0.000083	0.000084	DIFF	-1E-06	Pass Diff	0.00013	0.00012	DIFF	0.000006	Pass Diff
Nickel	mg/L	0.000050	20	30	0.00048	0.00048	RPD	-0.4	Pass RPD	0.00083	0.00081	RPD	2.6	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	1.1	1.0	RPD	4.8	Pass RPD	1.2	1.2	RPD	1.7	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	0.0014	0.0014	RPD	-2.9	Pass RPD	0.0016	0.0015	RPD	5.3	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000043	0.000043	DIFF	0	Pass Diff	0.000048	0.000045	DIFF	0.000003	Pass Diff
Silicon	mg/L	0.050	20	30	0.15	0.15	DIFF	0	Pass Diff	0.24	0.24	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
Sodium	mg/L	0.020	20	30	5.4	5.5	RPD	-1.8	Pass RPD	8.2	7.9	RPD	3.8	Pass RPD
Strontium	mg/L	0.000020	20	30	0.041	0.042	RPD	-1	Pass RPD	0.059	0.056	RPD	5.4	Pass RPD
Sulfur	mg/L	0.50	20	30	1.6	1.6	DIFF	-0.01	Pass Diff	2.6	2.6	RPD	-0.8	Pass RPD
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

Table A-4. Water quality field duplicate results for Meliadine AEMP – July 2023

Month	Units	July DLs	Relative Percent Difference DQOs		July DUP-1 (MEL-03-04)					July DUP-2 (MEL-01-09)				
Station					MEL-03-04	DUP-1	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-01-09	DUP-2	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-07-15	2023-07-15				2023-07-16	2023-07-16			
ALS Sample ID			Lab	Field	WP2317117-004	WP2317114-001				WP2317119-005	WP2317114-002			
Parameter					Water	Water				Water	Water			
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	0.000035	0.000031	DIFF	0.000004	Pass Diff	0.000043	*<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	0.000016	0.000016	RPD	5	Pass RPD	0.000023	0.000024	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	*<0.00050*	*<0.00050*	*<DL*	*<DL*	*<DL*	*<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*

Notes:

[a] Field Dup Methods are based on the concentrations:

RPD = relative percent difference is used to

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. Water quality field duplicate results for Meliadine AEMP – July 2023

Month	Units	July DLs	Relative Percent Difference DQOs		July DUP-3 (D7-01)				
Station					D7-01	DUP-3	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-07-17	2023-07-17			
ALS Sample ID			Lab	Field	WP2317108-004	WP2317114-003			
Parameter					Water	Water			
Physical Tests									
Conductivity	µS/cm	1.0	10	15	135	134	RPD	0.7	Pass RPD
Acidity (as CaCO3)	mg/L	2.0		40	2.6	2.2	DIFF	0.4	Pass Diff
Alkalinity, bicarbonate (as CaCO3)	mg/L	1.0		40	46.5	45.5	RPD	2.2	Pass RPD
Alkalinity, bicarbonate (as HCO3)	mg/L	1.0		40			DIFF	0	Pass Diff
Alkalinity, carbonate (as CO3)	mg/L	1.0		40			DIFF	0	Pass Diff
Alkalinity, carbonate (as CaCO3)	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, hydroxide (as CaCO3)	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, hydroxide (as OH)	mg/L	1.0		40			DIFF	0	Pass Diff
Alkalinity, phenolphthalein (as CaCO3)	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, total (as CaCO3)	mg/L	2.0		40	46.5	45.5	RPD	2.2	Pass RPD
Hardness (as CaCO3), dissolved	mg/L	0.50		40	52.6	50.2	RPD	4.7	Pass RPD
Solids, total dissolved [TDS]	mg/L	3.0		40	66.1	76.8	RPD	-15	Pass RPD
Solids, total dissolved [TDS], calculated	mg/L	1.0		40	87.8	87.1	RPD	0.8	Pass RPD
Solids, total suspended [TSS]	mg/L	1.0		40	1.6	5.8	DIFF	-4.2	Fail
Turbidity	NTU	0.10	15	23	0.67	0.67	RPD	0	Pass RPD
pH	pH units	0.10		40	7.8	7.8	RPD	-0.5	Pass RPD
Anions and Nutrients (Water)									
Ammonia, total (as N)	mg/L	0.0050	20	30	0.0092	0.027	DIFF	-0.0178	Fail
Bromide	mg/L	0.10	20	30	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*
Chloride	mg/L	0.10	20	30	9.5	9.4	RPD	1.1	Pass RPD
Fluoride	mg/L	0.020	20	30	0.045	0.045	DIFF	0	Pass Diff
Kjeldahl nitrogen, dissolved [DKN]	mg/L	0.050	20	30	0.27	0.29	RPD	-6.8	Pass RPD
Kjeldahl nitrogen, total [TKN]	mg/L	0.050	20	30	0.26	0.27	RPD	-2.3	Pass RPD
Nitrate (as N)	mg/L	0.0050	20	30	0.0071	*<0.0050*	*<DL*	*<DL*	*<DL*
Nitrate + Nitrite (as N)	mg/L	0.0050	20	30	0.0071	*<0.0051*	*<DL*	*<DL*	*<DL*
Nitrite (as N)	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Nitrogen, total	mg/L	0.050	20	30	0.27	0.27	RPD	0.4	Pass RPD
Nitrogen, total dissolved	mg/L	0.020	20	30	0.28	0.29	RPD	-4.2	Pass RPD
Phosphate, ortho-, dissolved (as P)	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Phosphorus, total	mg/L	0.0010	20	30	0.0079	0.011	RPD	-28.3	Pass RPD
Phosphorus, total dissolved	mg/L	0.0010	20	30	0.0029	0.0027	DIFF	0.0002	Pass Diff
Silicate (as SiO2)	mg/L	0.010	20	30	0.22	0.22	RPD	-1.4	Pass RPD
Sulfate (as SO4)	mg/L	0.30	20	30	5.1	5.1	RPD	0.4	Pass RPD
Cyanides									
Cyanide, Weak Acid Diss	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Cyanide, Total	mg/L	0.0010	20	30	*<0.0010*	0.0010	*<DL*	*<DL*	*<DL*
Cyanide, Free	mg/L	0.0010	20	30	*<0.0010*	0.0011	*<DL*	*<DL*	*<DL*
Organic / Inorganic Carbon									
Dissolved Organic Carbon	mg/L	0.50	20	30	4.9	4.2	RPD	15.9	Pass RPD
Total Organic Carbon	mg/L	0.50	20	30	4.3	4.3	RPD	1.6	Pass RPD

Table A-4. Water quality field duplicate results for Meliadine AEMP – July 2023

Month	Units	July DLs	Relative Percent Difference DQOs		July DUP-3 (D7-01)				
Station					D7-01	DUP-3	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-07-17	2023-07-17			
ALS Sample ID			Lab	Field	WP2317108-004	WP2317114-003			
Parameter					Water	Water			
Mercury, total									
Mercury, total	ng/L	0.1	20	30	*<0.50*	0.57	*<DL*	*<DL*	*<DL*
Total Metals									
Aluminum	mg/L	0.0010	20	30	0.013	0.012	RPD	7.2	Pass RPD
Antimony	mg/L	0.000020	20	30	0.000023	0.000024	DIFF	-0.000001	Pass Diff
Arsenic	mg/L	0.000020	20	30	0.0017	0.0016	RPD	4.3	Pass RPD
Barium	mg/L	0.000020	20	30	0.018	0.018	RPD	0	Pass RPD
Beryllium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Bismuth	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Boron	mg/L	0.0050	20	30	0.012	0.013	DIFF	-0.0003	Pass Diff
Cadmium	mg/L	0.000005	20	30	0.000007	0.000008	DIFF	-0.0000009	Pass Diff
Calcium	mg/L	0.010	20	30	15.4	15.7	RPD	-1.9	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000008	0.000008	DIFF	5E-07	Pass Diff
Chromium	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Cobalt	mg/L	0.000005	20	30	0.000057	0.000054	RPD	4.7	Pass RPD
Copper	mg/L	0.000050	20	30	0.0011	0.0011	RPD	1.8	Pass RPD
Gallium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Iron	mg/L	0.0010	20	30	0.091	0.085	RPD	6.7	Pass RPD
Lanthanum	mg/L	0.000010	20	30	0.000044	0.000046	DIFF	-0.000002	Pass Diff
Lead	mg/L	0.000010	20	30	0.00013	0.000080	RPD	46.9	Fail
Lithium	mg/L	0.00050	20	30	0.0015	0.0015	DIFF	-6E-05	Pass Diff
Magnesium	mg/L	0.0040	20	30	2.8	2.8	RPD	-1.8	Pass RPD
Manganese	mg/L	0.000050	20	30	0.0095	0.0091	RPD	4.8	Pass RPD
Molybdenum	mg/L	0.000050	20	30	0.00052	0.00053	RPD	-2.5	Pass RPD
Niobium	mg/L	0.000050	20	30	0.00075	0.00075	RPD	-0.5	Pass RPD
Nickel	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Phosphorus	mg/L	0.050	20	30	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*
Potassium	mg/L	0.020	20	30	1.3	1.3	RPD	-2.3	Pass RPD
Rhenium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Rubidium	mg/L	0.000005	20	30	0.0012	0.0012	RPD	-0.9	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000048	0.000047	DIFF	0.000001	Pass Diff
Silicon	mg/L	0.050	20	30	0.12	0.12	DIFF	0.001	Pass Diff
Silver	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Sodium	mg/L	0.020	20	30	7.3	7.3	RPD	-1.1	Pass RPD
Strontium	mg/L	0.000020	20	30	0.075	0.075	RPD	-0.1	Pass RPD
Sulfur	mg/L	0.50	20	30	2.0	2.0	DIFF	0.01	Pass Diff
Tantalum	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Tellurium	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Thallium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Thorium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Tin	mg/L	0.000020	20	30	0.000037	0.000063	DIFF	-0.000026	Pass Diff
Titanium	mg/L	0.000050	20	30	0.00070	0.00046	RPD	42.2	Fail
Tungsten	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*

Table A-4. Water quality field duplicate results for Meliadine AEMP – July 2023

Month	Units	July DLs	Relative Percent Difference DQOs		July DUP-3 (D7-01)				
Station					D7-01	DUP-3	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-07-17	2023-07-17			
ALS Sample ID			Lab	Field	WP2317108-004	WP2317114-003			
Parameter					Water	Water			
Uranium	mg/L	0.000001	20	30	0.000087	0.000093	RPD	-6.4	Pass RPD
Vanadium	mg/L	0.000050	20	30	0.00010	0.000096	DIFF	0.000006	Pass Diff
Yttrium	mg/L	0.000010	20	30	0.000012	0.000013	DIFF	-1E-06	Pass Diff
Zinc	mg/L	0.00050	20	30	0.0055	0.0053	RPD	3.9	Pass RPD
Zirconium	mg/L	0.000010	20	30	0.000012	0.000012	DIFF	0	Pass Diff
Dissolved Metals									
Aluminum	mg/L	0.0010	20	30	0.0039	0.0045	DIFF	-0.0006	Pass Diff
Antimony	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Arsenic	mg/L	0.000020	20	30	0.0013	0.0012	RPD	0.8	Pass RPD
Barium	mg/L	0.000020	20	30	0.016	0.017	RPD	-5.5	Pass RPD
Beryllium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Bismuth	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Boron	mg/L	0.0050	20	30	0.014	0.013	DIFF	0.0009	Pass Diff
Cadmium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Calcium	mg/L	0.010	20	30	16.1	15.5	RPD	3.8	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000006	0.000006	DIFF	0.0000002	Pass Diff
Chromium	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Cobalt	mg/L	0.000005	20	30	0.000023	0.000026	DIFF	-0.0000024	Pass Diff
Copper	mg/L	0.000050	20	30	0.00093	0.00099	RPD	-6.4	Pass RPD
Gallium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Iron	mg/L	0.0010	20	30	0.039	0.032	RPD	19.3	Pass RPD
Lanthanum	mg/L	0.000010	20	30	0.000014	0.000015	DIFF	-0.000001	Pass Diff
Lead	mg/L	0.000010	20	30	0.000014	0.000021	DIFF	-0.000007	Pass Diff
Lithium	mg/L	0.00050	20	30	0.0015	0.0015	DIFF	-3E-05	Pass Diff
Magnesium	mg/L	0.0040	20	30	3.0	2.8	RPD	8.3	Pass RPD
Manganese	mg/L	0.000050	20	30	0.0014	0.0015	RPD	-3.4	Pass RPD
Mercury	mg/L	0.000005	20	30			DIFF	0	Pass Diff
Mercury	ng/L	0.10	20	30	0.61	0.47	DIFF	0.14	Pass Diff
Molybdenum	mg/L	0.000050	20	30	0.00052	0.00051	RPD	2.3	Pass RPD
Nickel	mg/L	0.000050	20	30	0.00069	0.00068	RPD	1.3	Pass RPD
Niobium	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Phosphorus	mg/L	0.050	20	30	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*
Potassium	mg/L	0.020	20	30	1.4	1.3	RPD	6.8	Pass RPD
Rhenium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Rubidium	mg/L	0.000005	20	30	0.0011	0.0011	RPD	0.9	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000042	*<0.000040*	*<DL*	*<DL*	*<DL*
Silicon	mg/L	0.050	20	30	0.13	0.12	DIFF	0.009	Pass Diff
Silver	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Sodium	mg/L	0.020	20	30	7.8	7.1	RPD	8.8	Pass RPD
Strontium	mg/L	0.000020	20	30	0.077	0.075	RPD	2.2	Pass RPD
Sulfur	mg/L	0.50	20	30	2.0	1.9	DIFF	0.08	Pass Diff
Tantalum	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Tellurium	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Thallium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*

Table A-4. Water quality field duplicate results for Meliadine AEMP – July 2023

Month	Units	July DLs	Relative Percent Difference DQOs		July DUP-3 (D7-01)				
Station					D7-01	DUP-3	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-07-17	2023-07-17			
ALS Sample ID			Lab	Field	WP2317108-004	WP2317114-003			
Parameter					Water	Water			
Thorium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Tin	mg/L	0.000020	20	30	0.000026	0.000076	DIFF	-0.00005	Fail
Titanium	mg/L	0.000050	20	30	0.000056	0.000056	DIFF	0	Pass Diff
Tungsten	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Uranium	mg/L	0.000001	20	30	0.000091	0.000099	RPD	-8.8	Pass RPD
Vanadium	mg/L	0.000050	20	30	0.000060	0.000062	DIFF	-0.000002	Pass Diff
Yttrium	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Zinc	mg/L	0.00050	20	30	0.00072	0.0014	DIFF	-0.00068	Pass Diff
Zirconium	mg/L	0.000010		40	0.000011	0.000010	DIFF	1E-06	Pass Diff

Notes:

[a] Field Dup Methods are based on the concentrations:

RPD = relative percent difference is used to

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. Water quality field duplicate results for Meliadine AEMP – August 2023

Month	Units	August DLs	Relative Percent Difference DQOs		August DUP-1 (MEL-03-03)					August DUP-2 (MEL-01-06)				
Station					MEL-03-03	DUP-1	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-01-06	DUP-2	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-08-18	2023-08-18				2023-08-22	2023-08-22			
ALS Sample ID			Lab	Field	WP2320729-008	WP2320997-001				WP2320999-002	WP2320997-002			
Parameter					Water	Water				Water	Water			
Physical Tests														
Conductivity	µS/cm	1.0	10	15	82.2	84.3	RPD	-2.5	Pass RPD	109	108	RPD	0.9	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 (as CaCO3)	mg/L	1.0		40	20.8	20.5	RPD	1.5	Pass RPD	22.7	24.7	RPD	-8.4	Pass RPD
Alkalinity, bicarbonate (as HCO3)	mg/L	1.0		40			DIFF	0	Pass Diff			DIFF	0	Pass Diff
Alkalinity, carbonate (as CO3)	mg/L	1.0		40			DIFF	0	Pass Diff			DIFF	0	Pass Diff
Alkalinity, carbonate (as CaCO3)	mg/L	1.0		40	<1.0	<1.0	<DL	<DL	<DL	<1.0	<1.0	<DL	<DL	<DL
Alkalinity, hydroxide (as CaCO3)	mg/L	1.0		40	<1.0	<1.0	<DL	<DL	<DL	<1.0	<1.0	<DL	<DL	<DL
Alkalinity, hydroxide (as OH)	mg/L	1.0		40			DIFF	0	Pass Diff			DIFF	0	Pass Diff
Alkalinity, phenolphthalein (as CaCO3)	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	2.0		40	20.8	20.5	RPD	1.5	Pass RPD	22.7	24.7	RPD	-8.4	Pass RPD
Hardness (as CaCO3), dissolved	mg/L	0.50		40	26.5	26.4	RPD	0.4	Pass RPD	33.6	32.4	RPD	3.6	Pass RPD
Solids, total dissolved [TDS]	mg/L	3.0		40	54.2	59.8	RPD	-9.8	Pass RPD	58.7	61.7	RPD	-5	Pass RPD
Solids, total dissolved [TDS], calculated	mg/L	1.0		40	53.4	54.8	RPD	-2.6	Pass RPD	70.8	70.2	RPD	0.9	Pass RPD
Solids, total suspended [TSS]	mg/L	1.0		40	8.7	<1.0	<DL	<DL	<DL	<1.0	<1.0	<DL	<DL	<DL
Turbidity	NTU	0.10	15	23	0.30	0.36	DIFF	-0.06	Pass Diff	0.43	0.42	DIFF	0.01	Pass Diff
pH	pH units	0.10		40	7.5	7.5	RPD	-0.5	Pass RPD	7.4	7.5	RPD	-1.6	Pass RPD
Anions and Nutrients (Water)														
Ammonia, total (as N)	mg/L	0.0050	20	30	0.018	<0.0050	<DL	<DL	<DL	<0.0050	<0.0050	<DL	<DL	<DL
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	11.2	10.9	RPD	2.7	Pass RPD	15.3	15.3	RPD	0	Pass RPD
Fluoride	mg/L	0.020	20	30	0.029	0.028	DIFF	0.001	Pass Diff	0.030	0.030	DIFF	0	Pass Diff
Kjeldahl nitrogen, dissolved [DKN]	mg/L	0.050	20	30	0.21	0.17	DIFF	0.037	Pass Diff	0.23	0.21	DIFF	0.025	Pass Diff
Kjeldahl nitrogen, total [TKN]	mg/L	0.050	20	30	0.21	0.17	DIFF	0.038	Pass Diff	0.26	0.22	DIFF	0.04	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
Nitrate + Nitrite (as N)	mg/L	0.0050	20	30	<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
Nitrogen, total	mg/L	0.050	20	30	0.21	0.17	DIFF	0.038	Pass Diff	0.26	0.22	DIFF	0.04	Pass Diff
Nitrogen, total dissolved	mg/L	0.020	20	30	0.21	0.17	RPD	19.3	Pass RPD	0.23	0.21	RPD	11.4	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	0.0021	0.0042	DIFF	-0.0021	Fail	0.0057	0.0054	RPD	5.4	Pass RPD
Phosphorus, total dissolved	mg/L	0.0010	20	30	<0.0010	0.0024	<DL	<DL	<DL	0.0023	0.0030	DIFF	-0.0007	Pass Diff
Silicate (as SiO2)	mg/L	0.010	20	30	0.37	0.37	RPD	1.1	Pass RPD	0.62	0.63	RPD	-1.9	Pass RPD
Sulfate (as SO4)	mg/L	0.30	20	30	4.5	4.4	RPD	1.6	Pass RPD	6.7	6.7	RPD	0.1	Pass RPD
Cyanides														
Cyanide, Weak Acid Diss	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, Free	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	3.6	4.0	RPD	-11.8	Pass RPD	3.8	5.0	RPD	-26	Pass RPD
Total Organic Carbon	mg/L	0.50	20	30	3.2	4.4	RPD	-31.9	Fail	4.2	5.0	RPD	-18.1	Pass RPD

Table A-5. Water quality field duplicate results for Meliadine AEMP – August 2023

Month	Units	August DLs	Relative Percent Difference DQOs		August DUP-1 (MEL-03-03)					August DUP-2 (MEL-01-06)				
Station					MEL-03-03	DUP-1	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-01-06	DUP-2	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-08-18	2023-08-18				2023-08-22	2023-08-22			
ALS Sample ID			Lab	Field	WP2320729-008	WP2320997-001				WP2320999-002	WP2320997-002			
Parameter					Water	Water				Water	Water			
Mercury, total														
Mercury, total	ng/L	0.1	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	0.0036	0.0027	DIFF	0.0009	Pass Diff	0.0030	0.0022	DIFF	0.0008	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	0.00044	0.00044	RPD	0.2	Pass RPD	0.00070	0.00069	RPD	0.9	Pass RPD
Barium	mg/L	0.000020	20	30	0.0086	0.0088	RPD	-2.3	Pass RPD	0.0095	0.0093	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
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	<0.0050	0.0053	<DL	<DL	<DL	0.0073	0.0075	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	7.7	7.9	RPD	-3.5	Pass RPD	10.4	9.8	RPD	5.5	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000010	0.000010	DIFF	-1E-07	Pass Diff	0.000009	0.000008	DIFF	0.0000005	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	0.000018	0.000016	DIFF	0.000002	Pass Diff	0.000031	0.000028	RPD	12.2	Pass RPD
Copper	mg/L	0.000050	20	30	0.00084	0.00084	RPD	-0.1	Pass RPD	0.0010	0.00095	RPD	9	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	0.016	0.015	RPD	6.6	Pass RPD	0.032	0.024	RPD	26.6	Pass RPD
Lanthanum	mg/L	0.000010	20	30	0.000025	0.000023	DIFF	0.000002	Pass Diff	0.000024	0.000024	DIFF	0	Pass Diff
Lead	mg/L	0.000010	20	30	0.000078	0.00012	RPD	-40	Fail	<0.000010	<0.000010	<DL	<DL	<DL
Lithium	mg/L	0.00050	20	30	0.00079	0.00091	DIFF	-0.00012	Pass Diff	0.0010	0.0011	DIFF	-0.0001	Pass Diff
Magnesium	mg/L	0.0040	20	30	1.3	1.3	RPD	-3.9	Pass RPD	1.9	1.8	RPD	4.9	Pass RPD
Manganese	mg/L	0.000050	20	30	0.0046	0.0051	RPD	-8.9	Pass RPD	0.016	0.015	RPD	7.9	Pass RPD
Molybdenum	mg/L	0.000050	20	30	0.000094	0.000089	DIFF	0.000005	Pass Diff	0.00015	0.00014	DIFF	0.000011	Pass Diff
Niobium	mg/L	0.000050	20	30	0.00056	0.00051	RPD	8	Pass RPD	0.00087	0.00083	RPD	4.1	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	0.95	0.97	RPD	-1.7	Pass RPD	1.2	1.2	RPD	5.1	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	0.0014	0.0014	RPD	-2.9	Pass RPD	0.0016	0.0015	RPD	3.8	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000047	0.000043	DIFF	0.000004	Pass Diff	0.000051	0.000047	DIFF	0.000004	Pass Diff
Silicon	mg/L	0.050	20	30	0.17	0.19	DIFF	-0.019	Pass Diff	0.36	0.31	RPD	13.4	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	5.1	5.4	RPD	-5.4	Pass RPD	8.0	7.6	RPD	5.9	Pass RPD
Strontium	mg/L	0.000020	20	30	0.041	0.041	RPD	-1.2	Pass RPD	0.060	0.056	RPD	6.9	Pass RPD
Sulfur	mg/L	0.50	20	30	1.6	1.6	DIFF	-0.08	Pass Diff	2.4	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	<0.000020	<0.000020	<DL	<DL	<DL	<0.000020	<0.000020	<DL	<DL	<DL
Titanium	mg/L	0.000050	20	30	0.00016	0.000050	DIFF	0.000112	Fail	0.00010	0.000062	DIFF	0.000038	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	0.000020	0.000022	RPD	-9.3	Pass RPD	0.000028	0.000024	RPD	15.3	Pass RPD

Table A-5. Water quality field duplicate results for Meliadine AEMP – August 2023

Month	Units	August DLs	Relative Percent Difference DQOs		August DUP-1 (MEL-03-03)					August DUP-2 (MEL-01-06)				
Station					MEL-03-03	DUP-1	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-01-06	DUP-2	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-08-18	2023-08-18				2023-08-22	2023-08-22			
ALS Sample ID			Lab	Field	WP2320729-008	WP2320997-001				WP2320999-002	WP2320997-002			
Parameter					Water	Water				Water	Water			
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	0.000023	0.000040	DIFF	-0.000017	Pass Diff	<0.000010	<0.000010	<DL	<DL	<DL
Zinc	mg/L	0.00050	20	30	0.0023	0.0082	DIFF	-0.00583	Fail	<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
Dissolved Metals														
Aluminum	mg/L	0.0010	20	30	0.0020	0.0018	DIFF	0.0002	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
Arsenic	mg/L	0.000020	20	30	0.00043	0.00042	RPD	1.2	Pass RPD	0.00066	0.00064	RPD	2.9	Pass RPD
Barium	mg/L	0.000020	20	30	0.0086	0.0088	RPD	-2	Pass RPD	0.0092	0.0093	RPD	-1.1	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	0.0053	<0.0050	<DL	<DL	<DL	0.0070	0.0070	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	8.4	8.3	RPD	1.2	Pass RPD	10.3	10.0	RPD	3.5	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000010	0.000010	DIFF	-0.0000002	Pass Diff	0.000008	0.000008	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
Cobalt	mg/L	0.000005	20	30	0.000009	0.000007	DIFF	0.0000018	Pass Diff	0.000014	0.000013	DIFF	0.0000013	Pass Diff
Copper	mg/L	0.000050	20	30	0.00090	0.00087	RPD	2.4	Pass RPD	0.00099	0.00095	RPD	3.7	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	0.0068	0.0071	RPD	-4.3	Pass RPD	0.0063	0.0058	RPD	8.3	Pass RPD
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	0.000060	0.000051	RPD	16.2	Pass RPD	0.000084	<0.000010	<DL	<DL	<DL
Lithium	mg/L	0.00050	20	30	0.00085	0.00084	DIFF	1E-05	Pass Diff	0.0010	0.0010	DIFF	2E-05	Pass Diff
Magnesium	mg/L	0.0040	20	30	1.4	1.4	RPD	-1.4	Pass RPD	1.9	1.8	RPD	4.3	Pass RPD
Manganese	mg/L	0.000050	20	30	0.00053	0.00046	RPD	14.2	Pass RPD	0.00083	0.00080	RPD	3.2	Pass RPD
Mercury	mg/L	0.000005	20	30			DIFF	0	Pass Diff			DIFF	0	Pass Diff
Mercury	ng/L	0.10	20	30	<0.50	<0.50	<DL	<DL	<DL	<0.50	<0.50	<DL	<DL	<DL
Molybdenum	mg/L	0.000050	20	30	0.000095	0.000095	DIFF	0	Pass Diff	0.00015	0.00015	DIFF	4E-06	Pass Diff
Nickel	mg/L	0.000050	20	30	0.00054	0.00050	RPD	6.5	Pass RPD	0.00081	0.00078	RPD	3.7	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	1.0	1.00	RPD	1.4	Pass RPD	1.2	1.2	RPD	4.3	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	0.0014	0.0014	RPD	1.4	Pass RPD	0.0015	0.0015	RPD	4	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000046	0.000043	DIFF	0.000003	Pass Diff	0.000046	0.000049	DIFF	-0.000003	Pass Diff
Silicon	mg/L	0.050	20	30	0.18	0.18	DIFF	-0.002	Pass Diff	0.32	0.31	RPD	1.9	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	5.7	5.6	RPD	1.6	Pass RPD	7.9	7.6	RPD	3.4	Pass RPD
Strontium	mg/L	0.000020	20	30	0.042	0.043	RPD	-1.9	Pass RPD	0.059	0.057	RPD	4	Pass RPD
Sulfur	mg/L	0.50	20	30	1.6	1.6	DIFF	0	Pass Diff	2.5	2.4	DIFF	0.02	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	0.000045	<0.000020	<DL	<DL	<DL	0.000036	0.000024	DIFF	0.000012	Pass Diff

Table A-5. Water quality field duplicate results for Meliadine AEMP – August 2023

Month	Units	August DLs	Relative Percent Difference DQOs		August DUP-1 (MEL-03-03)					August DUP-2 (MEL-01-06)				
Station					MEL-03-03	DUP-1	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-01-06	DUP-2	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-08-18	2023-08-18				2023-08-22	2023-08-22			
ALS Sample ID			Lab	Field	WP2320729-008	WP2320997-001				WP2320999-002	WP2320997-002			
Parameter					Water	Water				Water	Water			
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	0.000016	0.000020	RPD	-21.3	Pass RPD	0.000026	0.000028	RPD	-4.8	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	0.0023	0.0020	DIFF	0.00032	Pass Diff	*<0.00050*	0.00055	*<DL*	*<DL*	*<DL*
Zirconium	mg/L	0.000010		40	*<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
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. Water quality field duplicate results for Meliadine AEMP – August 2023

Month	Units	August DLs	Relative Percent Difference DQOs		August DUP-3 (MEL-05-01)				
Station					MEL-05-01	DUP-3	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-08-18	2023-08-18			
ALS Sample ID			Lab	Field	WP2320734-006	WP2320997-003			
Parameter					Water	Water			
Physical Tests									
Conductivity	µS/cm	1.0	10	15	76.7	86.8	RPD	-12.4	Pass RPD
Acidity (as CaCO3)	mg/L	2.0		40	*<2.0*	*<2.0*	*<DL*	*<DL*	*<DL*
Alkalinity, bicarbonate (as CaCO3)	mg/L	1.0		40	23.3	21.9	RPD	6.2	Pass RPD
Alkalinity, bicarbonate (as HCO3)	mg/L	1.0		40			DIFF	0	Pass Diff
Alkalinity, carbonate (as CO3)	mg/L	1.0		40			DIFF	0	Pass Diff
Alkalinity, carbonate (as CaCO3)	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, hydroxide (as CaCO3)	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, hydroxide (as OH)	mg/L	1.0		40			DIFF	0	Pass Diff
Alkalinity, phenolphthalein (as CaCO3)	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, total (as CaCO3)	mg/L	2.0		40	23.3	21.9	RPD	6.2	Pass RPD
Hardness (as CaCO3), dissolved	mg/L	0.50		40	27	27.6	RPD	-2.2	Pass RPD
Solids, total dissolved [TDS]	mg/L	3.0		40	55.1	56.4	RPD	-2.3	Pass RPD
Solids, total dissolved [TDS], calculated	mg/L	1.0		40	49.8	56.4	RPD	-12.4	Pass RPD
Solids, total suspended [TSS]	mg/L	1.0		40	*<1.0*	1.1	*<DL*	*<DL*	*<DL*
Turbidity	NTU	0.10	15	23	0.29	0.24	DIFF	0.05	Pass Diff
pH	pH units	0.10		40	7.5	7.5	RPD	1.1	Pass RPD
Anions and Nutrients (Water)									
Ammonia, total (as N)	mg/L	0.0050	20	30	0.0098	*<0.0050*	*<DL*	*<DL*	*<DL*
Bromide	mg/L	0.10	20	30	*<0.10*	*<0.10*	*<DL*	*<DL*	*<DL*
Chloride	mg/L	0.10	20	30	11.1	10.9	RPD	1.8	Pass RPD
Fluoride	mg/L	0.020	20	30	0.030	0.028	DIFF	0.002	Pass Diff
Kjeldahl nitrogen, dissolved [DKN]	mg/L	0.050	20	30	0.21	0.16	DIFF	0.054	Pass Diff
Kjeldahl nitrogen, total [TKN]	mg/L	0.050	20	30	0.20	0.17	DIFF	0.035	Pass Diff
Nitrate (as N)	mg/L	0.0050	20	30	*<0.0050*	*<0.0050*	*<DL*	*<DL*	*<DL*
Nitrate + Nitrite (as N)	mg/L	0.0050	20	30	*<0.0051*	*<0.0051*	*<DL*	*<DL*	*<DL*
Nitrite (as N)	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Nitrogen, total	mg/L	0.050	20	30	0.20	0.17	DIFF	0.035	Pass Diff
Nitrogen, total dissolved	mg/L	0.020	20	30	0.21	0.16	RPD	29.2	Pass RPD
Phosphate, ortho-, dissolved (as P)	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Phosphorus, total	mg/L	0.0010	20	30	0.0035	0.0040	DIFF	-0.0005	Pass Diff
Phosphorus, total dissolved	mg/L	0.0010	20	30	0.0020	0.0028	DIFF	-0.0008	Pass Diff
Silicate (as SiO2)	mg/L	0.010	20	30	0.42	0.41	RPD	3.4	Pass RPD
Sulfate (as SO4)	mg/L	0.30	20	30	4.5	4.4	RPD	3.2	Pass RPD
Cyanides									
Cyanide, Weak Acid Diss	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Cyanide, Total	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Cyanide, Free	mg/L	0.0010	20	30	*<0.0010*	*<0.0010*	*<DL*	*<DL*	*<DL*
Organic / Inorganic Carbon									
Dissolved Organic Carbon	mg/L	0.50	20	30	4.0	4.1	RPD	-4.5	Pass RPD
Total Organic Carbon	mg/L	0.50	20	30	3.9	4.2	RPD	-7.4	Pass RPD

Table A-5. Water quality field duplicate results for Meliadine AEMP – August 2023

Month	Units	August DLs	Relative Percent Difference DQOs		August DUP-3 (MEL-05-01)				
Station					MEL-05-01	DUP-3	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-08-18	2023-08-18			
ALS Sample ID			Lab	Field	WP2320734-006	WP2320997-003			
Parameter					Water	Water			
Mercury, total									
Mercury, total	ng/L	0.1	20	30	*<0.50*	*<0.50*	*<DL*	*<DL*	*<DL*
Total Metals									
Aluminum	mg/L	0.0010	20	30	0.0023	0.0021	DIFF	0.0002	Pass Diff
Antimony	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Arsenic	mg/L	0.000020	20	30	0.00049	0.00049	RPD	-0.2	Pass RPD
Barium	mg/L	0.000020	20	30	0.0088	0.0091	RPD	-2.9	Pass RPD
Beryllium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Bismuth	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Boron	mg/L	0.0050	20	30	0.0052	0.0055	DIFF	-0.0003	Pass Diff
Cadmium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Calcium	mg/L	0.010	20	30	8.3	8.4	RPD	-1.6	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000009	0.000010	DIFF	-4E-07	Pass Diff
Chromium	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Cobalt	mg/L	0.000005	20	30	0.000015	0.000016	DIFF	-0.0000012	Pass Diff
Copper	mg/L	0.000050	20	30	0.00089	0.00086	RPD	3.4	Pass RPD
Gallium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Iron	mg/L	0.0010	20	30	0.012	0.011	RPD	13.1	Pass RPD
Lanthanum	mg/L	0.000010	20	30	0.000012	0.000012	DIFF	0	Pass Diff
Lead	mg/L	0.000010	20	30	0.000077	0.000073	RPD	5.3	Pass RPD
Lithium	mg/L	0.00050	20	30	0.00084	0.00093	DIFF	-0.00009	Pass Diff
Magnesium	mg/L	0.0040	20	30	1.3	1.4	RPD	-3.7	Pass RPD
Manganese	mg/L	0.000050	20	30	0.0048	0.0048	RPD	-0.8	Pass RPD
Molybdenum	mg/L	0.000050	20	30	0.000094	0.00010	DIFF	-6E-06	Pass Diff
Niobium	mg/L	0.000050	20	30	0.00048	0.00049	RPD	-1.2	Pass RPD
Nickel	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Phosphorus	mg/L	0.050	20	30	*<0.050*	*<0.050*	*<DL*	*<DL*	*<DL*
Potassium	mg/L	0.020	20	30	1.00	0.99	RPD	0.6	Pass RPD
Rhenium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Rubidium	mg/L	0.000005	20	30	0.0014	0.0014	RPD	-2.2	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000045	0.000040	DIFF	0.000005	Pass Diff
Silicon	mg/L	0.050	20	30	0.20	0.21	DIFF	-0.005	Pass Diff
Silver	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Sodium	mg/L	0.020	20	30	5.3	5.4	RPD	-1.7	Pass RPD
Strontium	mg/L	0.000020	20	30	0.042	0.042	RPD	-0.7	Pass RPD
Sulfur	mg/L	0.50	20	30	1.6	1.6	DIFF	-0.01	Pass Diff
Tantalum	mg/L	0.00010	20	30	*<0.00010*	*<0.00010*	*<DL*	*<DL*	*<DL*
Tellurium	mg/L	0.000020	20	30	*<0.000020*	*<0.000020*	*<DL*	*<DL*	*<DL*
Thallium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Thorium	mg/L	0.000005	20	30	*<0.0000050*	*<0.0000050*	*<DL*	*<DL*	*<DL*
Tin	mg/L	0.000020	20	30	0.000024	*<0.000020*	*<DL*	*<DL*	*<DL*
Titanium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Tungsten	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Uranium	mg/L	0.000001	20	30	0.000019	0.000018	RPD	7.7	Pass RPD

Table A-5. Water quality field duplicate results for Meliadine AEMP – August 2023

Month	Units	August DLs	Relative Percent Difference DQOs		August DUP-3 (MEL-05-01)				
Station					MEL-05-01	DUP-3	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-08-18	2023-08-18			
ALS Sample ID			Lab	Field	WP2320734-006	WP2320997-003			
Parameter					Water	Water			
Vanadium	mg/L	0.000050	20	30	<0.000050	<0.000050	<DL	<DL	<DL
Yttrium	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL
Zinc	mg/L	0.00050	20	30	0.0025	0.0019	DIFF	0.00058	Pass Diff
Zirconium	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL

Dissolved Metals

Aluminum	mg/L	0.0010	20	30	0.0013	0.0020	DIFF	-0.0007	Pass Diff
Antimony	mg/L	0.000020	20	30	<0.000020	<0.000020	<DL	<DL	<DL
Arsenic	mg/L	0.000020	20	30	0.00047	0.00049	RPD	-4.1	Pass RPD
Barium	mg/L	0.000020	20	30	0.0088	0.0091	RPD	-3.3	Pass RPD
Beryllium	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL
Bismuth	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL
Boron	mg/L	0.0050	20	30	0.0054	0.0050	DIFF	0.0004	Pass Diff
Cadmium	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL
Calcium	mg/L	0.010	20	30	8.6	8.7	RPD	-2.1	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000009	0.000010	DIFF	-3E-07	Pass Diff
Chromium	mg/L	0.00010	20	30	<0.00010	<0.00010	<DL	<DL	<DL
Cobalt	mg/L	0.000005	20	30	0.000007	0.000008	DIFF	-0.0000006	Pass Diff
Copper	mg/L	0.000050	20	30	0.00088	0.00092	RPD	-4.3	Pass RPD
Gallium	mg/L	0.000050	20	30	<0.000050	<0.000050	<DL	<DL	<DL
Iron	mg/L	0.0010	20	30	0.0060	0.0065	RPD	-8	Pass RPD
Lanthanum	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL
Lead	mg/L	0.000010	20	30	0.000065	0.000065	RPD	0	Pass RPD
Lithium	mg/L	0.00050	20	30	0.00088	0.00086	DIFF	2E-05	Pass Diff
Magnesium	mg/L	0.0040	20	30	1.4	1.4	RPD	-2.9	Pass RPD
Manganese	mg/L	0.000050	20	30	0.00047	0.00048	RPD	-1.7	Pass RPD
Mercury	mg/L	0.000005	20	30			DIFF	0	Pass Diff
Mercury	ng/L	0.10	20	30	<0.50	<0.50	<DL	<DL	<DL
Molybdenum	mg/L	0.000050	20	30	0.000098	0.00011	DIFF	-0.000008	Pass Diff
Nickel	mg/L	0.000050	20	30	0.00048	0.00047	RPD	2.3	Pass RPD
Niobium	mg/L	0.00010	20	30	<0.00010	<0.00010	<DL	<DL	<DL
Phosphorus	mg/L	0.050	20	30	<0.050	<0.050	<DL	<DL	<DL
Potassium	mg/L	0.020	20	30	1.0	1.0	RPD	-1	Pass RPD
Rhenium	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL
Rubidium	mg/L	0.000005	20	30	0.0014	0.0014	RPD	0.7	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000048	0.000044	DIFF	0.000004	Pass Diff
Silicon	mg/L	0.050	20	30	0.20	0.20	DIFF	-0.002	Pass Diff
Silver	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL
Sodium	mg/L	0.020	20	30	5.6	5.6	RPD	0.7	Pass RPD
Strontium	mg/L	0.000020	20	30	0.042	0.043	RPD	-3.5	Pass RPD
Sulfur	mg/L	0.50	20	30	1.6	1.6	DIFF	0.01	Pass Diff
Tantalum	mg/L	0.00010	20	30	<0.00010	<0.00010	<DL	<DL	<DL
Tellurium	mg/L	0.000020	20	30	<0.000020	<0.000020	<DL	<DL	<DL
Thallium	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL
Thorium	mg/L	0.000005	20	30	<0.0000050	<0.0000050	<DL	<DL	<DL
Tin	mg/L	0.000020	20	30	<0.000020	<0.000020	<DL	<DL	<DL

Table A-5. Water quality field duplicate results for Meliadine AEMP – August 2023

Month	Units	August DLs	Relative Percent Difference DQOs		August DUP-3 (MEL-05-01)				
Station					MEL-05-01	DUP-3	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-08-18	2023-08-18			
ALS Sample ID			Lab	Field	WP2320734-006	WP2320997-003			
Parameter					Water	Water			
Titanium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Tungsten	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Uranium	mg/L	0.000001	20	30	0.000018	0.000019	RPD	-4.3	Pass RPD
Vanadium	mg/L	0.000050	20	30	*<0.000050*	*<0.000050*	*<DL*	*<DL*	*<DL*
Yttrium	mg/L	0.000010	20	30	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*
Zinc	mg/L	0.00050	20	30	0.0023	0.0023	DIFF	0	Pass Diff
Zirconium	mg/L	0.000010		40	*<0.000010*	*<0.000010*	*<DL*	*<DL*	*<DL*

Notes:

[a] Field Dup Methods are based on the concentrations:
  RPD = relative percent difference is used to
  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-6. Water quality field duplicate results for Meliadine AEMP – September 2023

Month	Units	September DLs	Relative Percent Difference DQOs		September DUP-1 (MEL-03-05)					September DUP-2 (MEL-01-06)				
Station					MEL-03-05	DUP-1	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-01-06	DUP-2	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-09-15	2023-09-15				2023-09-15	2023-09-15			
ALS Sample ID			Lab	Field	WP2323948-010	WP2323951-001				WP2323956-002	WP2323951-002			
Parameter					Water	Water				Water	Water			
Physical Tests														
Conductivity	µS/cm	1.0	10	15	88.6	88	RPD	0.7	Pass RPD	119	117	RPD	1.7	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 (as CaCO3)	mg/L	1.0		40	18.8	18.7	RPD	0.5	Pass RPD	20.8	20.4	RPD	1.9	Pass RPD
Alkalinity, bicarbonate (as HCO3)	mg/L	1.0		40			DIFF	0	Pass Diff			DIFF	0	Pass Diff
Alkalinity, carbonate (as CO3)	mg/L	1.0		40			DIFF	0	Pass Diff			DIFF	0	Pass Diff
Alkalinity, carbonate (as CaCO3)	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, hydroxide (as CaCO3)	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Alkalinity, hydroxide (as OH)	mg/L	1.0		40			DIFF	0	Pass Diff			DIFF	0	Pass Diff
Alkalinity, phenolphthalein (as CaCO3)	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	2.0		40	18.8	18.7	RPD	0.5	Pass RPD	20.8	20.4	RPD	1.9	Pass RPD
Hardness (as CaCO3), dissolved	mg/L	0.50		40	26.2	26.4	RPD	-0.8	Pass RPD	35.5	34	RPD	4.3	Pass RPD
Solids, total dissolved [TDS]	mg/L	3.0		40	43.9	47.2	RPD	-7.2	Pass RPD	67.2	66.9	RPD	0.4	Pass RPD
Solids, total dissolved [TDS], calculated	mg/L	1.0		40	57.6	57.2	RPD	0.7	Pass RPD	77.4	76	RPD	1.8	Pass RPD
Solids, total suspended [TSS]	mg/L	1.0		40	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*	*<1.0*	*<1.0*	*<DL*	*<DL*	*<DL*
Turbidity	NTU	0.10	15	23	0.54	0.52	RPD	3.8	Pass RPD	0.41	0.78	DIFF	-0.37	Fail
pH	pH units	0.10		40	7.5	7.5	RPD	0.3	Pass RPD	7.5	7.5	RPD	0.3	Pass RPD
Anions and Nutrients (Water)														
Ammonia, total (as N)	mg/L	0.0050	20	30	*<0.0050*	0.016	*<DL*	*<DL*	*<DL*	0.013	*<0.0050*	*<DL*	*<DL*	*<DL*
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	11.2	11.3	RPD	-0.9	Pass RPD	16.8	16.8	RPD	0	Pass RPD
Fluoride	mg/L	0.020	20	30	0.029	0.029	DIFF	0	Pass Diff	0.032	0.031	DIFF	0.001	Pass Diff
Kjeldahl nitrogen, dissolved [DKN]	mg/L	0.050	20	30	0.33	0.26	RPD	25.4	Pass RPD	0.35	0.33	RPD	7.9	Pass RPD
Kjeldahl nitrogen, total [TKN]	mg/L	0.050	20	30	0.27	0.25	RPD	5	Pass RPD	0.35	0.32	RPD	6.9	Pass RPD
Nitrate (as N)	mg/L	0.0050	20	30	0.021	0.018	DIFF	0.0028	Pass Diff	*<0.0050*	0.015	*<DL*	*<DL*	*<DL*
Nitrate + Nitrite (as N)	mg/L	0.0050	20	30	0.021	0.018	DIFF	0.0028	Pass Diff	*<0.0051*	0.015	*<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	0.29	0.27	RPD	5.7	Pass RPD	0.35	0.34	RPD	2.3	Pass RPD
Nitrogen, total dissolved	mg/L	0.020	20	30	0.35	0.28	RPD	24.8	Pass RPD	0.35	0.34	RPD	3.4	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	0.0046	0.0038	DIFF	0.0008	Pass Diff	0.0067	0.0076	RPD	-12.6	Pass RPD
Phosphorus, total dissolved	mg/L	0.0010	20	30	0.0023	0.0025	DIFF	-0.0002	Pass Diff	0.0026	0.0036	DIFF	-0.001	Pass Diff
Silicate (as SiO2)	mg/L	0.010	20	30	0.34	0.34	RPD	2.1	Pass RPD	0.30	0.58	RPD	-63.2	Fail
Sulfate (as SO4)	mg/L	0.30	20	30	4.5	4.5	RPD	0	Pass RPD	7.1	7.1	RPD	-0.3	Pass RPD
Cyanides														
Cyanide, Weak Acid Diss	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, Free	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	3.0	4.1	RPD	-28.7	Pass RPD	4.0	4.2	RPD	-4.7	Pass RPD
Total Organic Carbon	mg/L	0.50	20	30	3.1	3.1	RPD	-1	Pass RPD	4.4	4.3	RPD	2.5	Pass RPD

Table A-6. Water quality field duplicate results for Meliadine AEMP – September 2023

Month	Units	September DLs	Relative Percent Difference DQOs		September DUP-1 (MEL-03-05)					September DUP-2 (MEL-01-06)				
Station					MEL-03-05	DUP-1	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-01-06	DUP-2	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-09-15	2023-09-15				2023-09-15	2023-09-15			
ALS Sample ID			Lab	Field	WP2323948-010	WP2323951-001				WP2323956-002	WP2323951-002			
Parameter					Water	Water				Water	Water			
Mercury, total														
Mercury, total	ng/L	0.1	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	0.0022	0.0023	DIFF	-1E-04	Pass Diff	0.0022	0.0023	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	0.00038	0.00040	RPD	-4.1	Pass RPD	0.00068	0.00065	RPD	4.7	Pass RPD
Barium	mg/L	0.000020	20	30	0.0086	0.0085	RPD	1.2	Pass RPD	0.0091	0.0091	RPD	0.4	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	<0.0050	<0.0050	<DL	<DL	<DL	0.0078	0.0072	DIFF	0.0006	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	8.7	8.8	RPD	-1.1	Pass RPD	10.2	10	RPD	2	Pass RPD
Cesium	mg/L	0.000005	20	30	0.000010	0.000010	DIFF	0.0000002	Pass Diff	0.000008	0.000009	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
Cobalt	mg/L	0.000005	20	30	0.000012	0.000012	DIFF	-3E-07	Pass Diff	0.000023	0.000022	DIFF	0.000001	Pass Diff
Copper	mg/L	0.000050	20	30	0.00078	0.00079	RPD	-0.9	Pass RPD	0.00092	0.00090	RPD	2.1	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	0.010	0.011	RPD	-1.9	Pass RPD	0.017	0.015	RPD	14.3	Pass RPD
Lanthanum	mg/L	0.000010	20	30	0.000016	0.000016	DIFF	0	Pass Diff	0.000019	0.000020	DIFF	-0.000001	Pass Diff
Lead	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL	<0.000010	<0.000010	<DL	<DL	<DL
Lithium	mg/L	0.00050	20	30	0.00087	0.00089	DIFF	-2E-05	Pass Diff	0.0012	0.0010	DIFF	0.00012	Pass Diff
Magnesium	mg/L	0.0040	20	30	1.4	1.5	RPD	-2.1	Pass RPD	1.9	1.9	RPD	2.6	Pass RPD
Manganese	mg/L	0.000050	20	30	0.0027	0.0028	RPD	-1.8	Pass RPD	0.0065	0.0062	RPD	4.5	Pass RPD
Molybdenum	mg/L	0.000050	20	30	0.00010	0.000098	DIFF	2E-06	Pass Diff	0.00015	0.00015	DIFF	-2E-06	Pass Diff
Niobium	mg/L	0.000050	20	30	0.00044	0.00045	RPD	-1.1	Pass RPD	0.00075	0.00073	RPD	2.8	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	1.1	1.1	RPD	-0.9	Pass RPD	1.2	1.2	RPD	1.7	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	0.0015	0.0015	RPD	0	Pass RPD	0.0016	0.0015	RPD	1.9	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000043	0.000045	DIFF	-0.000002	Pass Diff	0.000046	0.000045	DIFF	1E-06	Pass Diff
Silicon	mg/L	0.050	20	30	0.17	0.17	DIFF	-0.002	Pass Diff	0.32	0.31	RPD	3.5	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	5.8	6.0	RPD	-2	Pass RPD	8.3	8.1	RPD	2.4	Pass RPD
Strontium	mg/L	0.000020	20	30	0.044	0.044	RPD	-0.9	Pass RPD	0.059	0.058	RPD	2.1	Pass RPD
Sulfur	mg/L	0.50	20	30	1.7	1.7	DIFF	-0.01	Pass Diff	2.7	2.6	RPD	4.1	Pass RPD
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	<0.000020	0.000020	<DL	<DL	<DL	0.000029	<0.000020	<DL	<DL	<DL
Titanium	mg/L	0.000050	20	30	0.000054	0.000066	DIFF	-0.000012	Pass Diff	0.000054	0.000072	DIFF	-0.000018	Pass Diff
Tungsten	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL	<0.000010	<0.000010	<DL	<DL	<DL

Table A-6. Water quality field duplicate results for Meliadine AEMP – September 2023

Month	Units	September DLs	Relative Percent Difference DQOs		September DUP-1 (MEL-03-05)					September DUP-2 (MEL-01-06)				
Station					MEL-03-05	DUP-1	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-01-06	DUP-2	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-09-15	2023-09-15				2023-09-15	2023-09-15			
ALS Sample ID			Lab	Field	WP2323948-010	WP2323951-001				WP2323956-002	WP2323951-002			
Parameter					Water	Water				Water	Water			
Uranium	mg/L	0.000001	20	30	0.000021	0.000020	RPD	5.3	Pass RPD	0.000029	0.000028	RPD	2.5	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	<0.00050	<DL	<DL	<DL
Zirconium	mg/L	0.000010	20	30	<0.000010	<0.000010	<DL	<DL	<DL	<0.000010	<0.000010	<DL	<DL	<DL
Dissolved Metals														
Aluminum	mg/L	0.0010	20	30	0.0010	0.0012	DIFF	-0.0002	Pass Diff	0.0016	0.0010	DIFF	0.0006	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	0.00035	0.00035	RPD	1.4	Pass RPD	0.00061	0.00060	RPD	0.5	Pass RPD
Barium	mg/L	0.000020	20	30	0.0084	0.0084	RPD	-0.2	Pass RPD	0.0090	0.0090	RPD	0.2	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	0.0052	0.0051	DIFF	1E-04	Pass Diff	0.0072	0.0081	DIFF	-0.0009	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	8.3	8.3	RPD	-0.4	Pass RPD	11	10.5	RPD	4.7	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
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	0.000007	0.000007	DIFF	-2E-07	Pass Diff	0.000015	0.000013	DIFF	0.0000016	Pass Diff
Copper	mg/L	0.000050	20	30	0.00076	0.00074	RPD	2.3	Pass RPD	0.00096	0.00093	RPD	2.7	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	0.0036	0.0037	DIFF	-0.0001	Pass Diff	0.0063	0.0045	DIFF	0.0018	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	<0.000010	<0.000010	<DL	<DL	<DL	0.000012	<0.000010	<DL	<DL	<DL
Lithium	mg/L	0.00050	20	30	0.00086	0.00087	DIFF	-0.00001	Pass Diff	0.0011	0.0012	DIFF	-0.00011	Pass Diff
Magnesium	mg/L	0.0040	20	30	1.4	1.4	RPD	-1.5	Pass RPD	2.0	1.9	RPD	3.6	Pass RPD
Manganese	mg/L	0.000050	20	30	0.00036	0.00035	RPD	5.1	Pass RPD	0.00045	0.00043	RPD	5	Pass RPD
Mercury	mg/L	0.000005	20	30			DIFF	0	Pass Diff			DIFF	0	Pass Diff
Mercury	ng/L	0.10	20	30	<0.50	<0.50	<DL	<DL	<DL	<0.50	<0.50	<DL	<DL	<DL
Molybdenum	mg/L	0.000050	20	30	0.000094	0.000095	DIFF	-1E-06	Pass Diff	0.00017	0.00016	DIFF	0.000011	Pass Diff
Nickel	mg/L	0.000050	20	30	0.00043	0.00043	RPD	-0.2	Pass RPD	0.00079	0.00077	RPD	2.6	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	1.1	1.1	RPD	-2.8	Pass RPD	1.3	1.3	RPD	1.6	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	0.0014	0.0015	RPD	-3.5	Pass RPD	0.0016	0.0016	RPD	1.8	Pass RPD
Selenium	mg/L	0.000040	20	30	0.000042	0.000048	DIFF	-0.000006	Pass Diff	0.000057	0.000059	DIFF	-2E-06	Pass Diff
Silicon	mg/L	0.050	20	30	0.17	0.17	DIFF	0.003	Pass Diff	0.30	0.30	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	5.5	5.7	RPD	-3.2	Pass RPD	8.6	8.5	RPD	1.2	Pass RPD
Strontium	mg/L	0.000020	20	30	0.043	0.043	RPD	-0.2	Pass RPD	0.064	0.060	RPD	5.5	Pass RPD
Sulfur	mg/L	0.50	20	30	1.6	1.6	DIFF	0.01	Pass Diff	2.5	2.5	DIFF	-0.07	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

Table A-6. Water quality field duplicate results for Meliadine AEMP – September 2023

Month	Units	September DLs	Relative Percent Difference DQOs		September DUP-1 (MEL-03-05)					September DUP-2 (MEL-01-06)				
Station					MEL-03-05	DUP-1	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome	MEL-01-06	DUP-2	Field Dup Method [a]	Result [b] (RPD or Diff)	Outcome
Date Sampled					2023-09-15	2023-09-15				2023-09-15	2023-09-15			
ALS Sample ID			Lab	Field	WP2323948-010	WP2323951-001				WP2323956-002	WP2323951-002			
Parameter					Water	Water				Water	Water			
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	0.000022	0.000053	DIFF	-0.000031	Pass Diff	0.000066	0.000062	DIFF	0.000004	Pass Diff
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	0.000019	0.000018	RPD	8.6	Pass RPD	0.000028	0.000027	RPD	1.1	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	*<0.00050*	0.00054	*<DL*	*<DL*	*<DL*	*<0.00050*	0.00051	*<DL*	*<DL*	*<DL*
Zirconium	mg/L	0.000010		40	*<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

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-7. Outliers from the Meliadine Lake water sampling program in 2023

Area	Sample ID	Date	Parameter Class	Parameter	Units	Result	Detected?	Detection Limit	Laboratory Flag
MEL-01	MEL-01-01	2023-04-01	Dissolved Metals	Copper (D)	ug/L	21.9	Y	0.05	-
MEL-01	MEL-01-01	2023-04-01	Total Metals	Copper (T)	ug/L	21.7	Y	0.05	-
MEL-01	MEL-01-07	2023-04-01	Dissolved Metals	Tin (D)	ug/L	0.234	Y	0.02	DTC
MEL-01	MEL-01-08	2023-04-01	Dissolved Metals	Cadmium (D)	ug/L	0.0114	Y	0.005	-
MEL-01	MEL-01-08	2023-04-01	Total Metals	Cadmium (T)	ug/L	0.0115	Y	0.005	-
MEL-01	MEL-01-08	2023-04-01	Total Metals	Tungsten (T)	ug/L	0.016	Y	0.01	-
MEL-02	MEL-02-05	2023-04-02	Dissolved Metals	Molybdenum (D)	ug/L	0.564	Y	0.05	DTC
MEL-02	MEL-02-08	2023-04-02	Dissolved Metals	Silver (D)	ug/L	0.0102	Y	0.005	-
MEL-02	MEL-02-08	2023-04-02	Total Metals	Silver (T)	ug/L	0.0154	Y	0.005	-
MEL-03	MEL-03-01	2023-04-03	Dissolved Metals	Tin (D)	ug/L	0.718	Y	0.02	DTC
MEL-01	MEL-01-01	2023-07-16	Total Metals	Thorium (T)	ug/L	0.0088	Y	0.005	-
MEL-01	MEL-01-09	2023-07-16	Total Metals	Thorium (T)	ug/L	0.0075	Y	0.005	-
MEL-02	MEL-02-05	2023-07-15	Total Metals	Tin (T)	ug/L	0.128	Y	0.02	-
MEL-02	MEL-02-06	2023-07-15	Dissolved Metals	Tungsten (D)	ug/L	0.017	Y	0.01	-
MEL-02	MEL-02-06	2023-07-15	Dissolved Metals	Vanadium (D)	ug/L	0.076	Y	0.05	-
MEL-02	MEL-02-06	2023-07-15	Dissolved Metals	Zirconium (D)	ug/L	0.33	Y	0.01	DTC
MEL-02	MEL-02-08	2023-07-15	Total Metals	Zirconium (T)	ug/L	0.097	Y	0.01	-
MEL-03	MEL-03-04	2023-07-15	Total Metals	Tin (T)	ug/L	0.1	Y	0.02	-
MEL-01	MEL-01-09	2023-08-22	Dissolved Metals	Tin (D)	ug/L	0.242	Y	0.02	DTC
MEL-03	MEL-03-01	2023-08-18	Conventional Parameters	Total Suspended Solids	mg/L	73.7	Y	1	-
MEL-03	MEL-03-01	2023-08-18	Conventional Parameters	Turbidity (lab)	NTU	11.4	Y	0.1	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Aluminum (D)	ug/L	26.2	Y	1	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Antimony (D)	ug/L	0.02	N	0.02	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Arsenic (D)	ug/L	0.519	Y	0.02	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Barium (D)	ug/L	8.62	Y	0.02	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Beryllium (D)	ug/L	0.005	N	0.005	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Bismuth (D)	ug/L	0.005	N	0.005	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Boron (D)	ug/L	6.4	Y	5	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Cadmium (D)	ug/L	0.005	N	0.005	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Cesium (D)	ug/L	0.01	Y	0.005	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Chromium (D)	ug/L	1.62	Y	0.1	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Cobalt (D)	ug/L	0.153	Y	0.005	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Copper (D)	ug/L	0.946	Y	0.05	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Gallium (D)	ug/L	0.05	N	0.05	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Iron (D)	ug/L	91.1	Y	1	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Lanthanum (D)	ug/L	0.022	Y	0.01	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Lead (D)	ug/L	0.078	Y	0.01	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Lithium (D)	ug/L	1.11	Y	0.5	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Manganese (D)	ug/L	20.8	Y	0.05	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Mercury (D)	ug/L	0.0005	N	0.5	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Molybdenum (D)	ug/L	0.291	Y	0.05	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Nickel (D)	ug/L	4.02	Y	0.05	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Niobium (D)	ug/L	0.1	N	0.1	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Phosphorus (D)	ug/L	50	N	50	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Rhenium (D)	ug/L	0.005	N	0.005	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Rubidium (D)	ug/L	1.51	Y	0.005	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Selenium (D)	ug/L	0.045	Y	0.04	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Silicon (D)	ug/L	261	Y	50	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Silver (D)	ug/L	0.005	N	0.005	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Strontium (D)	ug/L	42.6	Y	0.02	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Sulfur (D)	ug/L	1690	Y	500	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Tantalum (D)	ug/L	0.1	N	0.1	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Tellurium (D)	ug/L	0.02	N	0.02	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Thallium (D)	ug/L	0.005	N	0.005	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Thorium (D)	ug/L	0.005	N	0.005	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Tin (D)	ug/L	0.021	Y	0.02	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Titanium (D)	ug/L	0.322	Y	0.05	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Tungsten (D)	ug/L	0.014	Y	0.01	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Uranium (D)	ug/L	0.0176	Y	0.001	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Vanadium (D)	ug/L	0.083	Y	0.05	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Yttrium (D)	ug/L	0.01	N	0.01	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Zinc (D)	ug/L	4.76	Y	0.5	-
MEL-03	MEL-03-01	2023-08-18	Dissolved Metals	Zirconium (D)	ug/L	0.024	Y	0.01	-
MEL-03	MEL-03-01	2023-08-18	Nutrients	Total Phosphorus	mg/L	0.013	Y	0.001	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Aluminum (T)	ug/L	1400	Y	3	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Antimony (T)	ug/L	0.03	N	0.03	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Arsenic (T)	ug/L	1.33	Y	0.05	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Barium (T)	ug/L	22.4	Y	0.1	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Beryllium (T)	ug/L	0.0305	Y	0.005	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Bismuth (T)	ug/L	0.05	N	0.05	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Boron (T)	ug/L	10	N	10	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Cadmium (T)	ug/L	0.0068	Y	0.005	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Cesium (T)	ug/L	0.12	Y	0.005	-

Table A-7. Outliers from the Meliadine Lake water sampling program in 2023

Area	Sample ID	Date	Parameter Class	Parameter	Units	Result	Detected?	Detection Limit	Laboratory Flag
MEL-03	MEL-03-01	2023-08-18	Total Metals	Chromium (T)	ug/L	143	Y	0.5	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Cobalt (T)	ug/L	2.5	Y	0.05	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Copper (T)	ug/L	5.2	Y	0.5	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Gallium (T)	ug/L	0.41	Y	0.05	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Iron (T)	ug/L	2440	Y	10	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Lanthanum (T)	ug/L	1.1	Y	0.05	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Lead (T)	ug/L	0.721	Y	0.05	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Lithium (T)	ug/L	2.94	Y	0.5	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Manganese (T)	ug/L	62	Y	0.2	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Mercury (T)	ug/L	0.0005	N	0.5	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Molybdenum (T)	ug/L	3.21	Y	0.05	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Nickel (T)	ug/L	69.1	Y	0.2	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Niobium (T)	ug/L	0.17	Y	0.1	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Phosphorus (T)	ug/L	54	Y	50	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Rhenium (T)	ug/L	0.005	N	0.005	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Rubidium (T)	ug/L	2.75	Y	0.02	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Selenium (T)	ug/L	0.2	N	0.2	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Silicon (T)	ug/L	2280	Y	100	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Silver (T)	ug/L	0.005	N	0.005	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Strontium (T)	ug/L	50.1	Y	0.2	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Sulfur (T)	ug/L	1660	Y	500	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Tantalum (T)	ug/L	0.1	N	0.1	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Tellurium (T)	ug/L	0.05	N	0.05	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Thallium (T)	ug/L	0.0116	Y	0.005	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Thorium (T)	ug/L	0.119	Y	0.005	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Tin (T)	ug/L	0.2	N	0.2	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Titanium (T)	ug/L	100	Y	0.2	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Tungsten (T)	ug/L	0.19	Y	0.01	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Uranium (T)	ug/L	0.0835	Y	0.002	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Vanadium (T)	ug/L	3.7	Y	0.2	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Yttrium (T)	ug/L	0.211	Y	0.01	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Zinc (T)	ug/L	10.7	Y	3	-
MEL-03	MEL-03-01	2023-08-18	Total Metals	Zirconium (T)	ug/L	0.052	Y	0.05	-
MEL-03	MEL-03-02	2023-08-18	Conventional Parameters	Total Suspended Solids	mg/L	92	Y	1	-
MEL-03	MEL-03-02	2023-08-18	Conventional Parameters	Turbidity (lab)	NTU	0.9	Y	0.1	-
MEL-03	MEL-03-02	2023-08-18	Nutrients	Total Phosphorus	mg/L	0.0204	Y	0.001	-
MEL-03	MEL-03-02	2023-08-18	Total Metals	Aluminum (T)	ug/L	48.8	Y	1	-
MEL-03	MEL-03-02	2023-08-18	Total Metals	Cesium (T)	ug/L	0.0187	Y	0.005	-
MEL-03	MEL-03-02	2023-08-18	Total Metals	Chromium (T)	ug/L	0.65	Y	0.1	-
MEL-03	MEL-03-02	2023-08-18	Total Metals	Cobalt (T)	ug/L	0.0808	Y	0.005	-
MEL-03	MEL-03-02	2023-08-18	Total Metals	Iron (T)	ug/L	98.8	Y	1	-
MEL-03	MEL-03-02	2023-08-18	Total Metals	Lanthanum (T)	ug/L	0.127	Y	0.01	-
MEL-03	MEL-03-02	2023-08-18	Total Metals	Titanium (T)	ug/L	7.77	Y	0.05	-
MEL-03	MEL-03-02	2023-08-18	Total Metals	Vanadium (T)	ug/L	0.245	Y	0.05	-
MEL-04	MEL-04-01	2023-08-18	Dissolved Metals	Chromium (D)	ug/L	0.62	Y	0.1	DTC
MEL-04	MEL-04-01	2023-08-18	Dissolved Metals	Cobalt (D)	ug/L	0.134	Y	0.005	DTC
MEL-04	MEL-04-01	2023-08-18	Dissolved Metals	Nickel (D)	ug/L	10.2	Y	0.05	DTC
MEL-04	MEL-04-01	2023-08-18	Dissolved Metals	Zinc (D)	ug/L	44.6	Y	0.5	DTC
MEL-01	MEL-01-07	2023-09-15	Conventional Parameters	Turbidity (lab)	NTU	0.73	Y	0.1	-
MEL-03	MEL-03-02	2023-09-15	Total Metals	Aluminum (T)	ug/L	15	Y	1	-
MEL-03	MEL-03-04	2023-09-15	Dissolved Metals	Aluminum (D)	ug/L	20.5	Y	1	DTC

Notes:

DTC = dissolved concentration exceeded total

Table A-8. Water chemistry results from Lake B7 in October 2023 (re-analysis of metals in the sample from B7-03)

Client Sample ID	Lowest Detection Limit	Units	B7-01	B7-02	B7-03	RPDs for the samples from B7-03	B7-03 (79881)
Date Sampled			14-Oct-2023	14-Oct-2023	14-Oct-2023		14-Oct-2023
Time Sampled			17:15	17:45	17:30		17:30
ALS Sample ID			WP2327045-001	WP2327045-002	WP2327045-003		VA23C9556-001
Total Metals							
Aluminum	0.001	mg/L	0.0012	0.0018	0.0024	*<DL*	*<0.0010*
Antimony	0.00002	mg/L	0.000042	0.000038	0.000041	-31%	0.000056
Arsenic	0.00002	mg/L	0.0102	0.00964	0.00991	31%	0.00725
Barium	0.00002	mg/L	0.0285	0.0282	0.0291	-2%	0.0297
Beryllium	0.000005	mg/L	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<DL*	*<0.0000050*
Bismuth	0.000005	mg/L	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<DL*	*<0.0000050*
Boron	0.005	mg/L	0.0154	0.0155	0.0153	-8%	0.0165
Cadmium	0.000005	mg/L	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<DL*	*<0.0000050*
Calcium	0.01	mg/L	38.3	37.7	38.5	2%	37.9
Cesium	0.000005	mg/L	0.0000205	0.0000204	0.0000221	26%	0.000017
Chromium	0.0001	mg/L	*<0.00010*	*<0.00010*	*<0.00010*	*<DL*	*<0.00010*
Cobalt	0.000005	mg/L	0.00004	0.0000381	0.0000395	20%	0.0000324
Copper	0.00005	mg/L	0.000817	0.000781	0.000766	-10%	0.000844
Gallium	0.00005	mg/L	*<0.000050*	*<0.000050*	*<0.000050*	*<DL*	*<0.000050*
Iron	0.001	mg/L	0.0391	0.0378	0.0399	174%	0.0028
Lanthanum	0.00001	mg/L	0.000016	0.000017	0.000019	*<DL*	*<0.000010*
Lead	0.00001	mg/L	0.000062	0.000069	0.000059	106%	0.000018
Lithium	0.0005	mg/L	0.0177	0.0174	0.018	0%	0.018
Magnesium	0.004	mg/L	4.15	4.08	4.31	6%	4.05
Manganese	0.00005	mg/L	0.00406	0.00328	0.00353	163%	0.000355
Molybdenum	0.00005	mg/L	0.000364	0.000365	0.000375	-3%	0.000387
Nickel	0.00005	mg/L	0.000899	0.000872	0.000882	-100%	0.00266
Niobium	0.0001	mg/L	*<0.00010*	*<0.00010*	*<0.00010*	*<DL*	*<0.00010*
Phosphorus	0.05	mg/L	*<0.050*	*<0.050*	*<0.050*	*<DL*	*<0.050*
Potassium	0.02	mg/L	2.21	2.18	2.27	-1%	2.29
Rhenium	0.000005	mg/L	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<DL*	*<0.0000050*
Rubidium	0.000005	mg/L	0.00224	0.00218	0.00243	31%	0.00177
Selenium	0.00004	mg/L	0.000048	0.000046	0.000044	7%	0.000041
Silicon	0.05	mg/L	0.352	0.378	0.391	-74%	0.855
Silver	0.000005	mg/L	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<DL*	*<0.0000050*
Sodium	0.02	mg/L	10.1	9.96	10.5	5%	9.99
Strontium	0.00002	mg/L	0.316	0.31	0.312	3%	0.302
Sulfur	0.5	mg/L	4.77	4.76	4.98	6%	4.68
Tantalum	0.0001	mg/L	*<0.00010*	*<0.00010*	*<0.00010*	*<DL*	*<0.00010*
Tellurium	0.00002	mg/L	*<0.000020*	*<0.000020*	*<0.000020*	*<DL*	*<0.000020*
Thallium	0.000005	mg/L	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<DL*	*<0.0000050*
Thorium	0.000005	mg/L	*<0.0000050*	0.0000102	*<0.0000050*	*<DL*	*<0.0000100*
Tin	0.00002	mg/L	0.000033	0.000021	*<0.000020*	*<DL*	0.000038
Titanium	0.00005	mg/L	*<0.000050*	*<0.000050*	0.000064	21%	0.000052
Tungsten	0.00001	mg/L	0.000026	0.000027	0.000025	8%	0.000023
Uranium	0.000001	mg/L	0.0000824	0.0000844	0.0000837	7%	0.0000777
Vanadium	0.00005	mg/L	*<0.000050*	*<0.000050*	*<0.000050*	*<DL*	*<0.000050*
Yttrium	0.00001	mg/L	*<0.000010*	*<0.000010*	*<0.000010*	*<DL*	*<0.000010*
Zinc	0.0005	mg/L	*<0.00050*	*<0.00050*	*<0.00050*	*<DL*	0.0015
Zirconium	0.00001	mg/L	*<0.000010*	*<0.000010*	*<0.000010*	*<DL*	0.000048
Dissolved Metals							
Aluminum	0.001	mg/L	*<0.0010*	0.0011	0.047	190%	0.0012
Antimony	0.00002	mg/L	0.00004	0.000042	0.000068	21%	0.000055
Arsenic	0.00002	mg/L	0.00981	0.00866	0.00861	11%	0.00772
Barium	0.00002	mg/L	0.0288	0.0288	0.0285	-1%	0.0288
Beryllium	0.000005	mg/L	*<0.0000050*	*<0.0000050*	0.0000054	*<DL*	*<0.0000050*
Bismuth	0.000005	mg/L	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<DL*	*<0.000050*
Boron	0.005	mg/L	0.0169	0.0159	0.0168	1%	0.0167
Cadmium	0.000005	mg/L	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<DL*	*<0.0000050*
Calcium	0.01	mg/L	40.1	38.9	36.8	1%	36.6
Cesium	0.000005	mg/L	0.000023	0.0000222	0.0000222	24%	0.0000174
Chromium	0.0001	mg/L	*<0.00010*	*<0.00010*	0.00223	*<DL*	*<0.00050*
Cobalt	0.000005	mg/L	0.0000298	0.0000303	0.0000467	*<DL*	*<0.000050*
Copper	0.00005	mg/L	0.0037	0.000786	0.225	199%	0.00082
Gallium	0.00005	mg/L	*<0.000050*	*<0.000050*	*<0.000050*	*<DL*	*<0.000050*
Iron	0.001	mg/L	0.0197	0.018	0.152	*<DL*	*<0.010*
Lanthanum	0.00001	mg/L	*<0.000010*	*<0.000010*	*<0.000010*	*<DL*	*<0.000050*
Lead	0.00001	mg/L	0.000029	0.000033	0.00015	*<DL*	*<0.000050*
Lithium	0.0005	mg/L	0.0166	0.0177	0.0184	2%	0.018
Magnesium	0.004	mg/L	4.36	4.26	4.07	-12%	4.58
Manganese	0.00005	mg/L	0.00124	0.00074	0.00245	*<DL*	*<0.00020*
Mercury	0.5	ng/L	*<0.50*	*<0.50*	*<0.50*	*<DL*	NA
Molybdenum	0.00005	mg/L	0.000451	0.000393	0.000727	44%	0.000466
Nickel	0.00005	mg/L	0.00092	0.000881	0.00349	110%	0.00102
Niobium	0.0001	mg/L	*<0.00010*	*<0.00010*	*<0.00010*	*<DL*	*<0.00010*
Phosphorus	0.05	mg/L	*<0.050*	*<0.050*	*<0.050*	*<DL*	*<0.050*

Table A-8. Water chemistry results from Lake B7 in October 2023 (re-analysis of metals in the sample from B7-03)

Client Sample ID	Lowest Detection Limit	Units	B7-01	B7-02	B7-03	RPDs for the samples from B7-03	B7-03 (79881)
Date Sampled			14-Oct-2023	14-Oct-2023	14-Oct-2023		14-Oct-2023
Time Sampled			17:15	17:45	17:30		17:30
ALS Sample ID			WP2327045-001	WP2327045-002	WP2327045-003		VA23C9556-001
Potassium	0.02	mg/L	2.32	2.25	2.19	-5%	2.31
Rhenium	0.000005	mg/L	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<DL*	*<0.0000050*
Rubidium	0.000005	mg/L	0.00228	0.00224	0.00215	14%	0.00187
Selenium	0.00004	mg/L	0.000048	0.00005	*<0.000040*	*<DL*	*<0.00020*
Silicon	0.05	mg/L	0.379	0.387	0.384	-79%	0.882
Silver	0.000005	mg/L	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<DL*	*<0.0000050*
Sodium	0.02	mg/L	10.6	10.4	10.1	-11%	11.3
Strontium	0.00002	mg/L	0.323	0.317	0.298	-3%	0.307
Sulfur	0.5	mg/L	5.1	4.81	4.61	-5%	4.83
Tantalum	0.0001	mg/L	*<0.00010*	*<0.00010*	*<0.00010*	*<DL*	*<0.00010*
Tellurium	0.00002	mg/L	*<0.000020*	*<0.000020*	*<0.000020*	*<DL*	*<0.000050*
Thallium	0.000005	mg/L	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<DL*	*<0.0000050*
Thorium	0.000005	mg/L	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<DL*	*<0.0000050*
Tin	0.00002	mg/L	0.000024	0.000045	0.00341	*<DL*	*<0.00020*
Titanium	0.00005	mg/L	*<0.000050*	*<0.000050*	*<0.000050*	*<DL*	*<0.00020*
Tungsten	0.00001	mg/L	0.000028	0.000025	0.000038	38%	0.000026
Uranium	0.000001	mg/L	0.0000892	0.0000876	0.0000779	9%	0.0000714
Vanadium	0.00005	mg/L	*<0.000050*	*<0.000050*	*<0.000050*	*<DL*	*<0.000050*
Yttrium	0.00001	mg/L	*<0.000010*	*<0.000010*	*<0.000010*	*<DL*	*<0.000010*
Zinc	0.0005	mg/L	0.00057	*<0.00050*	0.00395	101%	0.0013
Zirconium	0.00001	mg/L	*<0.000010*	*<0.000010*	0.000019	*<DL*	*<0.000050*

Notes

Italicized numbers are below detection limits.

Table A-9. Field duplicate assessment for the phytoplankton taxonomy results in 2023

Field QA	Date	Sample	Phytoplankton Biomass (mg/m^3)						
			Cyanophyte	Chlorophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate	**TOTAL**
MEL-03-03	18-Aug-23	Sample	0	12	57	9	31	17	126
		DUP-1	0.1	12	76	13	28	12	141
		RPD (%)	**NA**	2	-29	-31	11	30	-11
MEL-01-06	22-Aug-23	Sample	0	9	182	16	34	56	296
		DUP-2	0	8	184	28	36	88	344
		RPD (%)	-18	14	-1	**-58**	-5	-45	-15
MEL-05-01	18-Aug-23	Sample	0	22	40	16	51	24	153
		DUP-3	0	16	60	21	60	15	173
		RPD (%)	**NA**	33	-41	-32	-16	44	-12

Field QA	Date	Sample	Phytoplankton Density (cells/L)						
			Cyanophyte	Chlorophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate	**TOTAL**
MEL-03-03	18-Aug-23	Sample	0	380,952	985,208	99,192	188,784	3,800	1,657,936
		DUP-1	200	467,160	984,808	68,656	175,016	2,800	1,698,640
		RPD (%)	**NA**	-20	0.0	36	8	30	-2
MEL-01-06	22-Aug-23	Sample	800	324,280	2,983,176	166,496	157,264	10,000	3,642,016
		DUP-2	800	288,360	2,337,816	253,088	144,696	12,800	3,037,560
		RPD (%)	0	12	24	-41	8.3	-24.6	18
MEL-05-01	18-Aug-23	Sample	0	1,236,248	711,216	128,728	293,760	5,600	2,375,552
		DUP-3	200	668,912	1,185,560	83,256	328,096	3,400	2,269,424
		RPD (%)	**NA**	**60**	**-50**	43	-11.0	48.9	5

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Bolded RPD values exceed 50%.

RPDs were not calculated if one or both of the samples is "0".

Table A-10. Laboratory duplicate assessment for the phytoplankton taxonomy results in 2023

Area-Replicate	Date	Sample	Phytoplankton Biomass (mg/m^3)						
			Cyanophyte	Chlorophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate	**TOTAL**
MEL -01-07	22-Aug-23	Sample	2.5	5.3	190	21	9.2	40	268
		Lab dup	4.4	3.3	175	79	17	40	318
		RPD (%)	**-55**	**48**	8	**-116**	**-58**	1	-17
MEL-03-01	18-Aug-23	Sample	0	9.5	91	5.9	26	29	161
		Lab dup	0	5.7	99	7.8	20	32	164
		RPD (%)		**49**	-8	**-28**	23	-9	-2
MEL-04-02	18-Aug-23	Sample	0	5.8	43	8.0	25	16	98
		Lab dup	0	8.8	42	8.4	26	17	102
		RPD (%)		**-41**	3	-5	-3	-6	-4

Area-Replicate	Date	Date	Phytoplankton Density (cells/L)						
			Cyanophyte	Chlorophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate	**TOTAL**
MEL -01-07	22-Aug-23	Sample	87,008	188,784	2,183,368	179,096	37,920	6,000	2,682,176
		Lab dup	172,816	151,864	2,273,160	271,472	68,256	5,200	2,942,768
		RPD (%)	**-66**	22	-4	**-41**	**-57**	14	-9.3
MEL-03-01	18-Aug-23	Sample	0	331,864	1,107,136	31,152	146,280	6,600	1,623,032
		Lab dup	0	252,040	1,121,704	48,320	116,744	6,800	1,545,608
		RPD (%)		**27**	-1.3	**-43**	22	-3	4.9
MEL-04-02	18-Aug-23	Sample	0	438,624	926,736	127,528	120,544	3,800	1,617,232
		Lab dup	0	439,024	991,392	137,312	88,624	3,000	1,659,352
		RPD (%)		0	-6.7	-7	**31**	24	-2.6

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Bolded RPD values exceed 25%.

RPDs were not calculated if one or both of the samples is "0".

Table A-11. Field duplicate assessment for chlorophyll-a (µg/L) in 2023

Chlorophyll-a (µg/L)									
Replicate	Sample = MEL-03-03 Duplicate = AUG-DUP-01-PC			Sample = MEL-01-06 Duplicate = AUG-DUP-02-PC			Sample = MEL-05-01 Duplicate = AUG-DUP-03-PC		
	Sample	Duplicate	**RPD**	Sample	Duplicate	**RPD**	Sample	Duplicate	**RPD**
1	0.39	0.66		3.4	4.0		0.93	0.87	
2	0.69	0.90		4.7	3.1		0.79	0.83	
3	0.51	0.45		4.2	3.4		0.68	0.81	
Mean	0.53	0.67	-23	4.08	3.51	15	0.80	0.84	-4

Notes:
RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.
The data quality objective (DQO) for field duplicates is an RPD of 50%.
Bolded RPD values exceed 50%.

APPENDIX B

EFFLUENT CHARACTERIZATION – SUPPORTING INFORMATION

Appendix B1
Effluent Quality – Supporting Data

APPENDIX B1 – TABLES

Table B1-1. Daily discharge (m^3) from the Effluent Water Treatment Plant in 2023

Total Volume (m^3) Discharged from CP1 to Meliadine Lake in 2023: 515,962							
June		July		August		September	
Date	Volume (m^3)	Date	Volume (m^3)	Date	Volume (m^3)	Date	Volume (m^3)
01-Jun		01-Jul	4,912	01-Aug	0	01-Sep	17,584
02-Jun		02-Jul	4,830	02-Aug	0	02-Sep	11,359
03-Jun		03-Jul	4,997	03-Aug	0	03-Sep	17,808
04-Jun		04-Jul	4,930	04-Aug	0	04-Sep	11,539
05-Jun		05-Jul	4,935	05-Aug	0	05-Sep	8,905
06-Jun		06-Jul	4,067	06-Aug	0	06-Sep	5,653
07-Jun		07-Jul	4,925	07-Aug	0	07-Sep	0
08-Jun		08-Jul	4,953	08-Aug	0	08-Sep	0
09-Jun		09-Jul	4,950	09-Aug	0	09-Sep	0
10-Jun	6,495	10-Jul	4,947	10-Aug	0	10-Sep	0
11-Jun	9,436	11-Jul	4,868	11-Aug	0	11-Sep	1,497
12-Jun	9,448	12-Jul	4,917	12-Aug	0	12-Sep	0
13-Jun	10,172	13-Jul	4,080	13-Aug	0	13-Sep	0
14-Jun	11,794	14-Jul	4,793	14-Aug	0	14-Sep	0
15-Jun	6,619	15-Jul	4,947	15-Aug	0	15-Sep	0
16-Jun	10,253	16-Jul	4,705	16-Aug	0	16-Sep	3,657
17-Jun	13,559	17-Jul	2,964	17-Aug	0	17-Sep	9,996
18-Jun	13,525	18-Jul	1,399	18-Aug	0	18-Sep	9,998
19-Jun	3,335	19-Jul	0	19-Aug	0	19-Sep	10,578
20-Jun	14,762	20-Jul	0	20-Aug	0	20-Sep	12,383
21-Jun	12,842	21-Jul	0	21-Aug	3,391	21-Sep	9,253
22-Jun	14,646	22-Jul	0	22-Aug	4,989	22-Sep	7,304
23-Jun	14,805	23-Jul	0	23-Aug	4,995	23-Sep	1,565
24-Jun	13,535	24-Jul	0	24-Aug	3,493	24-Sep	1,445
25-Jun	14,744	25-Jul	0	25-Aug	2,350	25-Sep	9,077
26-Jun	11,027	26-Jul	0	26-Aug	0	26-Sep	9,945
27-Jun	4,623	27-Jul	0	27-Aug	0	27-Sep	9,232
28-Jun	4,024	28-Jul	0	28-Aug	0	28-Sep	6,848
29-Jun	4,489	29-Jul	0	29-Aug	8,995	29-Sep	7,310
30-Jun	4,894	30-Jul	0	30-Aug	13,100	30-Sep	1,577
		31-Jul	0	31-Aug	13,583		
June	**209,024**	**July**	**81,119**	**August**	**41,312**	**September**	**184,508**

Table B1-2. Chemistry and toxicity test results for MEL-14 samples in 2023

Parameter	Units	Limits (Grab Samples)		June				July			August	September				
		WL	MDMER	2023-06-12	2023-06-21	2023-06-25	2023-06-28	2023-07-03	2023-07-10	2023-07-17	2023-08-21	2023-09-03	2023-09-11	2023-09-18	2023-09-25	2023-09-27
Field Measurements																
DO (%)	%	-	-	99.3	99.3	107.4	89.5	88.4	96.3	95.8	89.5	101.1	84.8	113.8	94.7	-
DO (mg/L)	mg/L	-	-	10.73	10.73	11.61	8.98	8.48	10.38	-	9.4	-	10.01	12.77	10.07	-
pH (field)	pH units	6 | 9.5	6 | 9.5	7.3	7.3	6.64	7.06	7.13	7.27	7.52	6.62	7.15	7.51	8.15	7.58	7.32
Sp. Conductivity (field)	uS/cm	-	-	1451	1608	1598	1666	1842	1937	2017	2566	3163	3252	3555	3787	3829
Temperature	C	-	-	11.7	11.7	11.6	15	17.1	12	18.1	12.8	4.1	7.7	9.7	12	7.0
Turbidity (field)	NTU	-	-	1.09	1.38	0.838	1.15	1.07	0.86	-	0.46	-	0.89	1.15	1.5	-
Conventional Parameters																
Conductivity (lab)	uS/cm	-	-	1400	1600	1600	1700	1800	2000	2100	2500	3000	3300	3500	3600	-
Hardness (D)	mg/L	-	-	290	315	338	362	396	413	418	465	574	640	699	734	809
Hardness (T)	mg/L	-	-	285	331	317	361	358	357	381	417	551	604	581	844	873
pH (lab)	pH units	-	-	7.31	7.6	7.52	7.44	7.51	7.69	7.8	7.3	7.42	7.86	8.15	7.61	7.59
Total Dissolved Solids	mg/L	4500	-	790	945	995	1050	1160	1230	1310	1440	1880	1810	1890	2140	2270
Total Dissolved Solids (Calculated)	mg/L	-	-	730	790	830	880	910	1000	1100	1300	1500	1700	1900	2100	2100
Total Suspended Solids	mg/L	30	30	2	3	3	2	3	2	3	3	9	4	3	3	5
Turbidity (lab)	NTU	-	-	0.5	0.4	0.4	0.4	0.4	0.4	0.6	0.3	0.4	0.4	0.4	0.5	0.7
Major Ions																
Alkalinity, Bicarbonate	mg/L	-	-	34	47	50	54	68	68	76	57	68	79	80	87	84
Alkalinity, Carbonate	mg/L	-	-	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Alkalinity, Total	mg/L	-	-	34	47	50	54	68	68	76	57	68	80	81	88	85
Calcium (D)	mg/L	-	-	78.4	87	92.8	99.7	110	115	117	122	147	171	187	197	208
Calcium (T)	mg/L	-	-	79.7	90.1	86.9	98.6	101	97.9	105	111	147	160	158	226	225
Chloride	mg/L	-	-	280	310	330	340	320	410	480	580	650	720	780	960	910
Fluoride	mg/L	-	-	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.11	< 0.1	< 0.1	< 0.1
Magnesium (D)	mg/L	-	-	22.9	23.6	25.8	27.6	29.4	30.4	34	38.7	50.4	51.8	56.6	58.8	70.5
Magnesium (T)	mg/L	-	-	20.9	25.7	24.3	28	25.6	27.3	28.7	34.1	44.6	50	45.2	68.1	75.4
Potassium (D)	mg/L	-	-	12.6	14.3	14.7	15.4	16.2	17.8	18.8	23.1	26.4	28.1	31	30.7	33.2
Potassium (T)	mg/L	-	-	12.1	14.2	13.8	15.1	15.1	16	16.7	20.9	26.7	26.9	24.6	35.1	35.4
Reactive Silica (SiO2)	mg/L	-	-	0.077	0.099	0.16	0.25	0.2	0.13	0.099	0.12	0.38	0.38	0.27	0.54	0.46
Sodium (D)	mg/L	-	-	139	147	158	167	182	193	212	281	322	364	396	402	427
Sodium (T)	mg/L	-	-	129	160	152	170	161	178	195	244	333	348	316	458	462
Sulphate	mg/L	-	-	150	150	160	170	180	180	190	210	250	300	310	340	330
Nutrients																
Ammonia (as N)	mg/L	18	-	0.33	0.16	0.14	0.23	0.41	0.24	0.19	0.16	0.68	0.65	0.43	0.28	0.23
Nitrate (as N)	mg/L	-	-	8.02	5.73	4.9	6.04	5.89	5.97	5.77	2.8	5.77	7.66	10.1	11.6	12
Nitrate + Nitrite (as N)	mg/L	-	-	8.29	5.92	5.05	6.18	6.07	6.12	6.02	2.9	6.24	7.91	10.4	11.8	12.2
Nitrite (as N)	mg/L	-	-	0.267	0.187	0.151	0.145	0.188	0.154	0.251	0.1	0.468	0.253	0.289	0.208	0.207
Orthophosphate (PO4-P)	mg/L	-	-	< 0.01	< 0.01	< 0.01	< 0.01	0.014	< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01

Table B1-2. Chemistry and toxicity test results for MEL-14 samples in 2023

		Limits (Grab Samples)		June				July			August	September				
Parameter	**Units**	**WL**	**MDMER**	**2023-06-12**	**2023-06-21**	**2023-06-25**	**2023-06-28**	**2023-07-03**	**2023-07-10**	**2023-07-17**	**2023-08-21**	**2023-09-03**	**2023-09-11**	**2023-09-18**	**2023-09-25**	**2023-09-27**
Total Kjeldahl Nitrogen	mg/L	-	-	0.75	0.57	0.36	0.67	0.79	0.78	1.2	0.97	1.6	1.4	0.67	0.9	0.86
Total Phosphorus	mg/L	4	-	0.051	0.027	*< 0.02*	0.038	0.033	0.055	0.045	*< 0.02*	0.028	0.034	0.024	0.035	0.04
Unionized Ammonia (calculated)	mg/L	-	1	0.0017	0.00063	*< 0.00061*	0.00089	0.0022	0.0012	0.0022	*< 0.00061*	0.0014	0.0039	0.013	0.0028	0.00087
Organic/Inorganic Carbon																
Dissolved Organic Carbon	mg/L	-	-	4.8	6.4	5.4	5.7	7.3	6.6	8.1	8.2	7.6	9.9	9.9	10	10
Total Organic Carbon	mg/L	-	-	5.3	5.6	5.8	6.2	8.1	7.1	8.3	8.6	8.8	10	10	11	11
Total Metals																
Aluminum (T)	mg/L	3	-	0.335	0.423	0.333	0.228	0.252	0.232	0.288	0.249	0.866	0.34	0.339	0.45	0.511
Antimony (T)	mg/L	-	-	0.00085	0.00085	0.00079	0.00085	0.00086	0.00083	8.70E-04	0.00069	0.00073	8.00E-04	*< 0.001*	*< 0.001*	*< 0.001*
Arsenic (T)	mg/L	0.6	0.6	0.00515	0.00498	0.00374	0.00383	0.00587	0.00398	0.00622	0.00467	0.00619	0.00536	0.00327	0.00582	0.00445
Barium (T)	mg/L	-	-	0.0273	0.0343	0.0342	0.0386	0.0412	0.0397	0.043	0.0486	0.0554	0.0601	0.0536	0.0827	0.0817
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*	*< 2e-04*	*< 2e-04*
Bismuth (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*	*< 0.002*	*< 0.002*
Boron (T)	mg/L	-	-	0.151	0.166	0.171	0.186	0.176	0.194	0.202	0.28	0.318	0.317	0.34	0.41	0.41
Cadmium (T)	mg/L	-	-	0.000013	0.000016	1.40E-05	1.40E-05	2.00E-05	1.50E-05	1.70E-05	*< 1e-05*	1.10E-05	1.20E-05	*< 2e-05*	*< 2e-05*	*< 2e-05*
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*	*< 0.002*	*< 0.002*
Cobalt (T)	mg/L	-	-	0.00111	0.00115	0.00107	0.00113	0.00109	0.00099	0.00097	0.00075	0.00104	0.00104	0.00083	0.0011	0.00109
Copper (T)	mg/L	0.4	0.6	0.00217	0.00231	0.00226	0.00233	0.00284	0.00254	0.00304	0.00245	0.00199	0.00234	0.0022	0.0024	0.0021
Iron (T)	mg/L	-	-	0.027	0.024	0.018	0.016	0.019	0.019	0.017	0.02	0.092	0.02	*< 0.02*	0.024	0.051
Lead (T)	mg/L	0.2	2	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*
Lithium (T)	mg/L	-	-	0.017	0.0187	0.0187	0.0213	0.0211	0.0238	0.0259	0.0327	0.041	0.0387	0.0413	0.0516	0.0493
Manganese (T)	mg/L	-	-	0.0279	0.0287	0.0381	0.0416	0.0555	0.0503	0.0336	0.0235	0.0725	0.0563	0.034	0.0737	0.0981
Mercury (T)	mg/L	-	-	*< 1e-05*	*< 1e-05*	*< 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	-	-	0.0044	0.0047	0.0049	0.0056	0.0048	0.0045	0.0051	0.0059	0.0062	0.0057	0.0046	0.0061	0.0065
Nickel (T)	mg/L	1	1	0.0037	0.0037	0.005	0.0038	0.0042	0.0037	0.0035	0.004	0.0055	0.0062	0.005	0.0065	0.006
Selenium (T)	mg/L	-	-	0.00064	0.00076	0.00071	0.00077	0.00074	0.00068	0.00069	0.00046	0.0006	0.00069	0.0007	0.00092	0.00096
Silicon (T)	mg/L	-	-	0.1	*< 0.1*	*< 0.1*	0.11	0.12	*< 0.1*	*< 0.1*	*< 0.1*	0.22	0.15	*< 0.2*	*< 0.2*	*< 0.2*
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*	*< 4e-05*	*< 4e-05*
Strontium (T)	mg/L	-	-	0.963	1.06	1.03	1.17	1.14	1.18	1.29	1.53	1.99	1.98	1.74	2.75	2.82
Sulfur (T)	mg/L	-	-	44.3	51.5	49.1	55.2	54.9	55.2	59.8	63.4	88.9	94.8	90.3	131	132
Thallium (T)	mg/L	-	-	0.000016	0.00002	0.000019	0.000023	0.000024	0.000016	0.000023	0.000017	*< 1e-05*	0.000022	0.000021	0.000022	*< 2e-05*
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*	*< 0.01*	*< 0.01*
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*	*< 0.01*	*< 0.01*
Uranium (T)	mg/L	-	-	0.00033	0.00044	0.00023	0.0002	8.00E-04	0.00045	0.00116	0.00048	0.00121	0.00317	0.00228	0.00385	0.00307
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*	*< 0.01*	*< 0.01*
Zinc (T)	mg/L	0.8	1	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.01*	*< 0.01*	*< 0.01*
Zirconium (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*	*< 2e-04*	*< 2e-04*
Dissolved Metals																

Table B1-2. Chemistry and toxicity test results for MEL-14 samples in 2023

		Limits (Grab Samples)		June				July			August	September				
Parameter	**Units**	**WL**	**MDMER**	**2023-06-12**	**2023-06-21**	**2023-06-25**	**2023-06-28**	**2023-07-03**	**2023-07-10**	**2023-07-17**	**2023-08-21**	**2023-09-03**	**2023-09-11**	**2023-09-18**	**2023-09-25**	**2023-09-27**
Aluminum (D)	mg/L	-	-	0.0749	0.0916	0.0641	0.0646	0.112	0.0734	0.161	0.0976	0.0724	0.141	0.122	0.117	0.0974
Antimony (D)	mg/L	-	-	0.00082	0.00089	0.00084	0.00086	0.001	9.60E-04	0.00094	0.00078	0.00071	0.00083	*< 0.001*	*< 0.001*	*< 0.001*
Arsenic (D)	mg/L	-	-	0.00379	0.00355	0.00296	0.00327	0.00546	0.00369	0.00481	0.00436	0.00259	0.00453	0.00317	0.00375	0.00289
Barium (D)	mg/L	-	-	0.0273	0.0347	0.0374	0.0394	0.0449	0.0476	0.0467	0.0545	0.0569	0.0623	0.0676	0.0724	0.0756
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*	*< 2e-04*	*< 2e-04*
Bismuth (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*	*< 0.002*	*< 0.002*
Boron (D)	mg/L	-	-	0.143	0.164	0.187	0.189	0.191	0.22	0.215	0.313	0.338	0.335	0.35	0.36	0.37
Cadmium (D)	mg/L	-	-	*< 1e-05*	0.000016	1.50E-05	1.60E-05	2.40E-05	1.80E-05	1.90E-05	1.30E-05	*< 1e-05*	*< 1e-05*	*< 2e-05*	*< 2e-05*	*< 2e-05*
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*	*< 0.002*	*< 0.002*
Cobalt (D)	mg/L	-	-	0.0011	0.00119	0.00109	0.00113	0.00121	0.00109	0.00103	0.00083	0.00094	0.00107	0.00101	0.00098	0.00105
Copper (D)	mg/L	-	-	0.00199	0.00222	0.00216	0.00228	0.00296	0.00279	0.00321	0.00225	0.00541	0.00233	0.00222	0.00219	0.00192
Iron (D)	mg/L	-	-	0.0113	0.0054	0.0064	0.0083	0.0095	0.0071	0.0908	0.0092	0.0155	0.0138	*< 0.01*	*< 0.01*	*< 0.01*
Lead (D)	mg/L	-	-	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 4e-04*	*< 4e-04*	*< 4e-04*
Lithium (D)	mg/L	-	-	0.017	0.0184	0.0206	0.0227	0.0214	0.0283	0.0268	0.0392	0.0401	0.0407	0.044	0.0444	0.046
Manganese (D)	mg/L	-	-	0.0226	0.0253	0.0372	0.0407	0.0601	0.0552	0.0341	0.0241	0.0666	0.0539	0.0376	0.0664	0.0927
Mercury (D)	mg/L	-	-	*< 1e-05*	*< 1e-05*	*< 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	-	-	0.0043	0.0047	0.0047	0.0048	0.0051	0.0053	0.0056	0.0066	0.0061	0.0061	0.006	0.0056	0.006
Nickel (D)	mg/L	-	-	0.0033	0.0034	0.0034	0.0037	0.0043	0.0039	0.0037	0.0042	0.0061	0.0066	0.0061	0.0056	0.0055
Selenium (D)	mg/L	-	-	0.00073	0.00076	0.00078	0.00077	0.00083	0.0008	0.00082	0.00055	0.00056	0.00071	0.00077	0.00085	0.00082
Silicon (D)	mg/L	-	-	*< 0.1*	*< 0.1*	*< 0.1*	0.1	0.11	*< 0.1*	*< 0.1*	*< 0.1*	0.15	0.15	*< 0.2*	*< 0.2*	*< 0.2*
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*	*< 4e-05*	*< 4e-05*
Strontium (D)	mg/L	-	-	0.96	1.07	1.13	1.22	1.28	1.37	1.49	1.68	2.11	2.08	2.28	2.38	2.52
Sulfur (D)	mg/L	-	-	47.5	52.1	52.2	54	57	60.8	63.8	74.8	84.9	97.8	111	113	120
Thallium (D)	mg/L	-	-	0.000015	0.000018	2.20E-05	2.10E-05	2.60E-05	2.00E-05	2.80E-05	1.90E-05	*< 1e-05*	2.00E-05	2.10E-05	*< 2e-05*	*< 2e-05*
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*	*< 0.01*	*< 0.01*
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*	*< 0.01*	*< 0.01*
Uranium (D)	mg/L	-	-	0.00023	0.00035	1.70E-04	0.00017	0.00081	0.00047	0.0012	0.00049	0.00086	0.0033	0.00268	0.00335	0.00273
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*	*< 0.01*	*< 0.01*
Zinc (D)	mg/L	-	-	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	0.0053	*< 0.01*	*< 0.01*	*< 0.01*
Zirconium (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*	*< 2e-04*	*< 2e-04*
Cyanides																
Cyanide (free)	mg/L	-	-	0.0056	0.0081	0.0034	0.0026	*< 0.002*	0.0076	0.0073	*< 0.002*	*< 0.002*	0.0064	*< 0.002*	*< 0.002*	*< 0.002*
Cyanide (Total)	mg/L	1	1	0.00332	0.00175	0.00071	*< 5e-04*	0.00056	0.0007	0.00095	0.00137	0.00104	0.00082	0.00083	0.00092	0.00104
Cyanide (WAD)	mg/L	-	-	0.0019	0.001	*< 5e-04*	*< 5e-04*	*< 5e-04*	0.00081	*< 5e-04*	0.00065	0.00083	0.00085	0.00089	0.00099	0.0012
Radium																
Radium-226	Bq/L	-	1.11	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	*< 0.005*	0.007	*< 0.005*	*< 0.005*	0.006	*< 0.005*	0.027	0.007
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*

Table B1-2. Chemistry and toxicity test results for MEL-14 samples in 2023

		Limits (Grab Samples)		June				July			August	September				
Parameter	**Units**	**WL**	**MDMER**	**2023-06-12**	**2023-06-21**	**2023-06-25**	**2023-06-28**	**2023-07-03**	**2023-07-10**	**2023-07-17**	**2023-08-21**	**2023-09-03**	**2023-09-11**	**2023-09-18**	**2023-09-25**	**2023-09-27**
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*
F2 (C10-C16)	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*
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*
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*
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*
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*
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*
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*
Toluene	mg/L	-	-	0.00041	0.00041	*< 2e-04*	0.00063	0.00028	*< 2e-04*	*< 2e-04*	*< 2e-04*	*< 2e-04*	0.0003	0.00024	0.00024	*< 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*

Notes

Italicized numbers are less than the analytical detection limit

Appendix B2
Effluent Quality – Supplemental Figures

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)

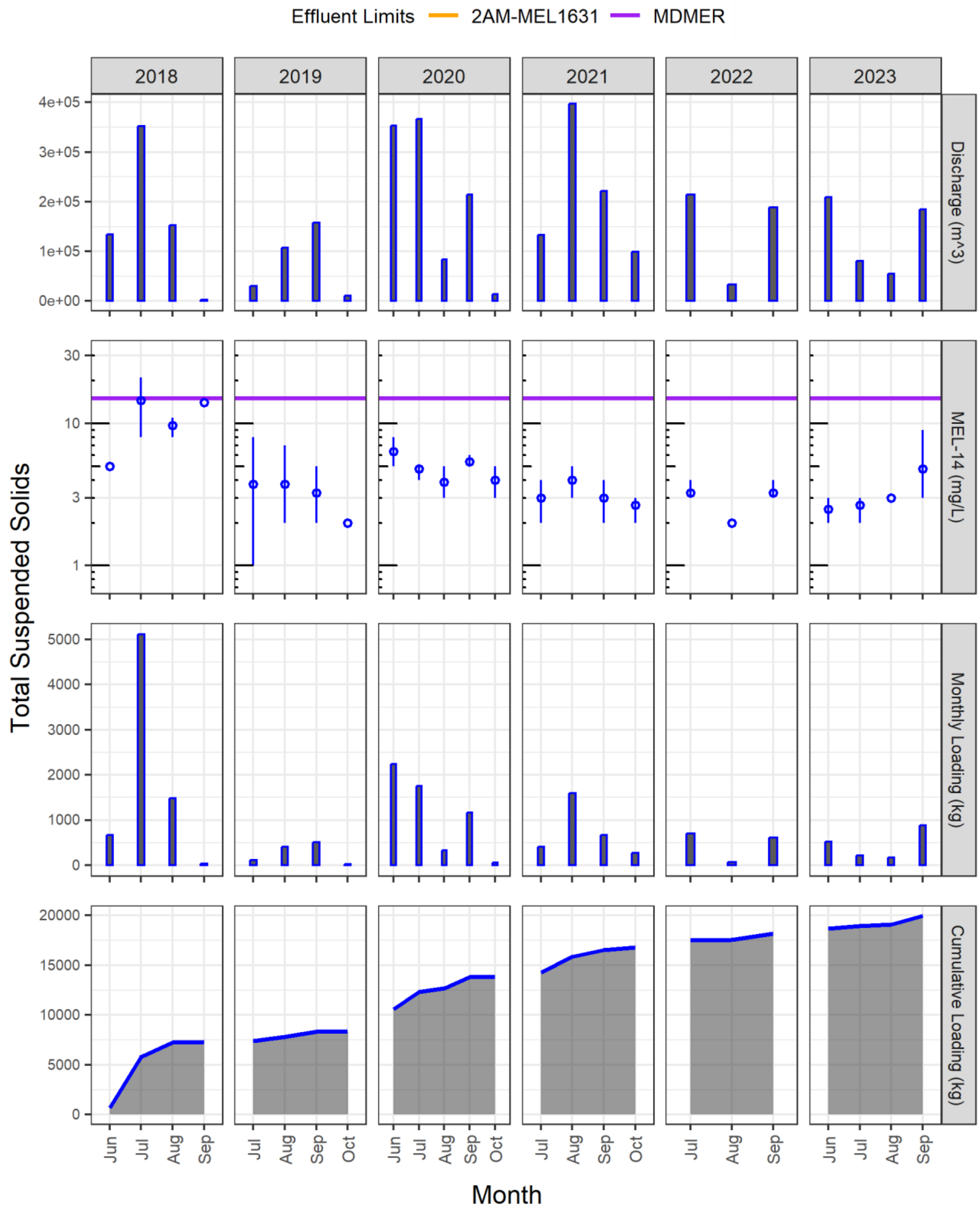


Figure B2-2. Total dissolved solids (TDS measured)

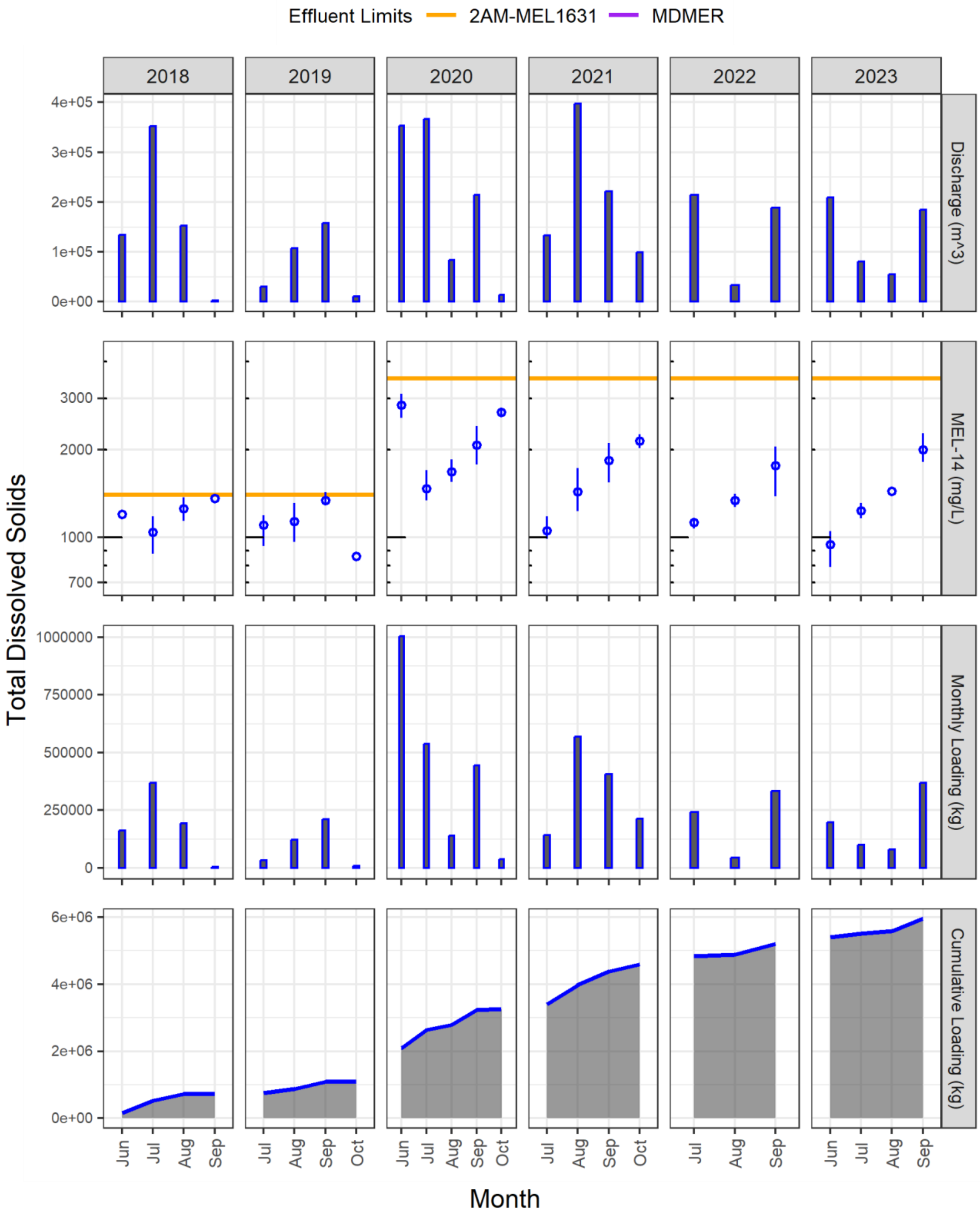


Figure B2-3. Chloride

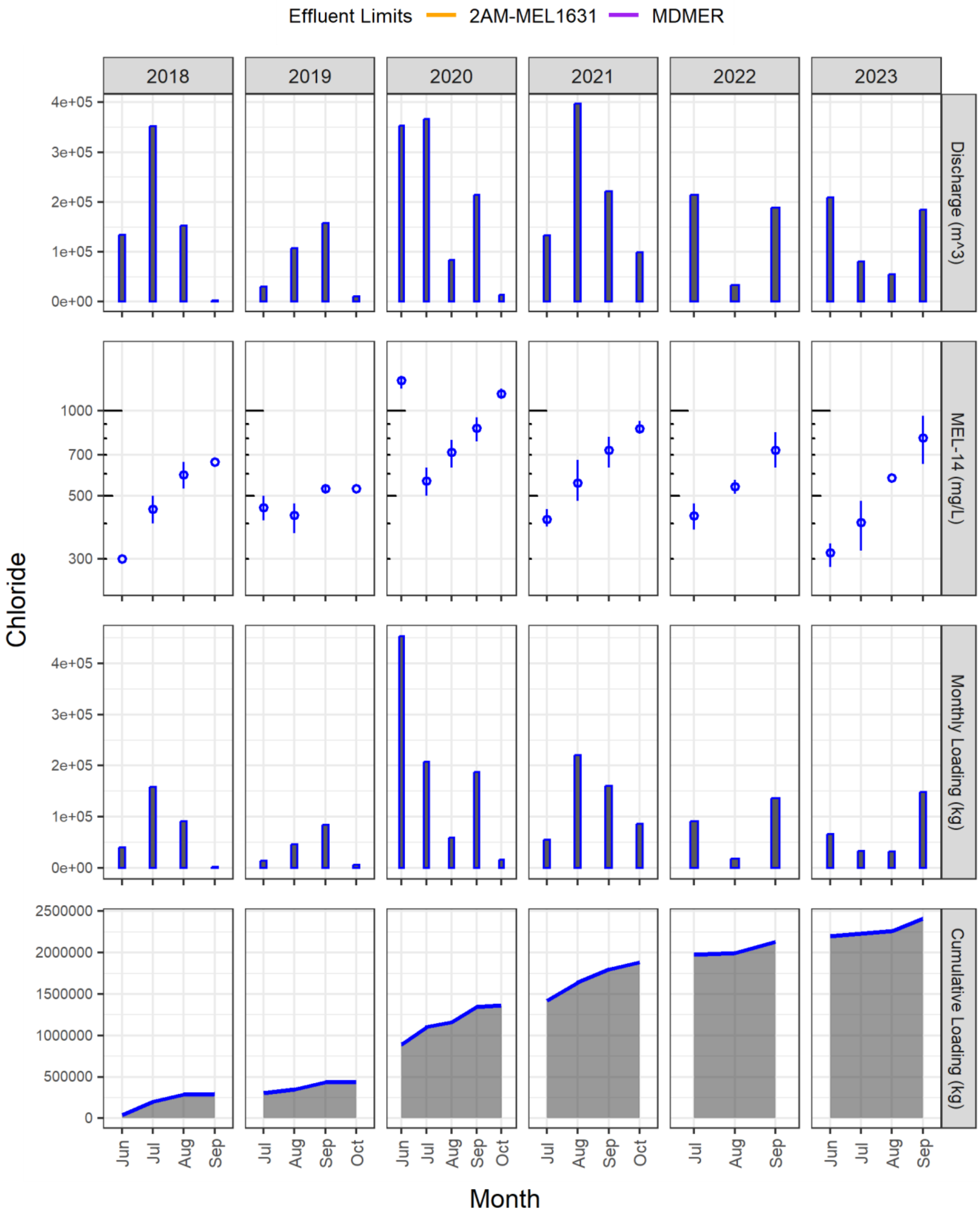


Figure B2-4. Sodium

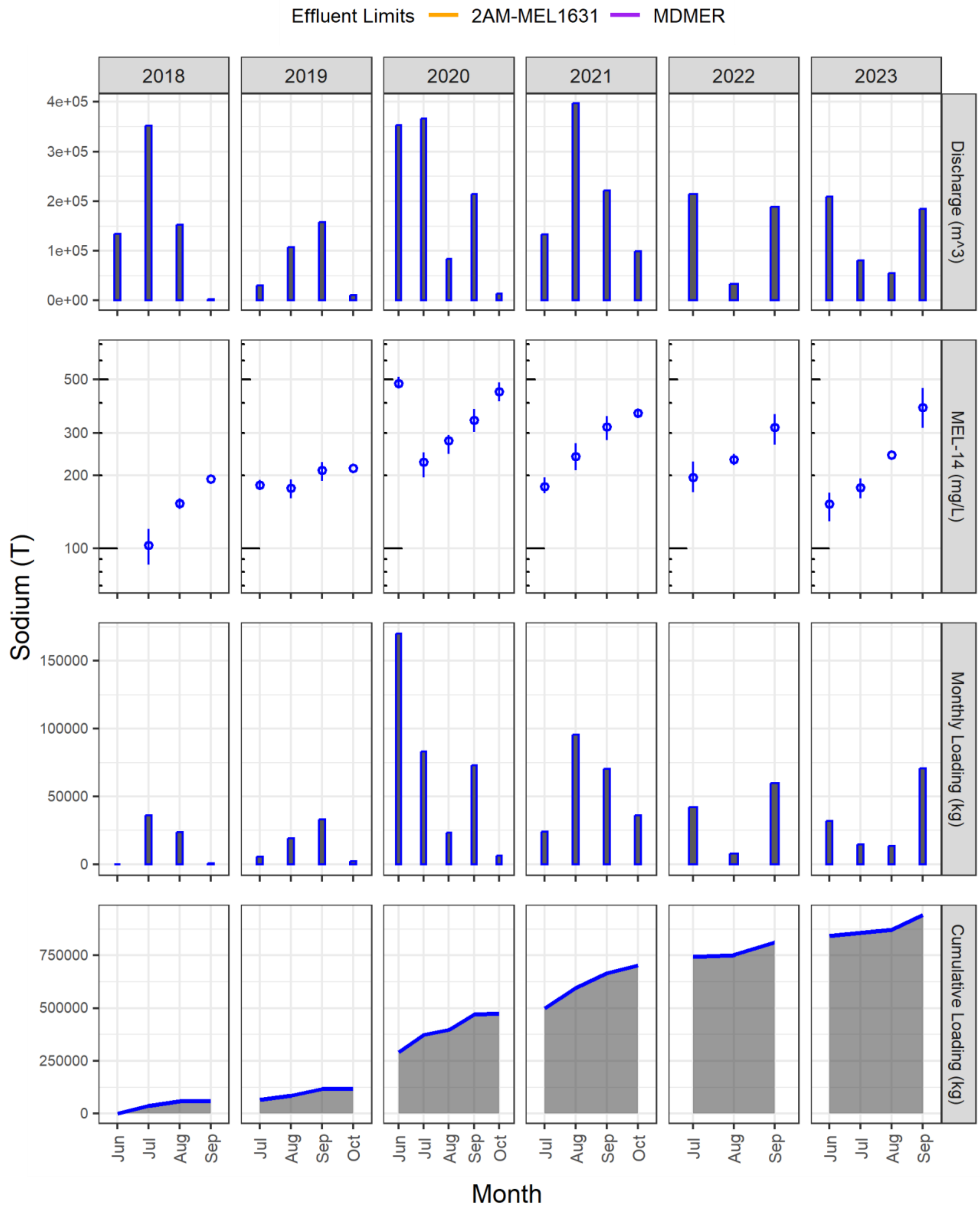


Figure B2-5. Calcium

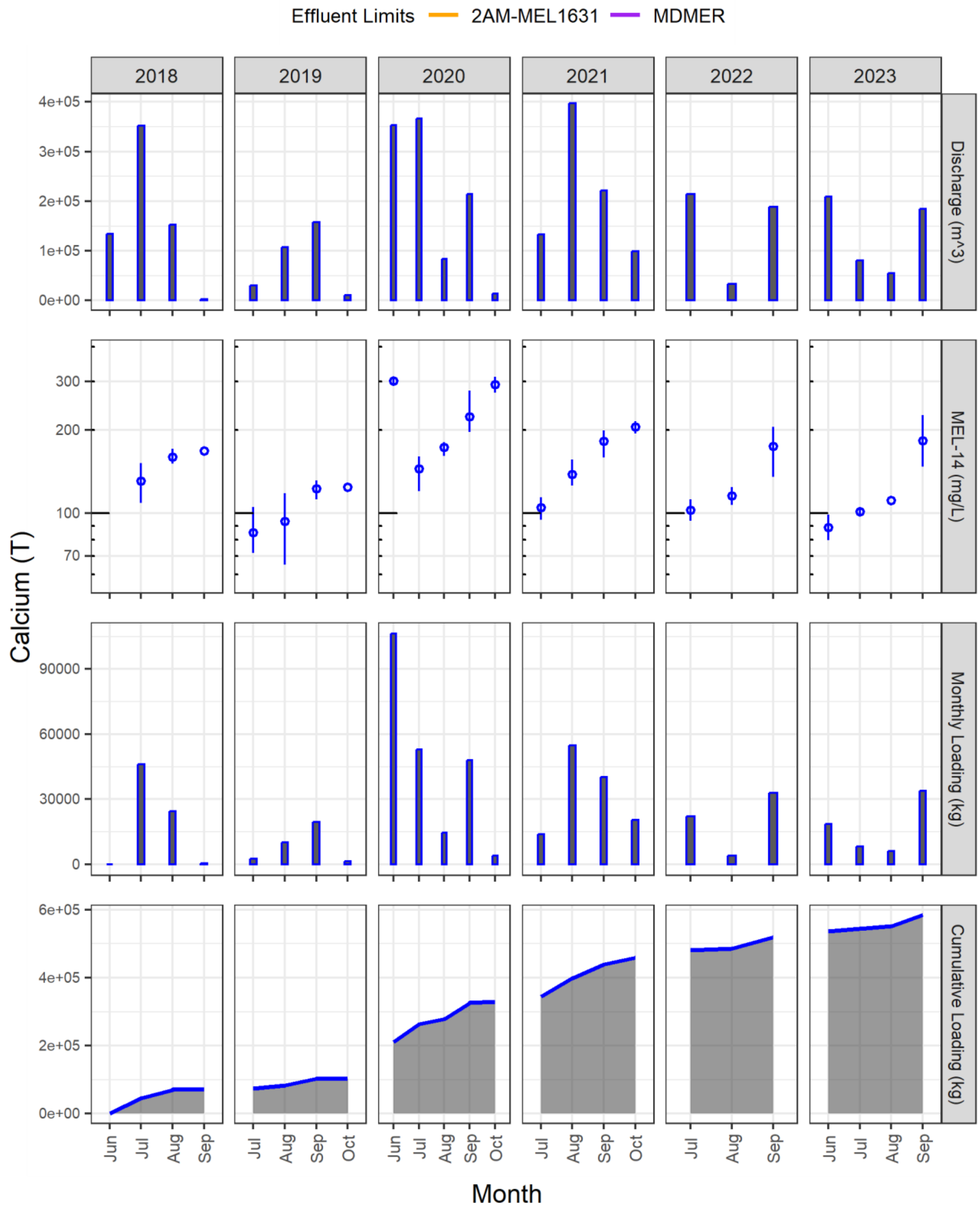


Figure B2-6. Magnesium

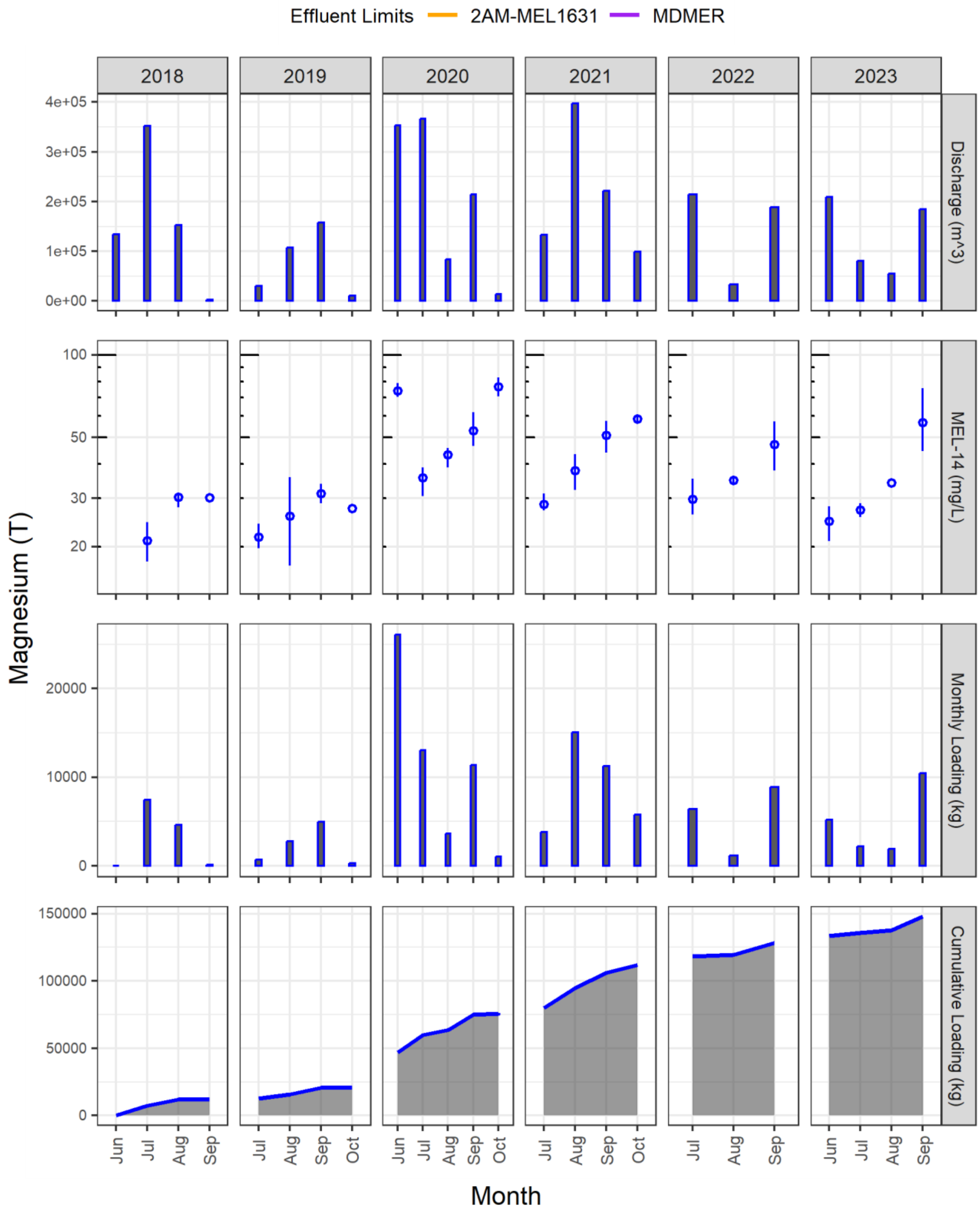


Figure B2-7. Potassium

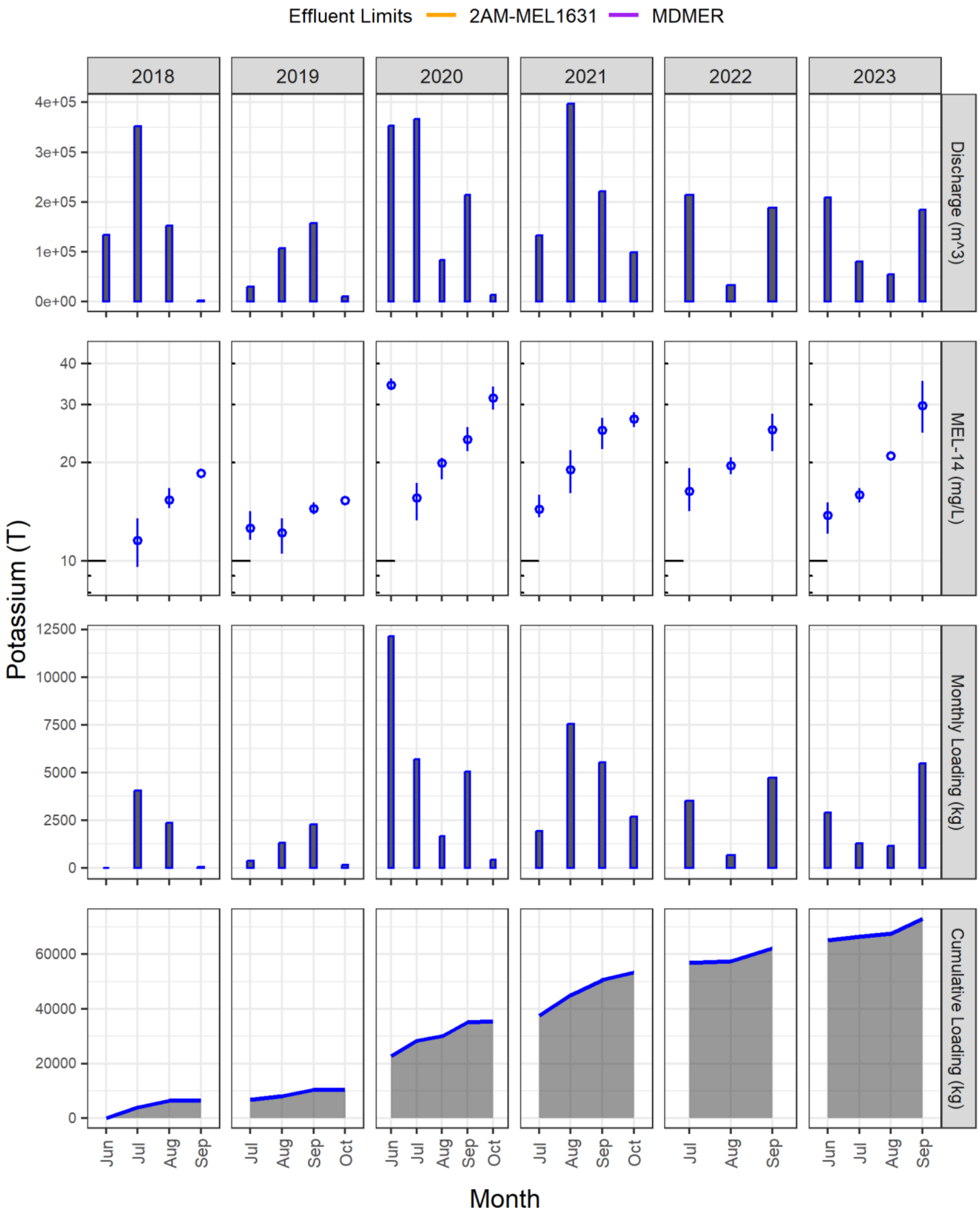


Figure B2-8. Sulphate

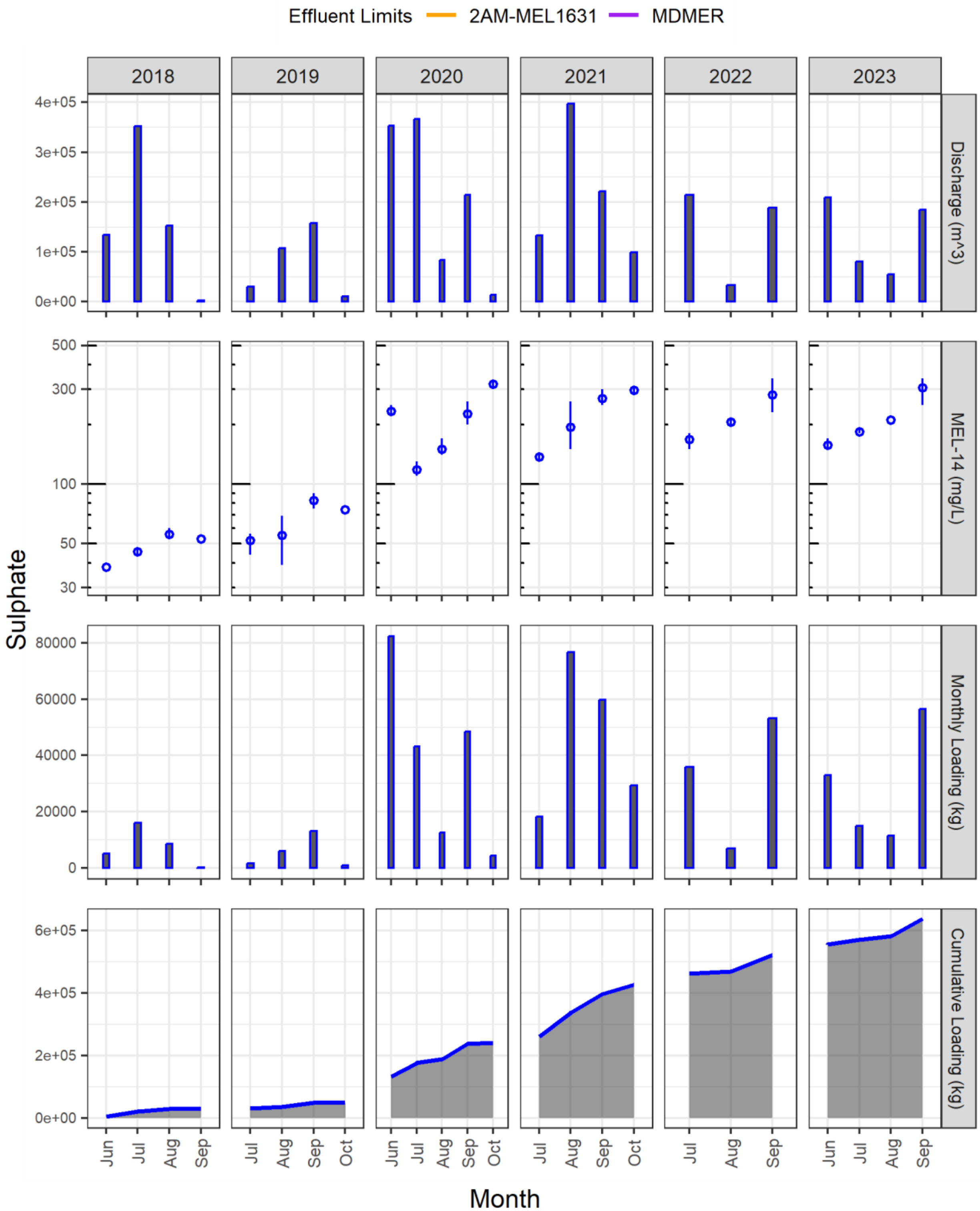


Figure B2-9. Alkalinity (Total)

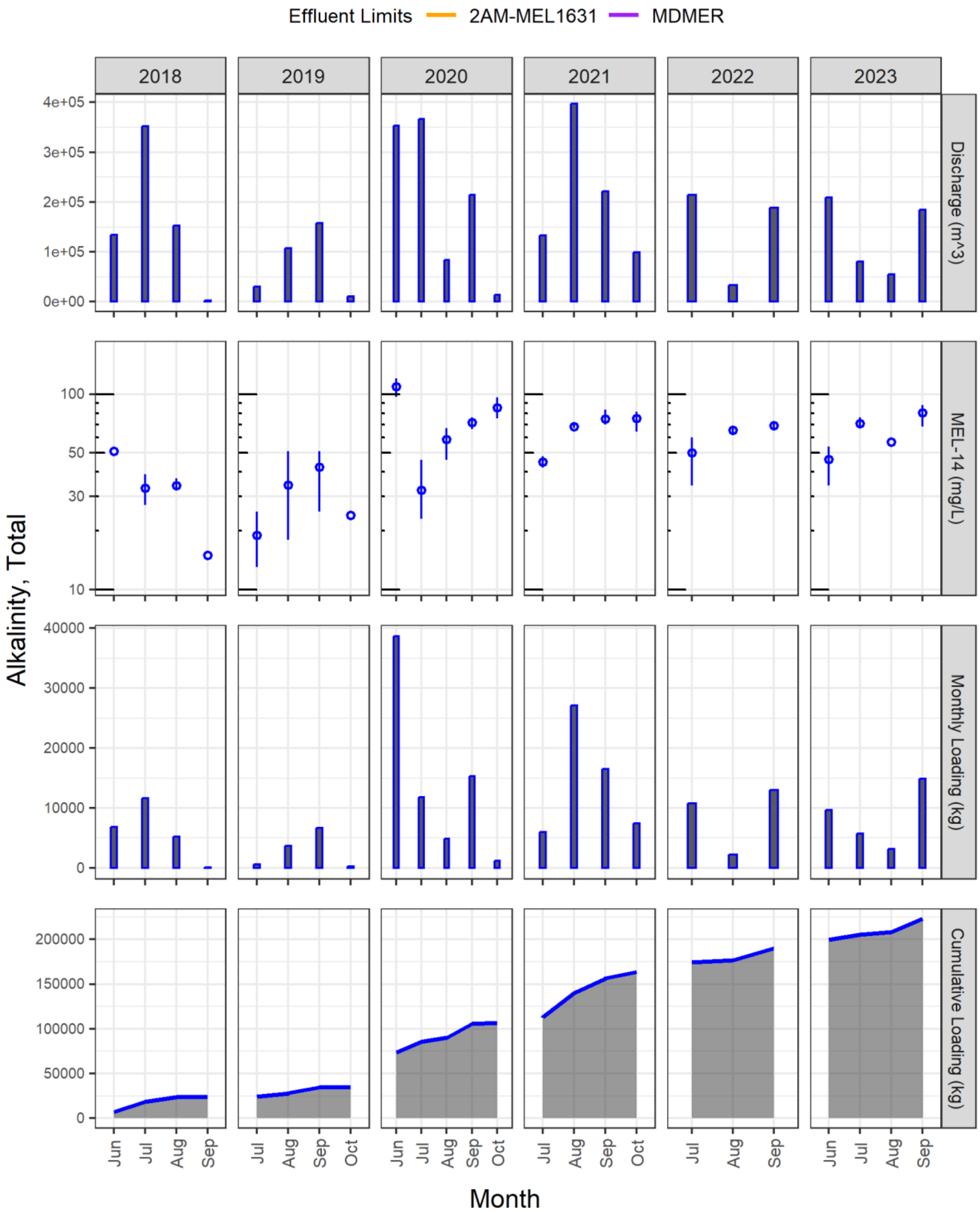


Figure B2-10. Reactive Silica

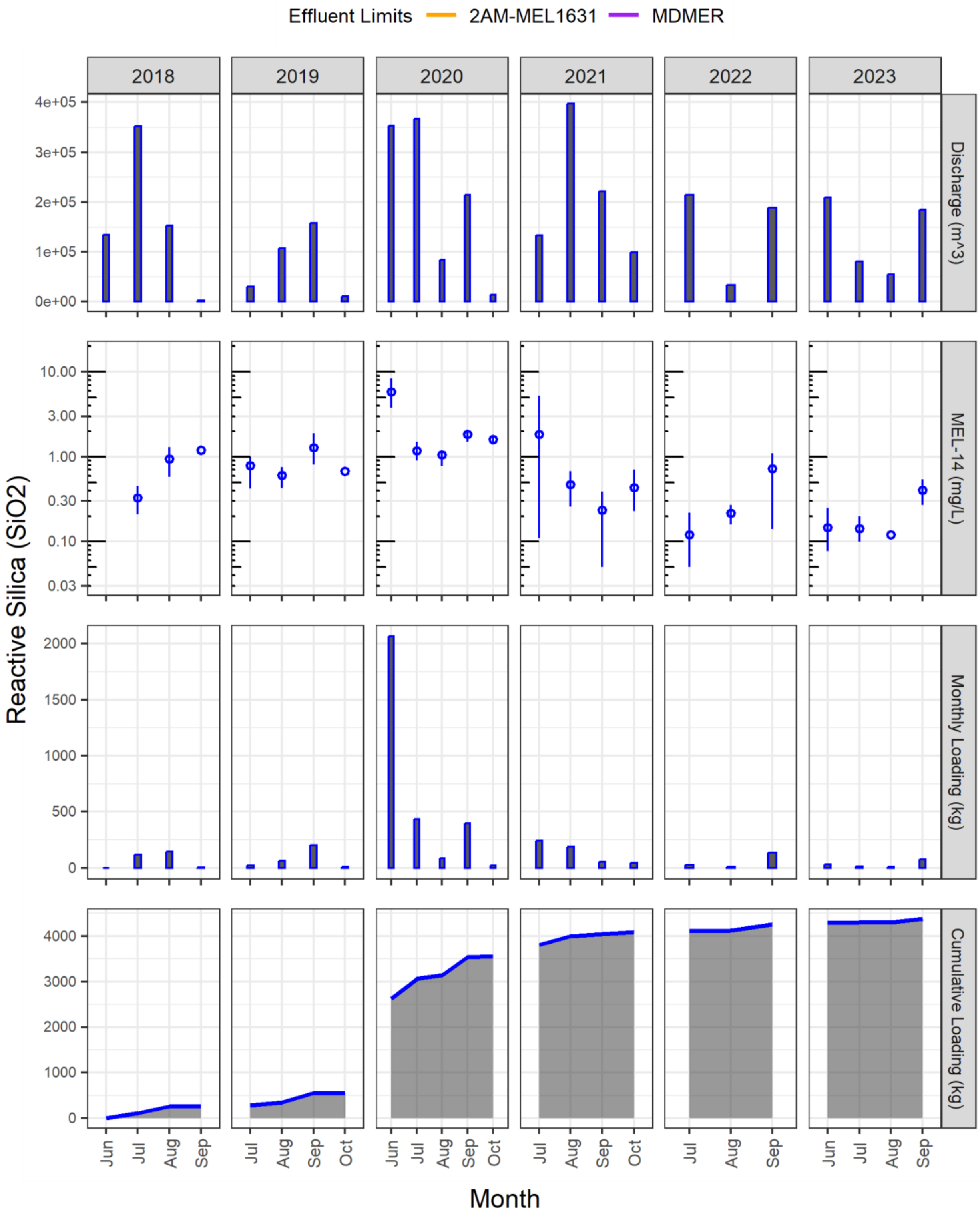


Figure B2-11. Nitrate (as N)

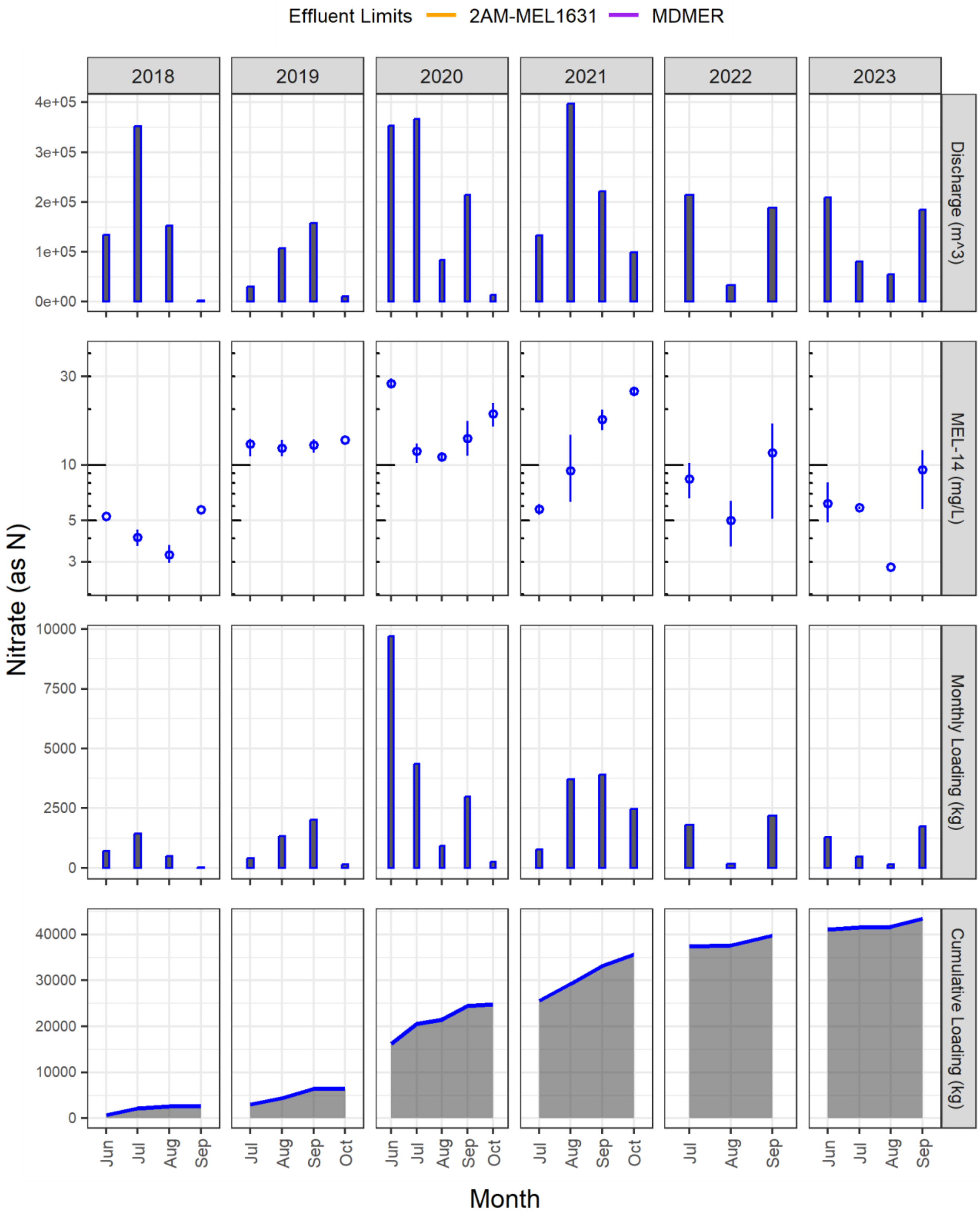


Figure B2-12. Nitrite (as N)

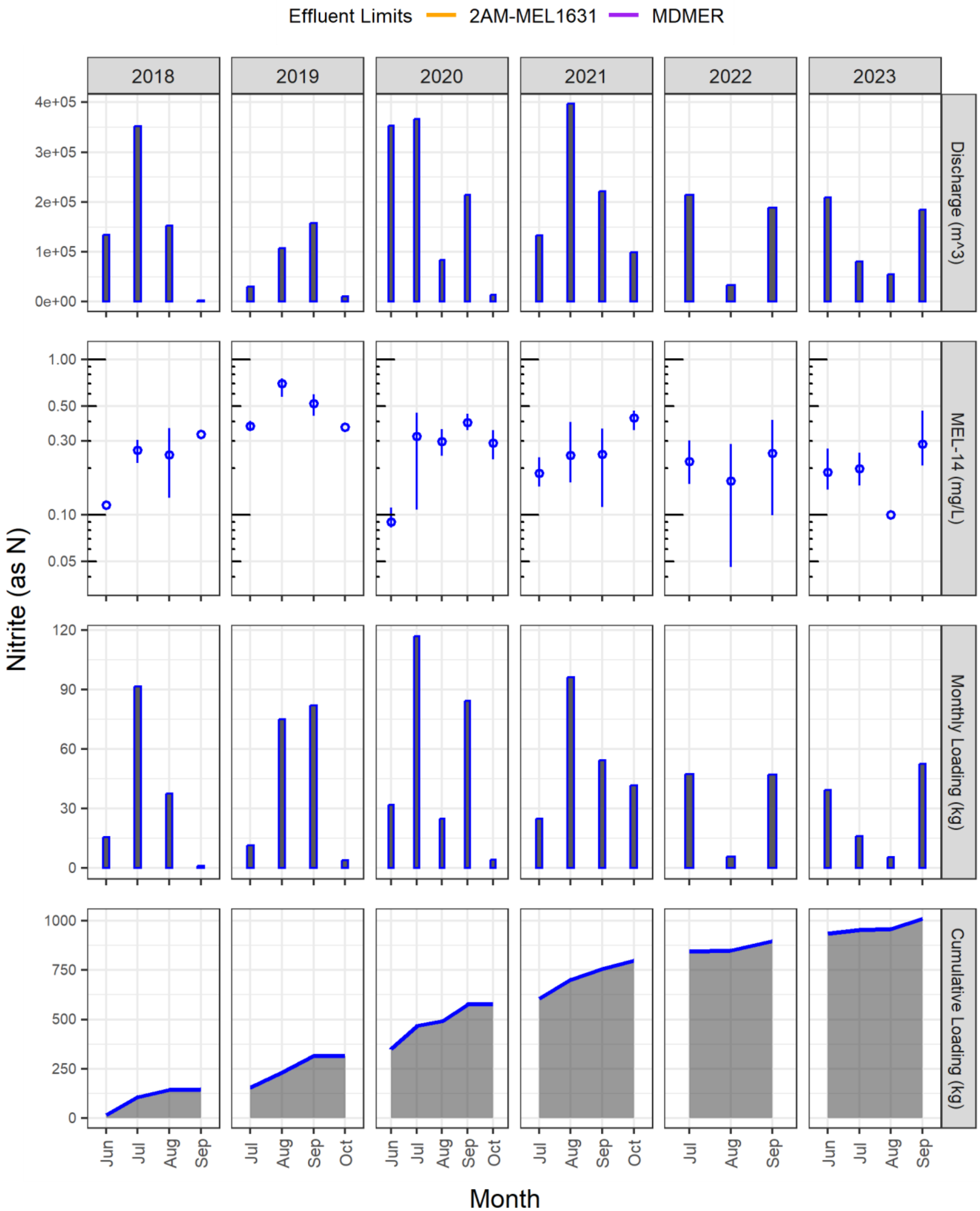


Figure B2-13. Nitrate + Nitrite (as N)

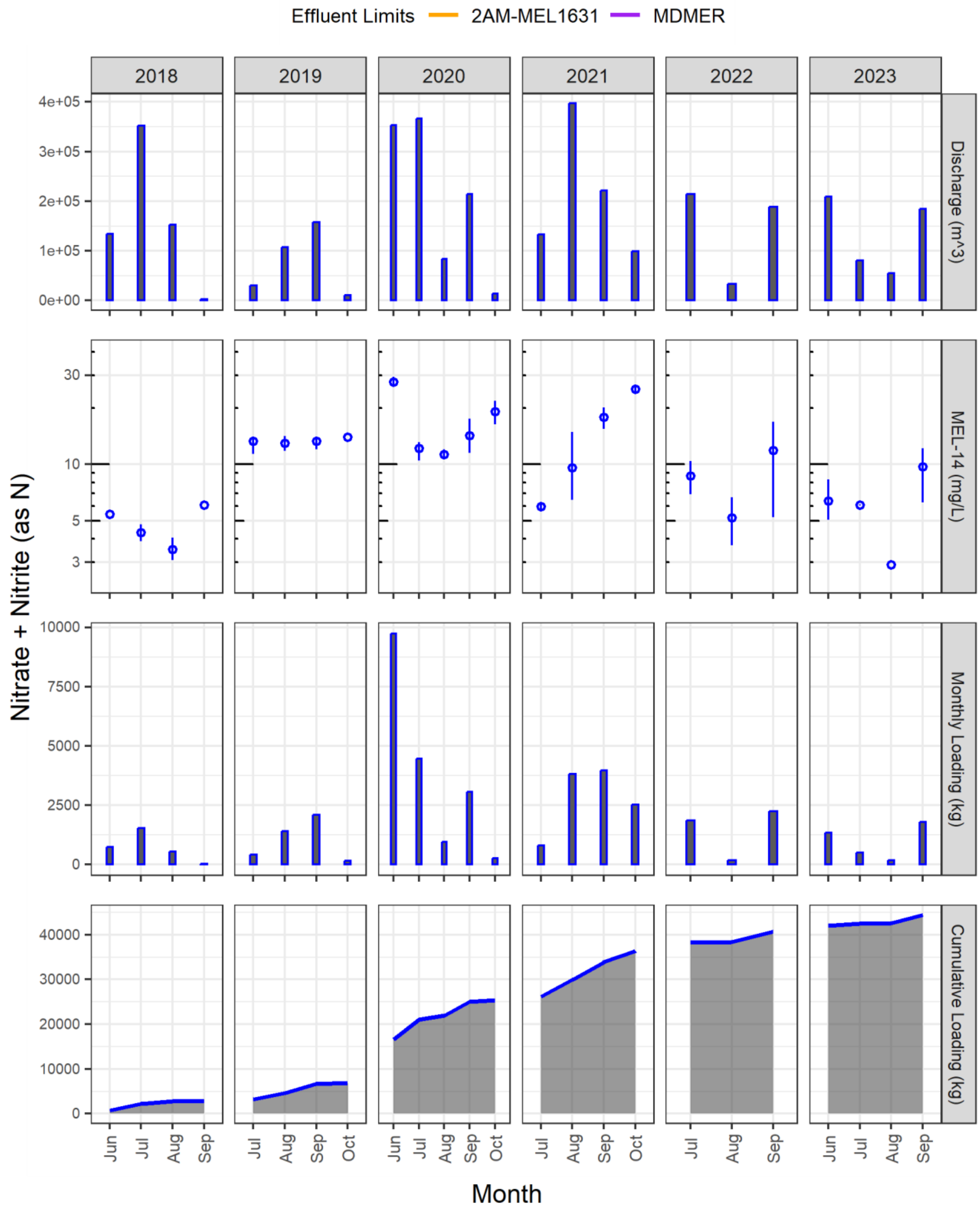


Figure B2-14.Total Kjeldahl nitrogen (TKN)

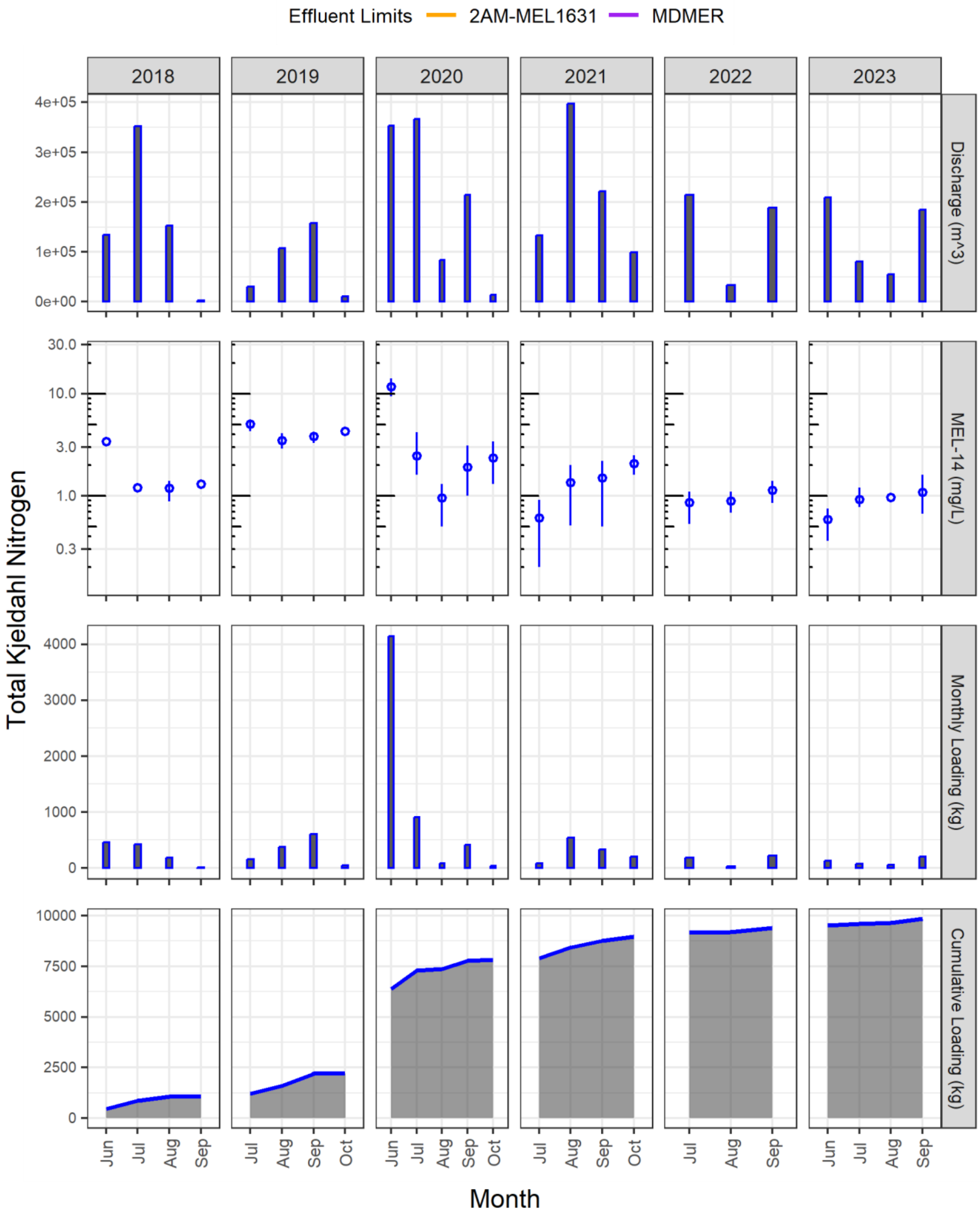


Figure B2-15. Ammonia (as N)

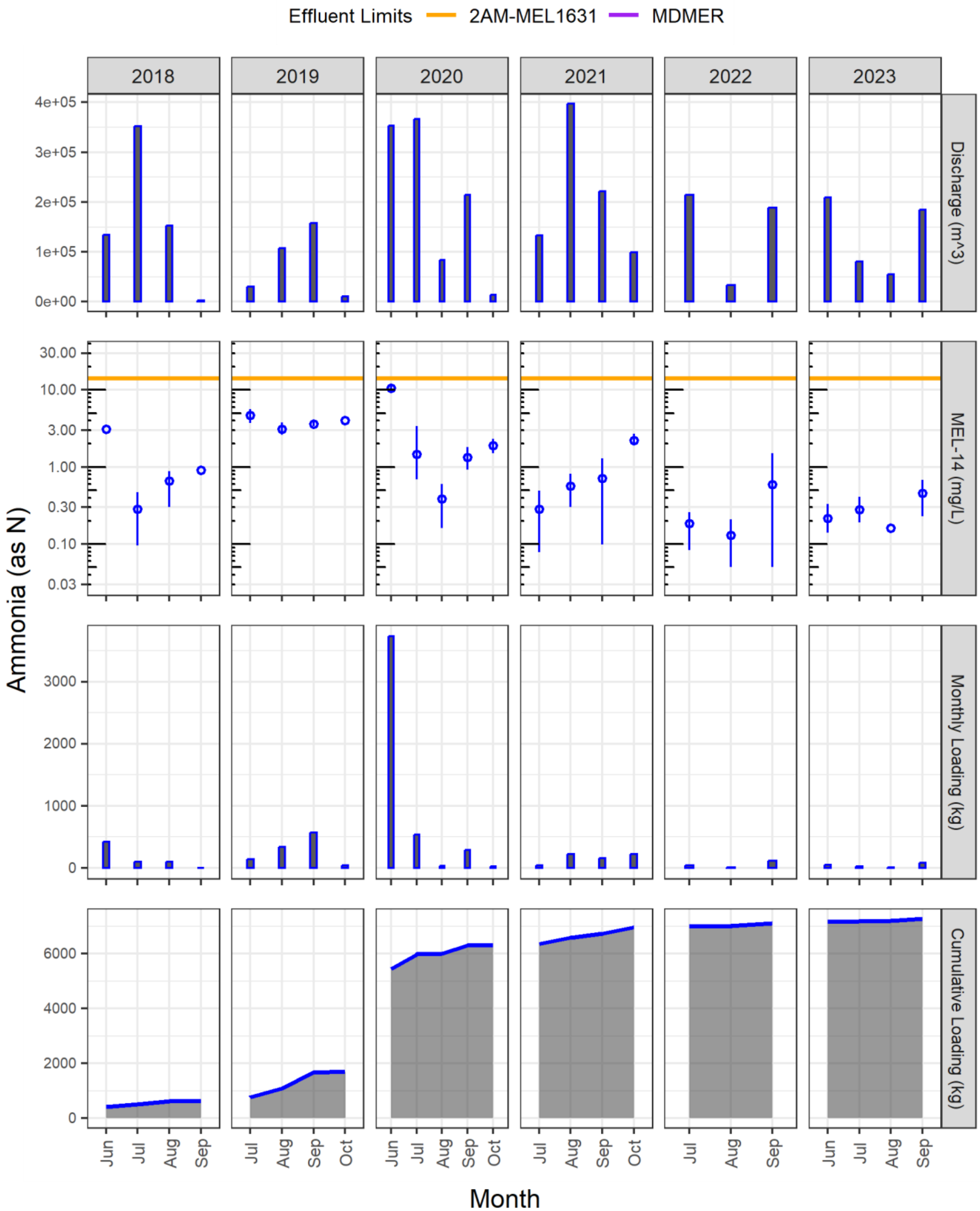


Figure B2-16. Total Phosphorus

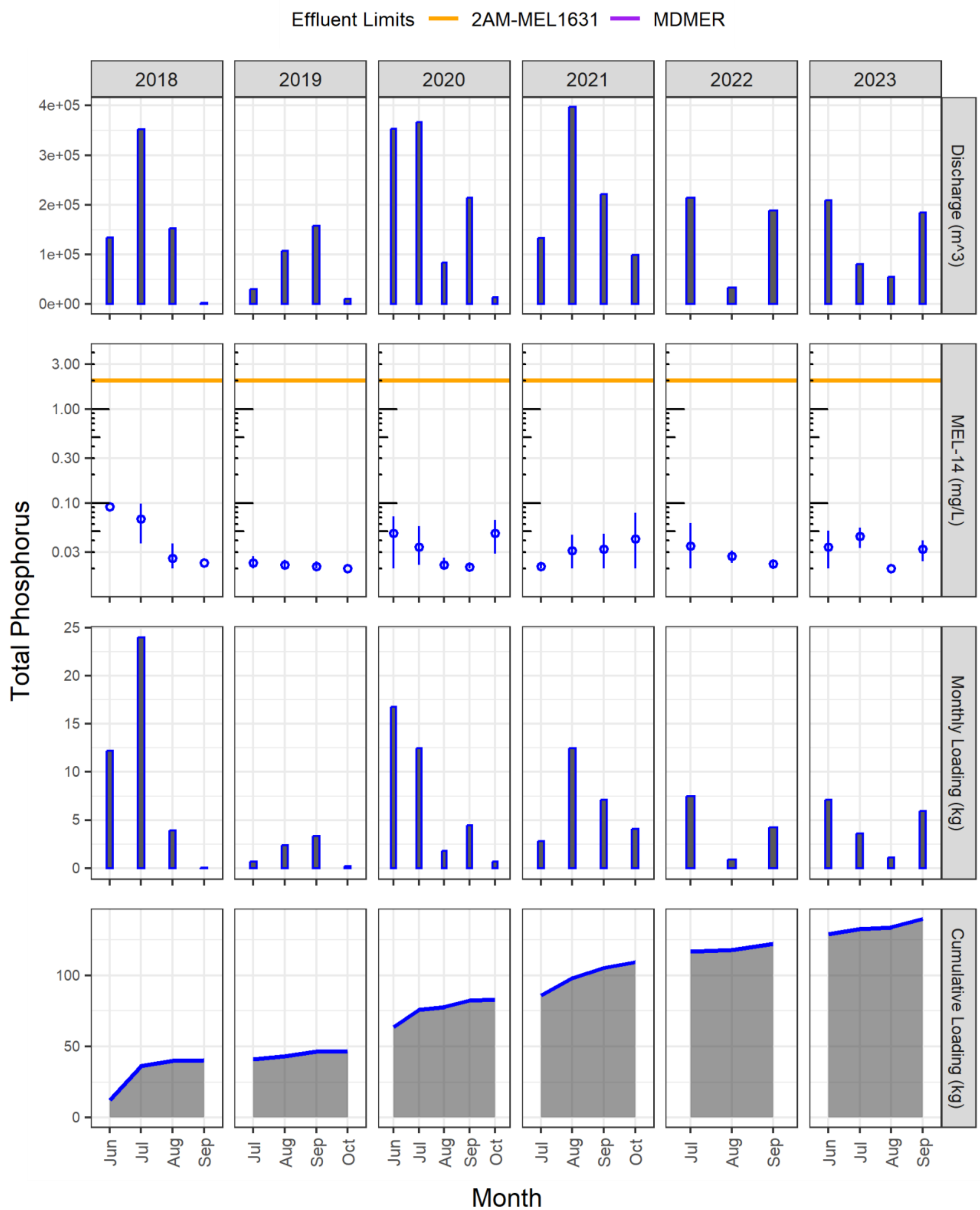


Figure B2-17. Orthophosphate

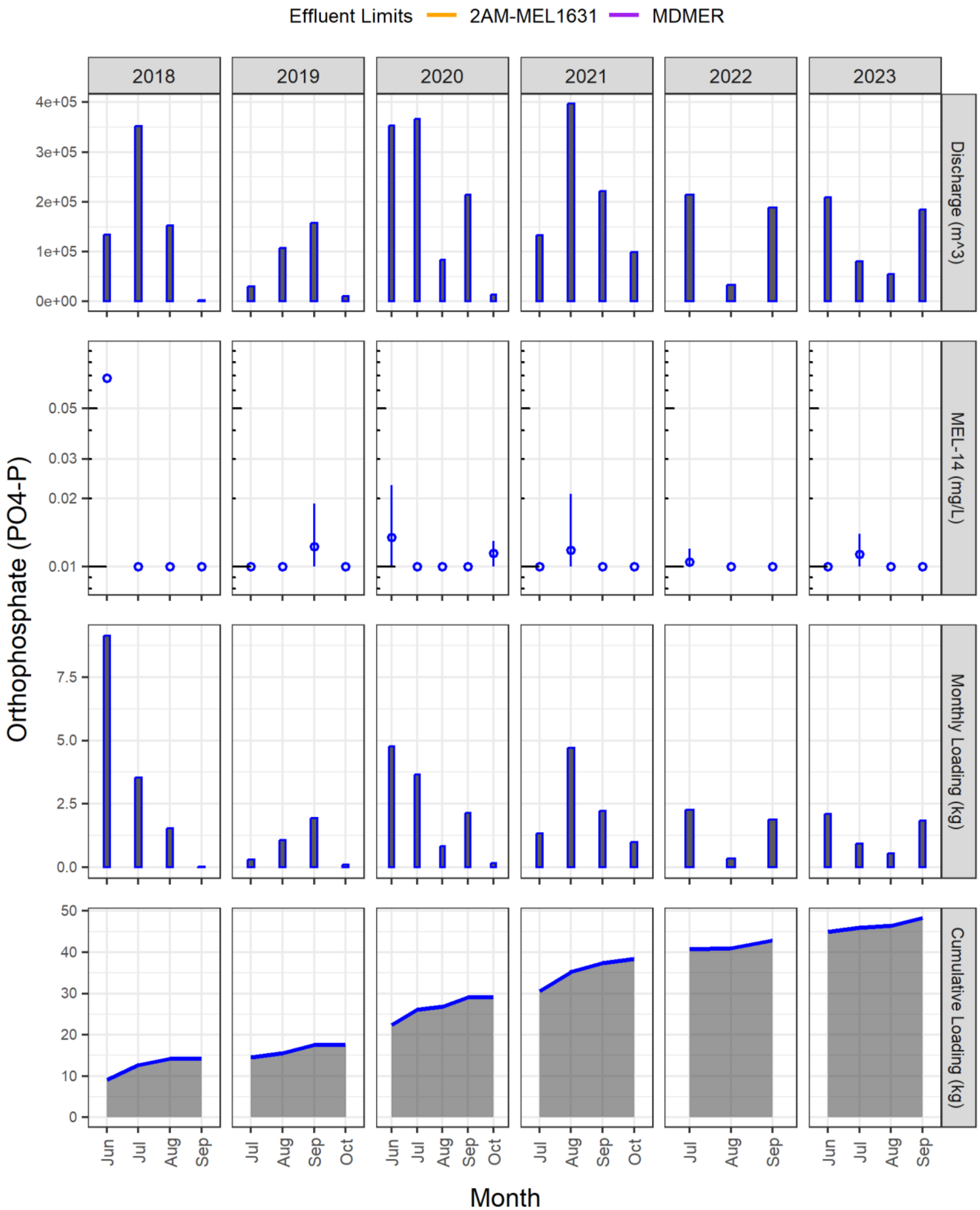


Figure B2-18. Total Organic Carbon (TOC)

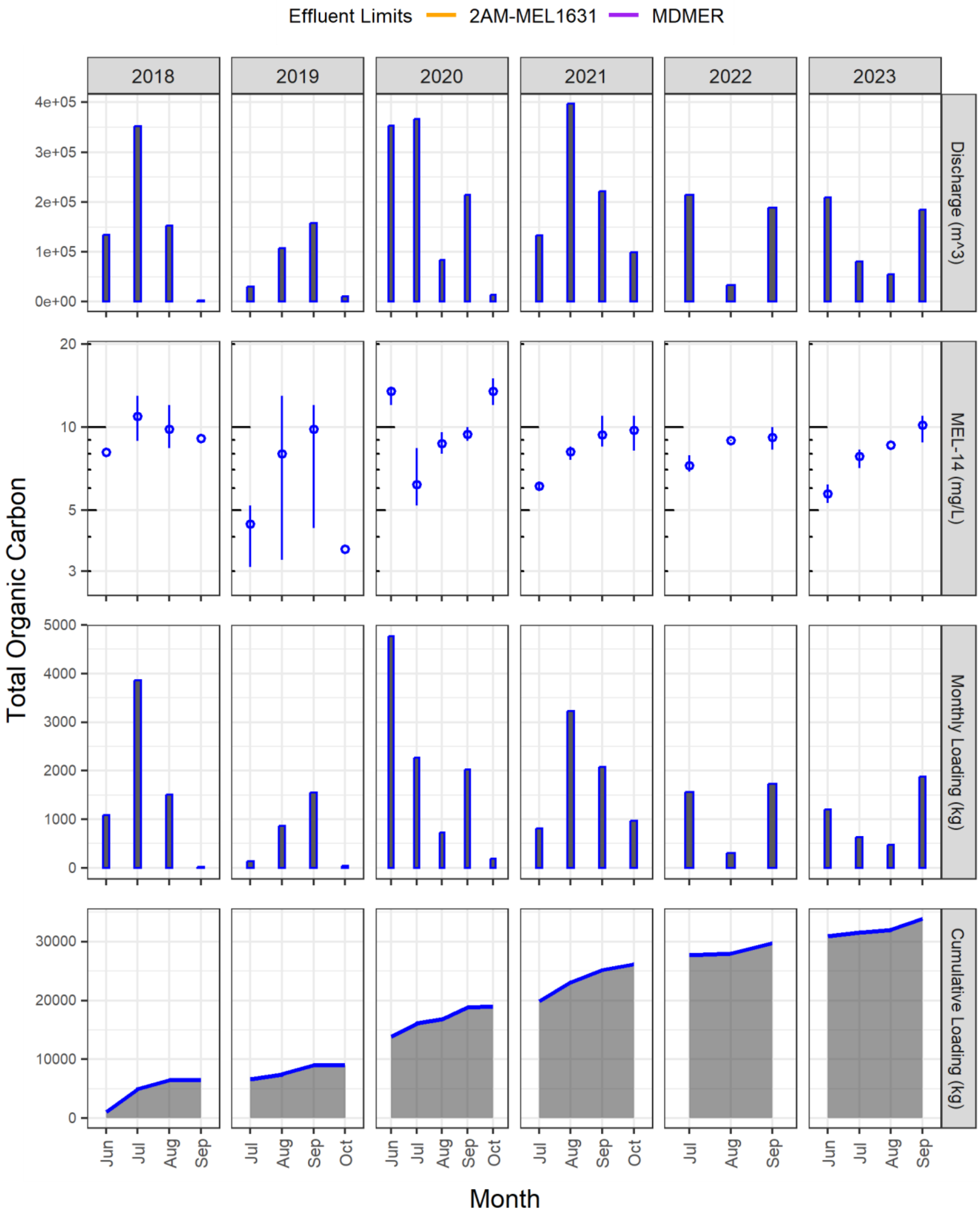


Figure B2-19. Aluminum

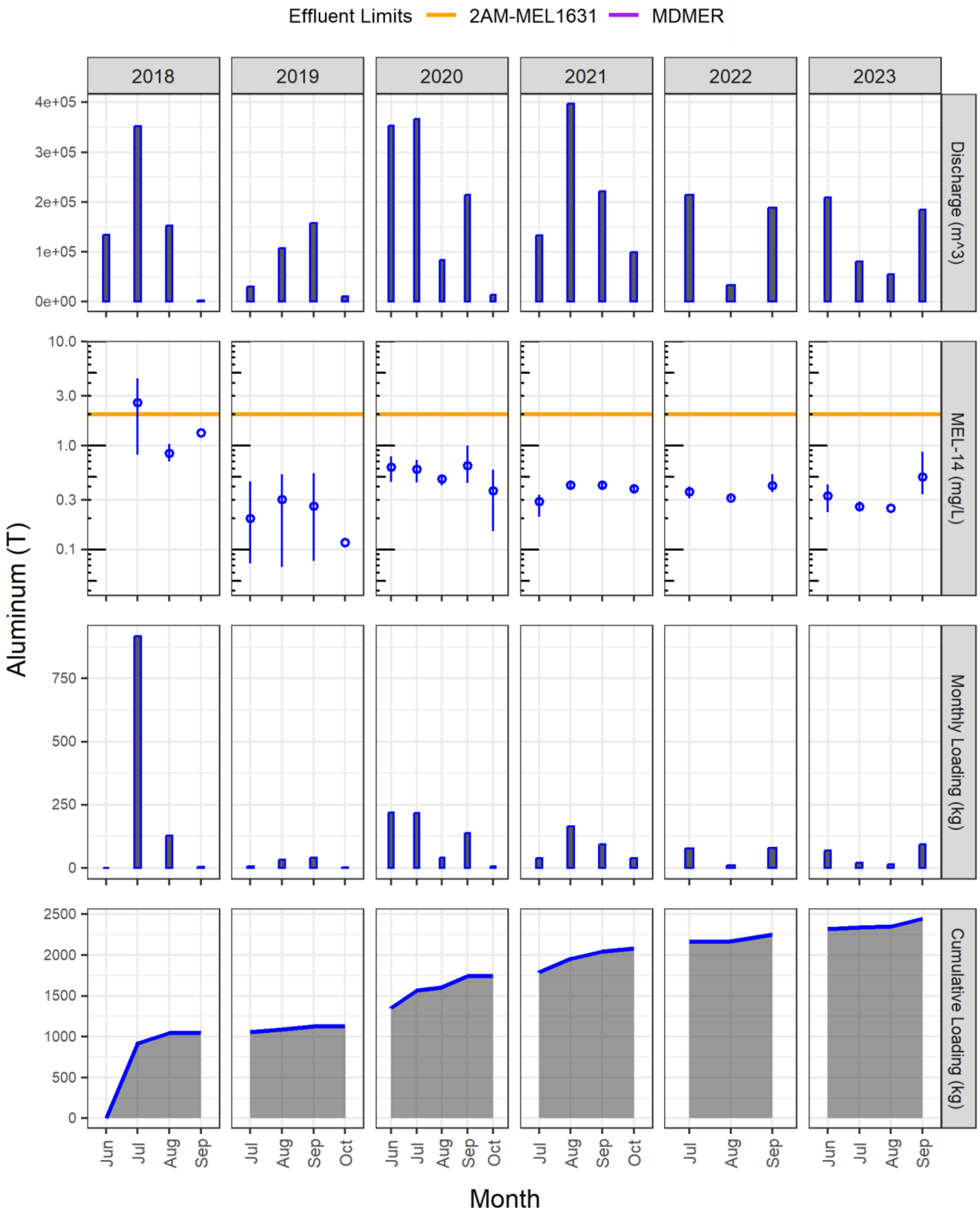


Figure B2-20. Arsenic

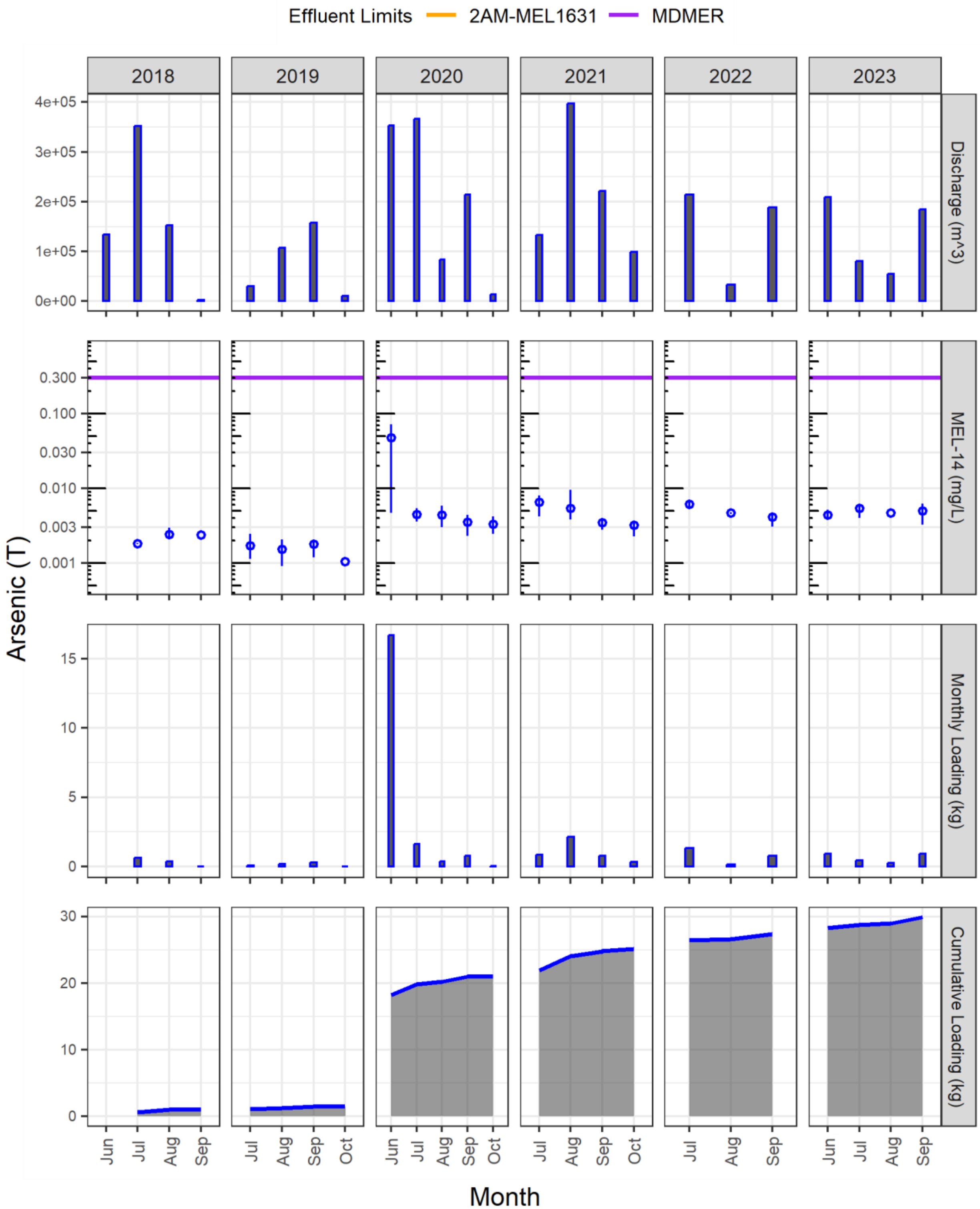


Figure B2-21. Barium

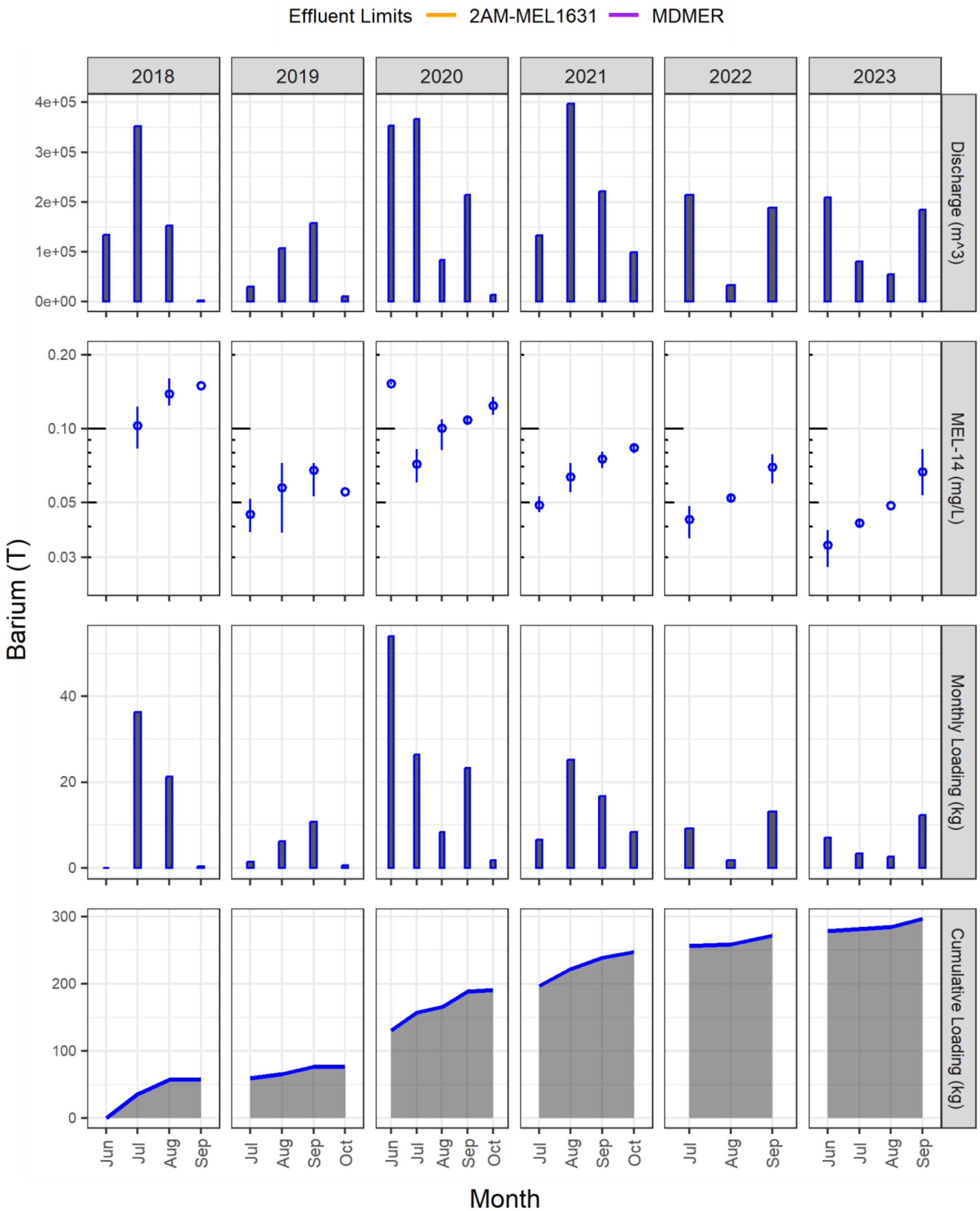


Figure B2-22. Beryllium

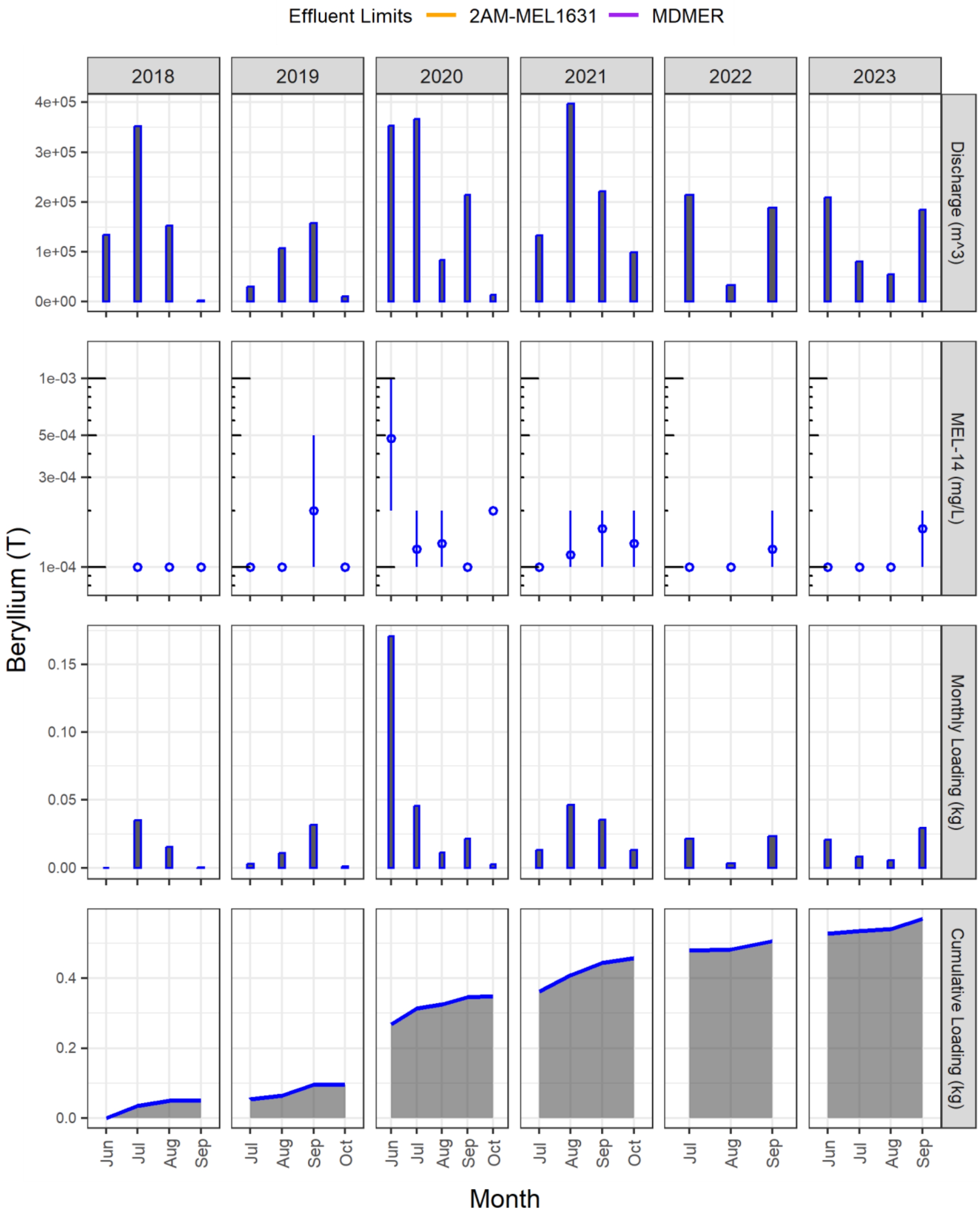


Figure B2-23. Bismuth

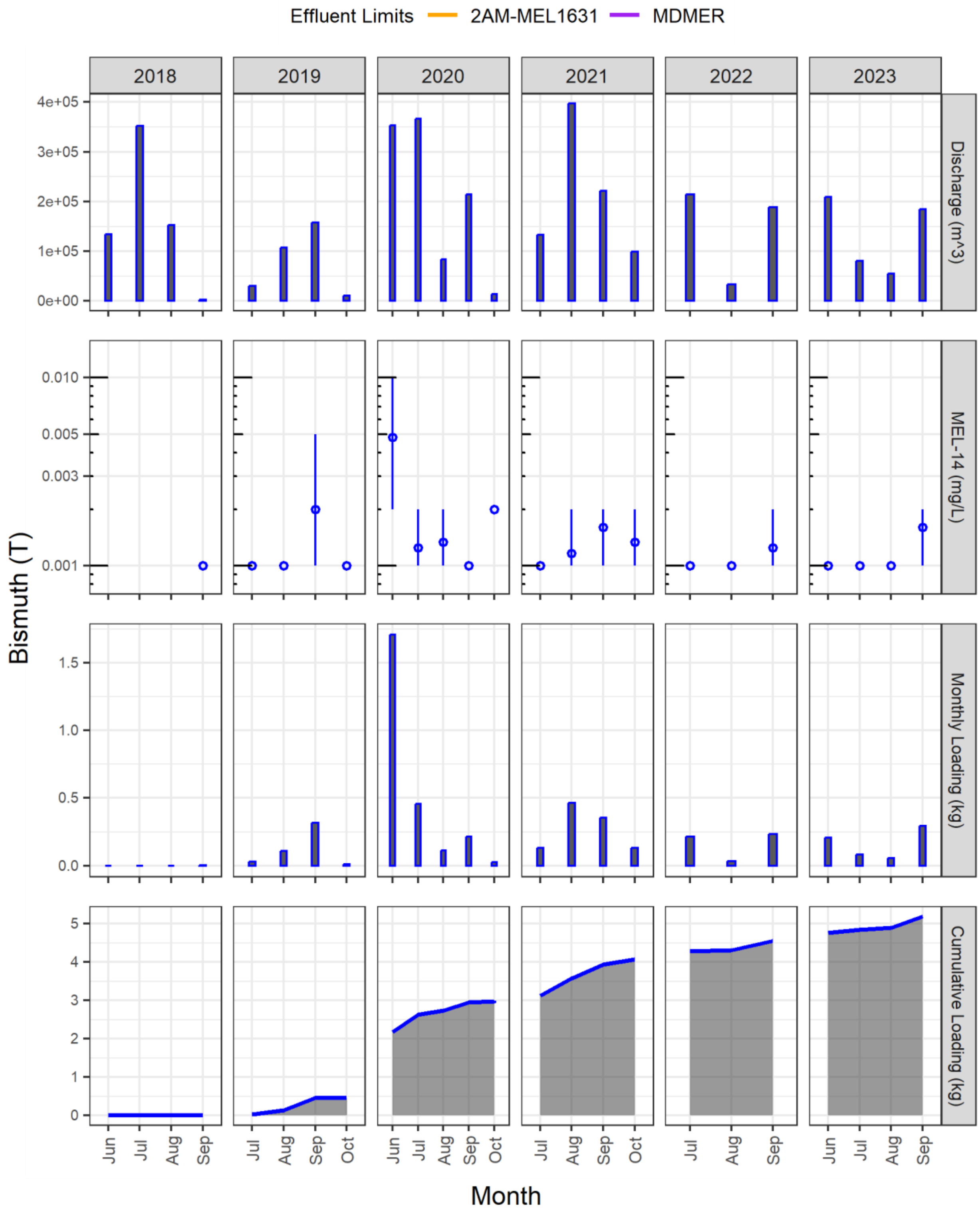


Figure B2-24. Boron

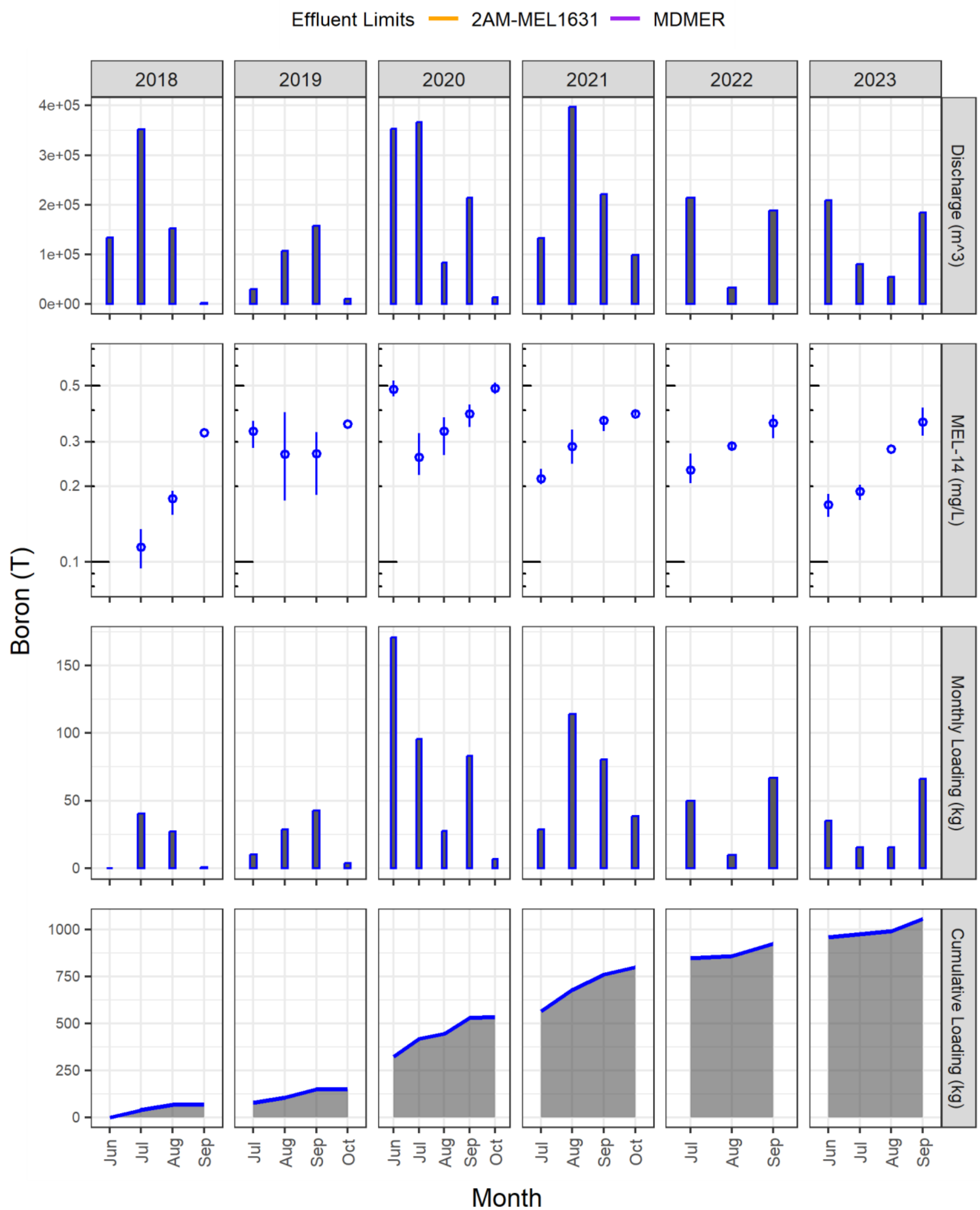


Figure B2-25. Cadmium

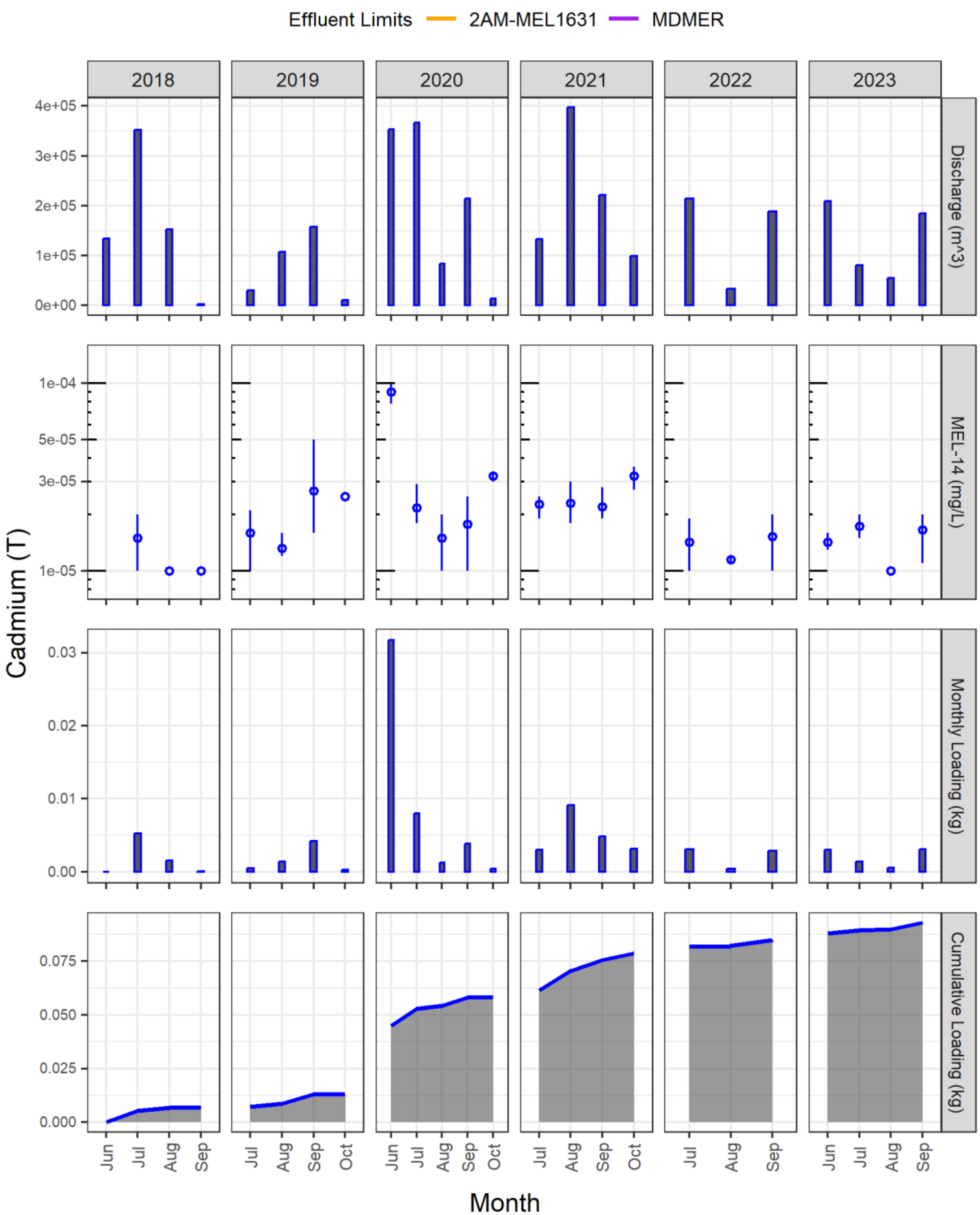


Figure B2-26. Chromium

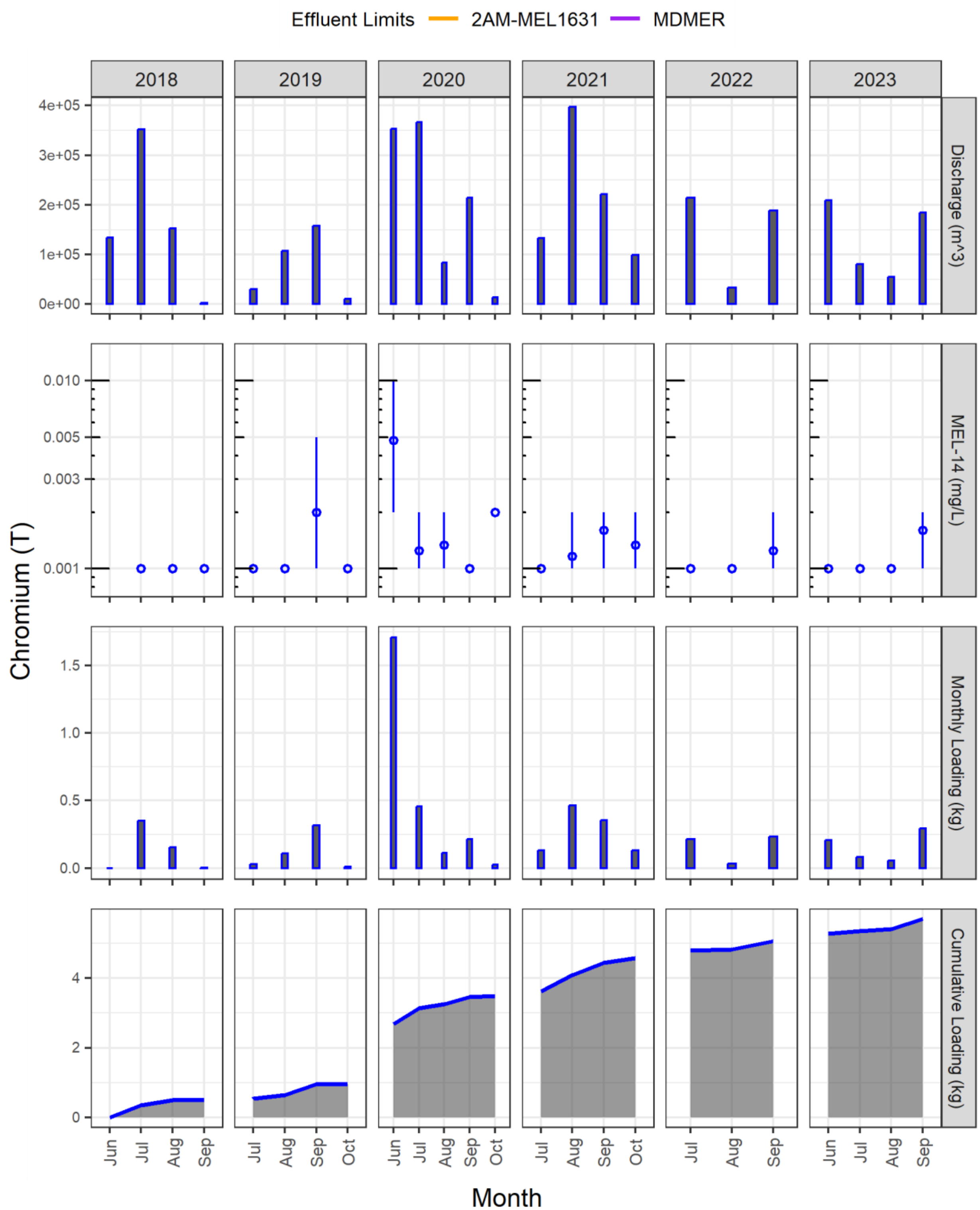


Figure B2-27. Cobalt

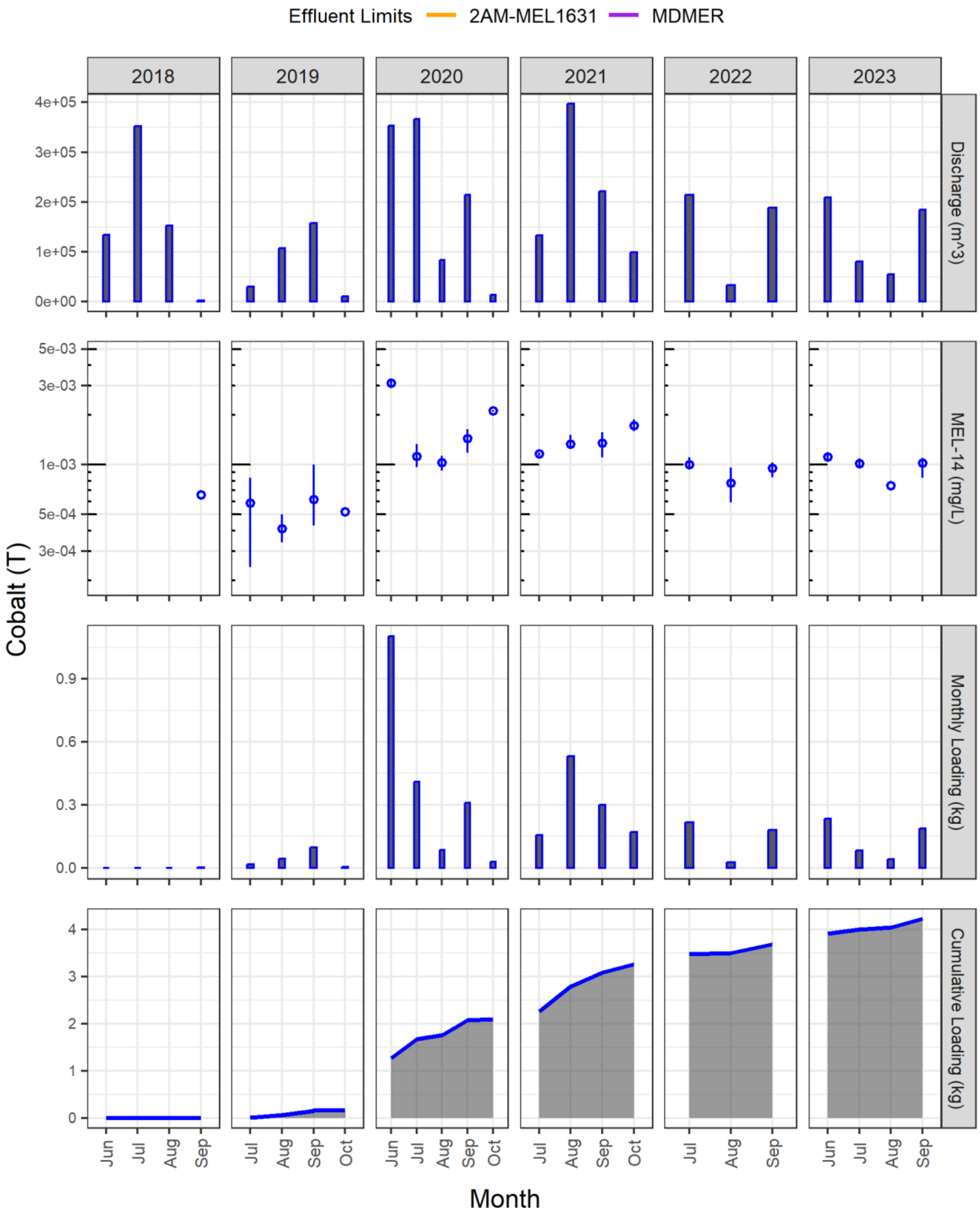


Figure B2-28. Copper

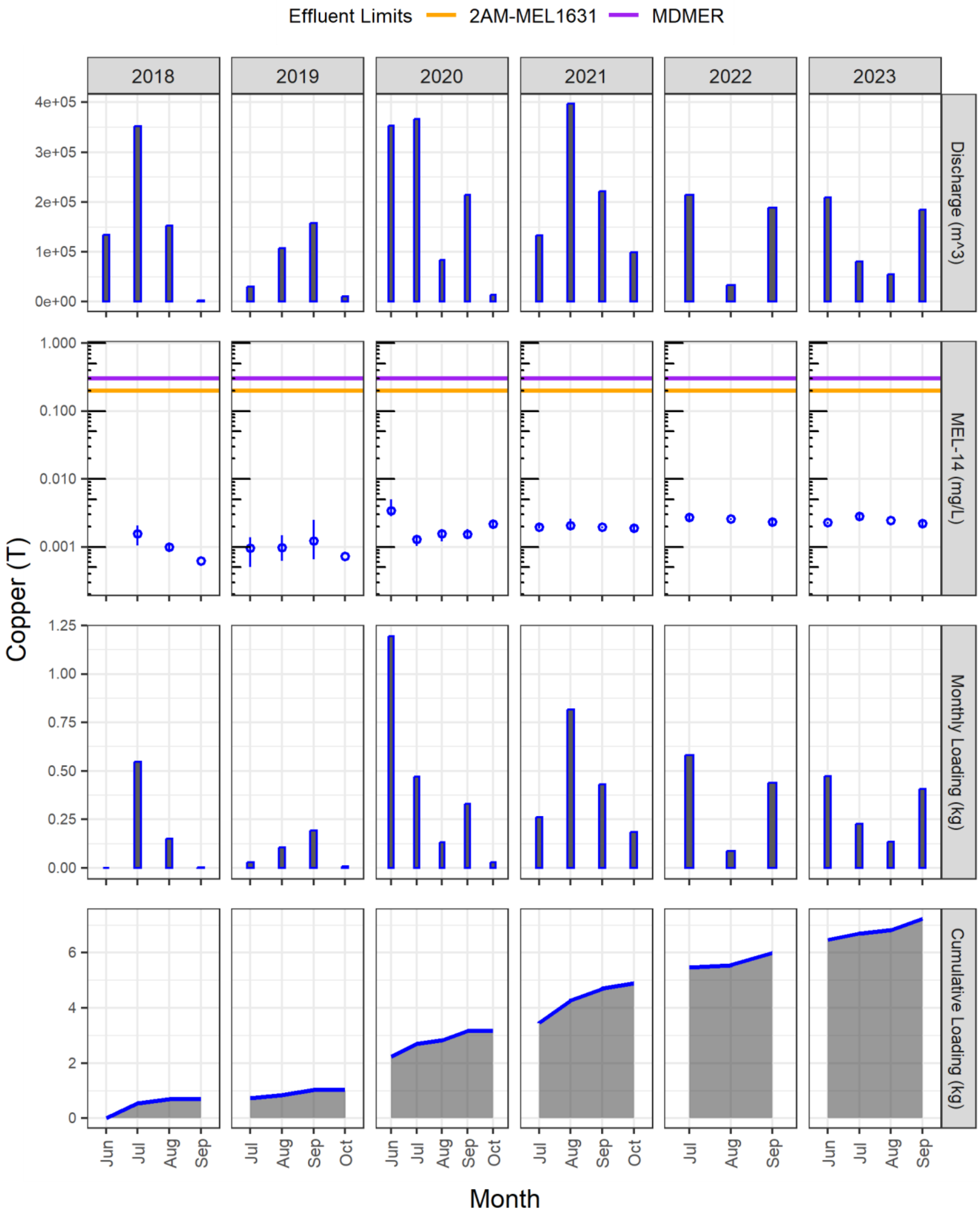


Figure B2-29. Iron

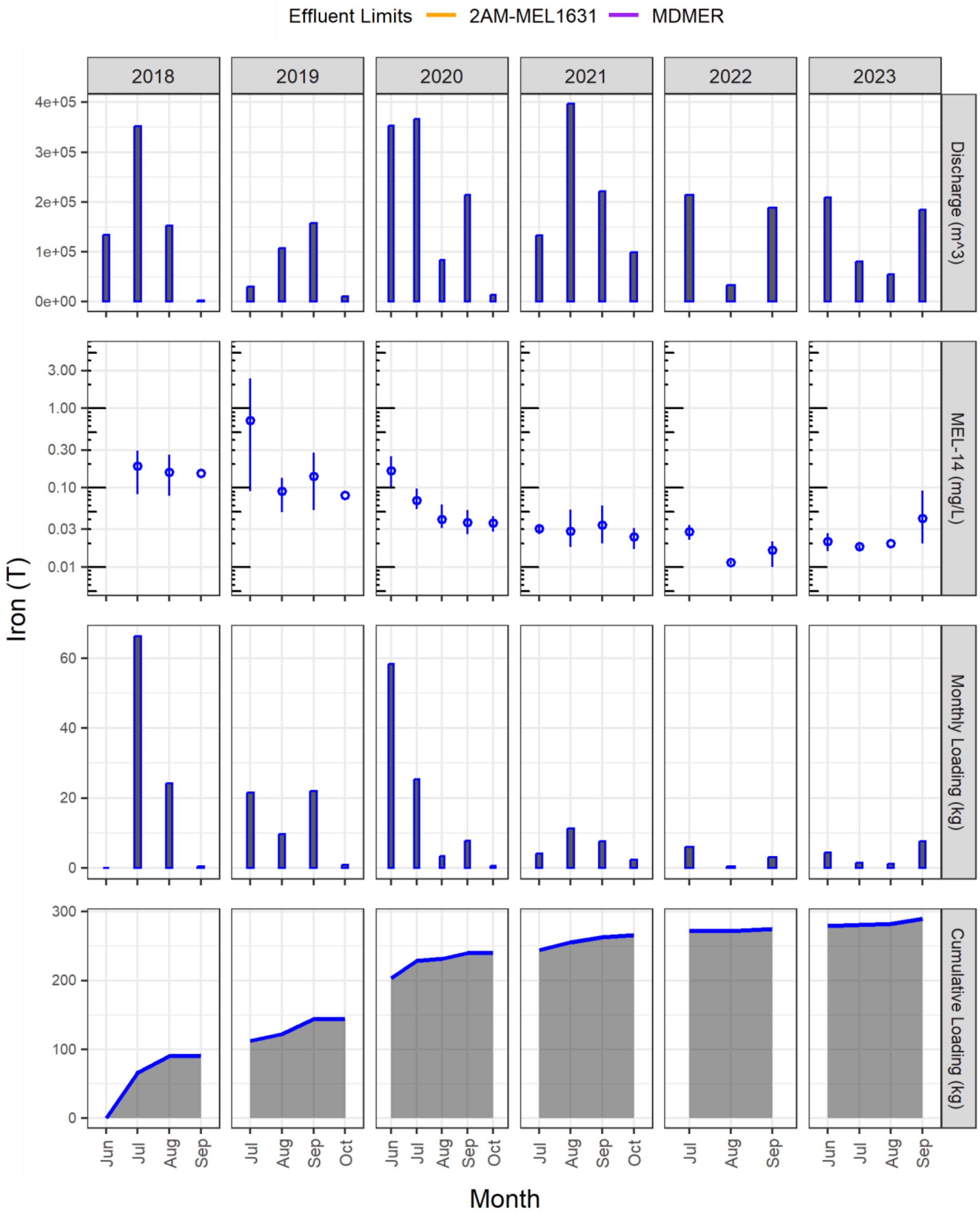


Figure B2-30. Lead

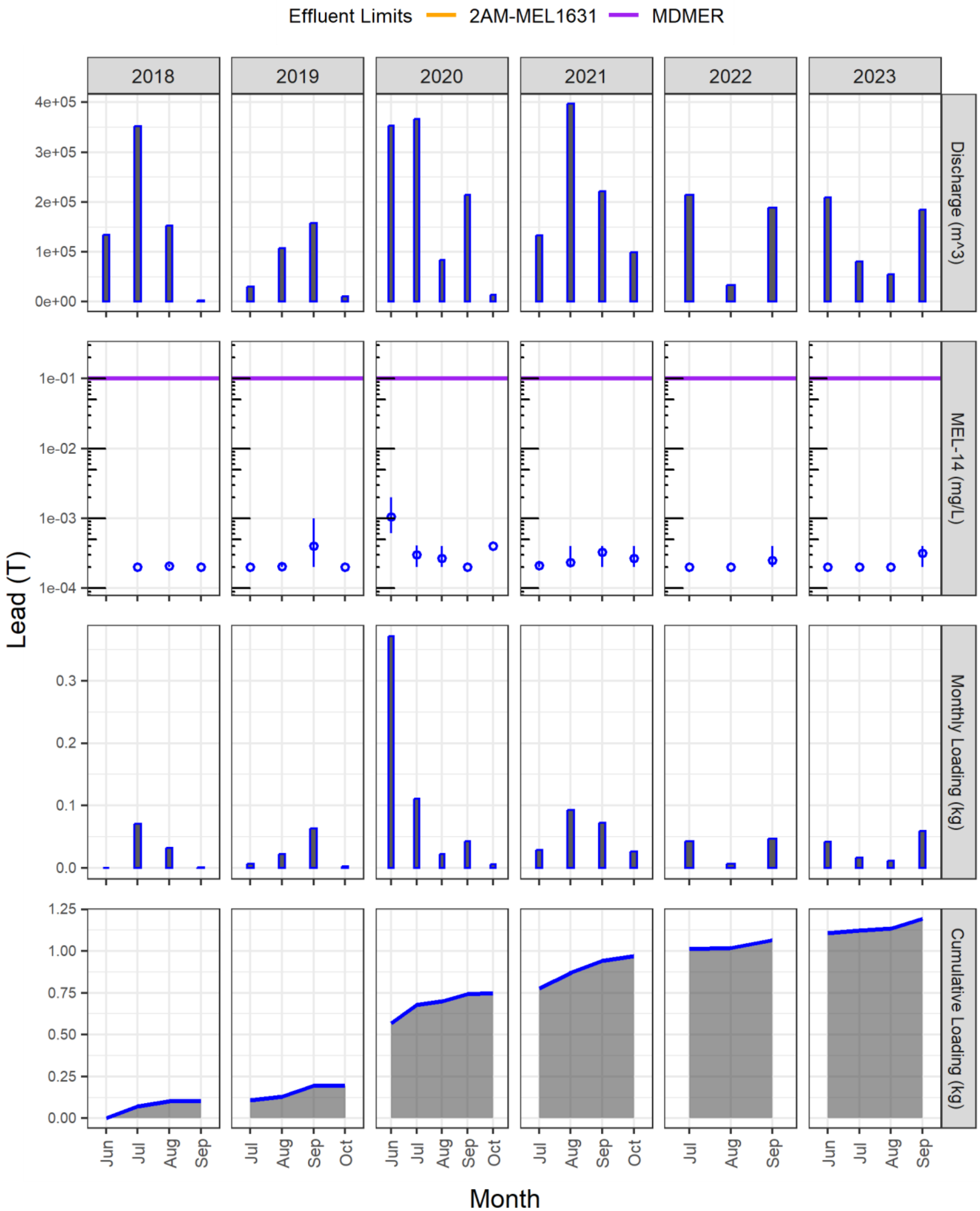


Figure B2-31. Lithium

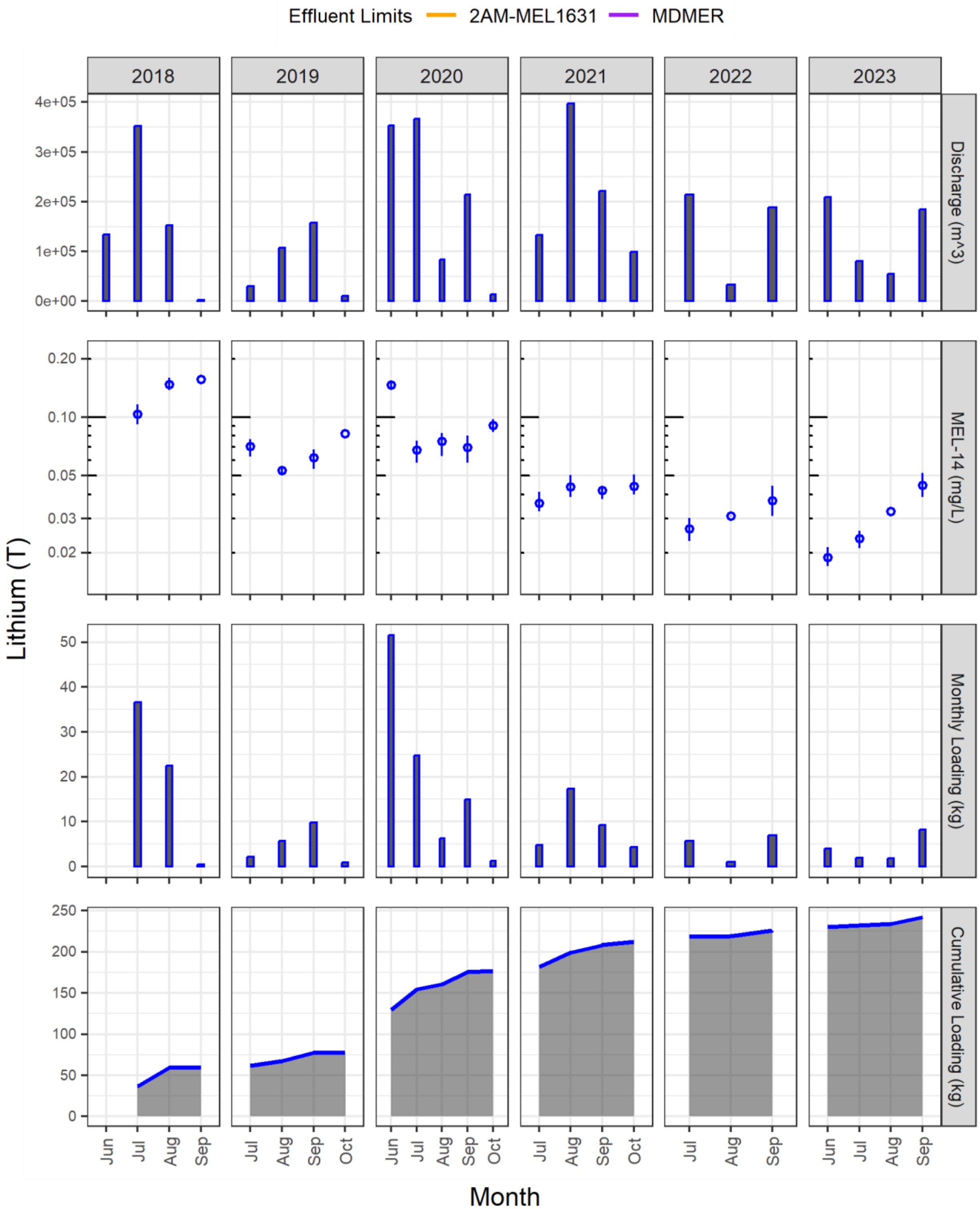


Figure B2-32. Manganese

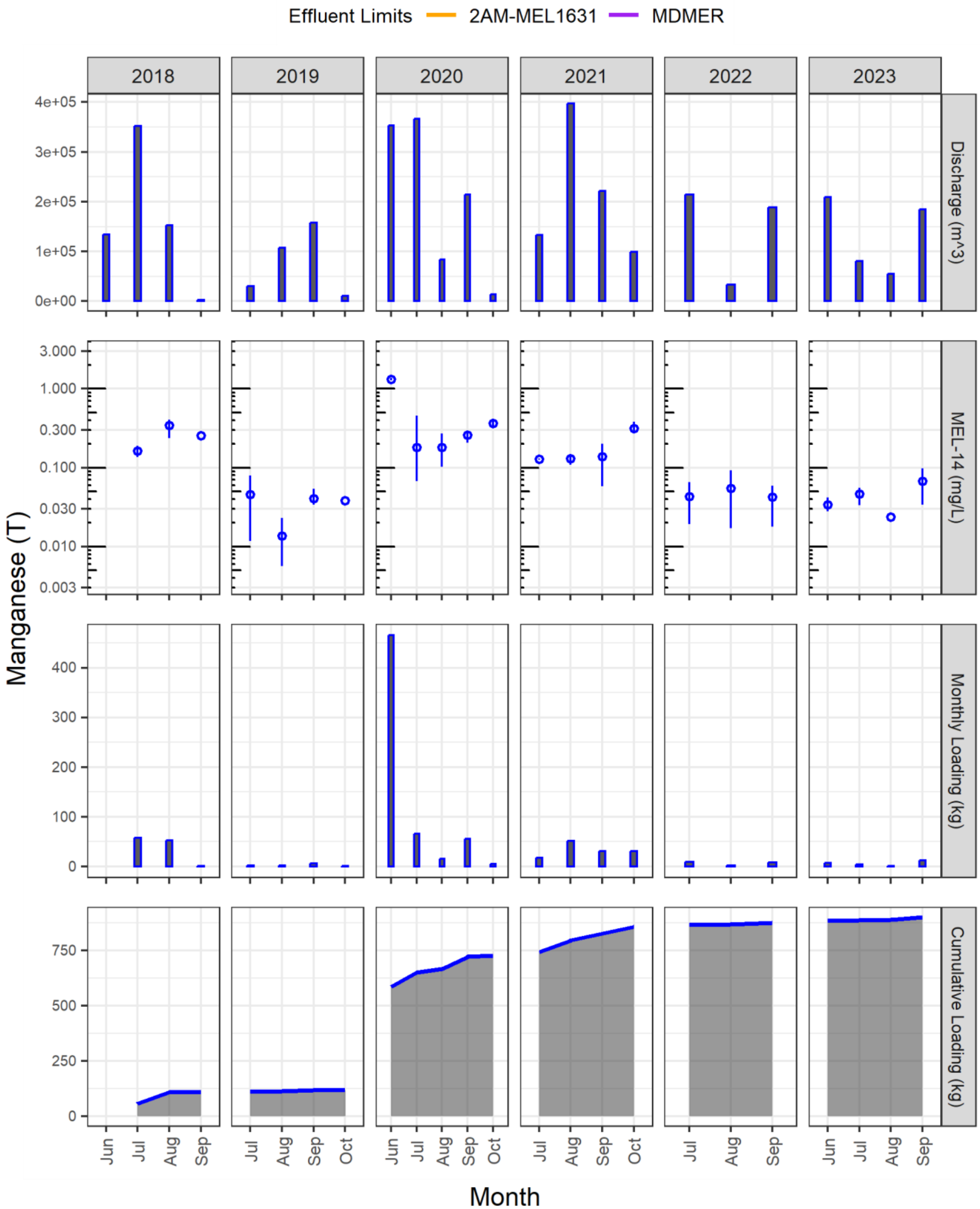


Figure B2-33. Mercury

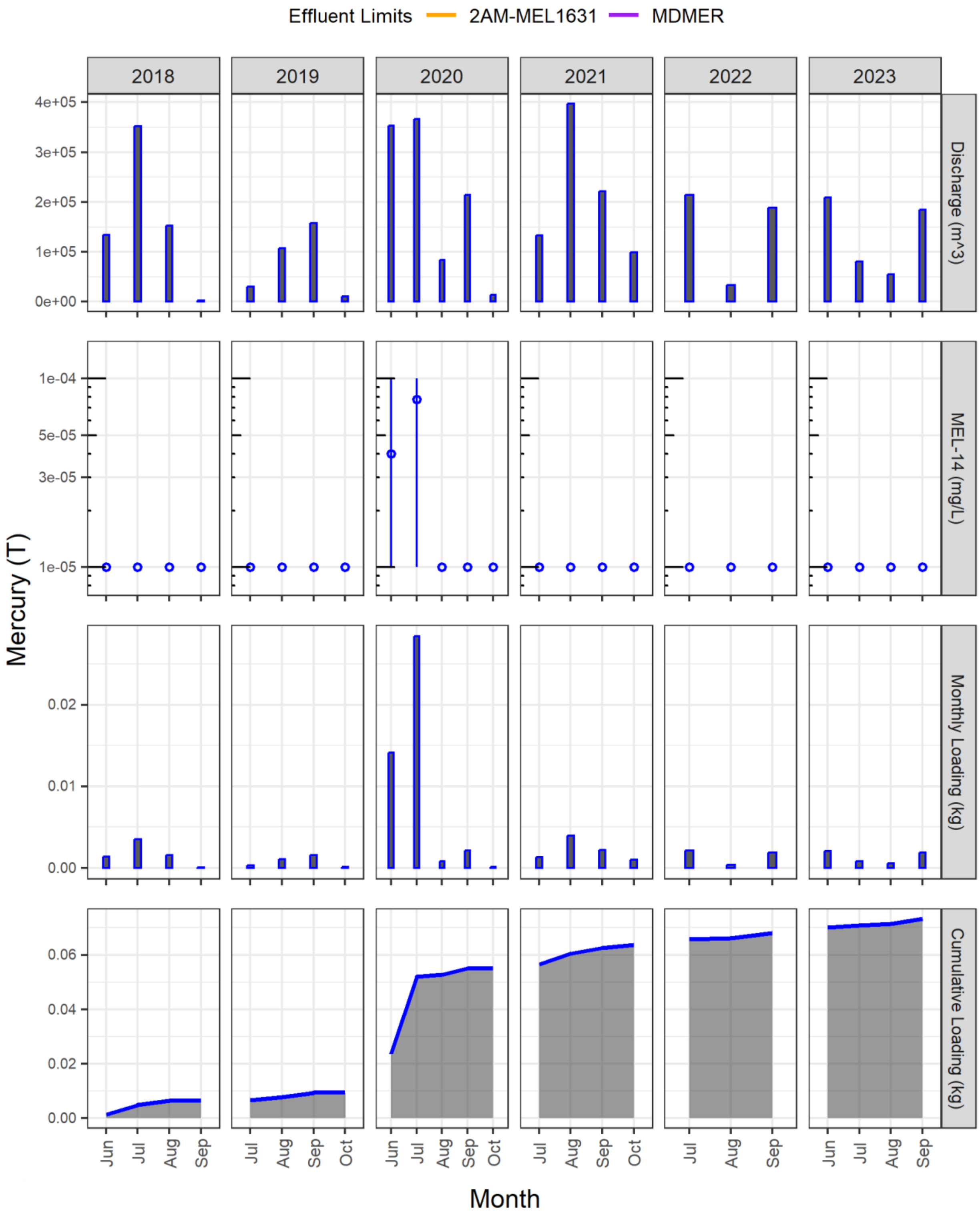


Figure B2-34. Molybdenum

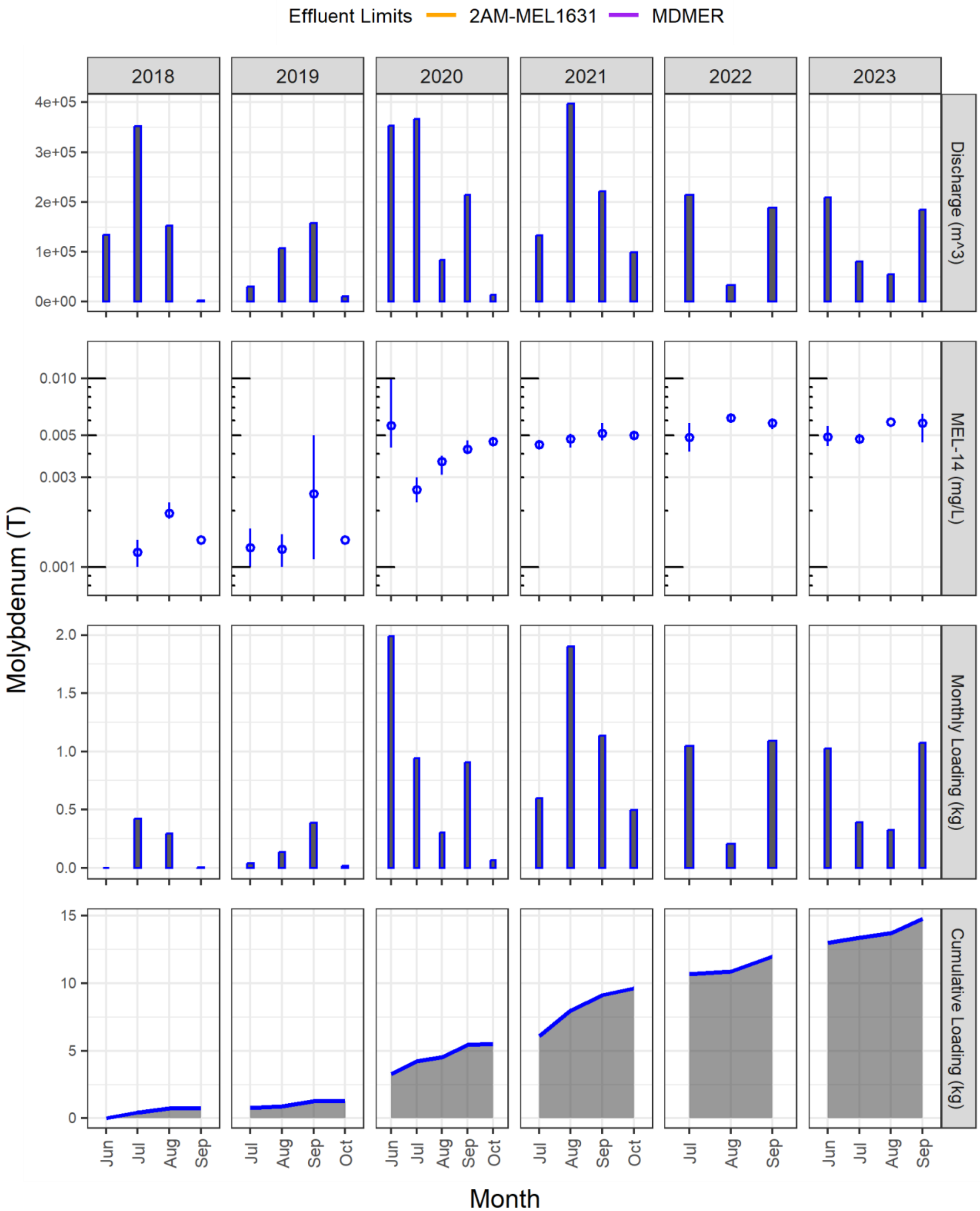


Figure B2-35. Nickel

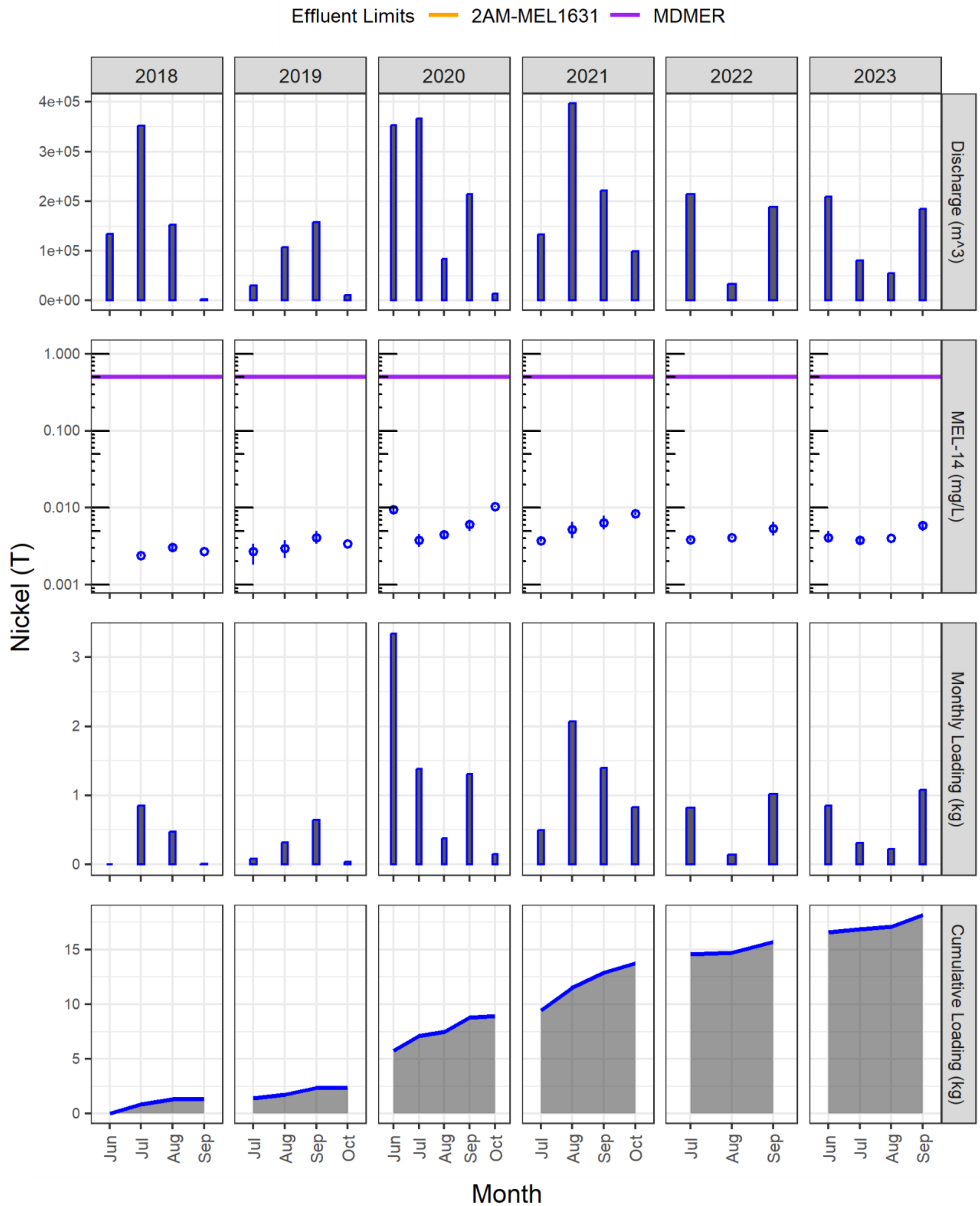


Figure B2-36. Selenium

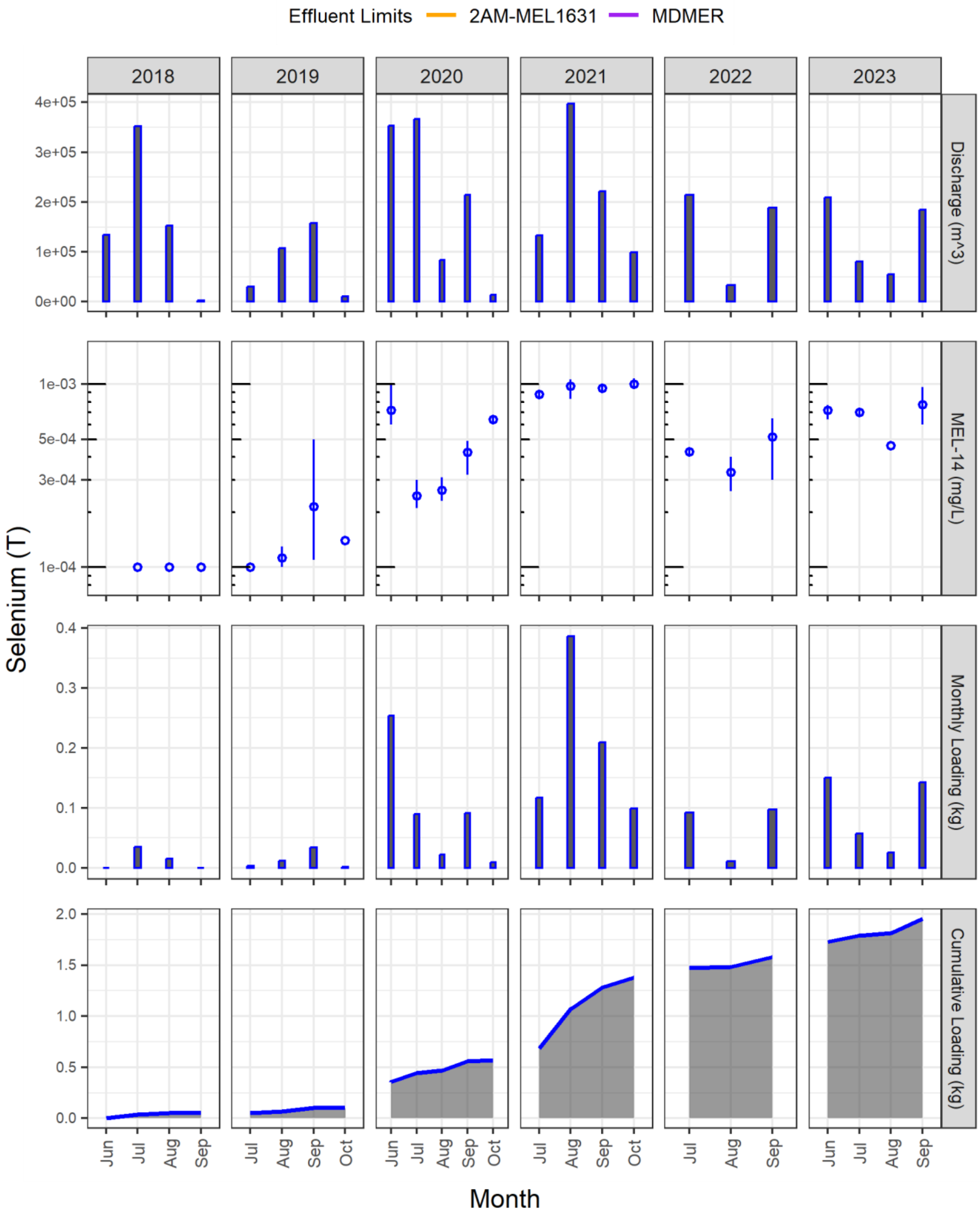


Figure B2-37. Silicon

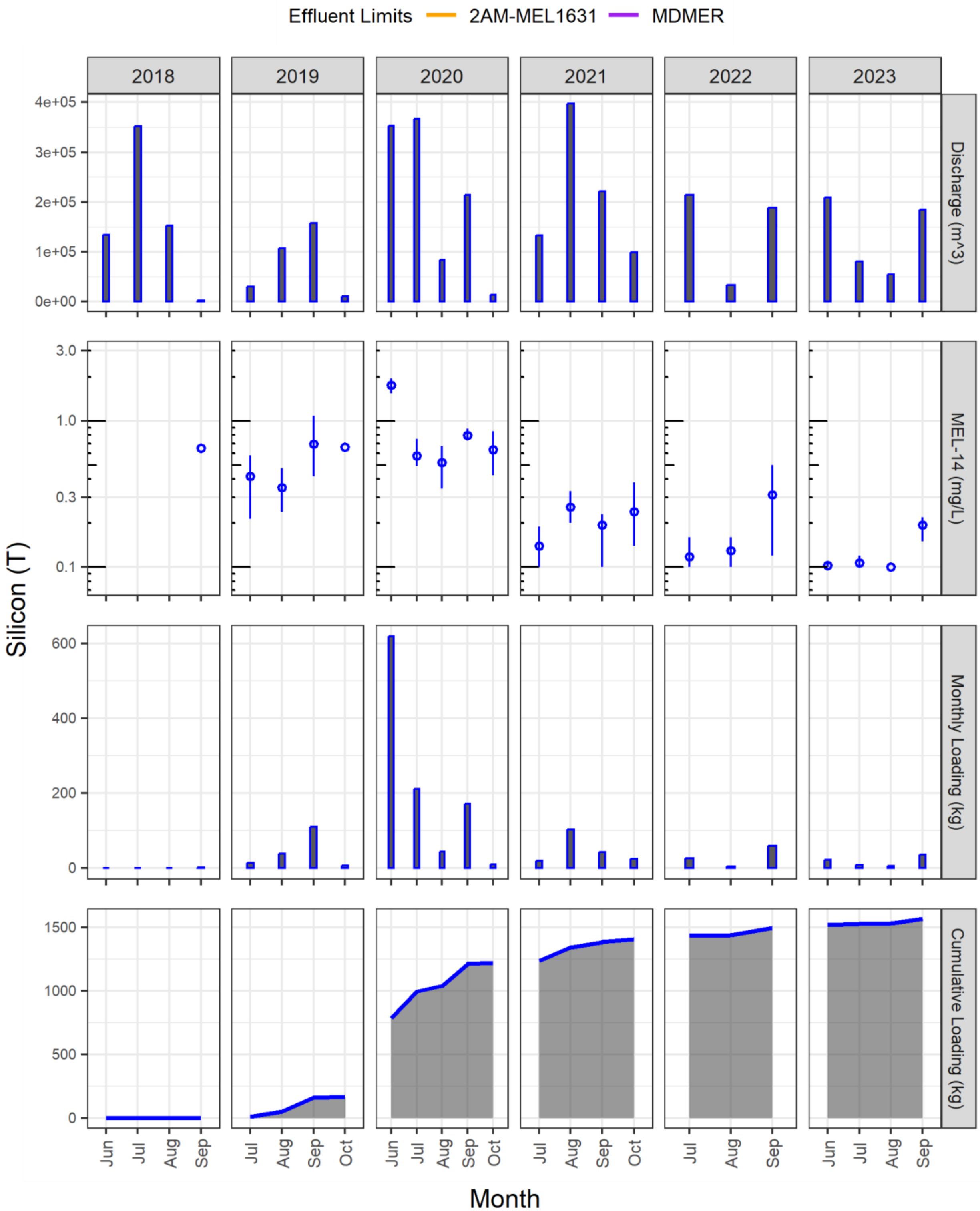


Figure B2-38. Silver

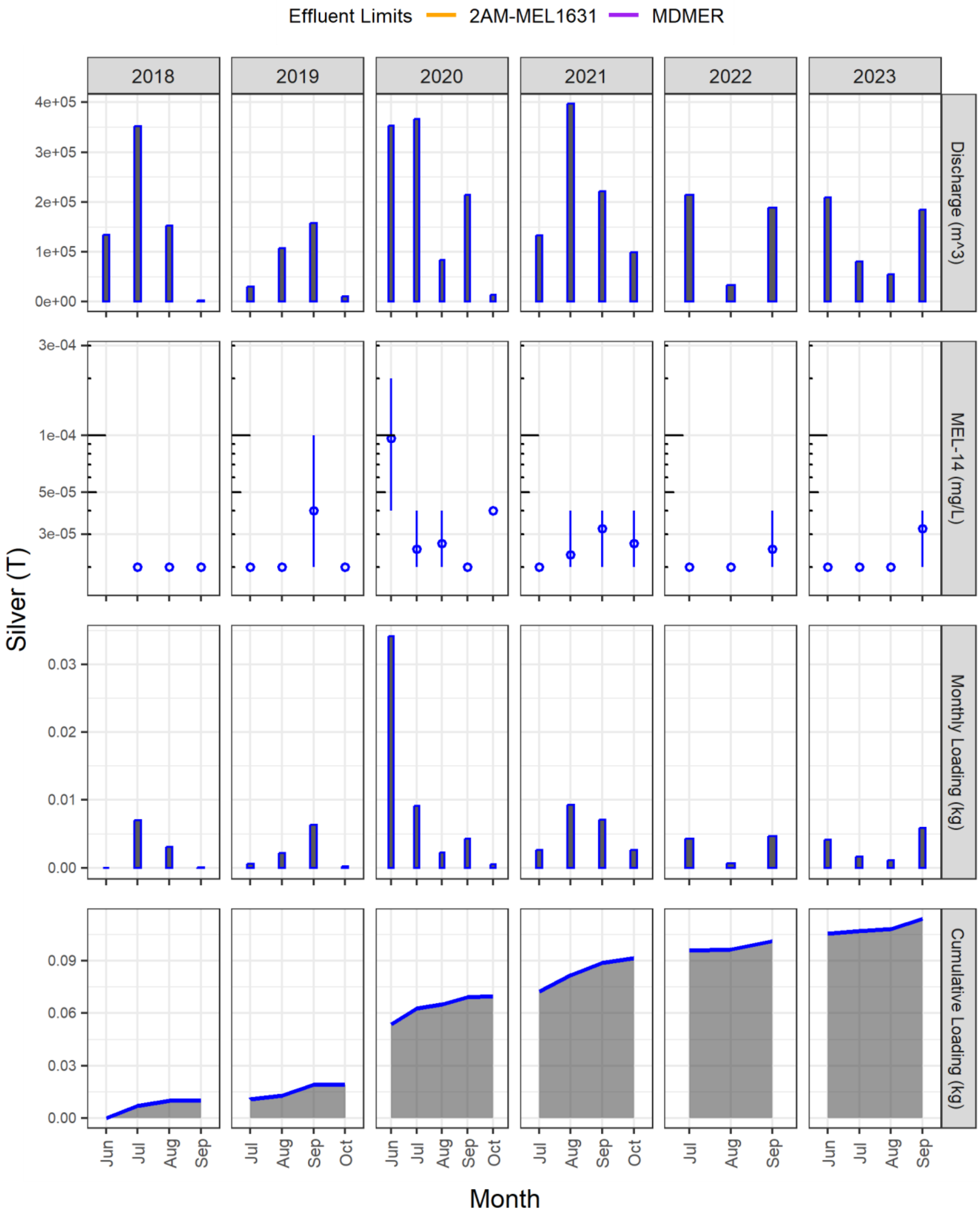


Figure B2-39. Strontium

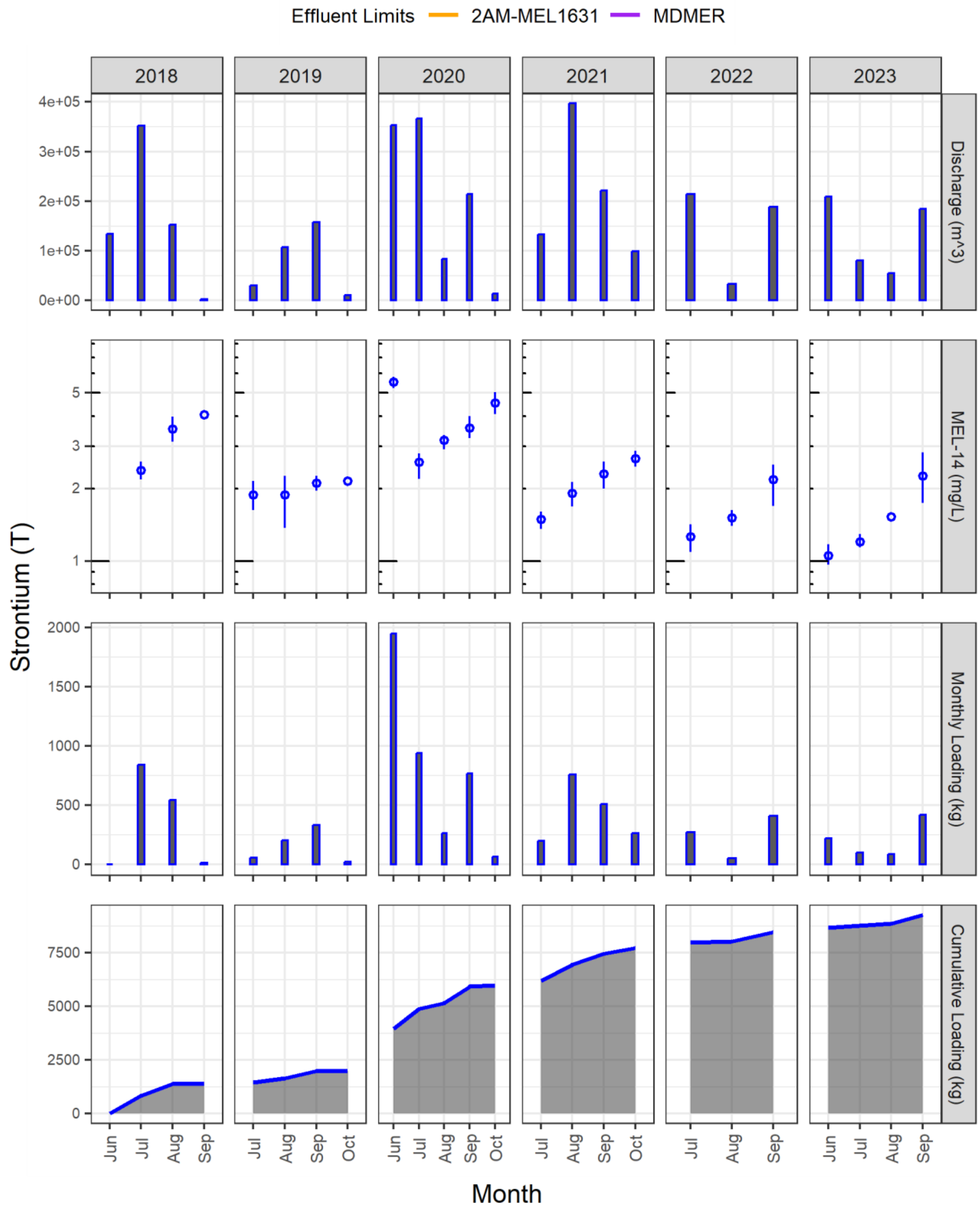


Figure B2-40. Thallium

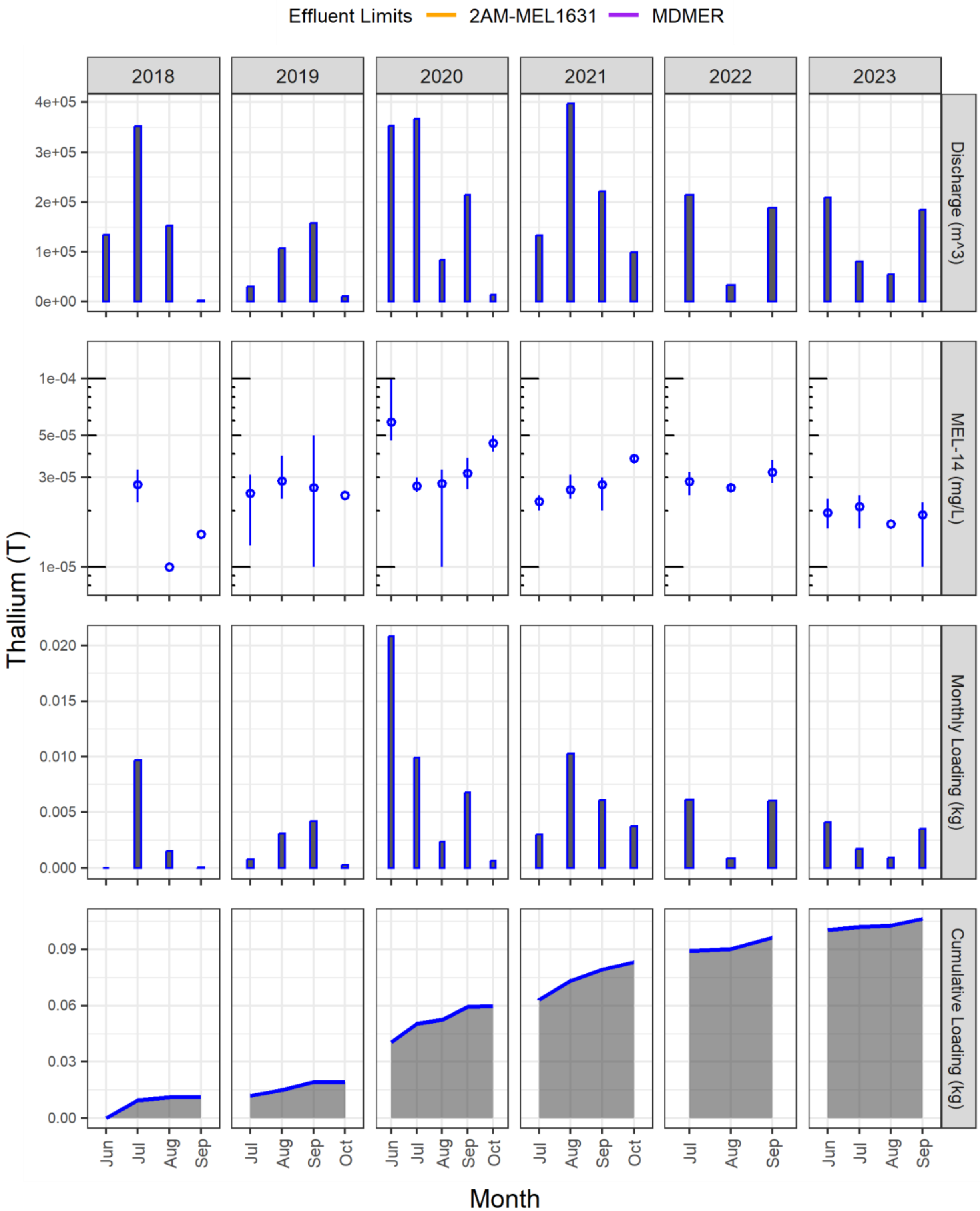


Figure B2-41. Tin

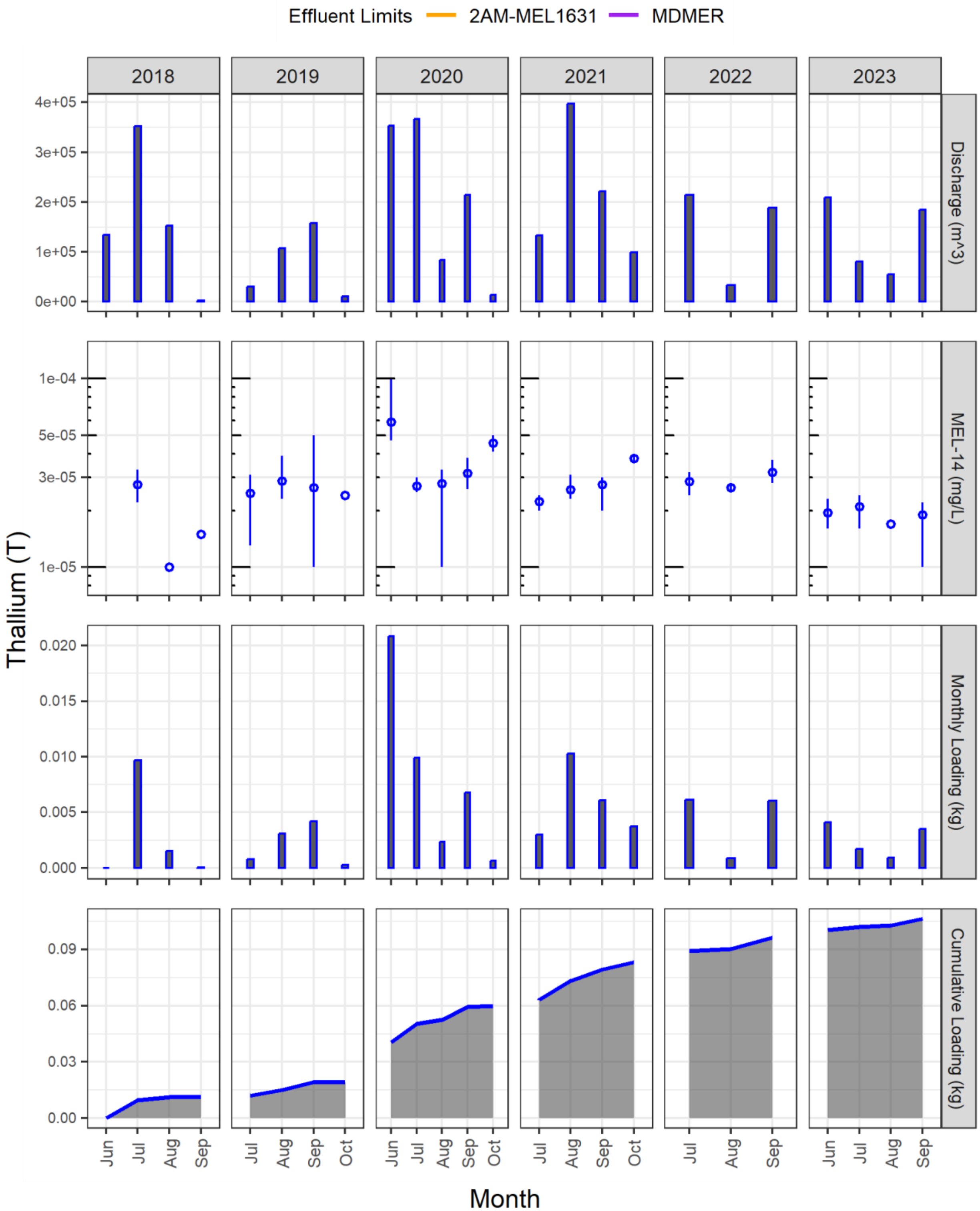


Figure B2-42. Titanium

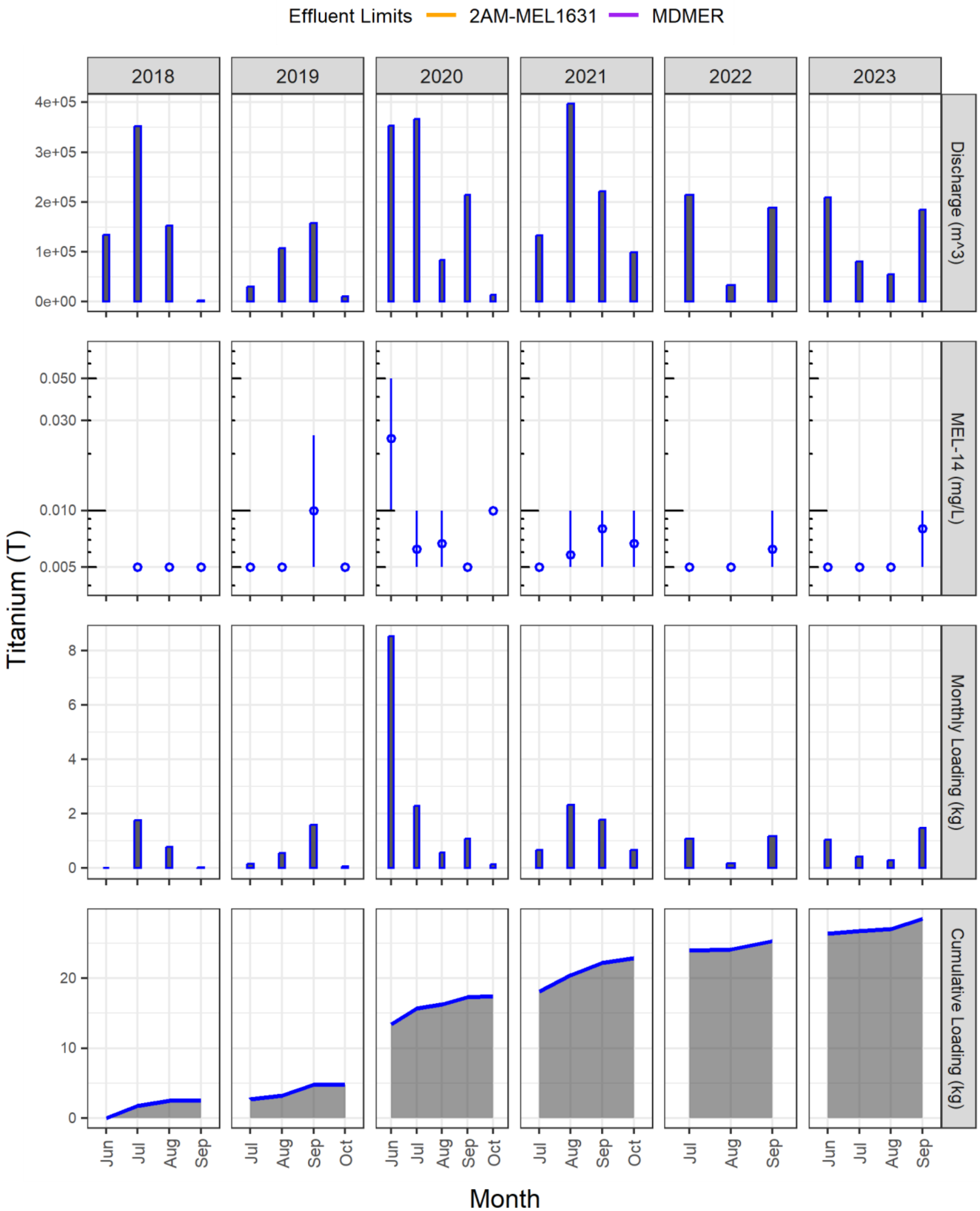


Figure B2-43. Uranium

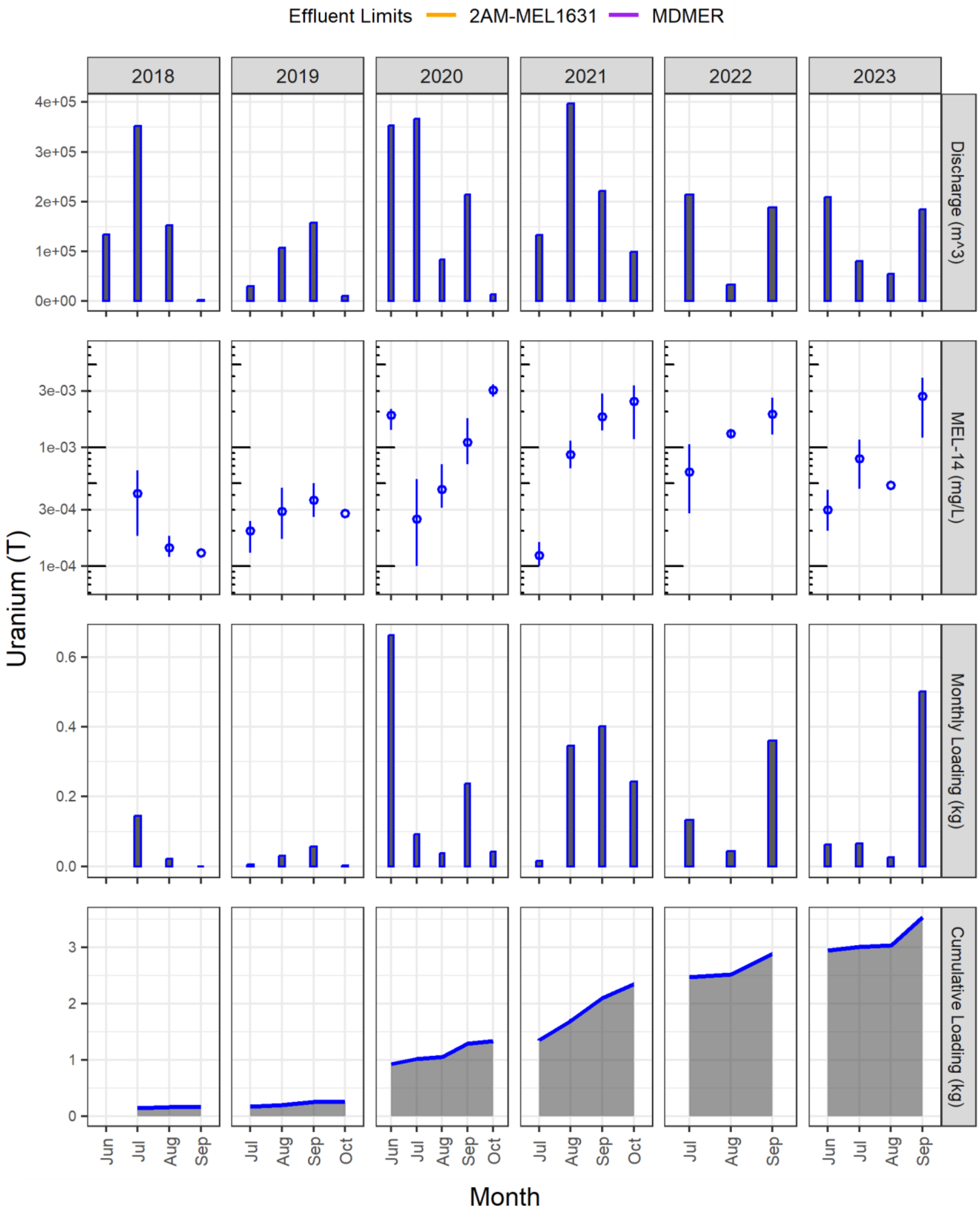


Figure B2-44. Vanadium

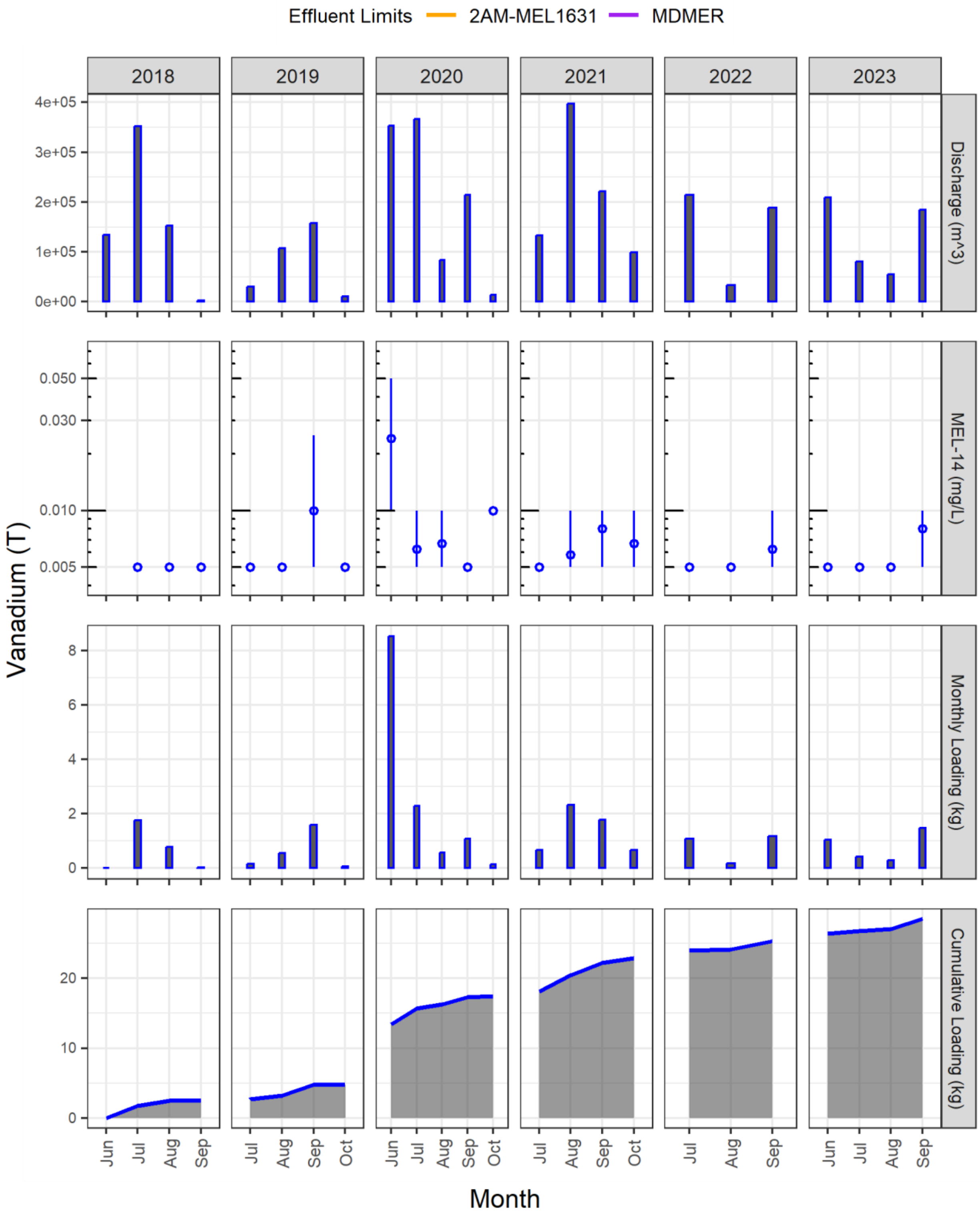


Figure B2-45. Zinc

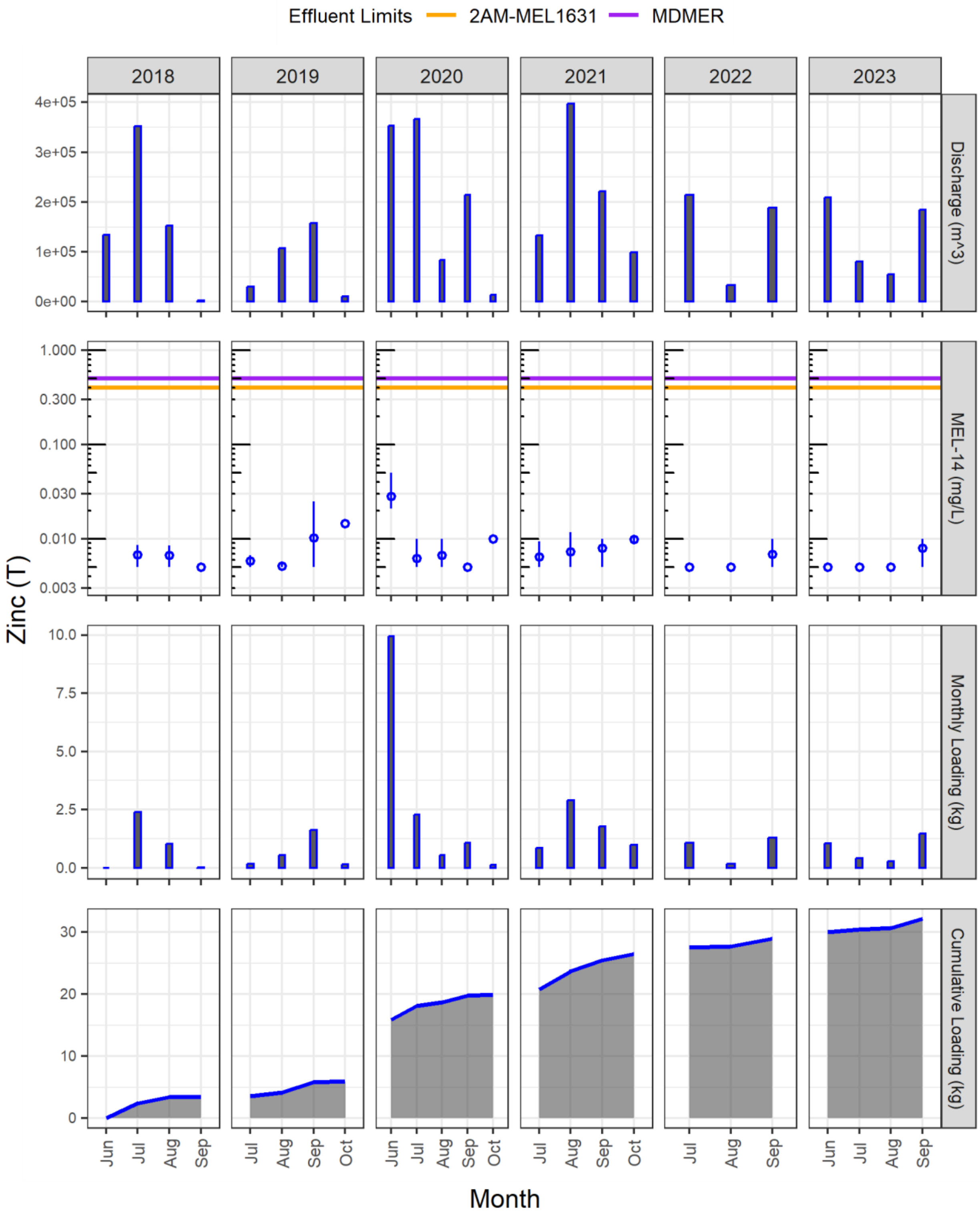


Figure B2-46. Zirconium

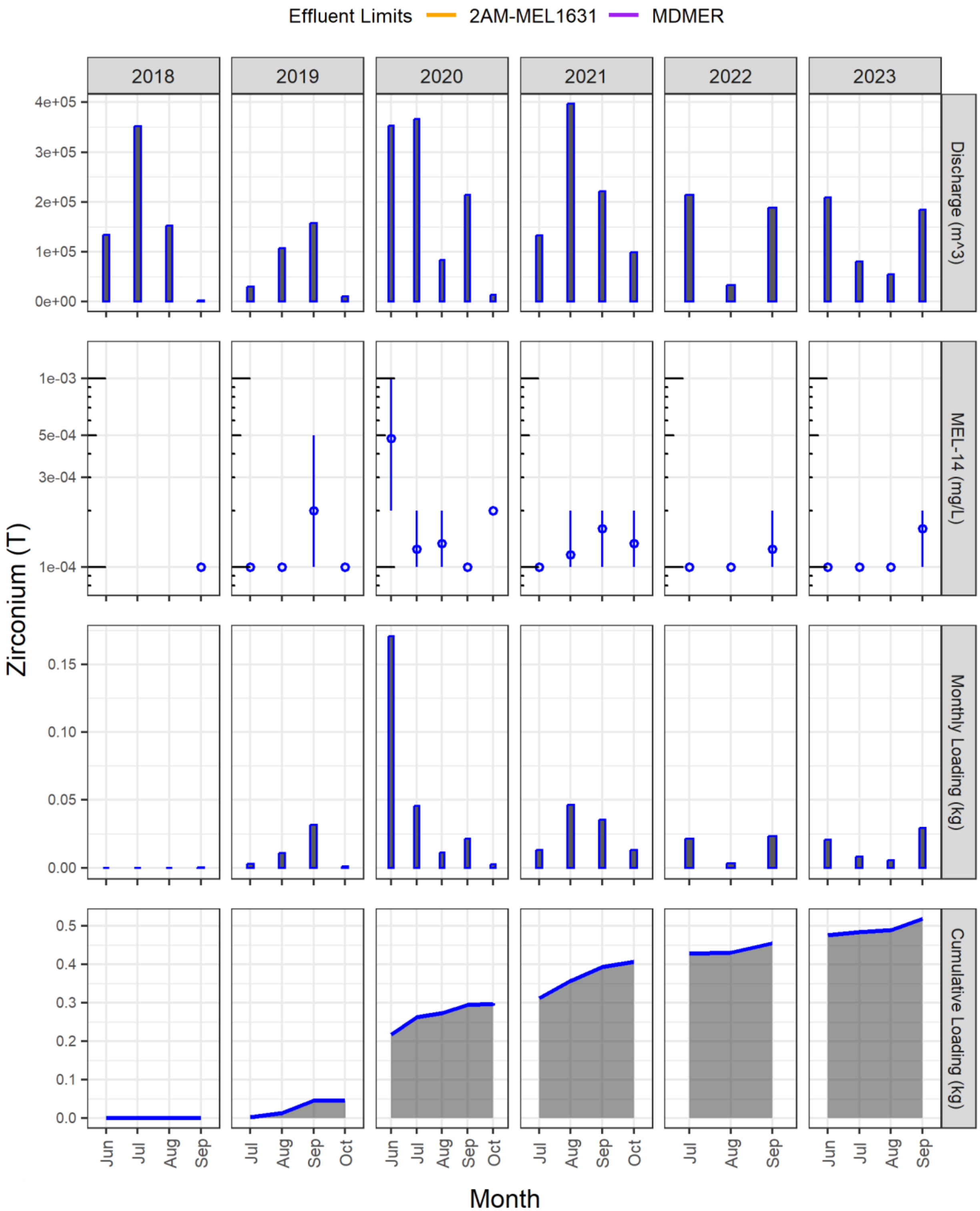


Figure B2-47. Cyanide (Free)

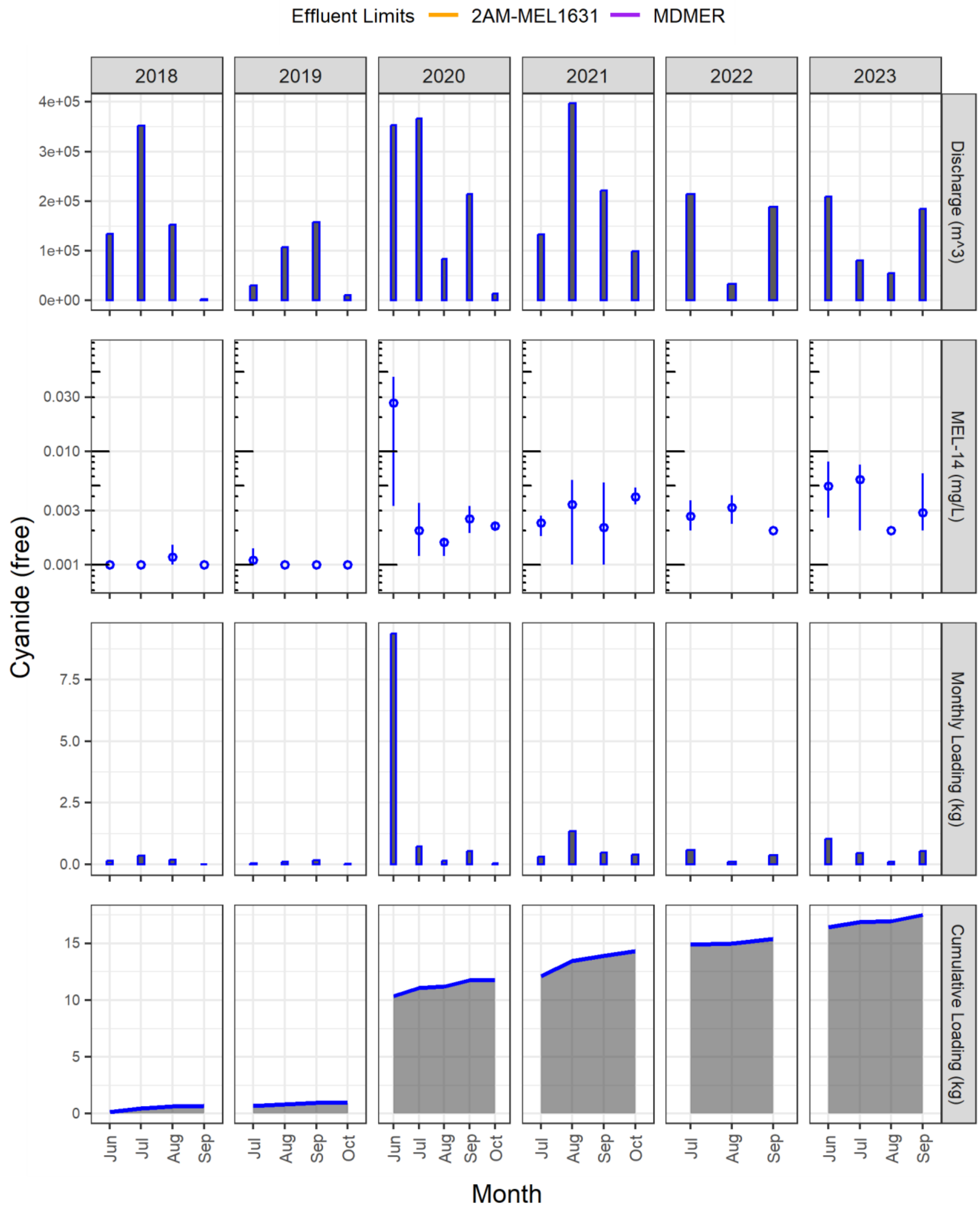


Figure B2-48. Cyanide (Total)

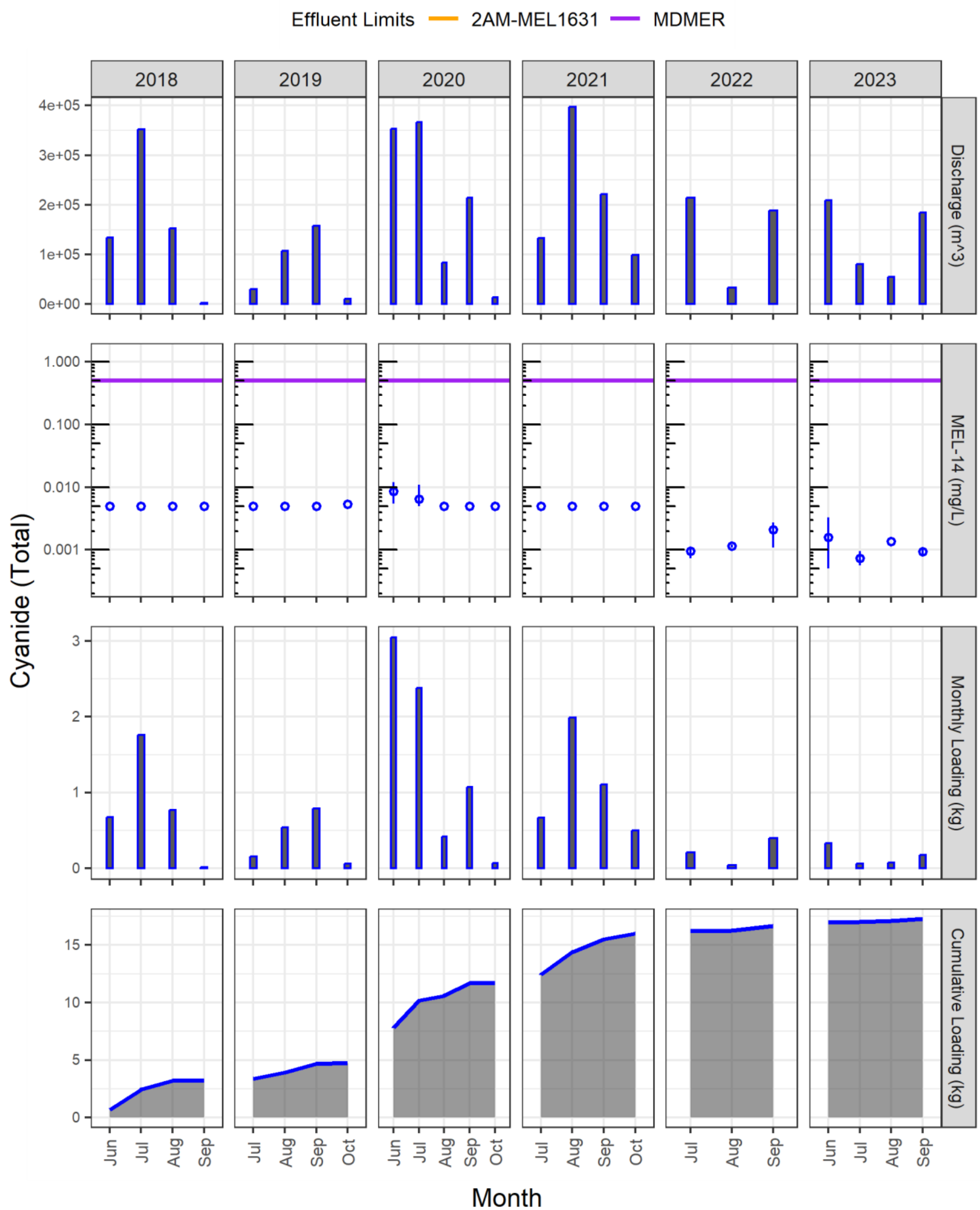
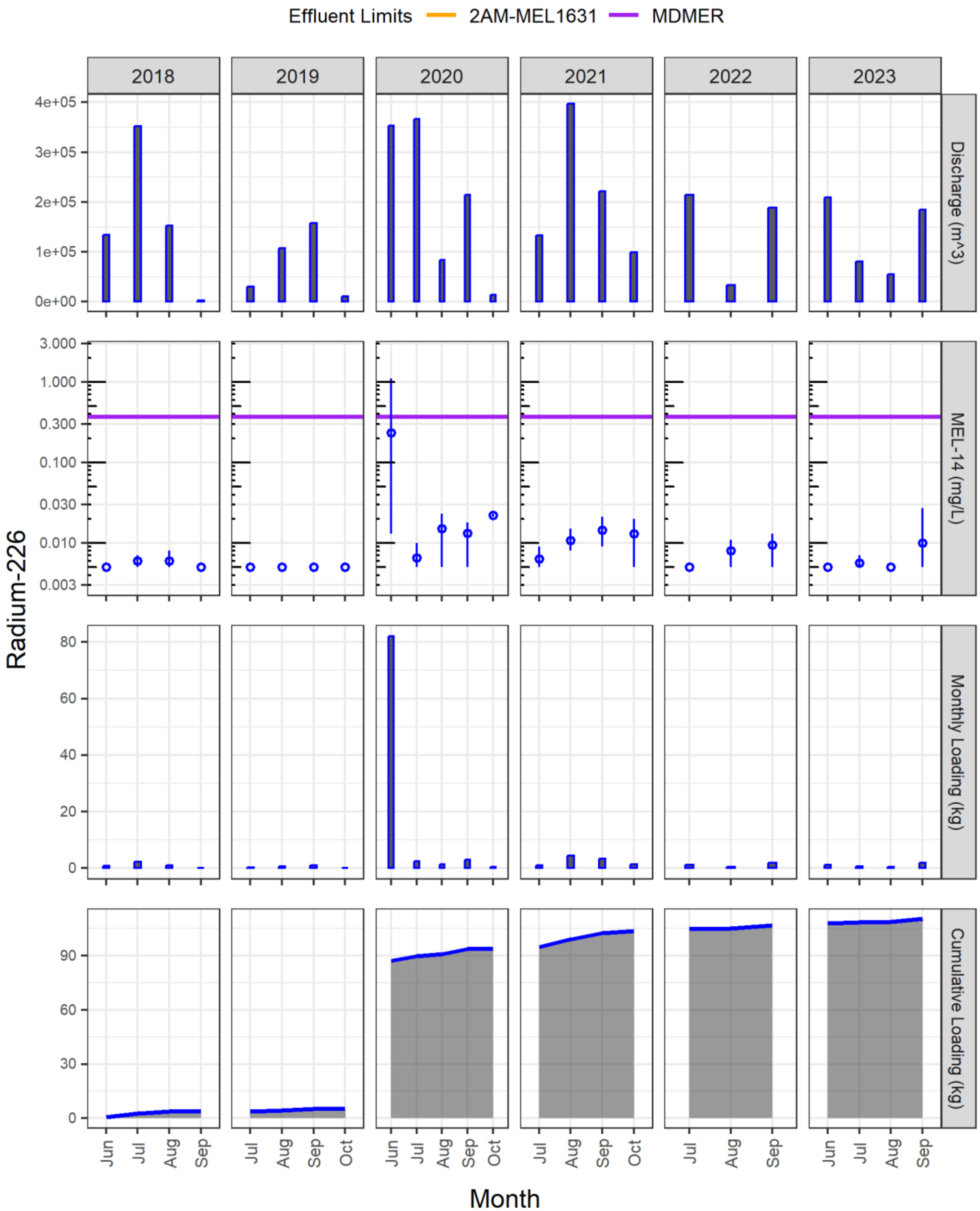


Figure B2-49. Radium-226



Appendix C

Meliadine Lake Water Quality – Supporting Information

Appendix C1
Meliadine Lake Water Quality – 2023 Summary Statistics

APPENDIX C1 – FIGURES

APPENDIX C1 – TABLES

Federal Environmental Quality Guideline for Copper

Environment and Climate Change Canada (ECCC) published an updated aquatic life guideline for copper in 2021. The federal WQG (FWQG) was adopted as the AEMP Benchmark for copper instead of the CCME aquatic life guideline from 1987 for total (unfiltered) copper. The FWQG applies to dissolved rather than total fraction of copper for three reasons:

1. Bioavailability and toxicity of copper to aquatic life is related to concentration of the copper ion (Cu^{2+}) in water.
2. Concentrations of total copper in Canadian surface waters can be affected by non-bioavailable mineral forms; and
3. Toxicity data used for deriving the guideline are based on exposures to dissolved copper.

Copper toxicity depends on the concentration of the free copper ion and site-specific water quality parameters such as temperature, pH, dissolved organic carbon, hardness, alkalinity, chloride, and major cations (e.g., calcium, magnesium, etc.) can modify the bioavailability and toxicity of copper to aquatic organisms. The FWQG is calculated for each sample using the biotic ligand model (BLM) tool. The software calculates the FWQG for each sample from the normalized species sensitivity distribution (SSD) of chronic toxicity tests on primary producers (5 species), aquatic invertebrates (17 species), and fish (11 species). The 5th percentile of the SSD is equal to the sample-specific FWQG. A detailed overview of the BLM is provided in *Federal environmental quality guidelines – Copper* (ECCC, 2021).

An example of the SSD output is provided in **Figure C1-1** below for sample MEL-01-06 collected in April 2023. The FWQG for this sample was 2.89 µg/L (5th percentile of the SSD). The two most sensitive species in the chronic toxicity dataset are the air-breathing snail (*Lymnea stagnalis*) and Rainbow mussel (*Villosa iris*). Neither of these species are found in northern Canada. In this regard, the FWQG has an added level of protection when evaluating risks to aquatic receptors in Meliadine Lake.

Figure C1-1. Copper BLM guideline for sample MEL-01-06 collected in April 2023

Note: The copper BLM guideline is indicated by the blue dashed line (log-normal 5% = 2.89 µg/L).

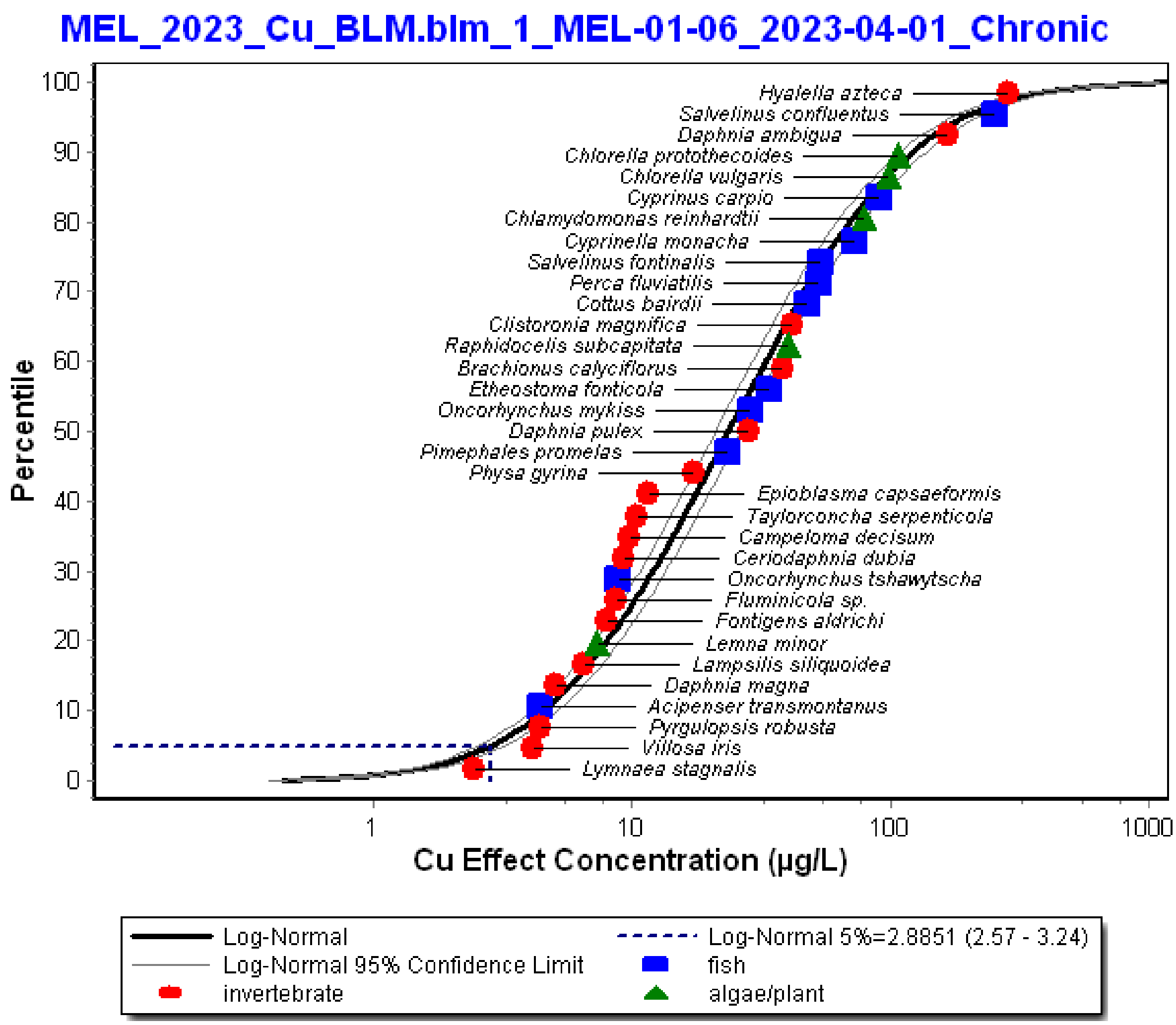


Table C1-1. Detection limits and screening values for the Meliadine Lake water quality program

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									
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0
Temperature	C	-	-	-	-	-	-	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	-	-	-
DO (mg/L)	mg/L	-	-	-	-	-	-	6.5	6.5
DO (%)	%	-	-	-	-	-	-	-	-
Conventional Parameters									
Conductivity (lab)	uS/cm	1	77.5	-	-	-	-	-	-
Hardness	mg/L	0.5	23.4	-	-	-	-	-	-
Total Dissolved Solids	mg/L	10	54	68	500	-	1000	375	500
TDS calculated	mg/L	1	39.6	68	500	-	1000	375	500
Total Suspended Solids	mg/L	1	1	3.1	-	-	-	-	-
Turbidity (lab)	NTU	0.1	-	-	-	-	-	-	-
pH (lab)	pH units	0.1	-	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0
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 | 0.02	7.33	-	-	-	-	-	-
Chloride	mg/L	0.1	9.56	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 | 0.01	1.18	-	-	-	-	-	-
Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-
Potassium (T)	mg/L	0.02 | 0.03	0.954	-	-	-	-	-	-
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	0.268	-	-	-	-	-	-
Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-
Sodium (T)	mg/L	0.02	4.85	5.3	-	-	-	-	-
Sulphate	mg/L	0.3	3.87	38	-	-	-	-	-
Nutrients									
Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.41 | 12.5	-	-	0.308 | 9.38	0.41 | 12.5
Nitrate (as N)	mg/L	0.005	0.018	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	0.25	-	-	-	-	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-
Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	-	0.0075	0.01
Organic/Inorganic Carbon									
Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	-	-	-
Total Organic Carbon	mg/L	0.5	3	-	-	-	-	-	-
Total Metals									
Aluminum (T)	ug/L	1	5.32	9.1	100	-	-	75	100
Antimony (T)	ug/L	0.02	0.02	0.51	-	6	-	4.5	6
Arsenic (T)	ug/L	0.02	0.275	3.8	5	10	25	18.8	25
Barium (T)	ug/L	0.02	8.05	77	-	1000	-	750	1000
Beryllium (T)	ug/L	0.005	0.005	-	-	-	-	-	-
Bismuth (T)	ug/L	0.005	0.005	-	-	-	-	-	-
Boron (T)	ug/L	5	6.52	23	1500	5000	-	1120	1500
Cadmium (T)	ug/L	0.005	0.005	0.05	0.04 | 0.0708	5	-	0.03 | 0.0531	0.04 | 0.0708
Cesium (T)	ug/L	0.005	-	-	-	-	-	-	-
Chromium (T)	ug/L	0.1	0.103	1.1	5	50	-	3.75	5
Cobalt (T)	ug/L	0.005	0.016	-	0.78	-	-	0.585	0.78
Copper (T)	ug/L	0.05	0.86	2	-	2000	-	1500	2000
Gallium (T)	ug/L	0.05	-	-	-	-	-	-	-
Iron (T)	ug/L	1	15	42	300	-	1060	795	1060
Lanthanum (T)	ug/L	0.01	-	-	-	-	-	-	-
Lead (T)	ug/L	0.01	0.0222	0.15	-	5	-	3.75	5
Lithium (T)	ug/L	0.5	0.72	-	-	-	-	-	-
Manganese (T)	ug/L	0.05	3.06	5.5	-	120	-	90	120
Mercury (T)	ug/L	0.1 | 0.5	8.00E-04	0.02	0.026	1	-	0.0195	0.026
Molybdenum (T)	ug/L	0.05	0.107	5.2	73	-	-	54.8	73
Nickel (T)	ug/L	0.05	0.441	2.7	25	-	-	18.8	25
Niobium (T)	ug/L	0.1	-	-	-	-	-	-	-
Phosphorus (T)	ug/L	50	-	-	-	-	-	-	-
Rhenium (T)	ug/L	0.005	-	-	-	-	-	-	-
Rubidium (T)	ug/L	0.005	-	-	-	-	-	-	-
Selenium (T)	ug/L	0.04	0.049	0.16	1	50	-	0.75	1
Silicon (T)	ug/L	50	-	-	-	-	-	-	-
Silver (T)	ug/L	0.005	0.005	0.1	0.25	-	-	0.188	0.25

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)
Strontium (T)	ug/L	0.02	36.1	-	2500	7000	-	1880	2500
Sulfur (T)	ug/L	500	-	-	-	-	-	-	-
Tantalum (T)	ug/L	0.1	-	-	-	-	-	-	-
Tellurium (T)	ug/L	0.02	-	-	-	-	-	-	-
Thallium (T)	ug/L	0.005	0.005	0.1	0.8	-	-	0.6	0.8
Thorium (T)	ug/L	0.005	-	-	-	-	-	-	-
Tin (T)	ug/L	0.02	0.0384	-	-	-	-	-	-
Titanium (T)	ug/L	0.05	0.17	-	-	-	-	-	-
Tungsten (T)	ug/L	0.01	-	-	-	-	-	-	-
Uranium (T)	ug/L	0.001	0.0164	1.5	15	20	-	11.2	15
Vanadium (T)	ug/L	0.05	0.05	-	120	-	-	90	120
Yttrium (T)	ug/L	0.01	-	-	-	-	-	-	-
Zinc (T)	ug/L	0.5	1.7	6.7	-	-	-	-	-
Zirconium (T)	ug/L	0.01	-	-	-	-	-	-	-
Dissolved Metals									
Aluminum (D)	ug/L	1	-	-	-	-	-	-	-
Antimony (D)	ug/L	0.02	-	-	-	-	-	-	-
Arsenic (D)	ug/L	0.02	-	-	-	-	-	-	-
Barium (D)	ug/L	0.02	-	-	-	-	-	-	-
Beryllium (D)	ug/L	0.005	-	-	-	-	-	-	-
Bismuth (D)	ug/L	0.005	-	-	-	-	-	-	-
Boron (D)	ug/L	5	-	-	-	-	-	-	-
Cadmium (D)	ug/L	0.005	-	-	-	-	-	-	-
Cesium (D)	ug/L	0.005	-	-	-	-	-	-	-
Chromium (D)	ug/L	0.1	-	-	-	-	-	-	-
Cobalt (D)	ug/L	0.005	-	-	-	-	-	-	-
Copper (D)	ug/L	0.05	0.861	-	-	-	-	-	-
Gallium (D)	ug/L	0.05	-	-	-	-	-	-	-
Iron (D)	ug/L	1	-	-	-	-	-	-	-
Lanthanum (D)	ug/L	0.01	-	-	-	-	-	-	-
Lead (D)	ug/L	0.01	0.0125	-	4.48 | 7.4	-	-	3.36 | 5.55	4.48 | 7.4
Lithium (D)	ug/L	0.5	-	-	-	-	-	-	-
Manganese (D)	ug/L	0.05	1.2	-	210 | 330	-	-	158 | 248	210 | 330
Mercury (D)	ug/L	0.1 | 0.5	-	-	-	-	-	-	-
Molybdenum (D)	ug/L	0.05	-	-	-	-	-	-	-
Nickel (D)	ug/L	0.05	-	-	-	-	-	-	-
Niobium (D)	ug/L	0.1	-	-	-	-	-	-	-
Phosphorus (D)	ug/L	50	-	-	-	-	-	-	-
Rhenium (D)	ug/L	0.005	-	-	-	-	-	-	-
Rubidium (D)	ug/L	0.005	-	-	-	-	-	-	-
Selenium (D)	ug/L	0.04	-	-	-	-	-	-	-
Silicon (D)	ug/L	50	-	-	-	-	-	-	-
Silver (D)	ug/L	0.005	-	-	-	-	-	-	-
Strontium (D)	ug/L	0.02	-	-	2500	-	-	1880	2500
Sulfur (D)	ug/L	500	-	-	-	-	-	-	-
Tantalum (D)	ug/L	0.1	-	-	-	-	-	-	-
Tellurium (D)	ug/L	0.02	-	-	-	-	-	-	-
Thallium (D)	ug/L	0.005	-	-	-	-	-	-	-
Thorium (D)	ug/L	0.005	-	-	-	-	-	-	-
Tin (D)	ug/L	0.02	-	-	-	-	-	-	-
Titanium (D)	ug/L	0.05	-	-	-	-	-	-	-
Tungsten (D)	ug/L	0.01	-	-	-	-	-	-	-
Uranium (D)	ug/L	0.001	-	-	-	-	-	-	-
Vanadium (D)	ug/L	0.05	-	-	-	-	-	-	-
Yttrium (D)	ug/L	0.01	-	-	-	-	-	-	-
Zinc (D)	ug/L	0.5	1.9	-	7.88 | 13.5	-	-	5.91 | 10.2	7.88 | 13.5
Zirconium (D)	ug/L	0.01	-	-	-	-	-	-	-
Cyanides									
Cyanide (Total)	mg/L	0.001	0.001	0.009	0.005	0.2	-	0.00375	0.005
Cyanide (WAD)	mg/L	0.001	-	-	-	-	-	-	-
Cyanide (free)	mg/L	0.001	-	0.00035	-	-	-	-	-

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 2023.

[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.

Table C1-2. MEL-01 summary statistics for the 2023 winter water sampling event

Parameter	Units	DL (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	MEL-01 (Near-field Exposure Area) Winter Sampling Event (April)										
						N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	%> FEIS	% > Act Lvl
Field Measurements																
Temperature	C	-	-	-	-	6	0	0	1.5	1.44	0.167	0.0681	1.39	1.83	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	6	0	0	159	159	1.09	0.446	158	161	-	-
pH (field)	pH units	-	-	6.5 | 9.0	6.5 | 9.0	6	0	0	7	6.92	0.172	0.0704	6.88	7.33	-	0
DO (mg/L)	mg/L	-	-	6.5	6.5	6	0	0	13.1	13.5	1.22	0.496	10.8	14.2	-	0
DO (%)	%	-	-	-	-	6	0	0	96.3	98.6	8.47	3.46	80.4	104	-	-
Conventional Parameters																
Conductivity (lab)	uS/cm	1	-	-	-	6	0	0	178	178	2.88	1.18	174	183	-	-
Hardness	mg/L	0.5	-	-	-	6	0	0	51.9	52	0.906	0.37	50.3	53	-	-
pH (lab)	pH units	0.1	-	6.5 | 9.0	6.5 | 9.0	6	0	0	7.17	7.18	0.0204	0.00833	7.14	7.2	-	0
Total Dissolved Solids	mg/L	10	68	375	500	6	0	0	86.4	84.5	8.06	3.29	76	97	100	0
Total Dissolved Solids (Calculated)	mg/L	1	68	375	500	-	-	-	-	-	-	-	-	-	-	-
Total Suspended Solids	mg/L	1	3.1	-	-	6	3	50	-	1.15	-	-	1	1.5	0	-
Turbidity (lab)	NTU	0.1	-	-	-	6	0	0	0.338	0.34	0.07	0.0286	0.26	0.46	-	-
Major Ions																
Alkalinity, Bicarbonate	mg/L	1	-	-	-	6	0	100	32.2	32.3	0.399	0.163	31.6	32.7	-	-
Alkalinity, Carbonate	mg/L	1	-	-	-	6	6	0	-	-	-	-	-	1	-	-
Alkalinity, Hydroxide	mg/L	1	-	-	-	6	6	0	-	-	-	-	-	1	-	-
Alkalinity, Total	mg/L	1	-	-	-	6	0	0	32.2	32.3	0.399	0.163	31.6	32.7	-	-
Bromide	mg/L	0.1	-	-	-	6	6	100	-	-	-	-	-	0.1	-	-
Calcium (D)	mg/L	0.01	-	-	-	6	0	0	15.9	16	0.234	0.0955	15.5	16.2	-	-
Calcium (T)	mg/L	0.01 | 0.02	-	-	-	6	0	0	15.8	15.8	0.645	0.263	14.7	16.7	-	-
Chloride	mg/L	0.1	14	90	120	6	0	0	25.3	25.3	0.489	0.199	24.7	26.1	100	0
Fluoride	mg/L	0.02	0.0084	2.1	2.8	6	0	0	0.047	0.0465	0.00155	0.000632	0.046	0.05	100	0
Magnesium (D)	mg/L	0.004	-	-	-	6	0	0	2.94	2.94	0.0845	0.0345	2.82	3.04	-	-
Magnesium (T)	mg/L	0.004 | 0.01	-	-	-	6	0	0	2.93	2.95	0.0969	0.0396	2.76	3.05	-	-
Potassium (D)	mg/L	0.02	-	-	-	6	0	0	1.87	1.86	0.0434	0.0177	1.83	1.95	-	-
Potassium (T)	mg/L	0.02 | 0.03	-	-	-	6	0	0	1.87	1.87	0.0612	0.025	1.78	1.96	-	-
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	-	-	-	6	0	0	0.844	0.843	0.0289	0.0118	0.805	0.886	-	-
Sodium (D)	mg/L	0.02	-	-	-	6	0	0	12.7	12.7	0.367	0.15	12.1	13.2	-	-
Sodium (T)	mg/L	0.02	5.3	-	-	6	0	0	13	13	0.468	0.191	12.3	13.7	100	-
Sulphate	mg/L	0.3	38	-	-	6	0	0	10.9	10.9	0.175	0.0715	10.6	11.1	0	-
Nutrients																
Ammonia (as N)	mg/L	0.005	0.54	0.308 | 9.38	0.41 | 12.5	6	0	0	0.0304	0.032	0.00482	0.00197	0.023	0.0366	0	0
Nitrate (as N)	mg/L	0.005	0.25	2.17	2.9	6	0	0	0.0206	0.0205	0.00174	0.000709	0.0187	0.023	0	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	6	5	83	-	0.0224	-	-	0.0224	0.023	-	-
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Orthophosphate (PO4-P)	mg/L	0.001	-	-	-	6	6	100	-	-	-	-	-	0.001	-	-
Total Diss Phosphorus	mg/L	0.001	-	-	-	6	0	0	0.00353	0.0036	0.000308	0.000126	0.0031	0.0038	-	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	6	0	0	0.387	0.398	0.0359	0.0146	0.319	0.415	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	-	-	-	6	0	0	0.389	0.396	0.0424	0.0173	0.334	0.457	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	6	0	0	0.373	0.376	0.0325	0.0133	0.319	0.415	-	-
Total Phosphorus	mg/L	0.001	0.0049	0.0075	0.01	6	0	0	0.00737	0.0073	0.000644	0.000263	0.0067	0.0082	100	40

Table C1-2. MEL-01 summary statistics for the 2023 winter water sampling event

Parameter	Units	DL (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	MEL-01 (Near-field Exposure Area) Winter Sampling Event (April)										
						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	5.64	5.67	0.208	0.0848	5.38	5.85	-	-
Total Organic Carbon	mg/L	0.5	-	-	-	6	0	0	5.9	5.86	0.151	0.0617	5.76	6.19	-	-
Total Metals																
Aluminum (T)	ug/L	1	9.1	75	100	6	1	17	2.1	1.7	1.11	0.453	1	4.1	0	0
Antimony (T)	ug/L	0.02	0.51	4.5	6	6	0	0	0.0287	0.0255	0.00665	0.00272	0.023	0.039	0	0
Arsenic (T)	ug/L	0.02	3.8	18.8	25	6	0	0	0.773	0.772	0.0333	0.0136	0.73	0.812	0	0
Barium (T)	ug/L	0.02	77	750	1000	6	0	0	14.7	14.8	0.445	0.182	14.1	15.2	0	0
Beryllium (T)	ug/L	0.005	-	-	-	6	6	100	-	-	-	-	-	0.005	-	-
Boron (T)	ug/L	5	23	1120	1500	6	0	0	11.8	11.7	0.393	0.161	11.3	12.4	0	0
Cadmium (T)	ug/L	0.005	0.05	0.03 | 0.0531	0.04 | 0.0708	5	5	100	-	-	-	-	-	0.005	0	0
Chromium (T)	ug/L	0.1	1.1	3.75	5	6	1	17	0.167	0.15	0.0653	0.0267	0.1	0.28	0	0
Cobalt (T)	ug/L	0.005	-	0.585	0.78	6	0	0	0.0266	0.0255	0.00281	0.00115	0.0238	0.0314	-	0
Copper (T)	ug/L	0.05	2	1500	2000	5	0	0	1.45	1.37	0.171	0.0765	1.34	1.75	0	0
Iron (T)	ug/L	1	42	795	1060	6	0	0	9.13	8.15	2.63	1.07	6.8	13.9	0	0
Lead (T)	ug/L	0.01	0.15	3.75	5	6	0	0	0.172	0.148	0.151	0.0617	0.017	0.349	50	0
Lithium (T)	ug/L	0.5	-	-	-	6	0	0	1.74	1.77	0.0547	0.0223	1.65	1.79	-	-
Manganese (T)	ug/L	0.05	5.5	90	120	6	0	0	1.89	1.92	0.21	0.0858	1.58	2.19	0	0
Mercury (T)	ug/L	0.1 | 0.5	0.02	0.0195	0.026	6	0	0	0.00793	0.0069	7.63E-03	3.12E-03	4.80E-04	0.0214	17	17
Molybdenum (T)	ug/L	0.05	5.2	54.8	73	6	0	0	0.196	0.194	0.00555	0.00227	0.191	0.205	0	0
Nickel (T)	ug/L	0.05	2.7	18.8	25	6	0	0	1.24	1.21	0.068	0.0278	1.19	1.37	0	0
Selenium (T)	ug/L	0.04	0.16	0.75	1	6	0	0	0.0613	0.061	0.00197	0.000803	0.059	0.064	0	0
Silver (T)	ug/L	0.005	0.1	0.188	0.25	6	6	100	-	-	-	-	-	0.005	0	0
Strontium (T)	ug/L	0.02	-	1880	2500	6	0	0	91.4	91.2	2.55	1.04	87.6	94.5	-	0
Thallium (T)	ug/L	0.005	0.1	0.6	0.8	6	6	100	-	-	-	-	-	0.005	0	0
Tin (T)	ug/L	0.02	-	-	-	6	6	100	-	-	-	-	-	0.02	-	-
Titanium (T)	ug/L	0.05	-	-	-	6	4	67	-	0.05	-	-	0.05	0.132	-	-
Uranium (T)	ug/L	0.001	1.5	11.2	15	6	0	0	0.0285	0.0286	0.00158	0.000644	0.0264	0.0302	0	0
Vanadium (T)	ug/L	0.05	-	90	120	6	6	100	-	-	-	-	-	0.05	-	0
Zinc (T)	ug/L	0.5	6.7	-	-	6	0	0	5.44	4.88	4.12	1.68	1.38	12	50	-
Dissolved Metals																
Aluminum (D)	ug/L	1	-	-	-	6	5	83	-	1	-	-	1	1.5	-	-
Antimony (D)	ug/L	0.02	-	-	-	6	0	0	0.0268	0.026	0.00337	0.00138	0.024	0.033	-	-
Arsenic (D)	ug/L	0.02	-	-	-	6	0	0	0.721	0.719	0.0215	0.00877	0.697	0.755	-	-
Barium (D)	ug/L	0.02	-	-	-	6	0	0	15	15	0.316	0.129	14.5	15.4	-	-
Beryllium (D)	ug/L	0.005	-	-	-	6	6	100	-	-	-	-	-	0.005	-	-
Boron (D)	ug/L	5	-	-	-	6	0	0	11.8	11.8	0.398	0.163	11.2	12.3	-	-
Cadmium (D)	ug/L	0.005	-	-	-	5	4	80	-	0.005	-	-	0.005	0.0051	-	-
Chromium (D)	ug/L	0.1	-	-	-	6	4	67	-	0.1	-	-	0.1	0.14	-	-
Cobalt (D)	ug/L	0.005	-	-	-	6	0	0	0.0224	0.021	0.0029	0.00119	0.02	0.0266	-	-
Copper (D)	ug/L	0.05	-	-	-	5	0	0	1.42	1.34	0.182	0.0813	1.31	1.74	-	0
Iron (D)	ug/L	1	-	-	-	6	0	0	3.23	3.2	0.266	0.109	2.9	3.7	-	-
Lead (D)	ug/L	0.01	-	3.36 | 5.55	4.48 | 7.4	6	1	17	0.0213	0.016	0.0124	0.00505	0.01	0.038	-	0
Lithium (D)	ug/L	0.5	-	-	-	6	0	0	1.77	1.76	0.0388	0.0158	1.71	1.82	-	-
Manganese (D)	ug/L	0.05	-	158 | 248	210 | 330	6	0	0	0.502	0.428	0.164	0.0668	0.361	0.77	-	0

Table C1-2. MEL-01 summary statistics for the 2023 winter water sampling event

Parameter	Units	DL (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	MEL-01 (Near-field Exposure Area) Winter Sampling Event (April)										
						N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	%> FEIS	% > Act Lvl
Mercury (D)	ug/L	0.1 | 0.5	-	-	-	6	0	0	0.00344	2.10E-03	0.00405	0.00165	3.00E-04	0.0112	-	-
Molybdenum (D)	ug/L	0.05	-	-	-	6	0	0	0.196	0.192	0.00846	0.00345	0.189	0.21	-	-
Nickel (D)	ug/L	0.05	-	-	-	6	0	0	1.21	1.2	0.0385	0.0157	1.16	1.26	-	-
Selenium (D)	ug/L	0.04	-	-	-	6	0	0	0.0615	0.0615	0.00373	0.00152	0.056	0.066	-	-
Silver (D)	ug/L	0.005	-	-	-	6	6	100	-	-	-	-	-	0.005	-	-
Strontium (D)	ug/L	0.02	-	1880	2500	6	0	0	89.8	90.1	1.89	0.772	87.5	92.8	-	0
Thallium (D)	ug/L	0.005	-	-	-	6	6	100	-	-	-	-	-	0.005	-	-
Tin (D)	ug/L	0.02	-	-	-	5	5	100	-	-	-	-	-	0.02	-	-
Titanium (D)	ug/L	0.05	-	-	-	6	6	100	-	-	-	-	-	0.05	-	-
Uranium (D)	ug/L	0.001	-	-	-	6	0	0	0.0291	0.0294	0.00189	0.000771	0.0257	0.0311	-	-
Vanadium (D)	ug/L	0.05	-	-	-	6	6	100	-	-	-	-	-	0.05	-	-
Zinc (D)	ug/L	0.5	-	5.91 | 10.2	7.88 | 13.5	6	0	0	5.01	4.62	3.87	1.58	1.13	11.1	-	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.

Table C1-3. MEL-02 summary statistics for the 2023 winter water sampling event

Parameter	Units	DL (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	MEL-02 (Mid-field Exposure Area) Winter Sampling Event (April)										
						N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	%> FEIS	% > Act Lvl
Field Measurements																
Temperature	C	-	-	-	-	5	0	0	1.17	1.19	0.15	0.067	0.97	1.38	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	5	0	0	130	126	9.37	4.19	123	146	-	-
pH (field)	pH units	-	-	6.5 | 9.0	6.5 | 9.0	5	0	0	7.22	7.22	0.139	0.0624	7.09	7.44	-	0
DO (mg/L)	mg/L	-	-	6.5	6.5	5	0	0	16.3	16.6	0.67	0.3	15.2	16.9	-	0
DO (%)	%	-	-	-	-	5	0	0	118	121	4.79	2.14	111	123	-	-
Conventional Parameters																
Conductivity (lab)	uS/cm	1	-	-	-	5	0	0	145	144	2.92	1.3	143	150	-	-
Hardness	mg/L	0.5	-	-	-	5	0	0	38	38.7	0.999	0.447	36.9	38.9	-	-
pH (lab)	pH units	0.1	-	6.5 | 9.0	6.5 | 9.0	5	0	0	7.43	7.41	0.0409	0.0183	7.4	7.5	-	0
Total Dissolved Solids	mg/L	10	68	375	500	5	0	0	71.9	71	8.1	3.62	62.7	85	80	0
Total Dissolved Solids (Calculated)	mg/L	1	68	375	500	-	-	-	-	-	-	-	-	-	-	-
Total Suspended Solids	mg/L	1	3.1	-	-	5	5	100	-	-	-	-	-	1	0	-
Turbidity (lab)	NTU	0.1	-	-	-	5	0	0	0.172	0.16	0.0432	0.0193	0.12	0.23	-	-
Major Ions																
Alkalinity, Bicarbonate	mg/L	1	-	-	-	5	0	0	28.9	28.7	0.812	0.363	28	30.2	-	-
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	28.9	28.7	0.812	0.363	28	30.2	-	-
Bromide	mg/L	0.1	-	-	-	5	5	100	-	-	-	-	-	0.1	-	-
Calcium (D)	mg/L	0.01	-	-	-	5	0	0	12	12.1	0.336	0.15	11.6	12.3	-	-
Calcium (T)	mg/L	0.01 | 0.02	-	-	-	5	0	0	13.4	13.5	0.259	0.116	13.1	13.7	-	-
Chloride	mg/L	0.1	14	90	120	5	0	0	18.5	18.3	0.416	0.186	18.2	19.2	100	0
Fluoride	mg/L	0.02	0.0084	2.1	2.8	5	0	0	0.043	0.043	0.001	0.000447	0.042	0.044	100	0
Magnesium (D)	mg/L	0.004	-	-	-	5	0	0	1.98	1.99	0.055	0.0246	1.92	2.06	-	-
Magnesium (T)	mg/L	0.004 | 0.01	-	-	-	5	0	0	2.32	2.32	0.0249	0.0111	2.3	2.36	-	-
Potassium (D)	mg/L	0.02	-	-	-	5	0	0	1.47	1.47	0.0385	0.0172	1.42	1.52	-	-
Potassium (T)	mg/L	0.02 | 0.03	-	-	-	5	0	0	1.63	1.64	0.0387	0.0173	1.58	1.67	-	-
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	-	-	-	5	0	0	0.64	0.631	0.0434	0.0194	0.604	0.713	-	-
Sodium (D)	mg/L	0.02	-	-	-	5	0	0	8.26	8.26	0.251	0.112	8	8.6	-	-
Sodium (T)	mg/L	0.02	5.3	-	-	5	0	0	9.63	9.5	0.331	0.148	9.35	10.1	100	-
Sulphate	mg/L	0.3	38	-	-	5	0	0	7.68	7.62	0.147	0.066	7.56	7.93	0	-
Nutrients																
Ammonia (as N)	mg/L	0.005	0.54	0.308 | 9.38	0.41 | 12.5	5	0	0	0.0299	0.0288	0.00466	0.00208	0.0248	0.0362	0	0
Nitrate (as N)	mg/L	0.005	0.25	2.17	2.9	5	0	0	0.0102	0.0089	0.00298	0.00133	0.0076	0.014	0	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	5	5	100	-	-	-	-	-	0.0224	-	-
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Orthophosphate (PO4-P)	mg/L	0.001	-	-	-	5	5	100	-	-	-	-	-	0.001	-	-
Total Diss Phosphorus	mg/L	0.001	-	-	-	5	0	0	0.0027	0.0026	0.000616	0.000276	0.0022	0.0037	-	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	5	0	0	0.277	0.289	0.0272	0.0122	0.238	0.307	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	-	-	-	5	0	0	0.295	0.291	0.0106	0.00474	0.284	0.309	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	5	0	0	0.277	0.289	0.0272	0.0122	0.238	0.307	-	-
Total Phosphorus	mg/L	0.001	0.0049	0.0075	0.01	5	0	0	0.00444	0.0044	0.000439	0.000196	0.004	0.0051	20	-

Table C1-3. MEL-02 summary statistics for the 2023 winter water sampling event

Parameter	Units	DL (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	MEL-02 (Mid-field Exposure Area) Winter Sampling Event (April)										
						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	4.16	4.15	0.168	0.0753	3.92	4.37	-	-
Total Organic Carbon	mg/L	0.5	-	-	-	5	0	0	4.66	4.45	0.324	0.145	4.43	5.13	-	-
Total Metals																
Aluminum (T)	ug/L	1	9.1	75	100	5	3	60	-	1	-	-	1	1.7	0	0
Antimony (T)	ug/L	0.02	0.51	4.5	6	5	4	80	-	0.02	-	-	0.02	0.026	0	0
Arsenic (T)	ug/L	0.02	3.8	18.8	25	5	0	0	0.682	0.65	0.0572	0.0256	0.636	0.757	0	0
Barium (T)	ug/L	0.02	77	750	1000	5	0	0	13.3	13.1	0.455	0.203	12.8	13.8	0	0
Beryllium (T)	ug/L	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-
Boron (T)	ug/L	5	23	1120	1500	5	0	0	8.54	8.4	0.397	0.178	8.2	9.2	0	0
Cadmium (T)	ug/L	0.005	0.05	0.03 | 0.0531	0.04 | 0.0708	5	5	100	-	-	-	-	-	0.005	0	0
Chromium (T)	ug/L	0.1	1.1	3.75	5	5	5	100	-	-	-	-	-	0.1	0	0
Cobalt (T)	ug/L	0.005	-	0.585	0.78	5	0	0	0.0139	0.0136	0.00135	0.000604	0.0123	0.0155	-	0
Copper (T)	ug/L	0.05	2	1500	2000	5	0	0	1.27	1.11	0.29	0.13	1.09	1.77	0	0
Iron (T)	ug/L	1	42	795	1060	5	0	0	3.68	3	1.76	0.786	2.4	6.6	0	0
Lead (T)	ug/L	0.01	0.15	3.75	5	5	2	40	0.0246	0.01	0.02	0.00894	0.01	0.047	0	0
Lithium (T)	ug/L	0.5	-	-	-	5	0	0	1.39	1.38	0.0421	0.0188	1.35	1.45	-	-
Manganese (T)	ug/L	0.05	5.5	90	120	5	0	0	0.845	0.8	0.131	0.0585	0.7	1.05	0	0
Mercury (T)	ug/L	0.1 | 0.5	0.02	0.0195	0.026	5	0	0	0.00224	0.00115	2.01E-03	8.97E-04	3.80E-04	0.00458	0	0
Molybdenum (T)	ug/L	0.05	5.2	54.8	73	5	0	0	0.178	0.152	0.0562	0.0251	0.147	0.278	0	0
Nickel (T)	ug/L	0.05	2.7	18.8	25	5	0	0	0.804	0.797	0.0297	0.0133	0.767	0.845	0	0
Selenium (T)	ug/L	0.04	0.16	0.75	1	5	0	0	0.057	0.056	0.00436	0.00195	0.053	0.064	0	0
Silver (T)	ug/L	0.005	0.1	0.188	0.25	4	4	100	-	-	-	-	-	0.005	0	0
Strontium (T)	ug/L	0.02	-	1880	2500	5	0	0	69.1	68.3	1.53	0.684	67.6	71.3	-	0
Thallium (T)	ug/L	0.005	0.1	0.6	0.8	5	5	100	-	-	-	-	-	0.005	0	0
Tin (T)	ug/L	0.02	-	-	-	5	5	100	-	-	-	-	-	0.02	-	-
Titanium (T)	ug/L	0.05	-	-	-	5	5	100	-	-	-	-	-	0.05	-	-
Uranium (T)	ug/L	0.001	1.5	11.2	15	5	0	0	0.0201	0.0206	0.00172	0.000768	0.0178	0.022	0	0
Vanadium (T)	ug/L	0.05	-	90	120	5	5	100	-	-	-	-	-	0.05	-	0
Zinc (T)	ug/L	0.5	6.7	-	-	5	0	0	2.08	1.8	1.16	0.518	0.9	3.79	0	-
Dissolved Metals																
Aluminum (D)	ug/L	1	-	-	-	5	5	100	-	-	-	-	-	1	-	-
Antimony (D)	ug/L	0.02	-	-	-	5	4	80	-	0.02	-	-	0.02	0.021	-	-
Arsenic (D)	ug/L	0.02	-	-	-	5	0	0	0.646	0.638	0.0275	0.0123	0.617	0.683	-	-
Barium (D)	ug/L	0.02	-	-	-	5	0	0	12.8	12.8	0.23	0.103	12.6	13.2	-	-
Beryllium (D)	ug/L	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-
Boron (D)	ug/L	5	-	-	-	5	0	0	8.32	8.4	0.164	0.0735	8.1	8.5	-	-
Cadmium (D)	ug/L	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-
Chromium (D)	ug/L	0.1	-	-	-	5	5	100	-	-	-	-	-	0.1	-	-
Cobalt (D)	ug/L	0.005	-	-	-	5	0	0	0.0113	0.0114	0.000311	0.000139	0.0109	0.0116	-	-
Copper (D)	ug/L	0.05	-	-	-	5	0	0	1.05	1.06	0.0308	0.0138	0.998	1.08	-	0
Iron (D)	ug/L	1	-	-	-	5	0	0	1.8	1.7	0.474	0.212	1.4	2.6	-	-
Lead (D)	ug/L	0.01	-	3.36 | 5.55	4.48 | 7.4	5	3	60	-	0.01	-	-	0.01	0.016	-	0
Lithium (D)	ug/L	0.5	-	-	-	5	0	0	1.28	1.28	0.0207	0.00927	1.25	1.3	-	-
Manganese (D)	ug/L	0.05	-	158 | 248	210 | 330	5	0	0	0.176	0.159	0.0461	0.0206	0.133	0.24	-	0

Table C1-3. MEL-02 summary statistics for the 2023 winter water sampling event

Parameter	Units	DL (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	MEL-02 (Mid-field Exposure Area) Winter Sampling Event (April)										
						N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	%> FEIS	% > Act Lvl
Mercury (D)	ug/L	0.1 | 0.5	-	-	-	5	0	0	0.00109	5.90E-04	0.0012	0.000535	3.20E-04	0.0032	-	-
Molybdenum (D)	ug/L	0.05	-	-	-	4	0	0	0.171	0.136	0.0714	0.0357	0.133	0.278	-	-
Nickel (D)	ug/L	0.05	-	-	-	5	0	0	0.733	0.74	0.015	0.00669	0.713	0.748	-	-
Selenium (D)	ug/L	0.04	-	-	-	5	0	0	0.0612	0.06	0.00356	0.00159	0.058	0.067	-	-
Silver (D)	ug/L	0.005	-	-	-	4	4	100	-	-	-	-	-	0.005	-	-
Strontium (D)	ug/L	0.02	-	1880	2500	5	0	0	64.5	65.2	1.56	0.699	62.2	65.9	-	0
Thallium (D)	ug/L	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-
Tin (D)	ug/L	0.02	-	-	-	5	5	100	-	-	-	-	-	0.02	-	-
Titanium (D)	ug/L	0.05	-	-	-	5	5	100	-	-	-	-	-	0.05	-	-
Uranium (D)	ug/L	0.001	-	-	-	5	0	0	0.02	0.0201	0.00119	0.000534	0.0183	0.0216	-	-
Vanadium (D)	ug/L	0.05	-	-	-	5	5	100	-	-	-	-	-	0.05	-	-
Zinc (D)	ug/L	0.5	-	5.91 | 10.2	7.88 | 13.5	5	0	0	1.9	1.84	0.844	0.378	0.99	3.23	-	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.

Table C1-4. MEL-03 summary statistics for the 2023 winter water sampling event

Parameter	Units	DL (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	MEL-03 (Reference Area 1) Winter Sampling Event (April)										
						N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	%> FEIS	% > Act Lvl
Field Measurements																
Temperature	C	-	-	-	-	5	0	0	0.658	0.65	0.0303	0.0136	0.63	0.71	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	5	0	0	114	114	3.2	1.43	110	118	-	-
pH (field)	pH units	-	-	6.5 | 9.0	6.5 | 9.0	5	0	0	7.55	7.44	0.242	0.108	7.37	7.95	-	0
DO (mg/L)	mg/L	-	-	6.5	6.5	5	0	0	15.6	15.7	0.435	0.195	14.8	15.9	-	0
DO (%)	%	-	-	-	-	5	0	0	112	113	2.9	1.3	107	114	-	-
Conventional Parameters																
Conductivity (lab)	uS/cm	1	-	-	-	5	0	0	124	123	2.92	1.3	122	129	-	-
Hardness	mg/L	0.5	-	-	-	5	0	0	34.3	33.5	2.55	1.14	32.3	38.7	-	-
pH (lab)	pH units	0.1	-	6.5 | 9.0	6.5 | 9.0	5	0	0	7.2	7.21	0.0391	0.0175	7.15	7.24	-	0
Total Dissolved Solids	mg/L	10	68	375	500	5	0	0	60.9	66	10.8	4.81	46.3	70.7	40	0
Total Dissolved Solids (Calculated)	mg/L	1	68	375	500	-	-	-	-	-	-	-	-	-	-	-
Total Suspended Solids	mg/L	1	3.1	-	-	5	5	100	-	-	-	-	-	1	0	-
Turbidity (lab)	NTU	0.1	-	-	-	5	0	0	0.144	0.14	0.0288	0.0129	0.12	0.19	-	-
Major Ions																
Alkalinity, Bicarbonate	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity, Carbonate	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity, Hydroxide	mg/L	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity, Total	mg/L	1	-	-	-	5	0	0	26.9	26.6	0.886	0.396	26.1	28.4	-	-
Bromide	mg/L	0.1	-	-	-	5	5	100	-	-	-	-	-	0.1	-	-
Calcium (D)	mg/L	0.01	-	-	-	5	0	0	10.8	10.6	0.75	0.335	10.2	12.1	-	-
Calcium (T)	mg/L	0.01 | 0.02	-	-	-	5	0	0	11.7	11.6	0.444	0.198	11.4	12.5	-	-
Chloride	mg/L	0.1	14	90	120	5	0	0	15.5	15.3	0.449	0.201	15.2	16.3	100	0
Fluoride	mg/L	0.02	0.0084	2.1	2.8	5	0	0	0.0408	0.041	0.000837	0.000374	0.04	0.042	100	0
Magnesium (D)	mg/L	0.004	-	-	-	5	0	0	1.78	1.7	0.166	0.0744	1.67	2.07	-	-
Magnesium (T)	mg/L	0.004 | 0.01	-	-	-	5	0	0	1.99	1.97	0.0611	0.0273	1.93	2.09	-	-
Potassium (D)	mg/L	0.02	-	-	-	5	0	0	1.37	1.34	0.0865	0.0387	1.3	1.52	-	-
Potassium (T)	mg/L	0.02 | 0.03	-	-	-	5	0	0	1.46	1.44	0.0614	0.0275	1.42	1.57	-	-
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	-	-	-	5	0	0	0.423	0.42	0.00953	0.00426	0.416	0.44	-	-
Sodium (D)	mg/L	0.02	-	-	-	5	0	0	7.21	6.92	0.63	0.282	6.84	8.33	-	-
Sodium (T)	mg/L	0.02	5.3	-	-	5	0	0	8.05	7.96	0.323	0.144	7.81	8.6	100	-
Sulphate	mg/L	0.3	38	-	-	5	0	0	6.3	6.21	0.173	0.0775	6.17	6.59	0	-
Nutrients																
Ammonia (as N)	mg/L	0.005	0.54	0.308 | 9.38	0.41 | 12.5	5	0	0	0.0257	0.0251	0.00728	0.00326	0.019	0.0379	0	0
Nitrate (as N)	mg/L	0.005	0.25	2.17	2.9	5	5	100	-	-	-	-	-	0.005	0	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	5	5	100	-	-	-	-	-	0.0224	-	-
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	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Orthophosphate (PO4-P)	mg/L	0.001	-	-	-	5	5	100	-	-	-	-	-	0.001	-	-
Total Diss Phosphorus	mg/L	0.001	-	-	-	5	0	0	0.00278	0.0027	0.000545	0.000244	0.0021	0.0036	-	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	5	0	0	0.234	0.217	0.0235	0.0105	0.216	0.264	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	-	-	-	5	0	0	0.252	0.247	0.0144	0.00645	0.237	0.271	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	5	0	0	0.234	0.217	0.0235	0.0105	0.216	0.264	-	-
Total Phosphorus	mg/L	0.001	0.0049	0.0075	0.01	5	0	0	0.00404	0.004	0.00059	0.000264	0.0034	0.005	20	-

Table C1-4. MEL-03 summary statistics for the 2023 winter water sampling event

Parameter	Units	DL (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	MEL-03 (Reference Area 1) Winter Sampling Event (April)										
						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	3.95	3.93	0.0918	0.0411	3.87	4.09	-	-
Total Organic Carbon	mg/L	0.5	-	-	-	5	0	0	3.79	3.73	0.127	0.0568	3.7	4.01	-	-
Total Metals																
Aluminum (T)	ug/L	1	9.1	75	100	5	4	80	-	1	-	-	1	2.1	0	0
Antimony (T)	ug/L	0.02	0.51	4.5	6	5	5	100	-	-	-	-	-	0.02	0	0
Arsenic (T)	ug/L	0.02	3.8	18.8	25	5	0	0	0.417	0.414	0.0165	0.00738	0.399	0.435	0	0
Barium (T)	ug/L	0.02	77	750	1000	5	0	0	12	11.9	0.381	0.17	11.6	12.6	0	0
Beryllium (T)	ug/L	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-
Boron (T)	ug/L	5	23	1120	1500	5	0	0	7.2	7.3	0.2	0.0894	6.9	7.4	0	0
Cadmium (T)	ug/L	0.005	0.05	0.03 | 0.0531	0.04 | 0.0708	5	5	100	-	-	-	-	-	0.005	0	0
Chromium (T)	ug/L	0.1	1.1	3.75	5	5	4	80	-	0.1	-	-	0.1	0.12	0	0
Cobalt (T)	ug/L	0.005	-	0.585	0.78	5	0	0	0.00932	0.0092	0.000661	0.000296	0.0084	0.0101	-	0
Copper (T)	ug/L	0.05	2	1500	2000	5	0	0	0.987	0.984	0.0228	0.0102	0.964	1.02	0	0
Iron (T)	ug/L	1	42	795	1060	5	0	0	2.36	1.8	1.05	0.47	1.6	4.1	0	0
Lead (T)	ug/L	0.01	0.15	3.75	5	5	4	80	-	0.01	-	-	0.01	0.015	0	0
Lithium (T)	ug/L	0.5	-	-	-	5	0	0	1.2	1.2	0.0303	0.0136	1.16	1.24	-	-
Manganese (T)	ug/L	0.05	5.5	90	120	5	0	0	0.523	0.498	0.0531	0.0238	0.49	0.616	0	0
Mercury (T)	ug/L	0.1 | 0.5	0.02	0.0195	0.026	5	5	100	-	-	-	-	-	0.005	0	0
Molybdenum (T)	ug/L	0.05	5.2	54.8	73	5	0	0	0.126	0.127	0.00543	0.00243	0.12	0.134	0	0
Nickel (T)	ug/L	0.05	2.7	18.8	25	5	0	0	0.604	0.598	0.0197	0.00881	0.585	0.636	0	0
Selenium (T)	ug/L	0.04	0.16	0.75	1	5	0	0	0.048	0.048	0.00324	0.00145	0.044	0.053	0	0
Silver (T)	ug/L	0.005	0.1	0.188	0.25	5	5	100	-	-	-	-	-	0.005	0	0
Strontium (T)	ug/L	0.02	-	1880	2500	5	0	0	57.4	56.4	2.4	1.08	55.7	61.6	-	0
Thallium (T)	ug/L	0.005	0.1	0.6	0.8	5	5	100	-	-	-	-	-	0.005	0	0
Tin (T)	ug/L	0.02	-	-	-	5	5	100	-	-	-	-	-	0.02	-	-
Titanium (T)	ug/L	0.05	-	-	-	5	4	80	-	0.05	-	-	0.05	0.104	-	-
Uranium (T)	ug/L	0.001	1.5	11.2	15	5	0	0	0.0169	0.0177	0.00171	0.000764	0.0139	0.018	0	0
Vanadium (T)	ug/L	0.05	-	90	120	5	5	100	-	-	-	-	-	0.05	-	0
Zinc (T)	ug/L	0.5	6.7	-	-	5	0	0	1.23	0.99	0.538	0.241	0.58	1.83	0	-
Dissolved Metals																
Aluminum (D)	ug/L	1	-	-	-	5	5	100	-	-	-	-	-	1	-	-
Antimony (D)	ug/L	0.02	-	-	-	5	5	100	-	-	-	-	-	0.02	-	-
Arsenic (D)	ug/L	0.02	-	-	-	5	0	0	0.409	0.402	0.0171	0.00764	0.394	0.435	-	-
Barium (D)	ug/L	0.02	-	-	-	5	0	0	11.9	11.6	0.653	0.292	11.4	13	-	-
Beryllium (D)	ug/L	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-
Boron (D)	ug/L	5	-	-	-	5	0	0	7.04	7.1	0.182	0.0812	6.8	7.2	-	-
Cadmium (D)	ug/L	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-
Chromium (D)	ug/L	0.1	-	-	-	5	5	100	-	-	-	-	-	0.1	-	-
Cobalt (D)	ug/L	0.005	-	-	-	5	0	0	0.00766	0.0078	0.000744	0.000333	0.0065	0.0085	-	-
Copper (D)	ug/L	0.05	-	0.813 | 4.27	1.08 | 5.7	5	0	0	0.923	0.904	0.051	0.0228	0.888	1.01	-	0
Iron (D)	ug/L	1	-	-	-	5	0	0	1.1	1.1	0.1	0.0447	1	1.2	-	-
Lead (D)	ug/L	0.01	-	3.36 | 5.55	4.48 | 7.4	5	5	100	-	-	-	-	-	0.01	-	0
Lithium (D)	ug/L	0.5	-	-	-	5	0	0	1.16	1.13	0.063	0.0282	1.12	1.27	-	-
Manganese (D)	ug/L	0.05	-	158 | 248	210 | 330	5	0	0	0.165	0.155	0.0259	0.0116	0.142	0.201	-	0

Table C1-4. MEL-03 summary statistics for the 2023 winter water sampling event

Parameter	Units	DL (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	MEL-03 (Reference Area 1) Winter Sampling Event (April)										
						N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	%> FEIS	% > Act Lvl
Mercury (D)	ug/L	0.1 | 0.5	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-
Molybdenum (D)	ug/L	0.05	-	-	-	5	0	0	0.12	0.12	0.00731	0.00327	0.113	0.13	-	-
Nickel (D)	ug/L	0.05	-	-	-	5	0	0	0.565	0.56	0.0247	0.011	0.538	0.604	-	-
Selenium (D)	ug/L	0.04	-	-	-	5	0	0	0.0558	0.058	0.00559	0.0025	0.048	0.061	-	-
Silver (D)	ug/L	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-
Strontium (D)	ug/L	0.02	-	1880	2500	5	0	0	55.2	54	3.52	1.57	52.7	61.2	-	0
Thallium (D)	ug/L	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-
Tin (D)	ug/L	0.02	-	-	-	4	4	100	-	-	-	-	-	0.02	-	-
Titanium (D)	ug/L	0.05	-	-	-	5	5	100	-	-	-	-	-	0.05	-	-
Uranium (D)	ug/L	0.001	-	-	-	5	0	0	0.0157	0.016	0.00141	0.00063	0.014	0.0174	-	-
Vanadium (D)	ug/L	0.05	-	-	-	5	5	100	-	-	-	-	-	0.05	-	-
Zinc (D)	ug/L	0.5	-	5.91 | 10.2	7.88 | 13.5	5	0	0	1.68	1.5	0.788	0.353	1.01	2.92	-	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.

Table C1-5. MEL-01 summary statistics for the 2023 open water sampling events

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	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	11.1	11.3	3.05	0.72	7.29	14.6	-	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	18	0	0	112	111	2.43	0.572	109	115	-	-	-
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9.0	6.5 | 9.0	18	0	0	7.5	7.46	0.134	0.0316	7.33	7.85	0	-	0
DO (mg/L)	mg/L	-	-	-	6.5	6.5	18	0	0	10.3	10.2	0.736	0.174	9.45	11.3	-	-	0
DO (%)	%	-	-	-	-	-	18	0	0	95.9	95.9	0.677	0.159	93.8	97	-	-	-
Conventional Parameters																		
Conductivity (lab)	uS/cm	1	77.5	-	-	-	18	0	0	116	114	8.09	1.91	109	144	100	-	-
Hardness	mg/L	0.5	23.4	-	-	-	18	0	0	33.5	33.5	1.49	0.352	31	37.9	100	-	-
pH (lab)	pH units	0.1	-	-	6.5 | 9.0	6.5 | 9.0	18	0	0	7.45	7.45	0.0463	0.0109	7.35	7.51	-	-	0
Total Dissolved Solids	mg/L	10	54	68	375	500	18	0	0	64	64.8	7.74	1.82	47	83.1	94	17	0
Total Dissolved Solids (Calculated)	mg/L	1	39.6	68	375	500	18	0	0	75.6	73.8	5.26	1.24	70.8	93.6	100	100	0
Total Suspended Solids	mg/L	1	1	3.1	-	-	18	12	67	-	1	-	-	1	1.6	28	0	-
Turbidity (lab)	NTU	0.1	-	-	-	-	17	0	0	0.472	0.48	0.0578	0.014	0.37	0.58	-	-	-
Major Ions																		
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	18	0	0	21	20.7	1.41	0.333	19.1	23.2	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	21	20.7	1.41	0.333	19.1	23.2	56	-	-
Bromide	mg/L	0.1	-	-	-	-	18	18	100	-	-	-	-	-	0.1	-	-	-
Calcium (D)	mg/L	0.01	-	-	-	-	18	0	0	10.3	10.2	0.426	0.1	9.53	11.4	-	-	-
Calcium (T)	mg/L	0.01 | 0.02	7.33	-	-	-	18	0	0	10.2	10.1	0.344	0.081	9.68	11.2	100	-	-
Chloride	mg/L	0.1	9.56	14	90	120	18	0	0	16.6	16.2	1.72	0.406	15.3	22.9	100	100	0
Fluoride	mg/L	0.02	0.028	0.0084	2.1	2.8	18	0	0	0.0303	0.03	0.00146	0.000343	0.028	0.034	94	100	0
Magnesium (D)	mg/L	0.004	-	-	-	-	18	0	0	1.9	1.88	0.116	0.0274	1.76	2.3	-	-	-
Magnesium (T)	mg/L	0.004 | 0.01	1.18	-	-	-	18	0	0	1.88	1.88	0.109	0.0257	1.77	2.25	100	-	-
Potassium (D)	mg/L	0.02	-	-	-	-	18	0	0	1.22	1.21	0.0578	0.0136	1.11	1.37	-	-	-
Potassium (T)	mg/L	0.02 | 0.03	0.954	-	-	-	18	0	0	1.19	1.19	0.0503	0.0119	1.14	1.37	100	-	-
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	0.268	-	-	-	18	0	0	0.544	0.556	0.0843	0.0199	0.3	0.654	100	-	-
Sodium (D)	mg/L	0.02	-	-	-	-	18	0	0	8.26	8.06	0.724	0.171	7.59	10.9	-	-	-
Sodium (T)	mg/L	0.02	4.85	5.3	-	-	18	0	0	8.24	7.98	0.78	0.184	7.56	11.1	100	100	-
Sulphate	mg/L	0.3	3.87	38	-	-	18	0	0	7.21	7.07	0.7	0.165	6.7	9.81	100	0	-
Nutrients																		
Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.308 | 9.38	0.41 | 12.5	18	4	22	0.00975	0.00975	0.00414	0.000976	0.005	0.0166	0	0	0
Nitrate (as N)	mg/L	0.005	0.018	0.25	2.17	2.9	18	8	44	0.0172	0.00735	0.0216	0.0051	0.005	0.0938	33	0	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	18	8	44	0.0173	0.00735	0.0219	0.00515	0.0051	0.0951	-	-	-
Nitrite (as N)	mg/L	0.001	0.001	0.051	0.045	0.06	18	17	94	-	0.001	-	-	0.001	0.0013	6	0	0
Nitrogen	mg/L	0.05	-	-	-	-	18	0	0	0.288	0.246	0.114	0.027	0.21	0.703	-	-	-
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	0.00238	0.00255	0.000528	0.000125	0.0014	0.0033	6	-	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	18	0	0	0.278	0.234	0.0765	0.018	0.195	0.403	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.25	-	-	-	18	0	0	0.273	0.232	0.112	0.0264	0.202	0.685	39	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	18	0	0	0.263	0.23	0.0728	0.0172	0.195	0.38	-	-	-
Total Phosphorus	mg/L	0.001	0.006	0.0049	0.0075	0.01	18	0	0	0.00597	0.00565	0.00155	0.000366	0.0042	0.0113	33	83	6

Table C1-5. MEL-01 summary statistics for the 2023 open water sampling events

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	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	4.28	4.24	0.274	0.0646	3.82	4.82	100	-	-
Total Organic Carbon	mg/L	0.5	3	-	-	-	18	0	0	4.2	4.18	0.252	0.0595	3.78	4.62	100	-	-
Total Metals																		
Aluminum (T)	ug/L	1	5.32	9.1	75	100	18	0	0	3.55	3.05	1.55	0.365	2.2	8.5	11	0	0
Antimony (T)	ug/L	0.02	0.02	0.51	4.5	6	18	16	89	-	0.02	-	-	0.02	0.03	11	0	0
Arsenic (T)	ug/L	0.02	0.275	3.8	18.8	25	18	0	0	0.642	0.648	0.0634	0.0149	0.53	0.724	100	0	0
Barium (T)	ug/L	0.02	8.05	77	750	1000	18	0	0	9.53	9.5	0.394	0.0929	9.06	10.5	100	0	0
Beryllium (T)	ug/L	0.005	0.005	-	-	-	18	18	100	-	-	-	-	-	0.005	0	-	-
Boron (T)	ug/L	5	6.52	23	1120	1500	18	0	0	7.67	7.45	0.697	0.164	7	10.1	100	0	0
Cadmium (T)	ug/L	0.005	0.005	0.05	0.03 | 0.0531	0.04 | 0.0708	18	18	100	-	-	-	-	-	0.005	0	0	0
Chromium (T)	ug/L	0.1	0.103	1.1	3.75	5	18	18	100	-	-	-	-	-	0.1	0	0	0
Cobalt (T)	ug/L	0.005	0.016	-	0.585	0.78	18	0	0	0.0295	0.0296	0.00603	0.00142	0.0227	0.0483	100	-	0
Copper (T)	ug/L	0.05	0.86	2	1500	2000	18	0	0	0.992	0.976	0.0771	0.0182	0.886	1.18	100	0	0
Iron (T)	ug/L	1	15	42	795	1060	18	0	0	24.6	24.8	6.39	1.51	15.3	33.6	100	0	0
Lead (T)	ug/L	0.01	0.0222	0.15	3.75	5	18	10	56	-	0.01	-	-	0.01	0.085	6	0	0
Lithium (T)	ug/L	0.5	0.72	-	-	-	18	0	0	1.11	1.06	0.122	0.0287	1	1.51	100	-	-
Manganese (T)	ug/L	0.05	3.06	5.5	90	120	18	0	0	9.5	6.54	4.68	1.1	5.76	16.6	100	100	0
Mercury (T)	ug/L	0.1 | 0.5	0.0008	0.02	0.0195	0.026	17	11	65	-	0.0005	-	-	0.0005	0.00235	6	0	0
Molybdenum (T)	ug/L	0.05	0.107	5.2	54.8	73	18	0	0	0.145	0.148	0.0164	0.00386	0.12	0.189	100	0	0
Nickel (T)	ug/L	0.05	0.441	2.7	18.8	25	18	0	0	0.829	0.835	0.0616	0.0145	0.746	0.981	100	0	0
Selenium (T)	ug/L	0.04	0.049	0.16	0.75	1	18	0	0	0.0499	0.0495	0.00453	0.00107	0.044	0.061	50	0	0
Silver (T)	ug/L	0.005	0.005	0.1	0.188	0.25	18	18	100	-	-	-	-	-	0.005	0	0	0
Strontium (T)	ug/L	0.02	36.1	-	1880	2500	18	0	0	59.2	58.3	3.81	0.899	56.4	73.1	100	-	0
Thallium (T)	ug/L	0.005	0.005	0.1	0.6	0.8	18	18	100	-	-	-	-	-	0.005	0	0	0
Tin (T)	ug/L	0.02	0.0384	-	-	-	18	4	22	0.034	0.0325	0.0142	0.00335	0.02	0.066	28	-	-
Titanium (T)	ug/L	0.05	0.17	-	-	-	18	0	0	0.208	0.101	0.353	0.0831	0.051	1.6	33	-	-
Uranium (T)	ug/L	0.001	0.0164	1.5	11.2	15	18	0	0	0.0284	0.0274	0.00418	0.000985	0.0255	0.0443	100	0	0
Vanadium (T)	ug/L	0.05	0.05	-	90	120	18	18	100	-	-	-	-	-	0.05	0	-	0
Zinc (T)	ug/L	0.5	1.7	6.7	-	-	18	12	67	-	0.5	-	-	0.5	2.67	6	0	-
Dissolved Metals																		
Aluminum (D)	ug/L	1	-	-	-	-	18	2	11	1.99	1.5	1.31	0.309	1	5.2	-	-	-
Antimony (D)	ug/L	0.02	-	-	-	-	18	14	78	-	0.02	-	-	0.02	0.03	-	-	-
Arsenic (D)	ug/L	0.02	-	-	-	-	18	0	0	0.606	0.618	0.0534	0.0126	0.521	0.665	-	-	-
Barium (D)	ug/L	0.02	-	-	-	-	18	0	0	9.3	9.28	0.474	0.112	8.41	10.3	-	-	-
Beryllium (D)	ug/L	0.005	-	-	-	-	18	18	100	-	-	-	-	-	0.005	-	-	-
Boron (D)	ug/L	5	-	-	-	-	18	0	0	7.52	7.3	0.751	0.177	7	10.2	-	-	-
Cadmium (D)	ug/L	0.005	-	-	-	-	18	18	100	-	-	-	-	-	0.005	-	-	-
Chromium (D)	ug/L	0.1	-	-	-	-	18	18	100	-	-	-	-	-	0.1	-	-	-
Cobalt (D)	ug/L	0.005	-	-	-	-	18	0	0	0.0168	0.0148	0.00513	0.00121	0.0127	0.0339	-	-	-
Copper (D)	ug/L	0.05	0.861	-	0.813 | 4.27	1.08 | 5.7	18	0	0	0.972	0.955	0.0931	0.0219	0.884	1.22	100	-	0
Iron (D)	ug/L	1	-	-	-	-	18	0	0	7.07	6.4	2.69	0.635	4.2	15.4	-	-	-
Lead (D)	ug/L	0.01	0.0125	-	3.36 | 5.55	4.48 | 7.4	18	12	67	-	0.01	-	-	0.01	0.084	22	-	0
Lithium (D)	ug/L	0.5	-	-	-	-	18	0	0	1.1	1.07	0.126	0.0298	1.01	1.58	-	-	-
Manganese (D)	ug/L	0.05	1.2	-	158 | 248	210 | 330	18	0	0	0.628	0.522	0.203	0.0478	0.43	0.977	0	-	0

Table C1-5. MEL-01 summary statistics for the 2023 open water sampling events

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	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 (D)	ug/L	0.1 | 0.5	-	-	-	-	18	17	94	-	5.00E-04	-	-	5.00E-04	0.00057	-	-	-
Molybdenum (D)	ug/L	0.05	-	-	-	-	18	0	0	0.15	0.153	0.0188	0.00442	0.117	0.202	-	-	-
Nickel (D)	ug/L	0.05	-	-	-	-	18	0	0	0.833	0.807	0.119	0.0281	0.717	1.18	-	-	-
Selenium (D)	ug/L	0.04	-	-	-	-	18	0	0	0.0507	0.0505	0.00494	0.00117	0.043	0.058	-	-	-
Silver (D)	ug/L	0.005	-	-	-	-	18	18	100	-	-	-	-	-	0.005	-	-	-
Strontium (D)	ug/L	0.02	-	-	1880	2500	18	0	0	60.1	59.3	3.87	0.911	55.8	73.3	-	-	0
Thallium (D)	ug/L	0.005	-	-	-	-	18	18	100	-	-	-	-	-	0.005	-	-	-
Tin (D)	ug/L	0.02	-	-	-	-	17	3	18	0.0445	0.033	0.0297	0.00721	0.02	0.104	-	-	-
Titanium (D)	ug/L	0.05	-	-	-	-	18	15	83	-	0.05	-	-	0.05	0.195	-	-	-
Uranium (D)	ug/L	0.001	-	-	-	-	18	0	0	0.0265	0.0258	0.00394	0.000929	0.0222	0.0403	-	-	-
Vanadium (D)	ug/L	0.05	-	-	-	-	18	18	100	-	-	-	-	-	0.05	-	-	-
Zinc (D)	ug/L	0.5	1.9	-	5.91 | 10.2	7.88 | 13.5	18	9	50	-	0.53	-	-	0.5	13.8	22	-	6
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.

Orange shaded values indicate parameters where at least 1 sample > Normal Range.

Table C1-6. MEL-02 summary statistics for the 2023 open water sampling events

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	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	11.8	11.3	3.78	0.976	7.54	16.6	-	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	15	0	0	97.1	96.7	1.58	0.407	95.1	99.3	-	-	-
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9.0	6.5 | 9.0	15	0	0	7.44	7.54	0.179	0.0462	7.09	7.6	7	-	0
DO (mg/L)	mg/L	-	-	-	6.5	6.5	15	0	0	10.3	10.3	0.695	0.179	9.46	11.2	-	-	0
DO (%)	%	-	-	-	-	-	15	0	0	97.7	96.9	1.9	0.491	95.7	101	-	-	-
Conventional Parameters																		
Conductivity (lab)	uS/cm	1	77.5	-	-	-	15	0	0	96.4	97.4	3.03	0.782	91.6	100	100	-	-
Hardness	mg/L	0.5	23.4	-	-	-	15	0	0	28.7	28.9	0.893	0.231	26	29.8	100	-	-
pH (lab)	pH units	0.1	-	-	6.5 | 9.0	6.5 | 9.0	15	0	0	7.42	7.45	0.0493	0.0127	7.33	7.47	-	-	0
Total Dissolved Solids	mg/L	10	54	68	375	500	15	0	0	55.2	54.9	3.54	0.914	47.5	61.1	60	0	0
Total Dissolved Solids (Calculated)	mg/L	1	39.6	68	375	500	15	0	0	62.7	63.3	1.97	0.508	59.5	65	100	0	0
Total Suspended Solids	mg/L	1	1	3.1	-	-	15	14	93	-	1	-	-	1	1.1	7	0	-
Turbidity (lab)	NTU	0.1	-	-	-	-	15	0	0	0.288	0.28	0.0457	0.0118	0.22	0.4	-	-	-
Major Ions																		
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	15	0	0	20.1	19.4	1.38	0.356	18.7	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	19.4	1.38	0.356	18.7	22	33	-	-
Bromide	mg/L	0.1	-	-	-	-	15	15	100	-	-	-	-	-	0.1	-	-	-
Calcium (D)	mg/L	0.01	-	-	-	-	15	0	0	8.98	9.04	0.264	0.0682	8.17	9.27	-	-	-
Calcium (T)	mg/L	0.01 | 0.02	7.33	-	-	-	15	0	0	8.9	8.96	0.377	0.0974	8.31	9.49	100	-	-
Chloride	mg/L	0.1	9.56	14	90	120	15	0	0	13.1	13.2	0.278	0.0718	12.7	13.6	100	0	0
Fluoride	mg/L	0.02	0.028	0.0084	2.1	2.8	15	0	0	0.0297	0.03	0.000724	0.000187	0.028	0.031	93	100	0
Magnesium (D)	mg/L	0.004	-	-	-	-	15	0	0	1.53	1.54	0.0592	0.0153	1.36	1.62	-	-	-
Magnesium (T)	mg/L	0.004 | 0.01	1.18	-	-	-	15	0	0	1.52	1.54	0.0653	0.0169	1.44	1.62	100	-	-
Potassium (D)	mg/L	0.02	-	-	-	-	15	0	0	1.08	1.08	0.0461	0.0119	0.96	1.18	-	-	-
Potassium (T)	mg/L	0.02 | 0.03	0.954	-	-	-	15	0	0	1.06	1.06	0.0375	0.00969	1.01	1.12	100	-	-
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	0.268	-	-	-	15	0	0	0.435	0.452	0.0526	0.0136	0.305	0.486	100	-	-
Sodium (D)	mg/L	0.02	-	-	-	-	15	0	0	6.53	6.53	0.194	0.0501	6.09	6.89	-	-	-
Sodium (T)	mg/L	0.02	4.85	5.3	-	-	15	0	0	6.39	6.51	0.309	0.0798	5.92	6.77	100	100	-
Sulphate	mg/L	0.3	3.87	38	-	-	15	0	0	5.55	5.57	0.241	0.0623	5.21	5.9	100	0	-
Nutrients																		
Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.308 | 9.38	0.41 | 12.5	15	3	20	0.0117	0.0078	0.00853	0.0022	0.005	0.0328	20	0	0
Nitrate (as N)	mg/L	0.005	0.018	0.25	2.17	2.9	15	9	60	-	0.005	-	-	0.005	0.0408	7	0	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	15	9	60	-	0.0051	-	-	0.0051	0.0408	-	-	-
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	0.258	0.246	0.0367	0.00946	0.209	0.347	-	-	-
Orthophosphate (PO4-P)	mg/L	0.001	0.001	-	-	-	15	15	100	-	-	-	-	-	0.001	0	-	-
Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	15	0	0	0.00204	0.0021	0.000431	0.000111	0.0012	0.0026	0	-	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	15	0	0	0.254	0.228	0.0617	0.0159	0.188	0.371	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.25	-	-	-	15	0	0	0.252	0.243	0.0358	0.00924	0.209	0.34	40	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	15	0	0	0.248	0.228	0.0597	0.0154	0.184	0.364	-	-	-
Total Phosphorus	mg/L	0.001	0.006	0.0049	0.0075	0.01	15	0	0	0.00437	0.0042	0.000753	0.000194	0.0033	0.0066	7	13	-

Table C1-6. MEL-02 summary statistics for the 2023 open water sampling events

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	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	3.99	3.88	0.48	0.124	3.27	5.12	100	-	-
Total Organic Carbon	mg/L	0.5	3	-	-	-	15	0	0	3.83	3.82	0.156	0.0402	3.5	4.19	100	-	-
Total Metals																		
Aluminum (T)	ug/L	1	5.32	9.1	75	100	15	0	0	2.54	2	1.05	0.271	1.7	5.2	0	0	0
Antimony (T)	ug/L	0.02	0.02	0.51	4.5	6	15	14	93	-	0.02	-	-	0.02	0.021	7	0	0
Arsenic (T)	ug/L	0.02	0.275	3.8	18.8	25	15	0	0	0.749	0.736	0.089	0.023	0.64	0.904	100	0	0
Barium (T)	ug/L	0.02	8.05	77	750	1000	15	0	0	9.14	9.06	0.36	0.093	8.72	9.77	100	0	0
Beryllium (T)	ug/L	0.005	0.005	-	-	-	15	15	100	-	-	-	-	-	0.005	0	-	-
Boron (T)	ug/L	5	6.52	23	1120	1500	15	0	0	5.82	5.8	0.157	0.0405	5.6	6.1	0	0	0
Cadmium (T)	ug/L	0.005	0.005	0.05	0.03 | 0.0531	0.04 | 0.0708	15	15	100	-	-	-	-	-	0.005	0	0	0
Chromium (T)	ug/L	0.1	0.103	1.1	3.75	5	15	15	100	-	-	-	-	-	0.1	0	0	0
Cobalt (T)	ug/L	0.005	0.016	-	0.585	0.78	15	0	0	0.0188	0.0198	0.00361	0.000933	0.0137	0.0275	67	-	0
Copper (T)	ug/L	0.05	0.86	2	1500	2000	15	0	0	1.09	0.912	0.481	0.124	0.833	2.73	80	7	0
Iron (T)	ug/L	1	15	42	795	1060	15	0	0	16.1	16.7	3.77	0.972	10.9	21.8	67	0	0
Lead (T)	ug/L	0.01	0.0222	0.15	3.75	5	15	4	27	0.0509	0.018	0.0772	0.0199	0.01	0.308	33	7	0
Lithium (T)	ug/L	0.5	0.72	-	-	-	15	0	0	0.914	0.92	0.0338	0.00872	0.86	0.96	100	-	-
Manganese (T)	ug/L	0.05	3.06	5.5	90	120	15	0	0	5.33	4.66	1.78	0.46	3.57	8.19	100	33	0
Mercury (T)	ug/L	0.1 | 0.5	0.0008	0.02	0.0195	0.026	15	10	67	-	0.0005	-	-	0.0005	0.00083	7	0	0
Molybdenum (T)	ug/L	0.05	0.107	5.2	54.8	73	15	0	0	0.107	0.109	0.00925	0.00239	0.092	0.123	53	0	0
Nickel (T)	ug/L	0.05	0.441	2.7	18.8	25	15	0	0	0.699	0.71	0.13	0.0336	0.561	1.06	100	0	0
Selenium (T)	ug/L	0.04	0.049	0.16	0.75	1	15	2	13	0.0455	0.046	0.00277	0.000716	0.04	0.049	0	0	0
Silver (T)	ug/L	0.005	0.005	0.1	0.188	0.25	15	15	100	-	-	-	-	-	0.005	0	0	0
Strontium (T)	ug/L	0.02	36.1	-	1880	2500	15	0	0	48.5	48.8	1.26	0.326	46.2	50.2	100	-	0
Thallium (T)	ug/L	0.005	0.005	0.1	0.6	0.8	15	15	100	-	-	-	-	-	0.005	0	0	0
Tin (T)	ug/L	0.02	0.0384	-	-	-	14	6	43	0.0238	0.0215	0.00435	0.00116	0.02	0.031	0	-	-
Titanium (T)	ug/L	0.05	0.17	-	-	-	15	9	60	-	0.05	-	-	0.05	0.132	0	-	-
Uranium (T)	ug/L	0.001	0.0164	1.5	11.2	15	15	0	0	0.0216	0.0215	0.00135	0.000349	0.0196	0.0242	100	0	0
Vanadium (T)	ug/L	0.05	0.05	-	90	120	15	15	100	-	-	-	-	-	0.05	0	-	0
Zinc (T)	ug/L	0.5	1.7	6.7	-	-	15	9	60	-	0.5	-	-	0.5	6.97	40	7	-
Dissolved Metals																		
Aluminum (D)	ug/L	1	-	-	-	-	15	5	33	1.55	1.2	1.21	0.312	1	5.8	-	-	-
Antimony (D)	ug/L	0.02	-	-	-	-	15	14	93	-	0.02	-	-	0.02	0.023	-	-	-
Arsenic (D)	ug/L	0.02	-	-	-	-	15	0	0	0.712	0.701	0.0986	0.0255	0.583	0.852	-	-	-
Barium (D)	ug/L	0.02	-	-	-	-	15	0	0	8.96	8.95	0.337	0.0871	8.32	9.64	-	-	-
Beryllium (D)	ug/L	0.005	-	-	-	-	15	15	100	-	-	-	-	-	0.005	-	-	-
Boron (D)	ug/L	5	-	-	-	-	15	0	0	6.02	6	0.211	0.0545	5.6	6.6	-	-	-
Cadmium (D)	ug/L	0.005	-	-	-	-	15	15	100	-	-	-	-	-	0.005	-	-	-
Chromium (D)	ug/L	0.1	-	-	-	-	15	14	93	-	0.1	-	-	0.1	0.24	-	-	-
Cobalt (D)	ug/L	0.005	-	-	-	-	15	0	0	0.0121	0.0106	0.00664	0.00171	0.0078	0.0347	-	-	-
Copper (D)	ug/L	0.05	0.861	-	0.813 | 4.27	1.08 | 5.7	15	0	0	1.2	0.858	0.827	0.213	0.801	4.06	47	-	7
Iron (D)	ug/L	1	-	-	-	-	15	0	0	6.97	6.9	4.42	1.14	2.8	20.8	-	-	-
Lead (D)	ug/L	0.01	0.0125	-	3.36 | 5.55	4.48 | 7.4	15	9	60	-	0.01	-	-	0.01	0.098	40	-	0
Lithium (D)	ug/L	0.5	-	-	-	-	15	0	0	0.953	0.95	0.0379	0.00978	0.87	1.05	-	-	-
Manganese (D)	ug/L	0.05	1.2	-	158 | 248	210 | 330	15	0	0	0.745	0.5	0.542	0.14	0.307	2.34	13	-	0

Table C1-6. MEL-02 summary statistics for the 2023 open water sampling events

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	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 (D)	ug/L	0.1 | 0.5	-	-	-	-	15	14	93	-	5.00E-04	-	-	5.00E-04	0.00055	-	-	-
Molybdenum (D)	ug/L	0.05	-	-	-	-	15	0	0	0.115	0.107	0.0282	0.00727	0.093	0.202	-	-	-
Nickel (D)	ug/L	0.05	-	-	-	-	15	0	0	0.753	0.699	0.295	0.0763	0.529	1.71	-	-	-
Selenium (D)	ug/L	0.04	-	-	-	-	15	1	7	0.0456	0.045	0.00447	0.00115	0.04	0.054	-	-	-
Silver (D)	ug/L	0.005	-	-	-	-	15	15	100	-	-	-	-	-	0.005	-	-	-
Strontium (D)	ug/L	0.02	-	-	1880	2500	15	0	0	48.2	48.6	1.91	0.493	42	50.1	-	-	0
Thallium (D)	ug/L	0.005	-	-	-	-	15	15	100	-	-	-	-	-	0.005	-	-	-
Tin (D)	ug/L	0.02	-	-	-	-	15	6	40	0.04	0.024	0.0361	0.00933	0.02	0.138	-	-	-
Titanium (D)	ug/L	0.05	-	-	-	-	15	13	87	-	0.05	-	-	0.05	0.3	-	-	-
Uranium (D)	ug/L	0.001	-	-	-	-	15	0	0	0.02	0.02	0.00124	0.000319	0.0176	0.022	-	-	-
Vanadium (D)	ug/L	0.05	-	-	-	-	14	14	100	-	-	-	-	-	0.05	-	-	-
Zinc (D)	ug/L	0.5	1.9	-	5.91 | 10.2	7.88 | 13.5	15	9	60	-	0.5	-	-	0.5	8.65	40	-	13
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.

Orange shaded values indicate parameters where at least 1 sample > Normal Range.

Table C1-7. MEL-03 summary statistics for the 2023 open water sampling events

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	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	11.3	10	3.73	0.963	7.38	16.2	-	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	15	0	0	85.3	85.7	1.44	0.372	82.8	86.7	-	-	-
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9.0	6.5 | 9.0	15	0	0	7.31	7.57	0.434	0.112	6.24	7.61	27	-	7
DO (mg/L)	mg/L	-	-	-	6.5	6.5	15	0	0	10.4	10.7	0.734	0.189	9.39	11.2	-	-	0
DO (%)	%	-	-	-	-	-	15	0	0	97.1	97.7	1.43	0.368	94.9	98.8	-	-	-
Conventional Parameters																		
Conductivity (lab)	uS/cm	1	77.5	-	-	-	15	0	0	85.4	86	2.6	0.672	81.5	89.1	100	-	-
Hardness	mg/L	0.5	23.4	-	-	-	15	0	0	25.9	26	0.289	0.0746	25.3	26.5	100	-	-
pH (lab)	pH units	0.1	-	-	6.5 | 9.0	6.5 | 9.0	15	0	0	7.47	7.47	0.0125	0.00322	7.45	7.49	-	-	0
Total Dissolved Solids	mg/L	10	54	68	375	500	15	0	0	48.1	47.2	3.7	0.956	42.6	54.2	7	0	0
Total Dissolved Solids (Calculated)	mg/L	1	39.6	68	375	500	15	0	0	55.5	55.9	1.7	0.438	53	57.9	100	0	0
Total Suspended Solids**	mg/L	1	1	3.1	-	-	13	10	77	-	1	-	-	1	8.7	23	8	-
Turbidity (lab)**	NTU	0.1	-	-	-	-	13	0	0	0.365	0.32	0.113	0.0312	0.26	0.62	-	-	-
Major Ions																		
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	15	0	0	19.4	18.8	1.48	0.381	17.9	22.3	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	19.4	18.8	1.48	0.381	17.9	22.3	33	-	-
Bromide	mg/L	0.1	-	-	-	-	15	15	100	-	-	-	-	-	0.1	-	-	-
Calcium (D)	mg/L	0.01	-	-	-	-	15	0	0	8.16	8.17	0.0965	0.0249	7.95	8.37	-	-	-
Calcium (T)	mg/L	0.01 | 0.02	7.33	-	-	-	15	0	0	8.27	8.08	0.448	0.116	7.67	9.09	100	-	-
Chloride	mg/L	0.1	9.56	14	90	120	15	0	0	11.1	11.2	0.171	0.0441	10.8	11.3	100	0	0
Fluoride	mg/L	0.02	0.028	0.0084	2.1	2.8	15	0	0	0.0287	0.029	0.000488	0.000126	0.028	0.029	67	100	0
Magnesium (D)	mg/L	0.004	-	-	-	-	15	0	0	1.35	1.35	0.0113	0.00293	1.33	1.37	-	-	-
Magnesium (T)	mg/L	0.004 | 0.01	1.18	-	-	-	15	0	0	1.4	1.33	0.195	0.0502	1.27	2.06	100	-	-
Potassium (D)	mg/L	0.02	-	-	-	-	15	0	0	1.02	1.01	0.0236	0.00609	0.981	1.06	-	-	-
Potassium (T)	mg/L	0.02 | 0.03	0.954	-	-	-	15	0	0	1.03	0.999	0.0836	0.0216	0.953	1.3	93	-	-
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	0.268	-	-	-	15	0	0	0.342	0.344	0.0348	0.00898	0.284	0.405	100	-	-
Sodium (D)	mg/L	0.02	-	-	-	-	15	0	0	5.55	5.56	0.0679	0.0175	5.4	5.66	-	-	-
Sodium (T)	mg/L	0.02	4.85	5.3	-	-	15	0	0	5.55	5.47	0.288	0.0743	5.09	5.97	100	80	-
Sulphate	mg/L	0.3	3.87	38	-	-	15	0	0	4.46	4.45	0.0488	0.0126	4.38	4.54	100	0	-
Nutrients																		
Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.308 | 9.38	0.41 | 12.5	15	5	33	0.0114	0.0107	0.00803	0.00207	0.005	0.0307	20	0	0
Nitrate (as N)	mg/L	0.005	0.018	0.25	2.17	2.9	15	8	53	-	0.005	-	-	0.005	0.0247	33	0	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	15	8	53	-	0.0051	-	-	0.0051	0.0247	-	-	-
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	0.234	0.216	0.0602	0.0155	0.153	0.38	-	-	-
Orthophosphate (PO4-P)	mg/L	0.001	0.001	-	-	-	15	15	100	-	-	-	-	-	0.001	0	-	-
Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	15	3	20	0.00171	0.0017	0.000554	0.000143	0.001	0.0024	0	-	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	15	0	0	0.244	0.208	0.0774	0.02	0.168	0.37	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.25	-	-	-	15	0	0	0.225	0.216	0.0561	0.0145	0.153	0.356	40	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	15	0	0	0.235	0.208	0.0713	0.0184	0.165	0.346	-	-	-
Total Phosphorus	mg/L	0.001	0.006	0.0049	0.0075	0.01	13	0	0	0.00388	0.0042	0.000943	0.000262	0.0021	0.0051	0	8	-

Table C1-7. MEL-03 summary statistics for the 2023 open water sampling events

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	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	3.47	3.46	0.234	0.0604	3.04	3.83	100	-	-
Total Organic Carbon	mg/L	0.5	3	-	-	-	15	0	0	3.17	3.16	0.109	0.0282	2.92	3.35	93	-	-
Total Metals**																		
Aluminum (T)	ug/L	1	5.32	9.1	75	100	12	0	0	3.18	2.75	1.09	0.314	2.2	5.5	8	0	0
Antimony (T)	ug/L	0.02	0.02	0.51	4.5	6	14	14	100	-	-	-	-	-	0.02	0	0	0
Arsenic (T)	ug/L	0.02	0.275	3.8	18.8	25	14	0	0	0.406	0.39	0.0347	0.00927	0.373	0.484	100	0	0
Barium (T)	ug/L	0.02	8.05	77	750	1000	14	0	0	8.81	8.76	0.292	0.0781	8.48	9.6	100	0	0
Beryllium (T)	ug/L	0.005	0.005	-	-	-	14	14	100	-	-	-	-	-	0.005	0	-	-
Boron (T)	ug/L	5	6.52	23	1120	1500	14	11	79	-	5	-	-	5	5.1	0	0	0
Cadmium (T)	ug/L	0.005	0.005	0.05	0.03 | 0.0531	0.04 | 0.0708	14	14	100	-	-	-	-	-	0.005	0	0	0
Chromium (T)	ug/L	0.1	0.103	1.1	3.75	5	13	13	100	-	-	-	-	-	0.1	0	0	0
Cobalt (T)	ug/L	0.005	0.016	-	0.585	0.78	13	0	0	0.0151	0.0158	0.00197	0.000547	0.0119	0.018	38	-	0
Copper (T)	ug/L	0.05	0.86	2	1500	2000	14	0	0	0.907	0.832	0.146	0.0389	0.771	1.21	43	0	0
Iron (T)	ug/L	1	15	42	795	1060	13	0	0	13.8	13.6	2.52	0.698	10.1	18.4	23	0	0
Lead (T)	ug/L	0.01	0.0222	0.15	3.75	5	14	3	21	0.0437	0.019	0.0631	0.0169	0.01	0.248	43	7	0
Lithium (T)	ug/L	0.5	0.72	-	-	-	14	0	0	0.839	0.825	0.0346	0.00925	0.79	0.89	100	-	-
Manganese (T)	ug/L	0.05	3.06	5.5	90	120	14	0	0	3.96	4.14	0.988	0.264	2.72	6.24	64	7	0
Mercury (T)	ug/L	0.1 | 0.5	0.0008	0.02	0.0195	0.026	14	8	57	-	0.0005	-	-	0.00036	0.00218	7	0	0
Molybdenum (T)	ug/L	0.05	0.107	5.2	54.8	73	14	0	0	0.0929	0.094	0.00793	0.00212	0.081	0.106	0	0	0
Nickel (T)	ug/L	0.05	0.441	2.7	18.8	25	14	0	0	0.525	0.492	0.118	0.0316	0.441	0.912	93	0	0
Selenium (T)	ug/L	0.04	0.049	0.16	0.75	1	14	1	7	0.0436	0.0435	0.00241	0.000644	0.04	0.047	0	0	0
Silver (T)	ug/L	0.005	0.005	0.1	0.188	0.25	14	14	100	-	-	-	-	-	0.005	0	0	0
Strontium (T)	ug/L	0.02	36.1	-	1880	2500	14	0	0	42.4	42	1.37	0.367	40.6	44.6	100	-	0
Thallium (T)	ug/L	0.005	0.005	0.1	0.6	0.8	14	14	100	-	-	-	-	-	0.005	0	0	0
Tin (T)	ug/L	0.02	0.0384	-	-	-	13	6	46	0.0288	0.024	0.0121	0.00336	0.02	0.052	23	-	-
Titanium (T)	ug/L	0.05	0.17	-	-	-	13	2	15	0.136	0.119	0.101	0.0281	0.05	0.407	15	-	-
Uranium (T)	ug/L	0.001	0.0164	1.5	11.2	15	14	0	0	0.0204	0.0201	0.00466	0.00125	0.0154	0.0355	86	0	0
Vanadium (T)	ug/L	0.05	0.05	-	90	120	13	13	100	-	-	-	-	-	0.05	0	-	0
Zinc (T)	ug/L	0.5	1.7	6.7	-	-	14	5	36	1.31	0.715	1.08	0.29	0.5	3.76	36	0	-
Dissolved Metals**																		
Aluminum (D)	ug/L	1	-	-	-	-	13	5	38	1.52	1.1	0.637	0.177	1	2.6	-	-	-
Antimony (D)	ug/L	0.02	-	-	-	-	14	14	100	-	-	-	-	-	0.02	-	-	-
Arsenic (D)	ug/L	0.02	-	-	-	-	14	0	0	0.386	0.369	0.0391	0.0104	0.349	0.458	-	-	-
Barium (D)	ug/L	0.02	-	-	-	-	14	0	0	8.56	8.59	0.156	0.0416	8.33	8.82	-	-	-
Beryllium (D)	ug/L	0.005	-	-	-	-	14	14	100	-	-	-	-	-	0.005	-	-	-
Boron (D)	ug/L	5	-	-	-	-	14	5	36	5.18	5.2	0.148	0.0395	5	5.4	-	-	-
Cadmium (D)	ug/L	0.005	-	-	-	-	14	14	100	-	-	-	-	-	0.005	-	-	-
Chromium (D)	ug/L	0.1	-	-	-	-	14	14	100	-	-	-	-	-	0.1	-	-	-
Cobalt (D)	ug/L	0.005	-	-	-	-	14	0	0	0.00739	0.00675	0.00219	0.000585	0.0056	0.0144	-	-	-
Copper (D)	ug/L	0.05	0.861	-	0.813 | 4.27	1.08 | 5.7	14	0	0	0.845	0.772	0.134	0.0357	0.733	1.14	36	-	7
Iron (D)	ug/L	1	-	-	-	-	14	0	0	4.68	3.65	1.86	0.498	2.7	8.2	-	-	-
Lead (D)	ug/L	0.01	0.0125	-	3.36 | 5.55	4.48 | 7.4	14	9	64	-	0.01	-	-	0.01	0.135	29	-	0
Lithium (D)	ug/L	0.5	-	-	-	-	14	0	0	0.848	0.85	0.0286	0.00764	0.79	0.89	-	-	-
Manganese (D)	ug/L	0.05	1.2	-	158 | 248	210 | 330	14	0	0	0.53	0.474	0.383	0.102	0.281	1.79	7	-	0

Table C1-7. MEL-03 summary statistics for the 2023 open water sampling events

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	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 (D)	ug/L	0.1 | 0.5	-	-	-	-	14	8	57	-	0.0005	-	-	0.00025	0.00059	-	-	-
Molybdenum (D)	ug/L	0.05	-	-	-	-	14	0	0	0.0897	0.0905	0.00627	0.00168	0.08	0.098	-	-	-
Nickel (D)	ug/L	0.05	-	-	-	-	14	0	0	0.496	0.482	0.0763	0.0204	0.424	0.714	-	-	-
Selenium (D)	ug/L	0.04	-	-	-	-	14	4	29	0.0437	0.044	0.00317	0.000848	0.04	0.048	-	-	-
Silver (D)	ug/L	0.005	-	-	-	-	14	14	100	-	-	-	-	-	0.005	-	-	-
Strontium (D)	ug/L	0.02	-	-	1880	2500	14	0	0	42.1	42.3	0.582	0.155	41	42.8	-	-	0
Thallium (D)	ug/L	0.005	-	-	-	-	14	14	100	-	-	-	-	-	0.005	-	-	-
Tin (D)	ug/L	0.02	-	-	-	-	14	3	21	0.031	0.0265	0.0119	0.00319	0.02	0.059	-	-	-
Titanium (D)	ug/L	0.05	-	-	-	-	14	13	93	-	0.05	-	-	0.05	0.05	-	-	-
Uranium (D)	ug/L	0.001	-	-	-	-	14	0	0	0.0169	0.0166	0.00124	0.00033	0.0153	0.0194	-	-	-
Vanadium (D)	ug/L	0.05	-	-	-	-	14	14	100	-	-	-	-	-	0.05	-	-	-
Zinc (D)	ug/L	0.5	1.9	-	5.91 | 10.2	7.88 | 13.5	14	8	57	-	0.5	-	-	0.5	5.69	29	-	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.

Orange shaded values indicate parameters where at least 1 sample > Normal Range.

** Two results for TSS and turbidity were flagged as outliers in the August 2023 sampling event. based on high concentrations of TSS and turbidity. Metals with elevated DLs were also removed from the dataset.

Table C1-8. MEL-04 summary statistics for the August 2023 sampling event

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	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	16	16	0.0778	0.0348	15.9	16.1	-	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	5	0	0	84.8	84.8	0.0447	0.02	84.8	84.9	-	-	-
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9.0	6.5 | 9.0	5	0	0	7.21	7.24	0.087	0.0389	7.08	7.31	20	-	0
DO (mg/L)	mg/L	-	-	-	6.5	6.5	5	0	0	9.46	9.47	0.0152	0.00678	9.44	9.48	-	-	0
DO (%)	%	-	-	-	-	-	5	0	0	98.6	98.7	0.23	0.103	98.4	98.9	-	-	-
Conventional Parameters																		
Conductivity (lab)	uS/cm	1	77.5	-	-	-	5	0	0	77.9	82	9.76	4.37	60.4	82.7	80	-	-
Hardness	mg/L	0.5	23.4	-	-	-	5	0	0	21.9	25.5	8.02	3.59	7.6	25.8	80	-	-
pH (lab)	pH units	0.1	-	-	6.5 | 9.0	6.5 | 9.0	5	0	0	7.4	7.42	0.065	0.0291	7.29	7.45	-	-	0
Total Dissolved Solids	mg/L	10	54	68	375	500	5	0	0	48.4	49.4	5.49	2.45	39.1	52.8	0	0	0
Total Dissolved Solids (Calculated)	mg/L	1	39.6	68	375	500	5	0	0	50.6	53.3	6.33	2.83	39.3	53.8	80	0	0
Total Suspended Solids	mg/L	1	1	3.1	-	-	5	3	60	-	1	-	-	1	2	40	0	-
Turbidity (lab)	NTU	0.1	-	-	-	-	5	0	0	0.334	0.31	0.0666	0.0298	0.27	0.41	-	-	-
Major Ions																		
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	5	0	0	19.2	20.7	3.4	1.52	13.1	20.8	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	19.2	20.7	3.4	1.52	13.1	20.8	60	-	-
Bromide	mg/L	0.1	-	-	-	-	5	5	100	-	-	-	-	-	0.1	-	-	-
Calcium (D)	mg/L	0.01	-	-	-	-	5	0	0	6.9	8.01	2.53	1.13	2.38	8.11	-	-	-
Calcium (T)	mg/L	0.01 | 0.02	7.33	-	-	-	5	0	0	7.82	7.8	0.113	0.0505	7.73	8.01	100	-	-
Chloride	mg/L	0.1	9.56	14	90	120	5	0	0	10.4	11	1.3	0.582	8.09	11	80	0	0
Fluoride	mg/L	0.02	0.028	0.0084	2.1	2.8	5	0	0	0.0278	0.029	0.00327	0.00146	0.022	0.03	80	100	0
Magnesium (D)	mg/L	0.004	-	-	-	-	5	0	0	1.15	1.33	0.416	0.186	0.403	1.35	-	-	-
Magnesium (T)	mg/L	0.004 | 0.01	1.18	-	-	-	5	0	0	1.29	1.28	0.0217	0.0097	1.26	1.31	100	-	-
Potassium (D)	mg/L	0.02	-	-	-	-	5	0	0	0.84	0.973	0.307	0.137	0.291	0.986	-	-	-
Potassium (T)	mg/L	0.02 | 0.03	0.954	-	-	-	5	0	0	0.967	0.963	0.0138	0.00616	0.956	0.989	100	-	-
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	0.268	-	-	-	5	0	0	0.331	0.35	0.045	0.0201	0.252	0.364	80	-	-
Sodium (D)	mg/L	0.02	-	-	-	-	5	0	0	4.7	5.45	1.71	0.765	1.64	5.5	-	-	-
Sodium (T)	mg/L	0.02	4.85	5.3	-	-	5	0	0	5.19	5.19	0.0537	0.024	5.14	5.28	100	0	-
Sulphate	mg/L	0.3	3.87	38	-	-	5	0	0	4.28	4.48	0.567	0.254	3.28	4.69	80	0	-
Nutrients																		
Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.308 | 9.38	0.41 | 12.5	5	0	0	0.0124	0.0126	0.00315	0.00141	0.008	0.0163	0	0	0
Nitrate (as N)	mg/L	0.005	0.018	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	0.198	0.199	0.00977	0.00437	0.184	0.21	-	-	-
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	1	20	0.0015	0.0014	0.0004	0.000179	0.001	0.0021	0	-	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	5	0	0	0.183	0.191	0.0257	0.0115	0.139	0.205	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.25	-	-	-	5	0	0	0.198	0.199	0.00977	0.00437	0.184	0.21	0	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	5	0	0	0.183	0.191	0.0257	0.0115	0.139	0.205	-	-	-
Total Phosphorus	mg/L	0.001	0.006	0.0049	0.0075	0.01	5	0	0	0.00358	0.0034	0.000545	0.000244	0.0031	0.0043	0	0	-

Table C1-8. MEL-04 summary statistics for the August 2023 sampling event

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	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	4.27	4.26	0.466	0.208	3.54	4.71	100	-	-
Total Organic Carbon	mg/L	0.5	3	-	-	-	5	0	0	3.99	4	0.14	0.0626	3.78	4.16	100	-	-
Total Metals																		
Aluminum (T)	ug/L	1	5.32	9.1	75	100	5	0	0	1.98	1.6	0.572	0.256	1.5	2.7	0	0	0
Antimony (T)	ug/L	0.02	0.02	0.51	4.5	6	5	5	100	-	-	-	-	-	0.02	0	0	0
Arsenic (T)	ug/L	0.02	0.275	3.8	18.8	25	5	0	0	0.364	0.365	0.00554	0.00248	0.355	0.37	100	0	0
Barium (T)	ug/L	0.02	8.05	77	750	1000	5	0	0	8.66	8.61	0.0943	0.0422	8.59	8.82	100	0	0
Beryllium (T)	ug/L	0.005	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	0	-	-
Boron (T)	ug/L	5	6.52	23	1120	1500	5	4	80	-	5	-	-	5	5.1	0	0	0
Cadmium (T)	ug/L	0.005	0.005	0.05	0.03 | 0.0531	0.04 | 0.0708	5	5	100	-	-	-	-	-	0.005	0	0	0
Chromium (T)	ug/L	0.1	0.103	1.1	3.75	5	5	5	100	-	-	-	-	-	0.1	0	0	0
Cobalt (T)	ug/L	0.005	0.016	-	0.585	0.78	5	0	0	0.015	0.0144	0.00142	0.000635	0.0133	0.0168	40	-	0
Copper (T)	ug/L	0.05	0.86	2	1500	2000	5	0	0	1.08	0.953	0.311	0.139	0.893	1.63	100	0	0
Iron (T)	ug/L	1	15	42	795	1060	5	0	0	8.14	8	0.841	0.376	7.4	9.4	0	0	0
Lead (T)	ug/L	0.01	0.0222	0.15	3.75	5	5	0	0	0.0956	0.084	0.0307	0.0137	0.075	0.15	100	0	0
Lithium (T)	ug/L	0.5	0.72	-	-	-	5	0	0	0.816	0.8	0.0305	0.0136	0.8	0.87	100	-	-
Manganese (T)	ug/L	0.05	3.06	5.5	90	120	5	0	0	3.76	3.75	0.137	0.0614	3.6	3.92	100	0	0
Mercury (T)	ug/L	0.1 | 0.5	0.0008	0.02	0.0195	0.026	5	5	100	-	-	-	-	-	0.0005	0	0	0
Molybdenum (T)	ug/L	0.05	0.107	5.2	54.8	73	5	0	0	0.089	0.088	0.00235	0.00105	0.087	0.092	0	0	0
Nickel (T)	ug/L	0.05	0.441	2.7	18.8	25	5	0	0	0.64	0.596	0.159	0.0711	0.519	0.916	100	0	0
Selenium (T)	ug/L	0.04	0.049	0.16	0.75	1	5	0	0	0.0438	0.043	0.00277	0.00124	0.041	0.048	0	0	0
Silver (T)	ug/L	0.005	0.005	0.1	0.188	0.25	5	5	100	-	-	-	-	-	0.005	0	0	0
Strontium (T)	ug/L	0.02	36.1	-	1880	2500	5	0	0	40.8	40.7	0.378	0.169	40.6	41.5	100	-	0
Thallium (T)	ug/L	0.005	0.005	0.1	0.6	0.8	5	5	100	-	-	-	-	-	0.005	0	0	0
Tin (T)	ug/L	0.02	0.0384	-	-	-	5	2	40	0.0268	0.022	0.012	0.00535	0.02	0.048	20	-	-
Titanium (T)	ug/L	0.05	0.17	-	-	-	5	5	100	-	-	-	-	-	0.05	0	-	-
Uranium (T)	ug/L	0.001	0.0164	1.5	11.2	15	5	0	0	0.0178	0.0176	0.00124	0.000554	0.0166	0.0197	100	0	0
Vanadium (T)	ug/L	0.05	0.05	-	90	120	5	5	100	-	-	-	-	-	0.05	0	-	0
Zinc (T)	ug/L	0.5	1.7	6.7	-	-	5	0	0	3.23	2.84	1.18	0.529	2.31	5.3	100	0	-
Dissolved Metals																		
Aluminum (D)	ug/L	1	-	-	-	-	5	1	20	1.76	1.1	1.32	0.591	1	4.1	-	-	-
Antimony (D)	ug/L	0.02	-	-	-	-	5	5	100	-	-	-	-	-	0.02	-	-	-
Arsenic (D)	ug/L	0.02	-	-	-	-	5	0	0	0.331	0.363	0.0743	0.0332	0.198	0.367	-	-	-
Barium (D)	ug/L	0.02	-	-	-	-	5	0	0	7.52	8.65	2.55	1.14	2.95	8.69	-	-	-
Beryllium (D)	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-
Boron (D)	ug/L	5	-	-	-	-	5	1	20	5.1	5.1	0.1	0.0447	5	5.2	-	-	-
Cadmium (D)	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-
Chromium (D)	ug/L	0.1	-	-	-	-	4	4	100	-	-	-	-	-	0.1	-	-	-
Cobalt (D)	ug/L	0.005	-	-	-	-	4	0	0	0.0148	0.0144	0.00266	1.33E-03	0.0122	0.0181	-	-	-
Copper (D)	ug/L	0.05	0.861	-	0.813 | 4.27	1.08 | 5.7	5	0	0	1.44	1.26	0.417	0.187	1.17	2.16	100	-	20
Iron (D)	ug/L	1	-	-	-	-	5	0	0	9.06	4.4	10.8	4.81	3.8	28.3	-	-	-
Lead (D)	ug/L	0.01	0.0125	-	3.36 | 5.55	4.48 | 7.4	5	0	0	0.106	0.088	0.0364	0.0163	0.076	0.164	100	-	0
Lithium (D)	ug/L	0.5	-	-	-	-	5	1	20	0.774	0.84	0.153	0.0685	0.5	0.85	-	-	-
Manganese (D)	ug/L	0.05	1.2	-	158 | 248	210 | 330	5	0	0	1.58	0.843	1.62	0.722	0.756	4.46	20	-	0

Table C1-8. MEL-04 summary statistics for the August 2023 sampling event

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	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 (D)	ug/L	0.1 | 0.5	-	-	-	-	5	5	100	-	-	-	-	-	0.0005	-	-	-
Molybdenum (D)	ug/L	0.05	-	-	-	-	5	1	20	0.086	0.091	0.0207	0.00924	0.05	0.101	-	-	-
Nickel (D)	ug/L	0.05	-	-	-	-	4	0	0	0.955	0.925	0.112	0.056	0.86	1.11	-	-	-
Selenium (D)	ug/L	0.04	-	-	-	-	5	3	60	-	0.04	-	-	0.04	0.041	-	-	-
Silver (D)	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-
Strontium (D)	ug/L	0.02	-	-	1880	2500	5	0	0	34.9	40.2	12.4	5.55	12.7	41.1	-	-	0
Thallium (D)	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-
Tin (D)	ug/L	0.02	-	-	-	-	5	1	20	0.032	0.026	0.0181	0.00809	0.02	0.064	-	-	-
Titanium (D)	ug/L	0.05	-	-	-	-	5	5	100	-	-	-	-	-	0.05	-	-	-
Uranium (D)	ug/L	0.001	-	-	-	-	5	0	0	0.0139	0.0158	0.0046	0.00206	0.0057	0.0167	-	-	-
Vanadium (D)	ug/L	0.05	-	-	-	-	5	5	100	-	-	-	-	-	0.05	-	-	-
Zinc (D)	ug/L	0.5	1.9	-	5.91 | 10.2	7.88 | 13.5	4	0	0	4.83	5.04	0.98	0.49	3.51	5.74	100	-	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.

Orange shaded values indicate parameters where at least 1 sample > Normal Range.

Table C1-9. MEL-05 summary statistics for the August 2023 sampling event

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	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	16.2	16.2	0.0152	0.00678	16.1	16.2	-	-	-
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	5	0	0	87.7	87.8	0.134	0.06	87.6	87.9	-	-	-
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9.0	6.5 | 9.0	5	0	0	7.43	7.44	0.0497	0.0222	7.35	7.48	0	-	0
DO (mg/L)	mg/L	-	-	-	6.5	6.5	5	0	0	9.47	9.46	0.0152	0.00678	9.45	9.49	-	-	0
DO (%)	%	-	-	-	-	-	5	0	0	98.9	98.9	0.114	0.051	98.7	99	-	-	-
Conventional Parameters																		
Conductivity (lab)	uS/cm	1	77.5	-	-	-	5	0	0	83.5	85.2	3.78	1.69	76.7	85.2	80	-	-
Hardness	mg/L	0.5	23.4	-	-	-	5	0	0	26.9	27	0.164	0.0735	26.7	27.1	100	-	-
pH (lab)	pH units	0.1	-	-	6.5 | 9.0	6.5 | 9.0	5	0	0	7.48	7.47	0.0292	0.013	7.46	7.53	-	-	0
Total Dissolved Solids	mg/L	10	54	68	375	500	5	0	0	51.6	51.1	3.24	1.45	47.8	55.1	40	0	0
Total Dissolved Solids (Calculated)	mg/L	1	39.6	68	375	500	5	0	0	54.2	55.4	2.48	1.11	49.8	55.4	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	0.298	0.3	0.00837	0.00374	0.29	0.31	-	-	-
Major Ions																		
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	5	0	0	22.4	22.2	0.526	0.235	22	23.3	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	22.4	22.2	0.526	0.235	22	23.3	100	-	-
Bromide	mg/L	0.1	-	-	-	-	5	5	100	-	-	-	-	-	0.1	-	-	-
Calcium (D)	mg/L	0.01	-	-	-	-	5	0	0	8.52	8.53	0.0534	0.0239	8.46	8.58	-	-	-
Calcium (T)	mg/L	0.01 | 0.02	7.33	-	-	-	5	0	0	8.17	8.17	0.0606	0.0271	8.08	8.25	100	-	-
Chloride	mg/L	0.1	9.56	14	90	120	5	0	0	11.1	11.1	0.0447	0.02	11.1	11.2	100	0	0
Fluoride	mg/L	0.02	0.028	0.0084	2.1	2.8	5	0	0	0.03	0.03	0	0	0.03	0.03	100	100	0
Magnesium (D)	mg/L	0.004	-	-	-	-	5	0	0	1.37	1.37	0.01	0.00447	1.36	1.38	-	-	-
Magnesium (T)	mg/L	0.004 | 0.01	1.18	-	-	-	5	0	0	1.31	1.31	0.0179	0.008	1.29	1.33	100	-	-
Potassium (D)	mg/L	0.02	-	-	-	-	5	0	0	1	0.998	0.0107	0.00477	0.996	1.02	-	-	-
Potassium (T)	mg/L	0.02 | 0.03	0.954	-	-	-	5	0	0	0.983	0.982	0.00956	0.00427	0.973	0.999	100	-	-
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	0.268	-	-	-	5	0	0	0.409	0.41	0.00952	4.26E-03	0.399	0.419	100	-	-
Sodium (D)	mg/L	0.02	-	-	-	-	5	0	0	5.58	5.6	0.0462	0.0206	5.53	5.63	-	-	-
Sodium (T)	mg/L	0.02	4.85	5.3	-	-	5	0	0	5.22	5.21	0.039	0.0174	5.18	5.28	100	0	-
Sulphate	mg/L	0.3	3.87	38	-	-	5	0	0	4.49	4.49	0.0207	0.00927	4.46	4.51	100	0	-
Nutrients																		
Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.308 | 9.38	0.41 | 12.5	5	0	0	0.0086	0.0098	0.00219	0.00098	0.0053	0.0103	0	0	0
Nitrate (as N)	mg/L	0.005	0.018	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	0.204	0.202	0.0103	0.00461	0.195	0.222	-	-	-
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	0.0022	0.0021	0.000292	0.00013	0.0019	0.0026	0	-	-

Table C1-9. MEL-05 summary statistics for the August 2023 sampling event

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	MEL-05 Reference Area 3 Open Water Sampling Event (August)											
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	5	0	0	0.211	0.212	0.00537	0.0024	0.204	0.219	-	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.25	-	-	-	5	0	0	0.204	0.202	0.0103	0.00461	0.195	0.222	0	-	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	5	0	0	0.211	0.212	0.00537	0.0024	0.204	0.219	-	-	-
Total Phosphorus	mg/L	0.001	0.006	0.0049	0.0075	0.01	5	0	0	0.0036	0.0035	0.0004	0.000179	0.0033	0.0043	0	0	-
Organic/Inorganic Carbon																		
Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	5	0	0	3.93	3.95	0.24	0.107	3.68	4.31	100	-	-
Total Organic Carbon	mg/L	0.5	3	-	-	-	5	0	0	3.93	3.88	0.252	0.113	3.6	4.25	100	-	-
Total Metals																		
Aluminum (T)	ug/L	1	5.32	9.1	75	100	5	0	0	1.88	1.8	0.249	0.111	1.7	2.3	0	0	0
Antimony (T)	ug/L	0.02	0.02	0.51	4.5	6	5	5	100	-	-	-	-	-	0.02	0	0	0
Arsenic (T)	ug/L	0.02	0.275	3.8	18.8	25	5	0	0	0.492	0.49	0.0063	0.00282	0.485	0.501	100	0	0
Barium (T)	ug/L	0.02	8.05	77	750	1000	5	0	0	8.99	8.98	0.131	0.0587	8.81	9.13	100	0	0
Beryllium (T)	ug/L	0.005	0.005	-	-	-	5	5	100	-	-	-	-	-	0.005	0	-	-
Boron (T)	ug/L	5	6.52	23	1120	1500	5	0	0	5.12	5.1	0.0837	0.0374	5	5.2	0	0	0
Cadmium (T)	ug/L	0.005	0.005	0.05	0.03 | 0.0531	0.04 | 0.0708	5	5	100	-	-	-	-	-	0.005	0	0	0
Chromium (T)	ug/L	0.1	0.103	1.1	3.75	5	5	5	100	-	-	-	-	-	0.1	0	0	0
Cobalt (T)	ug/L	0.005	0.016	-	0.585	0.78	5	0	0	0.0153	0.015	0.000907	4.06E-04	0.0146	0.0169	20	-	0
Copper (T)	ug/L	0.05	0.86	2	1500	2000	5	0	0	0.877	0.878	0.012	0.00538	0.86	0.889	80	0	0
Iron (T)	ug/L	1	15	42	795	1060	5	0	0	12.1	12.1	1.5	0.671	10.4	14.4	0	0	0
Lead (T)	ug/L	0.01	0.0222	0.15	3.75	5	5	0	0	0.0732	0.073	0.0039	0.00174	0.067	0.077	100	0	0
Lithium (T)	ug/L	0.5	0.72	-	-	-	5	0	0	0.818	0.81	0.0164	0.00735	0.8	0.84	100	-	-
Manganese (T)	ug/L	0.05	3.06	5.5	90	120	5	0	0	5	4.9	0.425	0.19	4.68	5.74	100	20	0
Mercury (T)	ug/L	0.1 | 0.5	0.0008	0.02	0.0195	0.026	5	3	60	-	0.0005	-	-	0.0005	0.00057	0	0	0
Molybdenum (T)	ug/L	0.05	0.107	5.2	54.8	73	5	0	0	0.0962	0.096	0.00148	0.000663	0.094	0.098	0	0	0
Nickel (T)	ug/L	0.05	0.441	2.7	18.8	25	5	0	0	0.503	0.508	0.0214	0.00958	0.479	0.528	100	0	0
Selenium (T)	ug/L	0.04	0.049	0.16	0.75	1	5	0	0	0.0442	0.045	0.00295	0.00132	0.04	0.048	0	0	0
Silver (T)	ug/L	0.005	0.005	0.1	0.188	0.25	5	5	100	-	-	-	-	-	0.005	0	0	0
Strontium (T)	ug/L	0.02	36.1	-	1880	2500	5	0	0	41.7	41.7	0.207	0.0927	41.4	41.9	100	-	0
Thallium (T)	ug/L	0.005	0.005	0.1	0.6	0.8	5	5	100	-	-	-	-	-	0.005	0	0	0
Tin (T)	ug/L	0.02	0.0384	-	-	-	5	3	60	-	0.02	-	-	0.02	0.032	0	-	-
Titanium (T)	ug/L	0.05	0.17	-	-	-	5	5	100	-	-	-	-	-	0.05	0	-	-
Uranium (T)	ug/L	0.001	0.0164	1.5	11.2	15	5	0	0	0.0188	0.0189	0.00192	0.000857	0.0156	0.0206	80	0	0
Vanadium (T)	ug/L	0.05	0.05	-	90	120	5	5	100	-	-	-	-	-	0.05	0	-	0
Zinc (T)	ug/L	0.5	1.7	6.7	-	-	5	0	0	2.3	2.34	0.178	0.0795	2	2.47	100	0	-
Dissolved Metals																		
Aluminum (D)	ug/L	1	-	-	-	-	5	0	0	1.7	1.5	0.4	0.179	1.3	2.3	-	-	-
Antimony (D)	ug/L	0.02	-	-	-	-	5	5	100	-	-	-	-	-	0.02	-	-	-
Arsenic (D)	ug/L	0.02	-	-	-	-	5	0	0	0.489	0.49	0.0129	0.00576	0.472	0.504	-	-	-
Barium (D)	ug/L	0.02	-	-	-	-	5	0	0	8.88	8.86	0.0789	0.0353	8.82	9.02	-	-	-
Beryllium (D)	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-

Table C1-9. MEL-05 summary statistics for the August 2023 sampling event

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	AEMP Benchmark[f]	MEL-05 Reference Area 3 Open Water Sampling Event (August)											
							N	N<MDL	% <MDL	Mean	Median	SD	SE	Min	Max	% > NR	%> FEIS	% > Act Lvl
Boron (D)	ug/L	5	-	-	-	-	5	0	0	5.4	5.4	0	0	5.4	5.4	-	-	-
Cadmium (D)	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-
Chromium (D)	ug/L	0.1	-	-	-	-	5	5	100	-	-	-	-	-	0.1	-	-	-
Cobalt (D)	ug/L	0.005	-	-	-	-	5	0	0	0.00946	0.0076	0.00341	0.00153	0.007	0.0152	-	-	-
Copper (D)	ug/L	0.05	0.861	-	0.813 | 4.27	1.08 | 5.7	5	0	0	1.02	0.998	0.15	0.0671	0.866	1.19	100	-	0
Iron (D)	ug/L	1	-	-	-	-	5	0	0	7.08	6.5	1.13	0.505	6	8.4	-	-	-
Lead (D)	ug/L	0.01	0.0125	-	3.36 | 5.55	4.48 | 7.4	5	0	0	0.0804	0.072	0.0221	0.00987	0.059	0.112	100	-	0
Lithium (D)	ug/L	0.5	-	-	-	-	5	0	0	0.882	0.88	0.011	0.0049	0.87	0.9	-	-	-
Manganese (D)	ug/L	0.05	1.2	-	158 | 248	210 | 330	5	0	0	0.664	0.608	0.168	0.0753	0.474	0.912	0	-	0
Mercury (D)	ug/L	0.1 | 0.5	-	-	-	-	5	5	100	-	-	-	-	-	0.0005	-	-	-
Molybdenum (D)	ug/L	0.05	-	-	-	-	5	0	0	0.0992	0.098	0.00239	0.00107	0.097	0.103	-	-	-
Nickel (D)	ug/L	0.05	-	-	-	-	5	0	0	0.589	0.515	0.175	0.078	0.483	0.895	-	-	-
Selenium (D)	ug/L	0.04	-	-	-	-	5	3	60	-	0.04	-	-	0.04	0.048	-	-	-
Silver (D)	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-
Strontium (D)	ug/L	0.02	-	-	1880	2500	5	0	0	41.6	41.8	0.476	0.213	40.9	42.1	-	-	0
Thallium (D)	ug/L	0.005	-	-	-	-	5	5	100	-	-	-	-	-	0.005	-	-	-
Tin (D)	ug/L	0.02	-	-	-	-	5	1	20	0.032	0.031	0.00914	0.00409	0.02	0.042	-	-	-
Titanium (D)	ug/L	0.05	-	-	-	-	5	5	100	-	-	-	-	-	0.05	-	-	-
Uranium (D)	ug/L	0.001	-	-	-	-	5	0	0	0.0187	0.0186	0.000889	0.000397	0.0176	0.0199	-	-	-
Vanadium (D)	ug/L	0.05	-	-	-	-	5	5	100	-	-	-	-	-	0.05	-	-	-
Zinc (D)	ug/L	0.5	1.9	-	5.91 | 10.2	7.88 | 13.5	5	0	0	3.15	2.89	1.06	0.475	2.12	4.55	100	-	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.

Orange shaded values indicate parameters where at least 1 sample > Normal Range.

Appendix C2
Meliadine Lake Water Quality – Supplemental Figures

APPENDIX C2 – FIGURES

Figure C2-1. Specific conductivity (µS/cm)

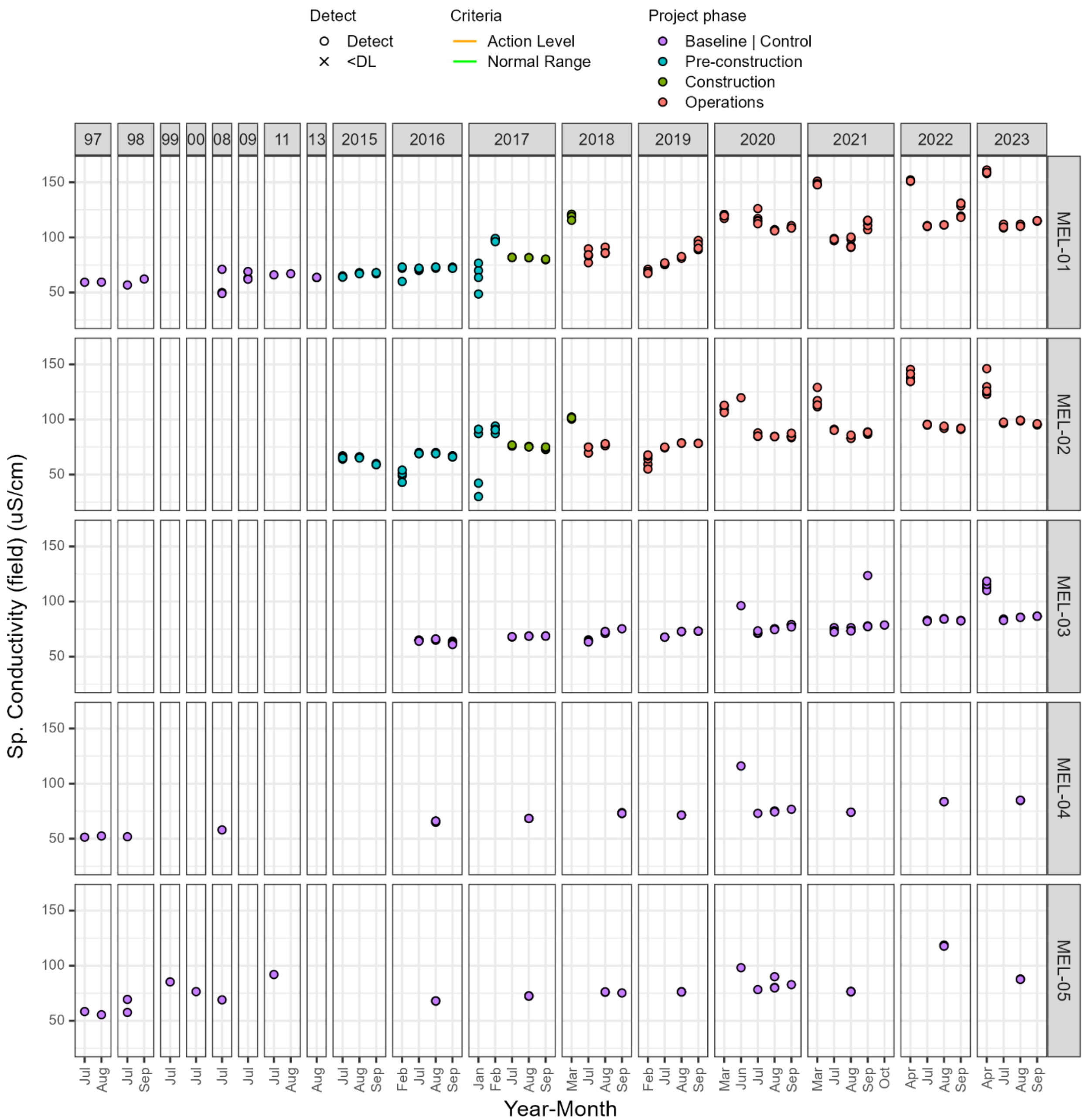


Figure C2-2. Lab-measured conductivity (µS/cm)

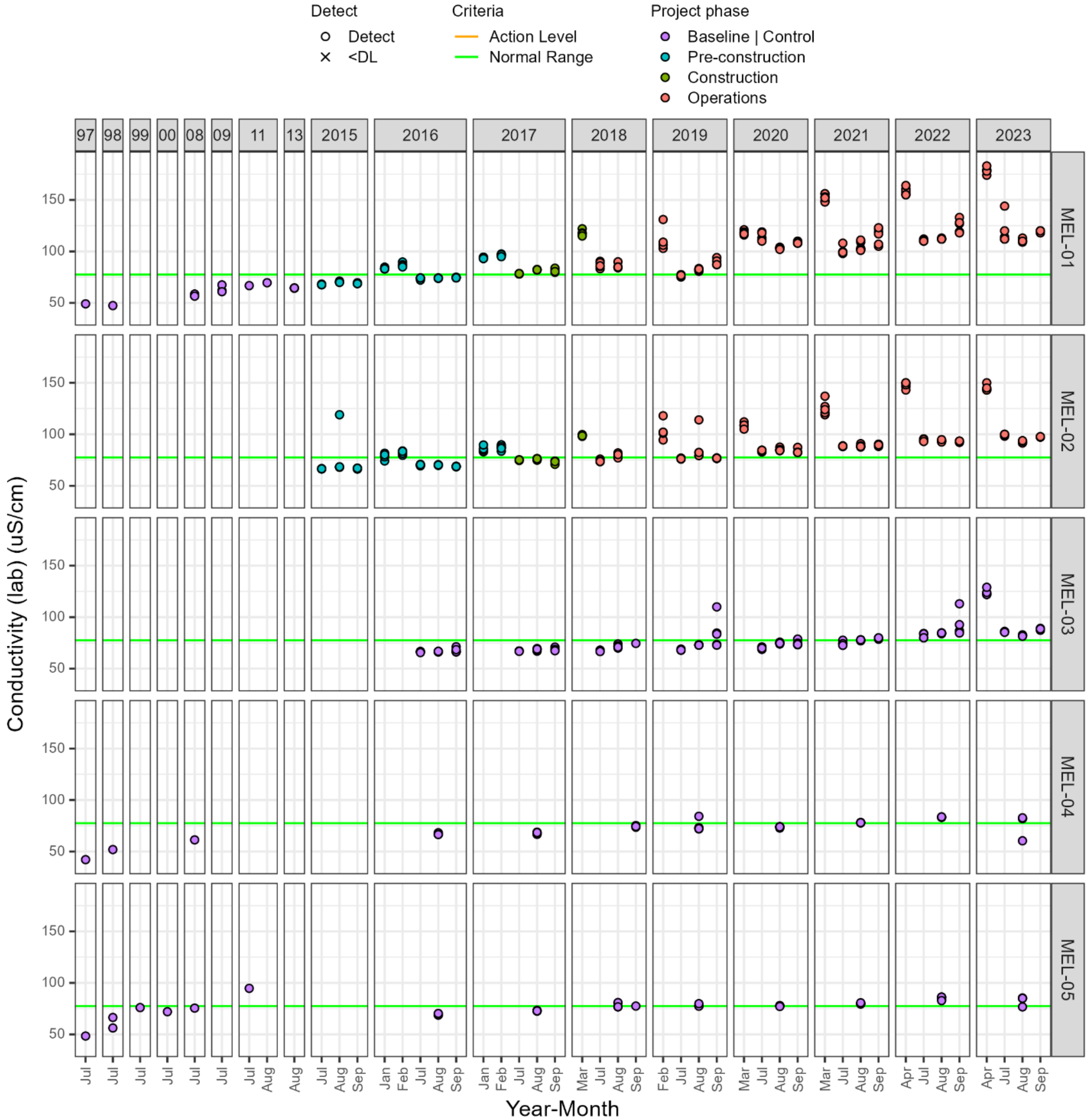


Figure C2-3. Field pH

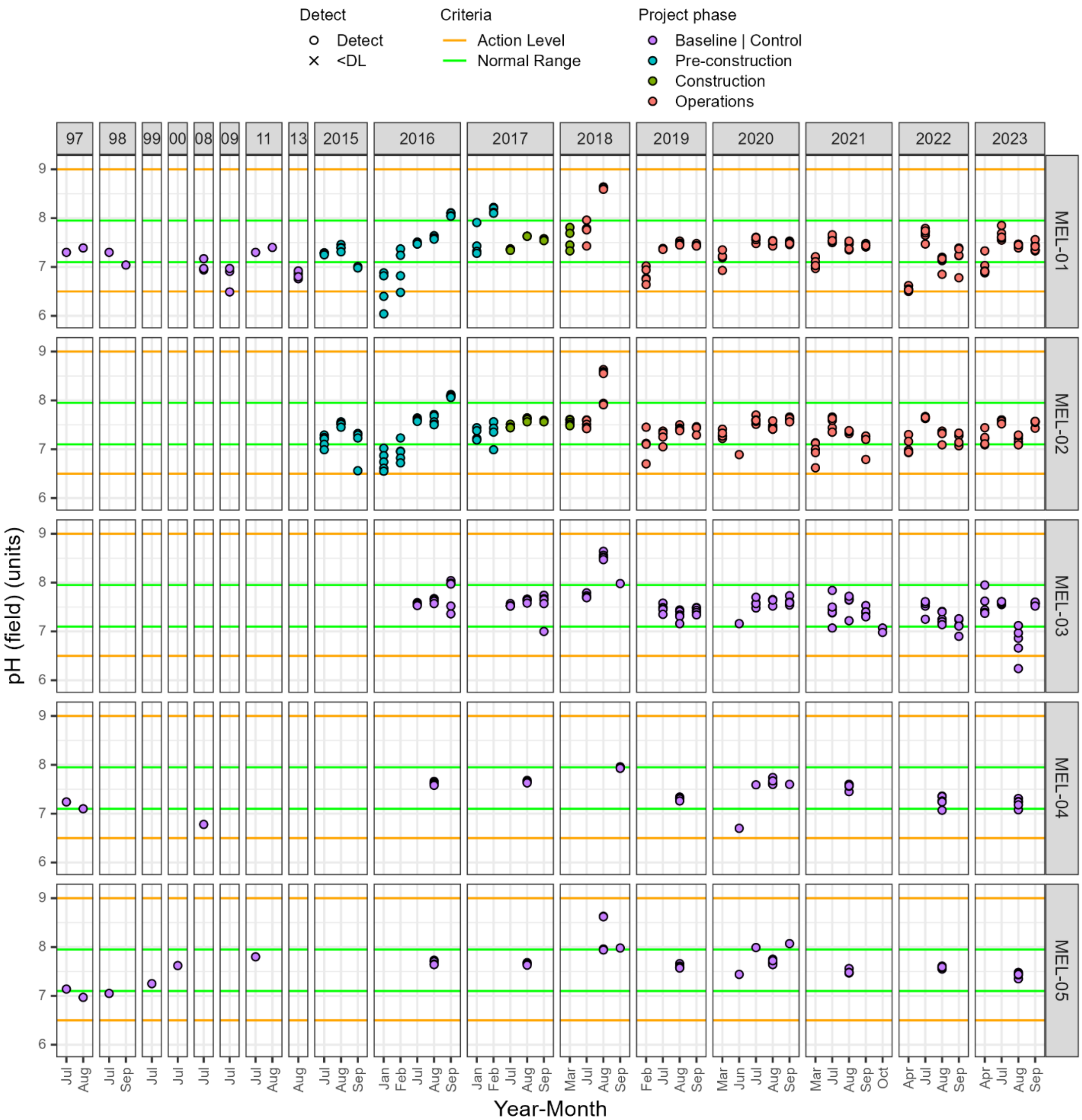


Figure C2-4. Lab measured pH

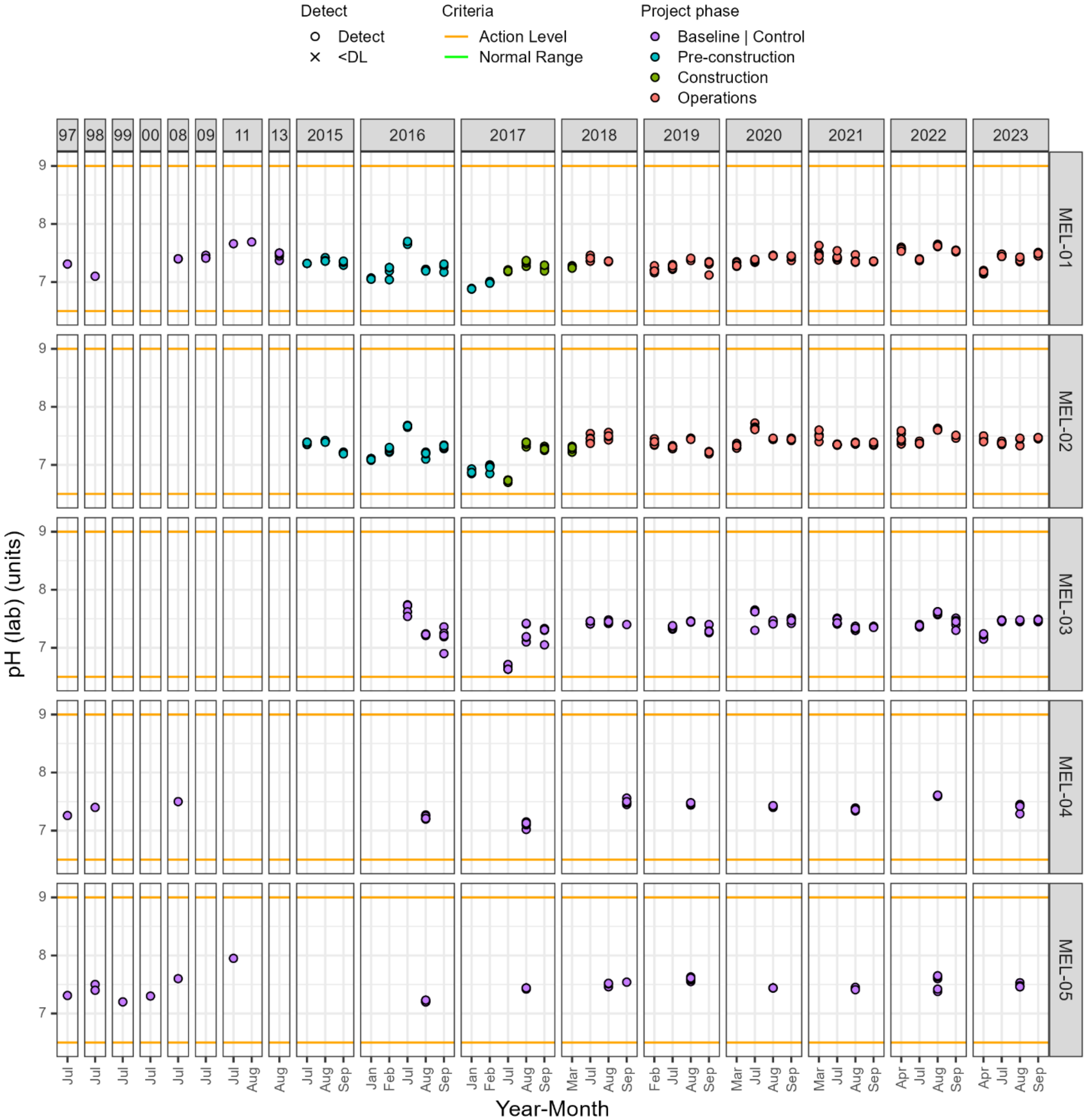


Figure C2-5. Hardness (mg/L)

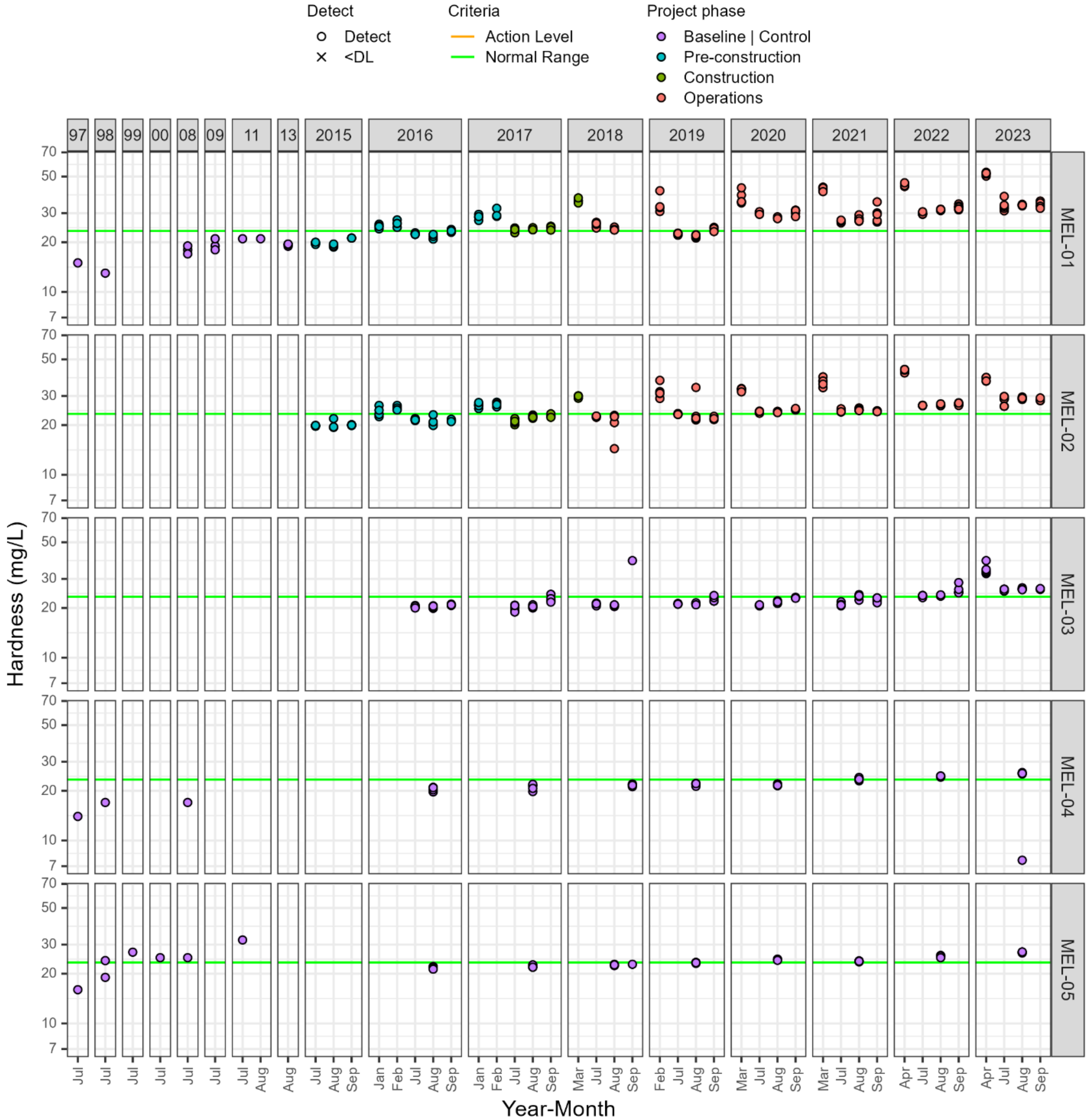


Figure C2-6. Total dissolved solids (measured; mg/L)

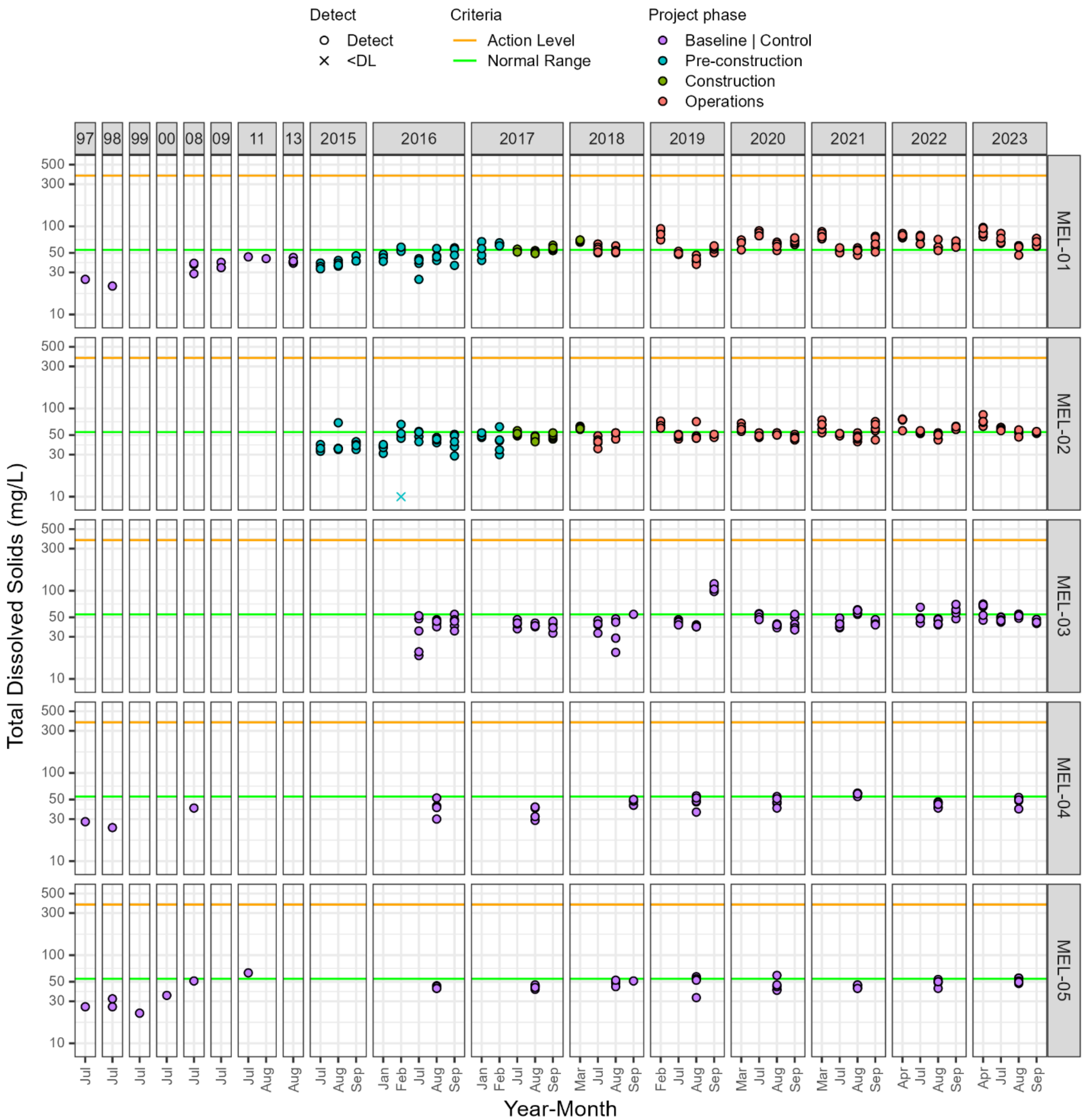


Figure C2-7. Total dissolved solids (calculated; mg/L)

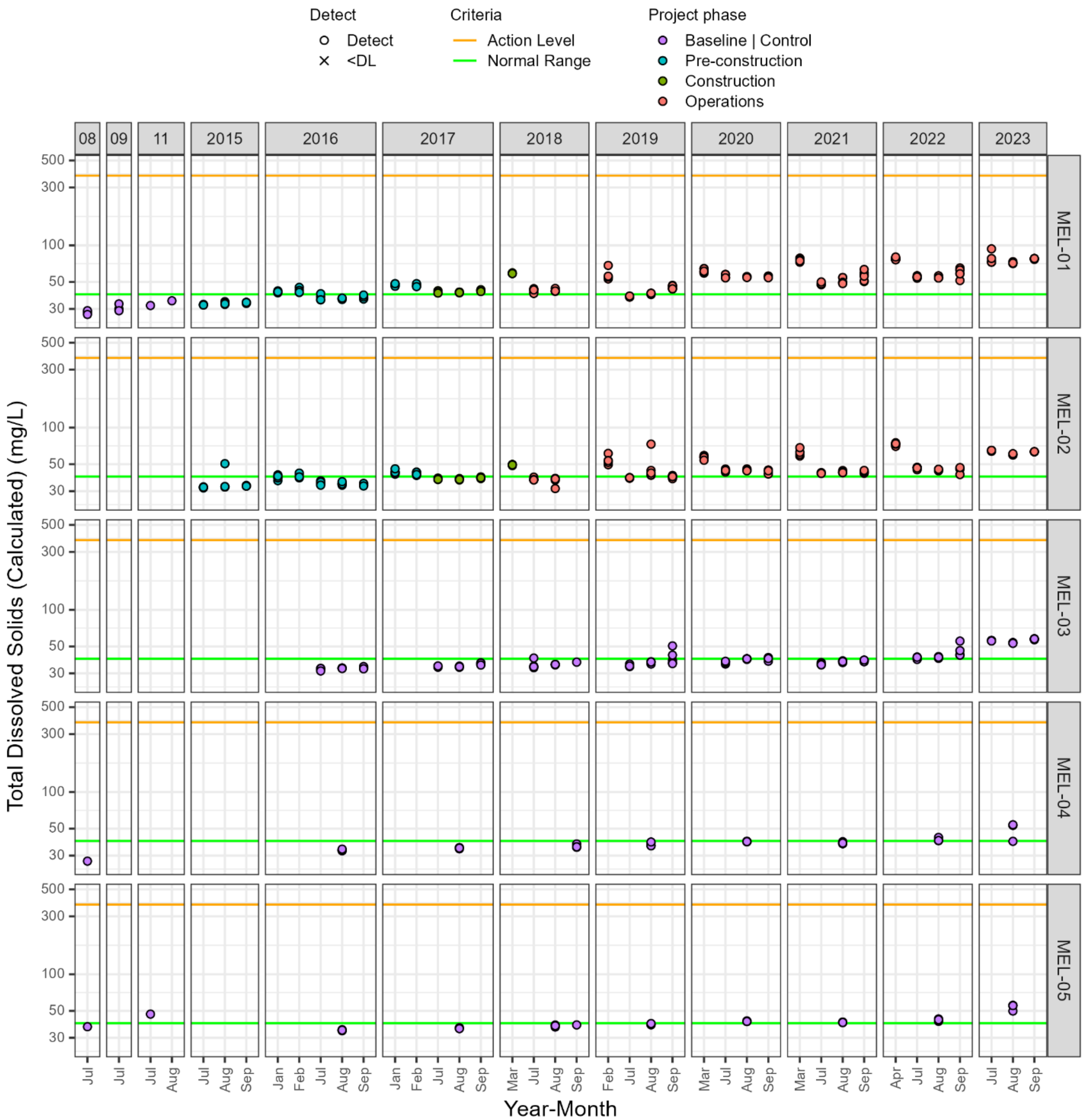


Figure C2-8. Total suspended solids (mg/L)

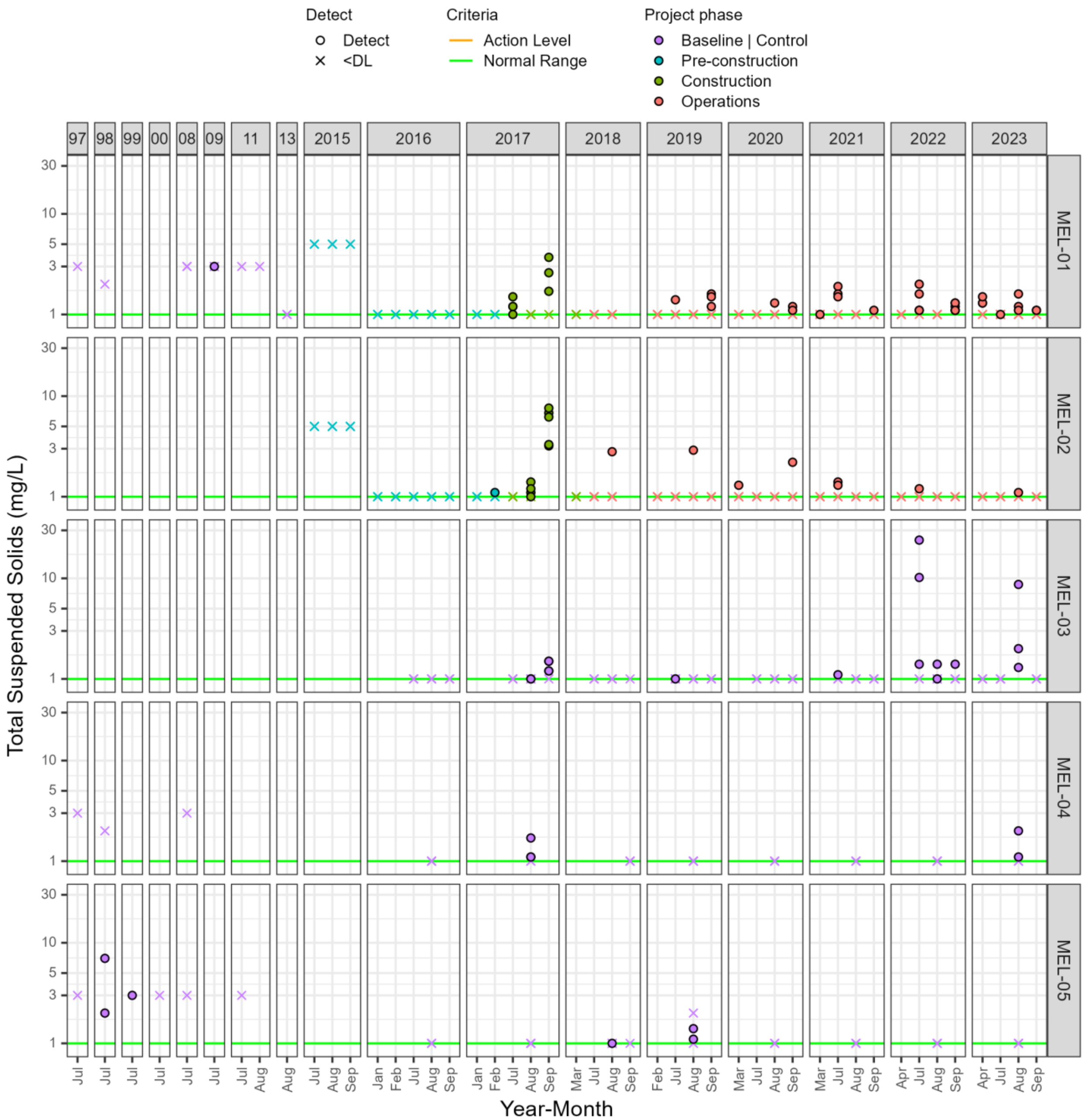


Figure C2-9. Lab measured turbidity (NTU)

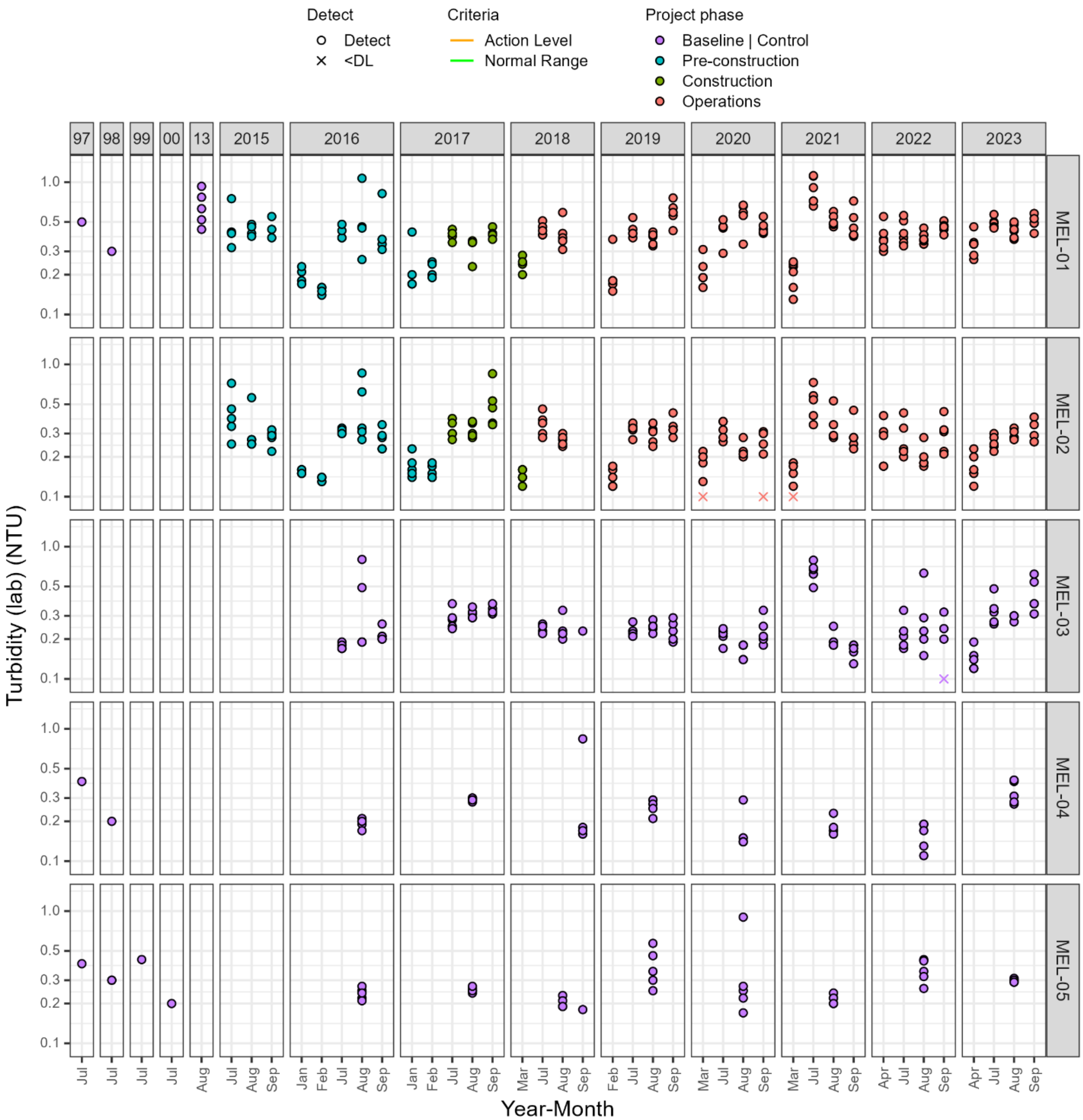


Figure C2-10. Bicarbonate alkalinity (mg/L)

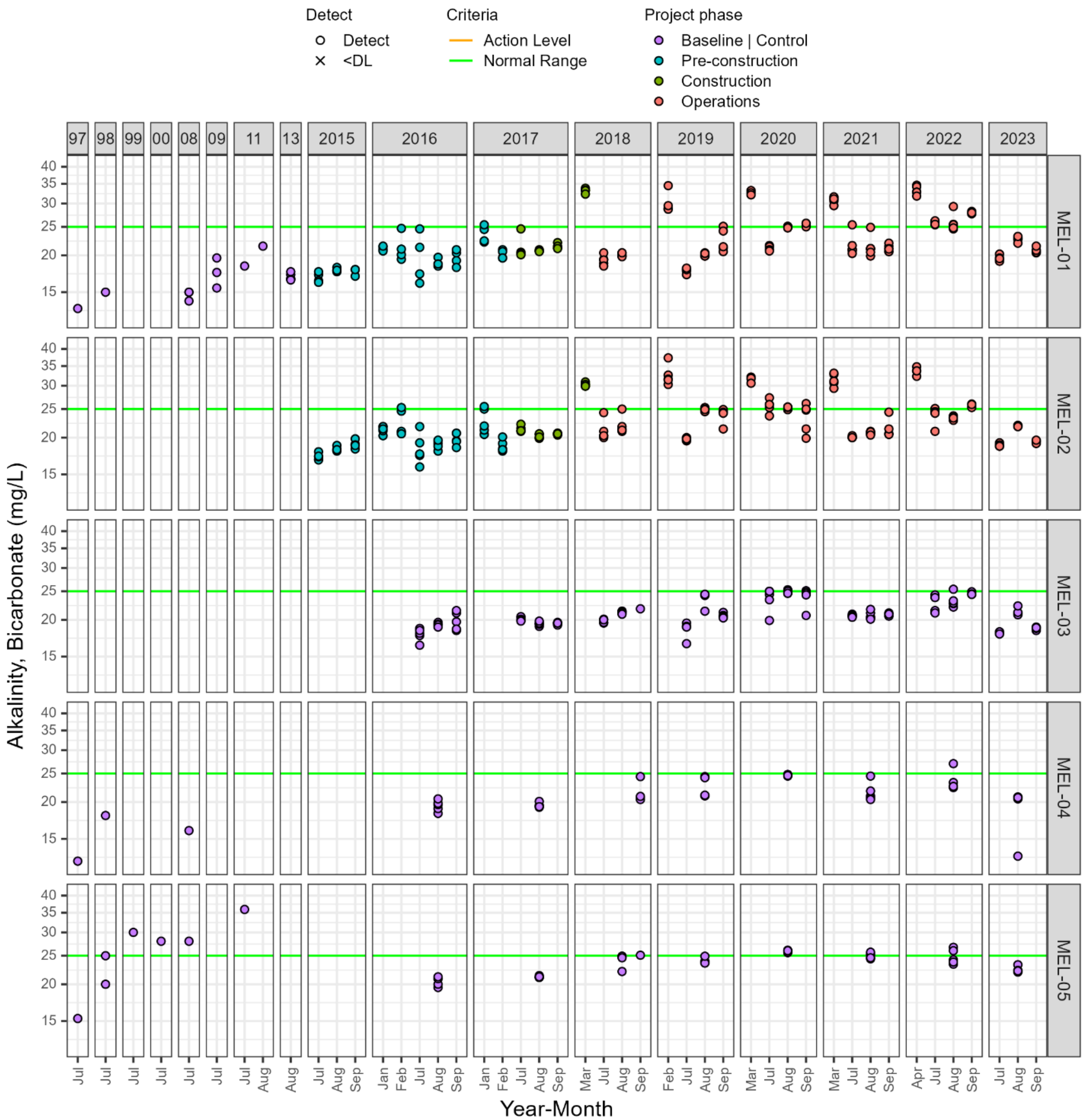


Figure C2-11. Total alkalinity (mg/L)

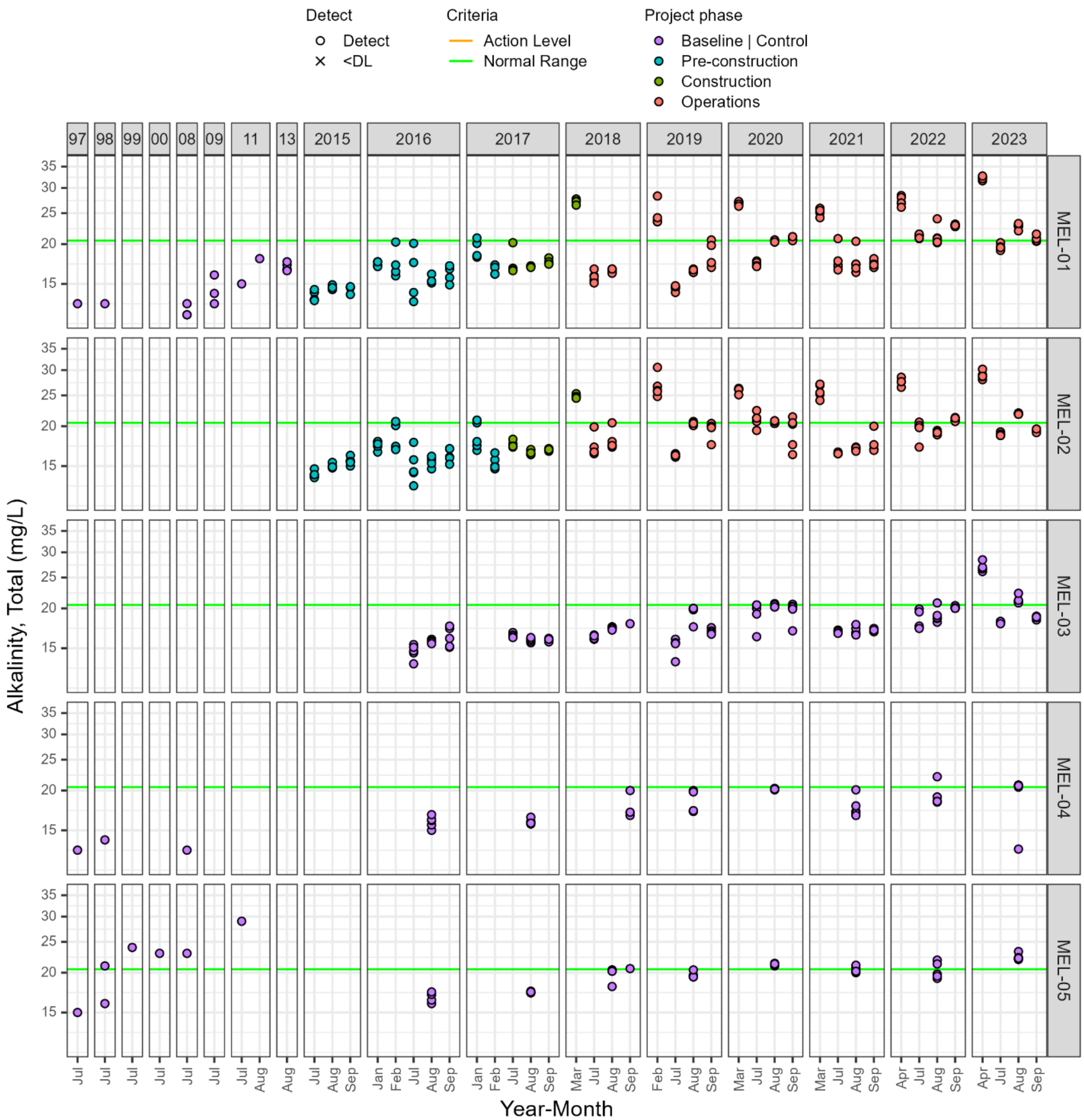


Figure C2-12. Total calcium (mg/L)

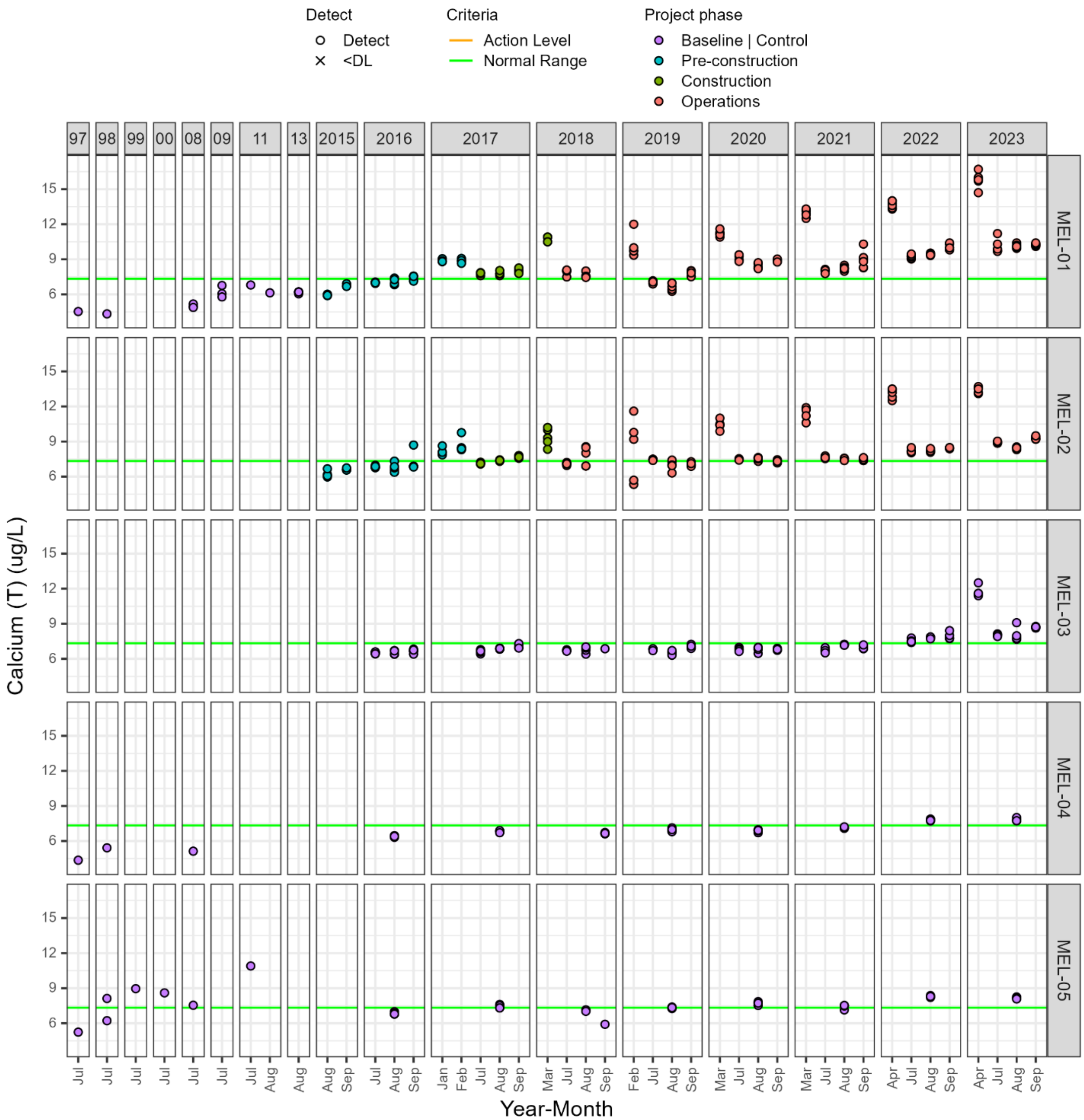


Figure C2-13. Total magnesium (mg/L)

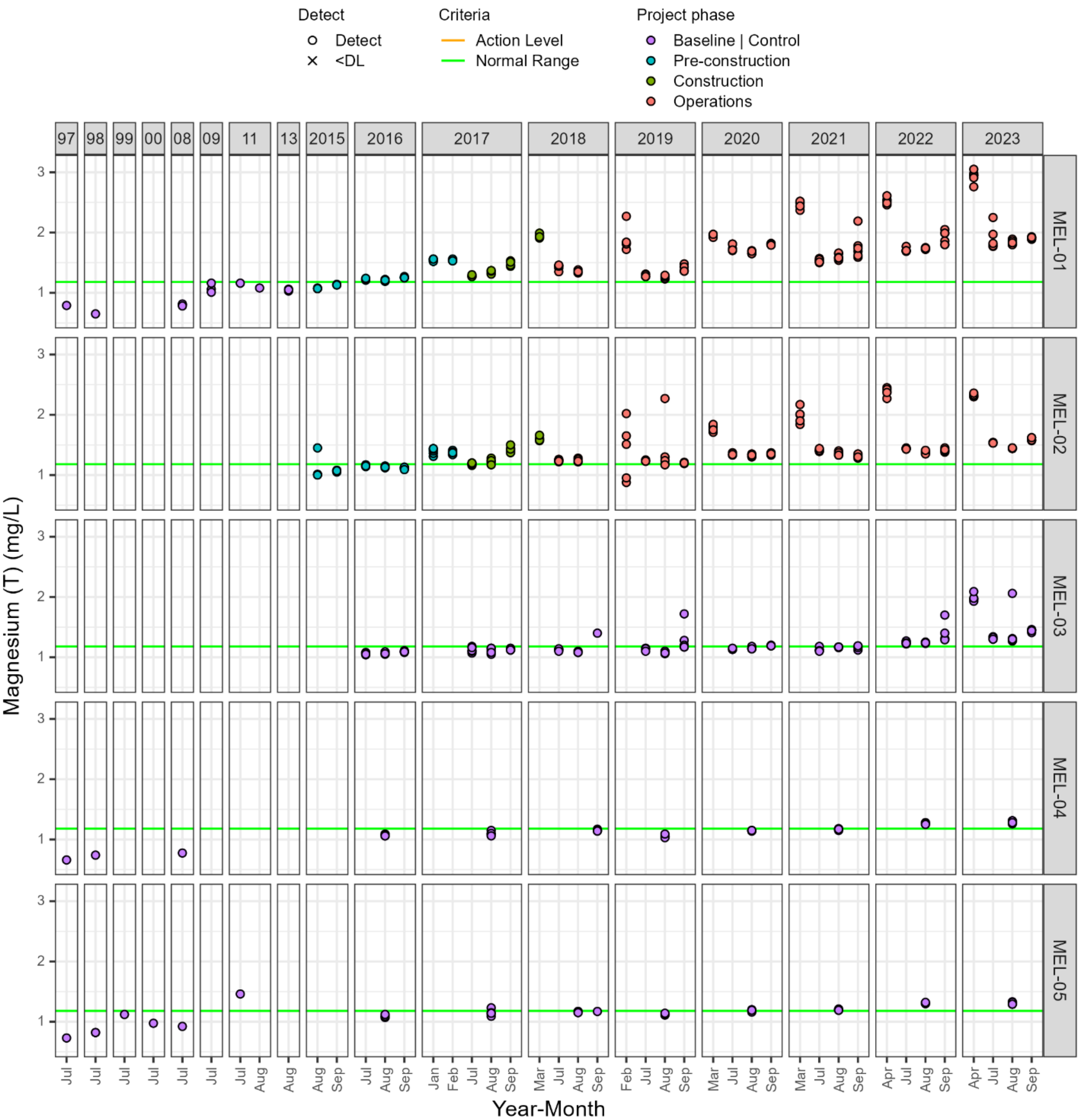


Figure C2-14. Total potassium (mg/L)

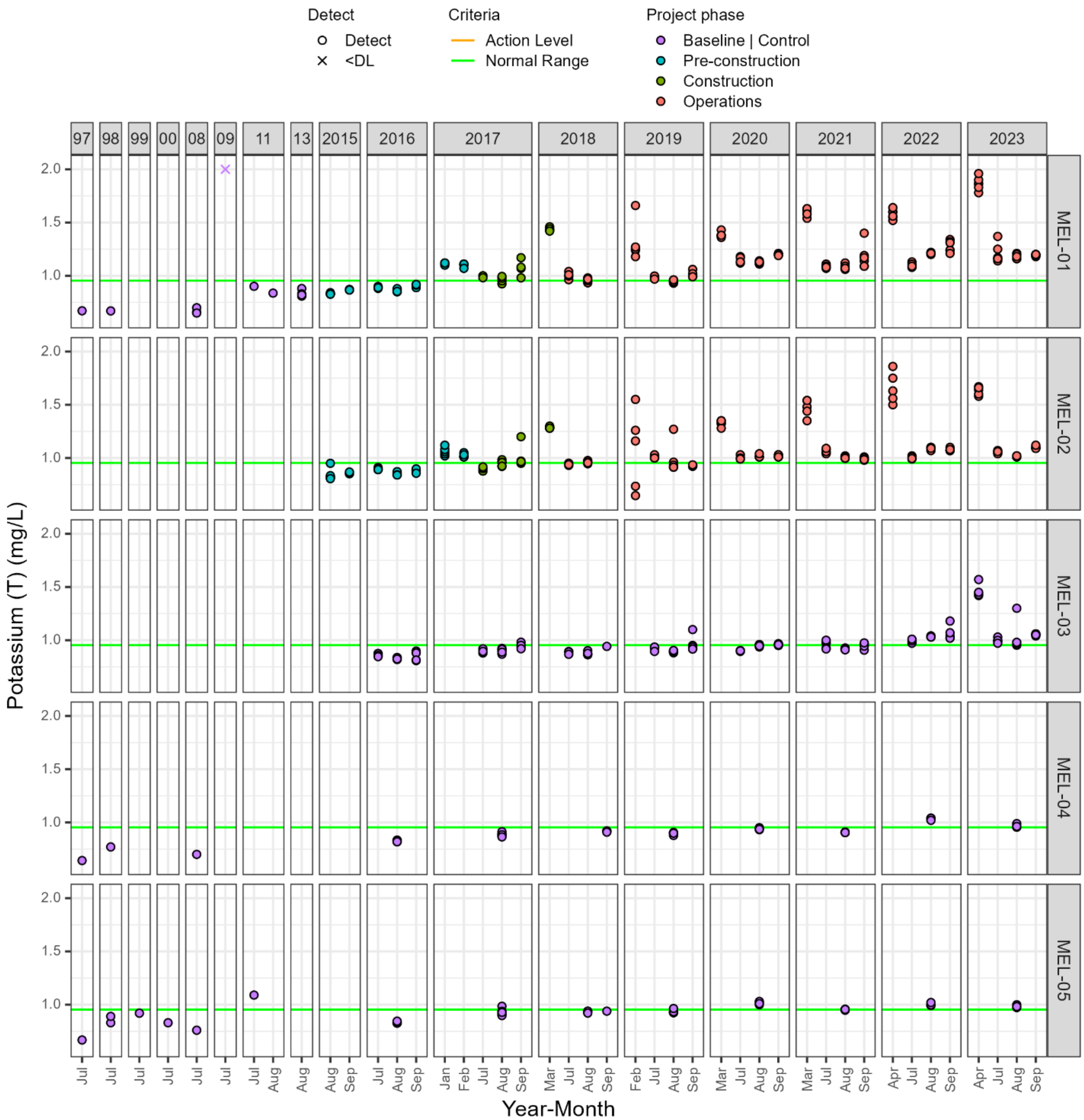


Figure C2-15. Total sodium (mg/L)

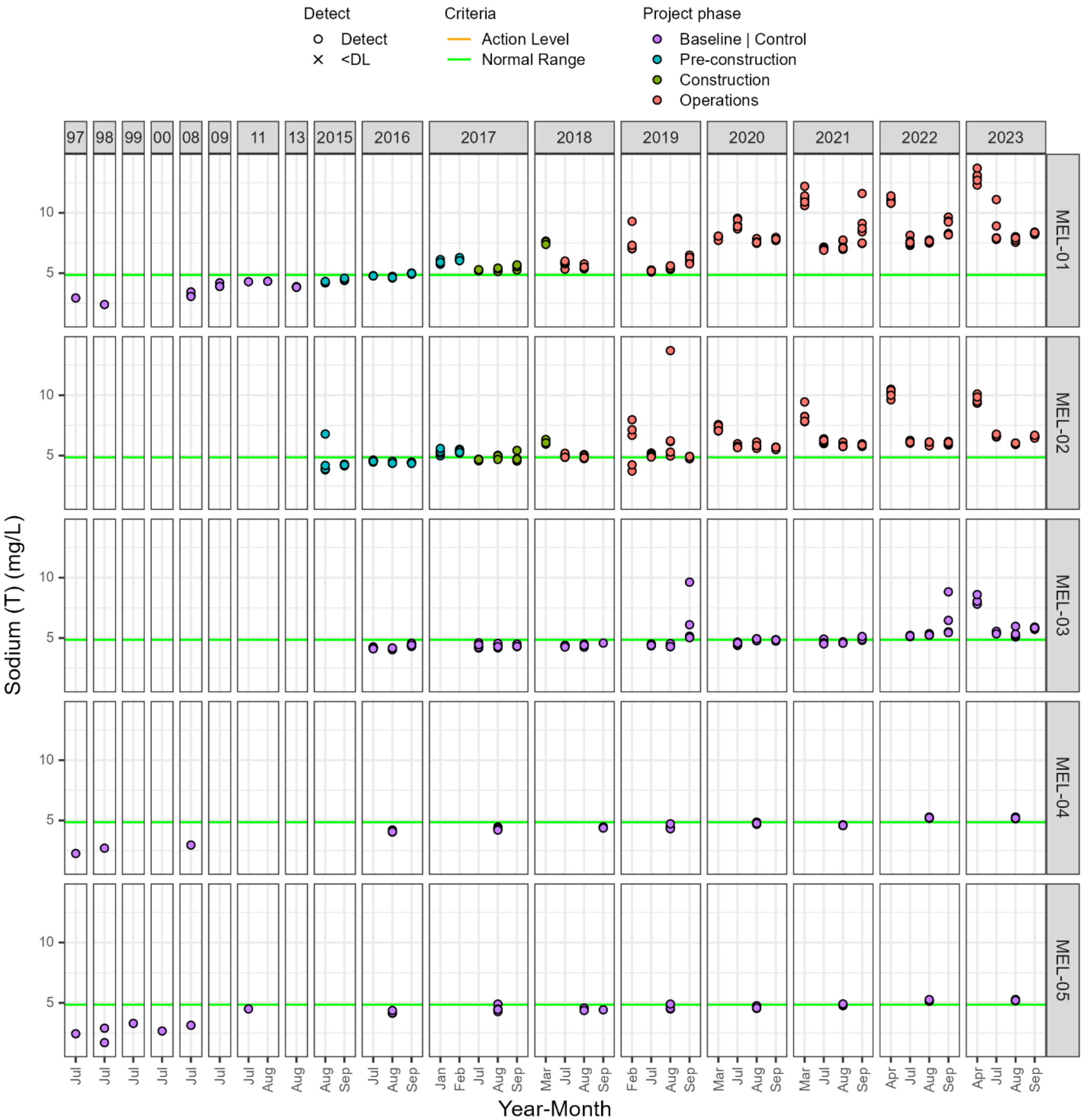


Figure C2-16. Chloride (mg/L)

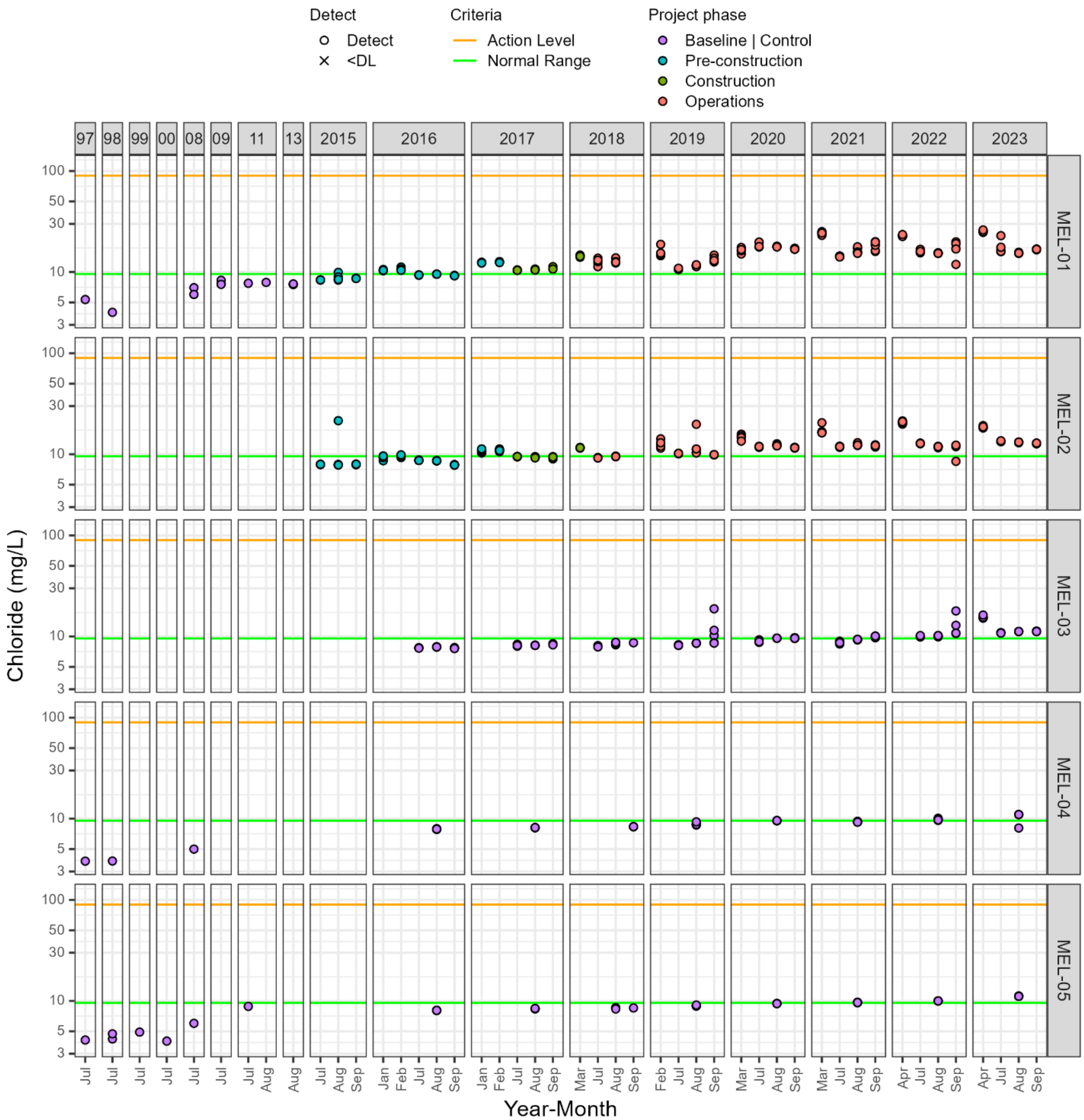


Figure C2-17. Fluoride (mg/L)

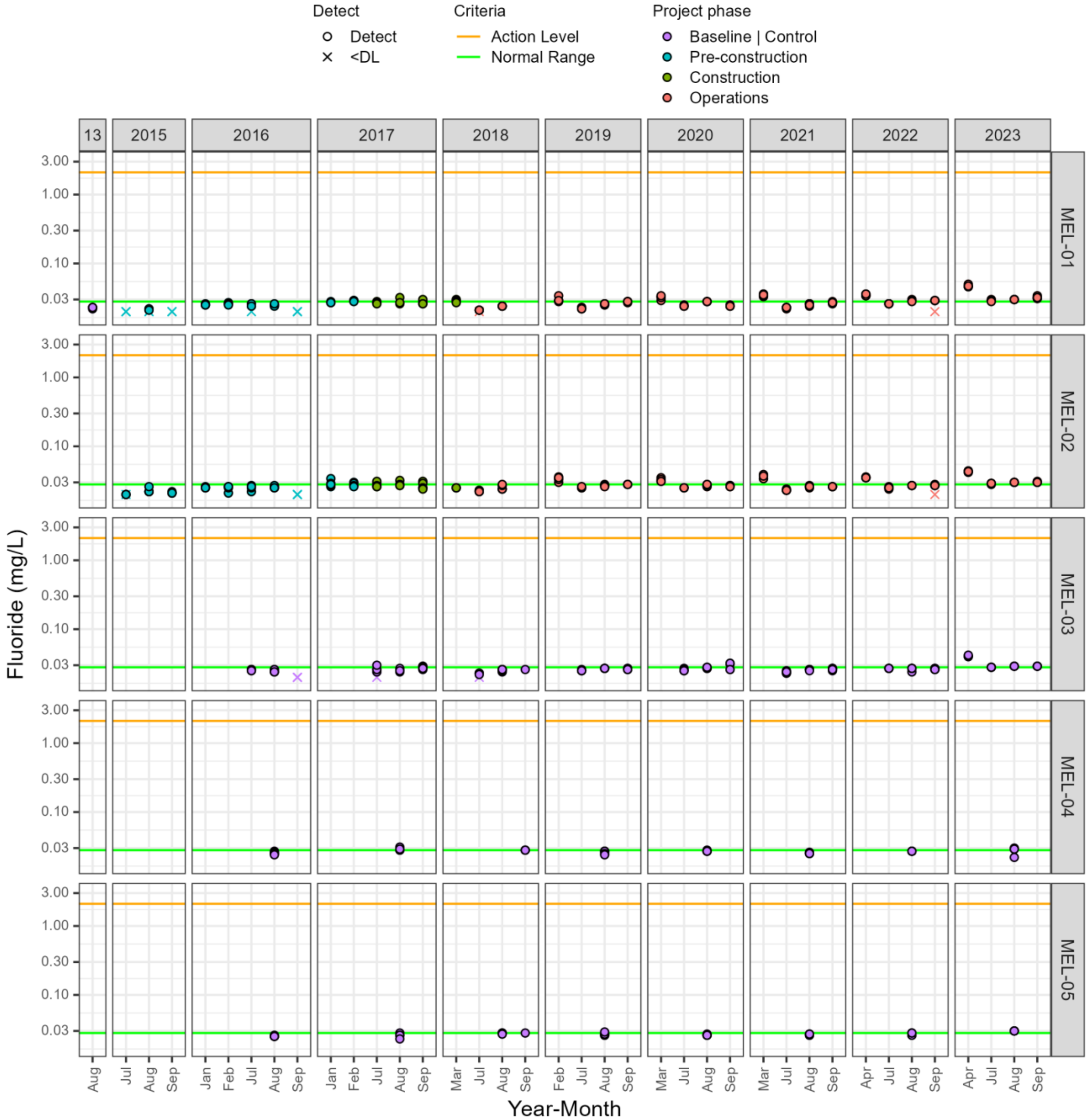


Figure C2-18. Ammonia (as nitrogen) (mg/L)

Notes: Ammonia data from August and September 2021 should be interpreted with caution because of higher detection limits reported by the laboratory.

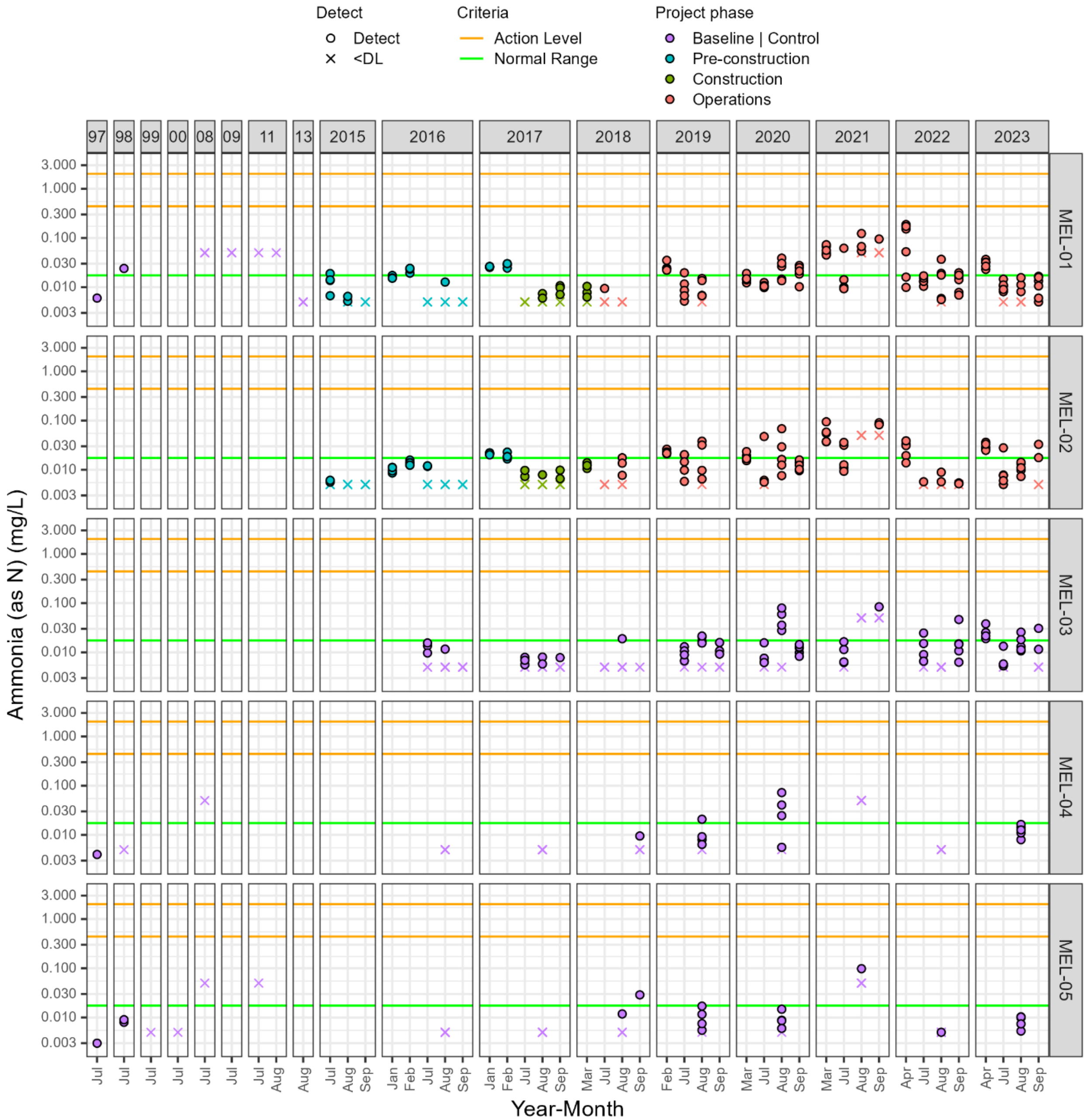


Figure C2-19. Nitrate (as N) (mg/L)

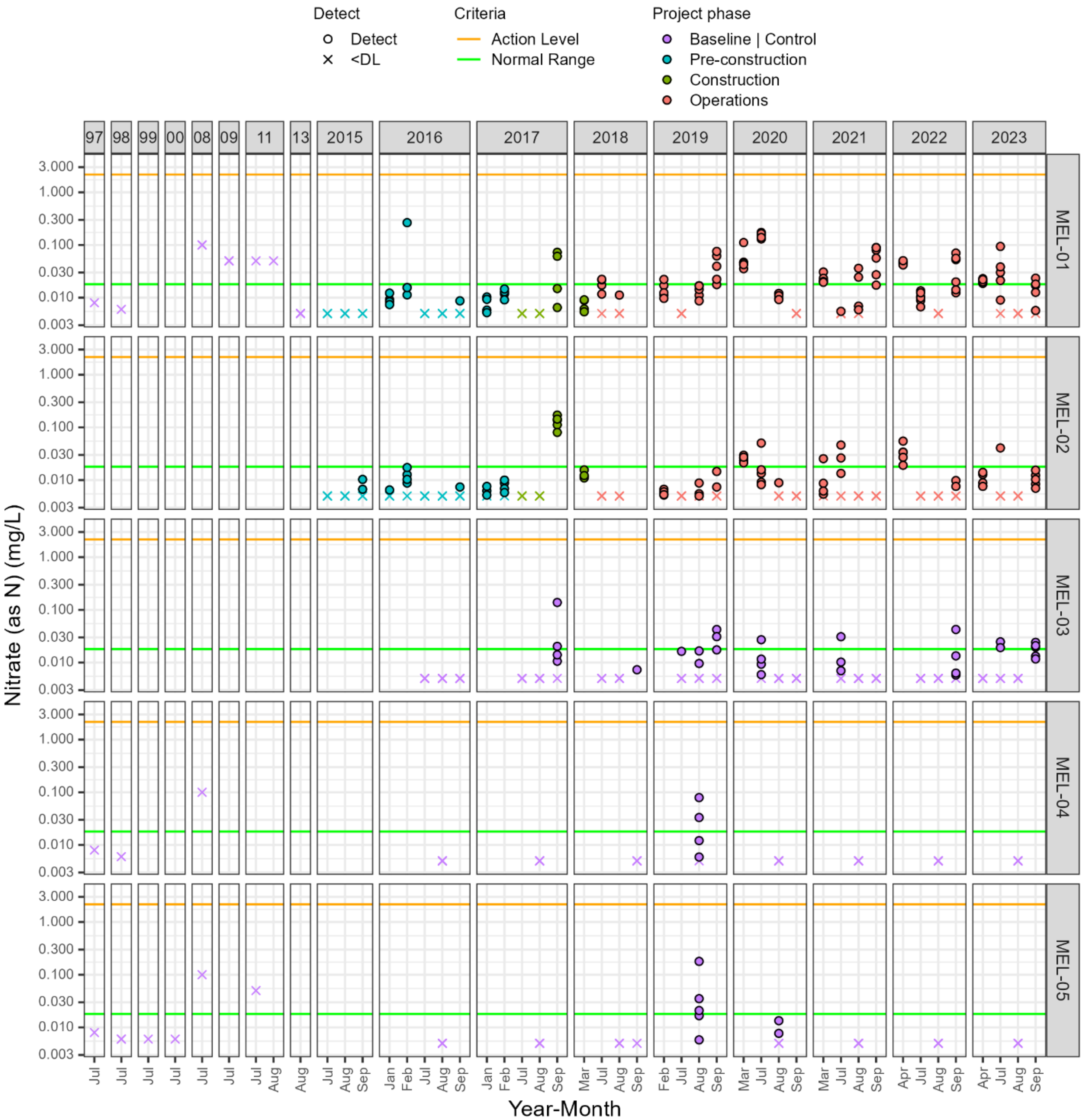


Figure C2-20. Nitrate and nitrite (as N) (mg/L)

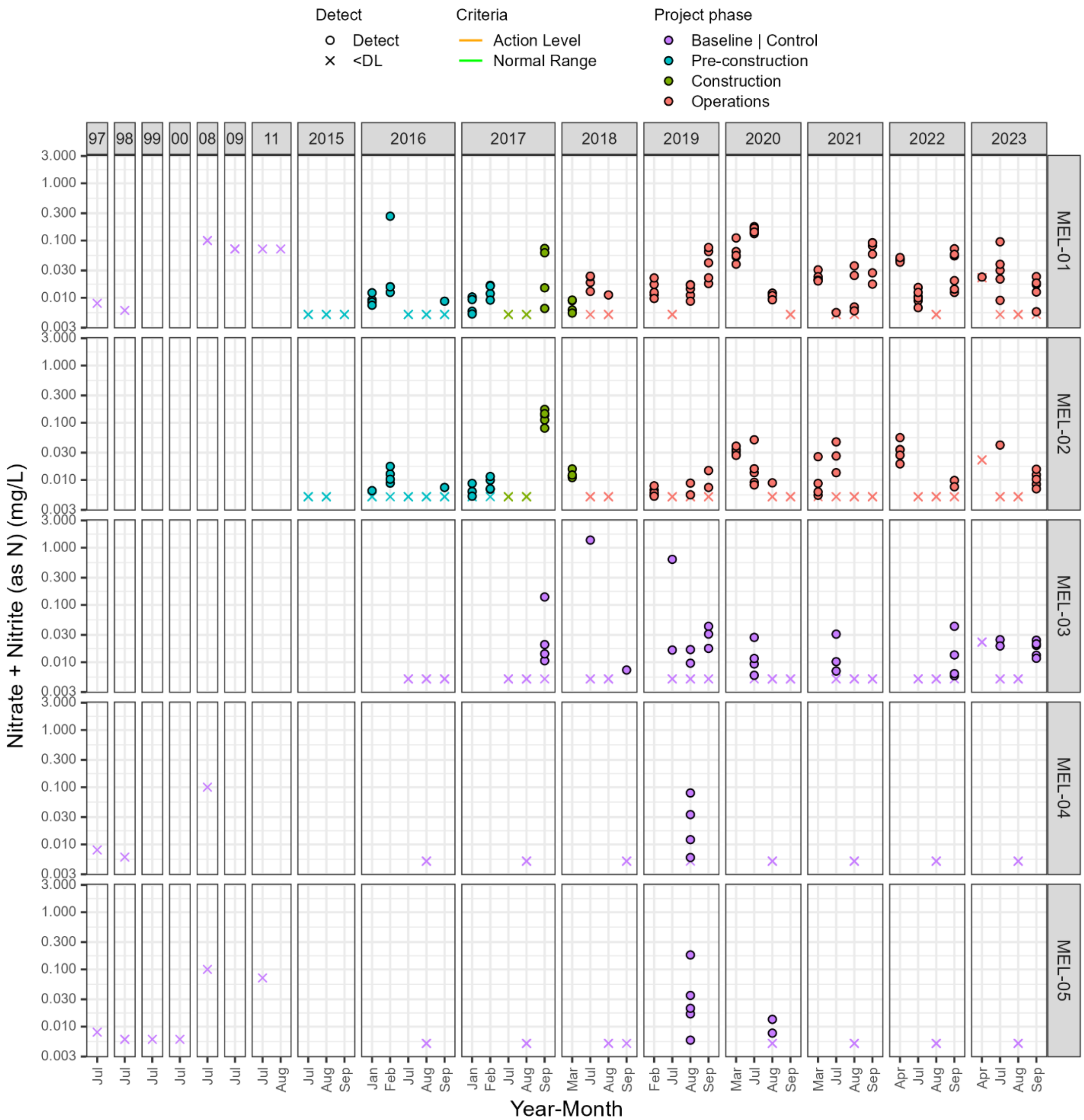


Figure C2-21. Total Kjeldahl nitrogen (TKN; mg/L)

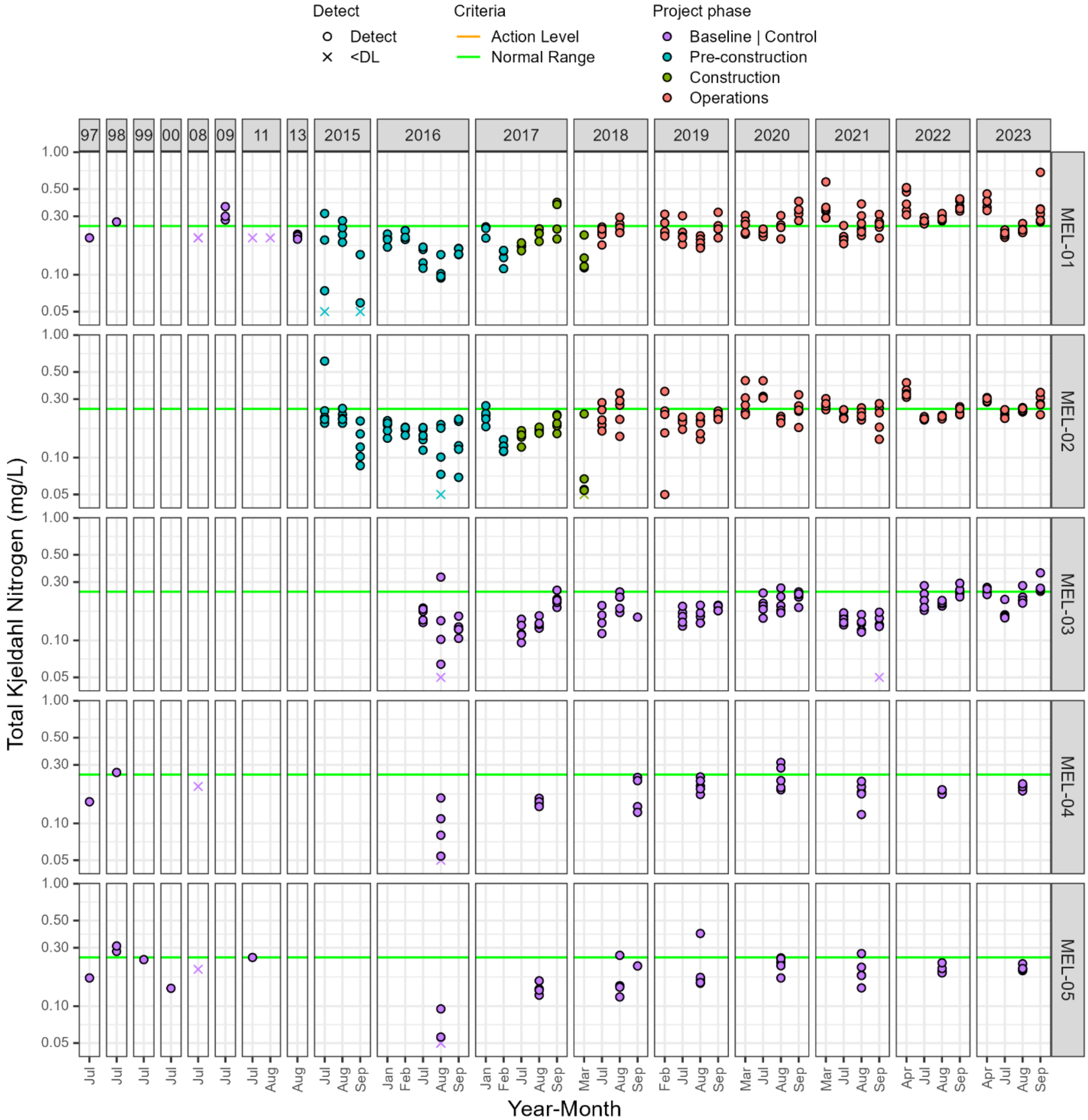


Figure C2-22. Sulphate (mg/L)

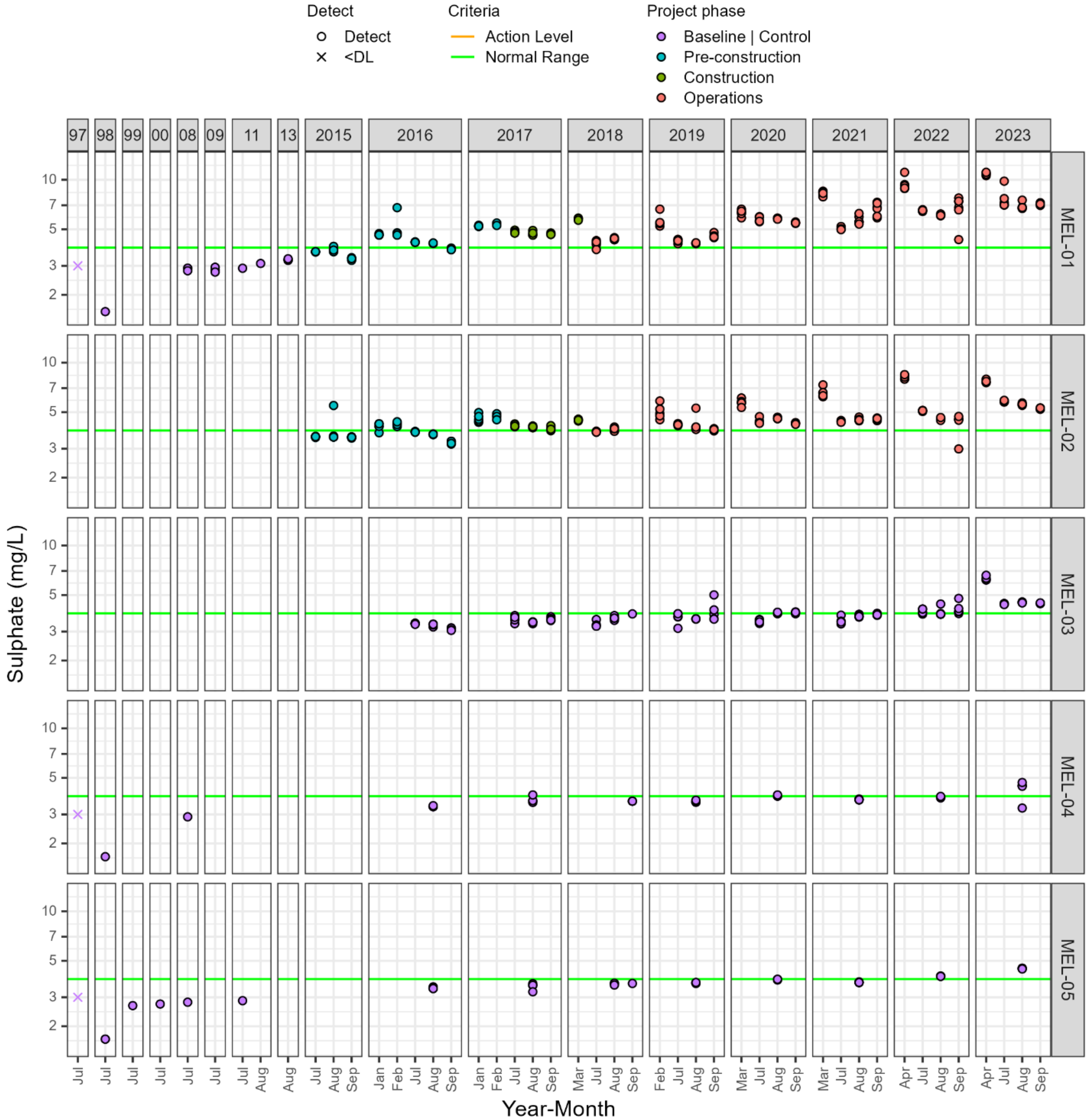


Figure C2-23. Total phosphorus (mg/L)

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.

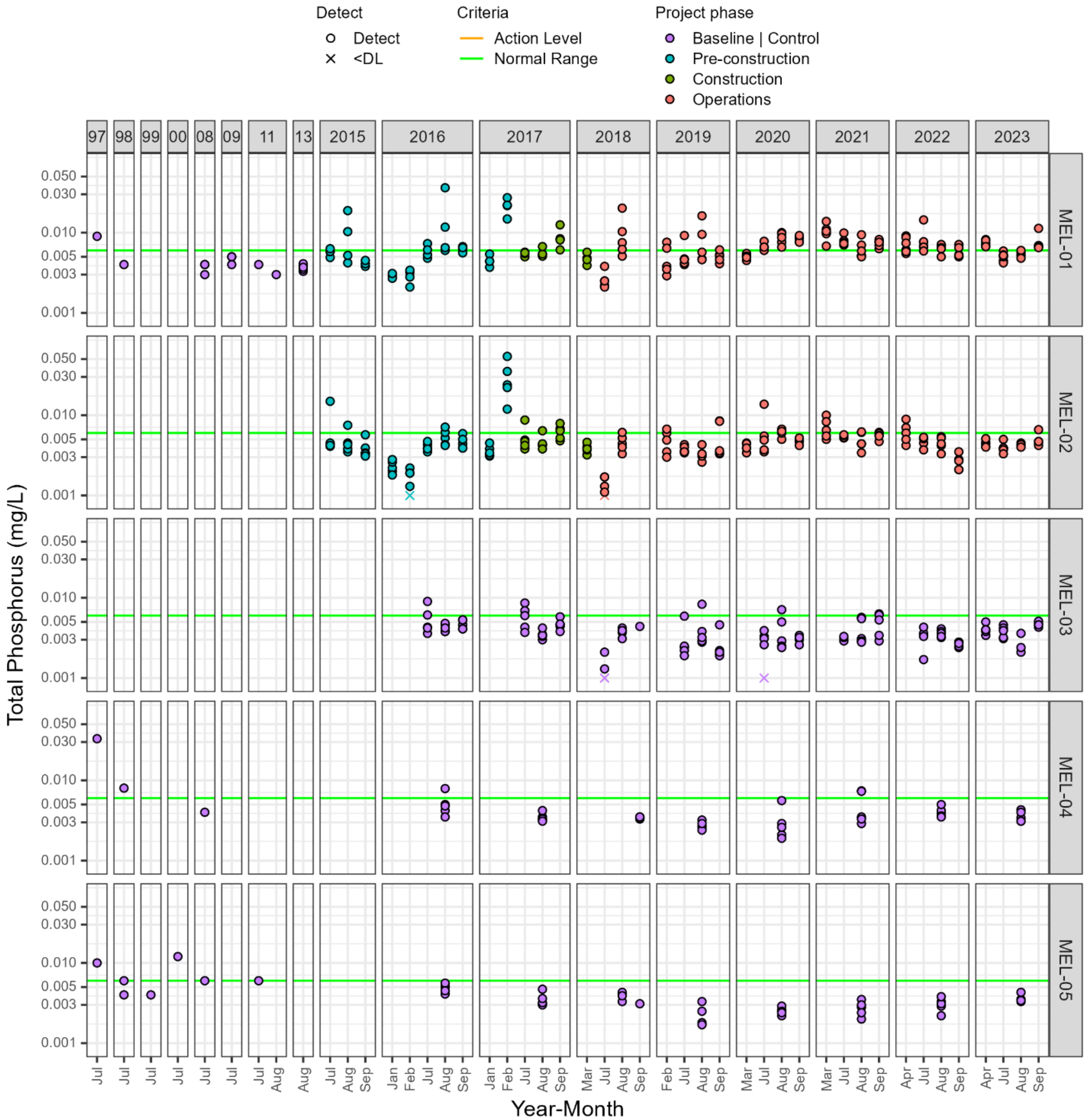


Figure C2-24. Dissolved organic carbon (mg/L)

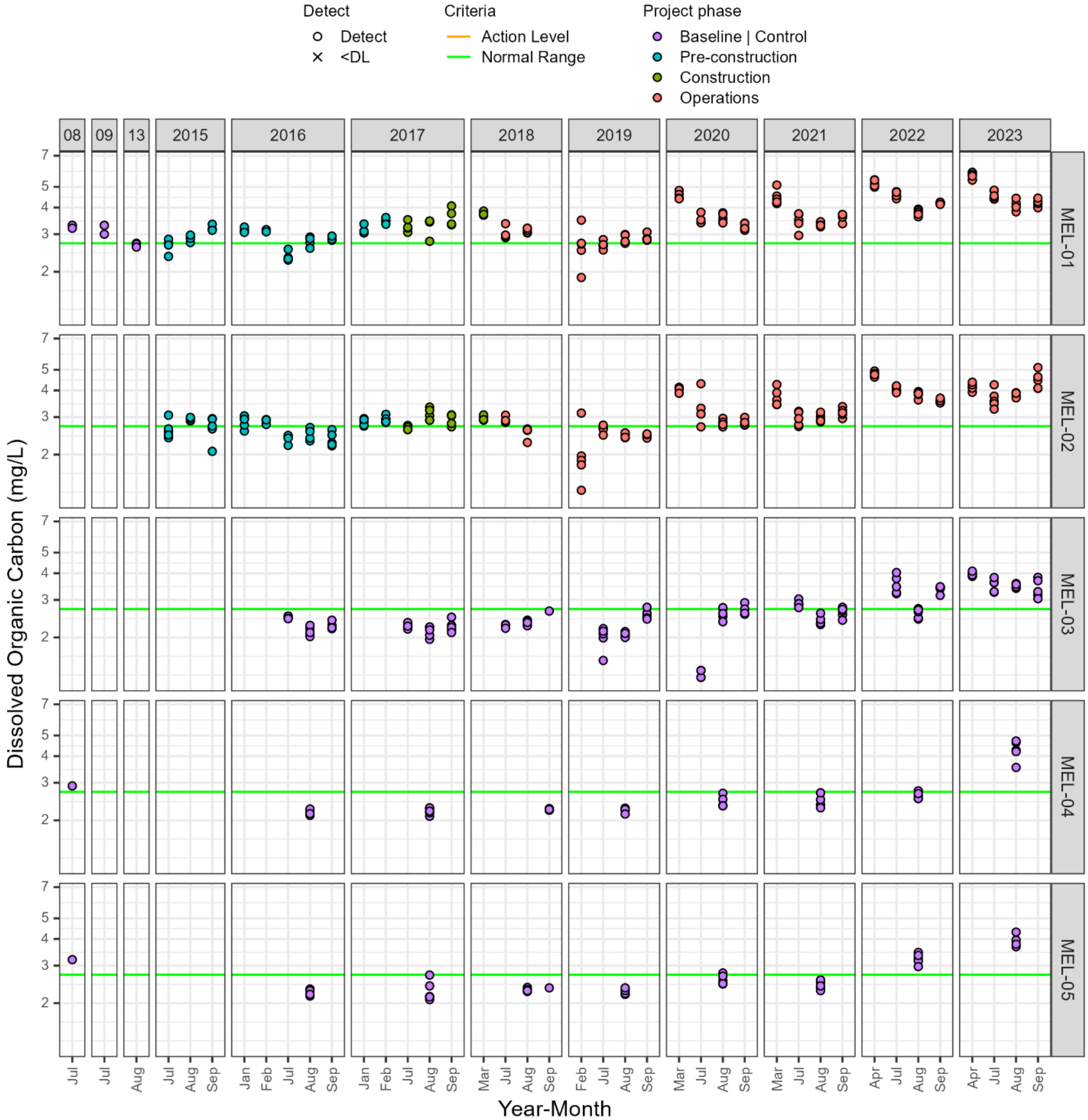


Figure C2-25. Total organic carbon (mg/L)

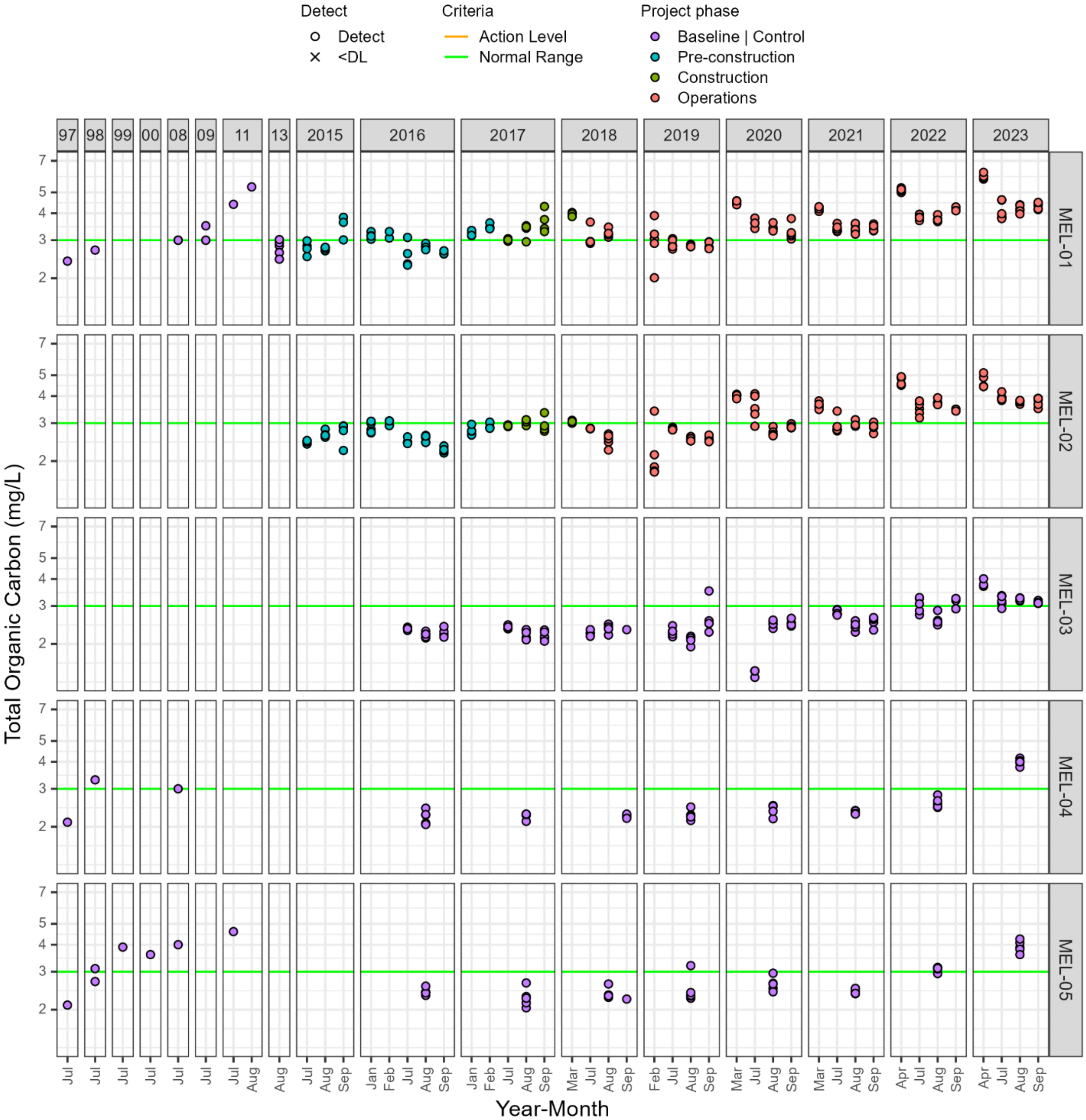


Figure C2-26. Total aluminum (µg/L)

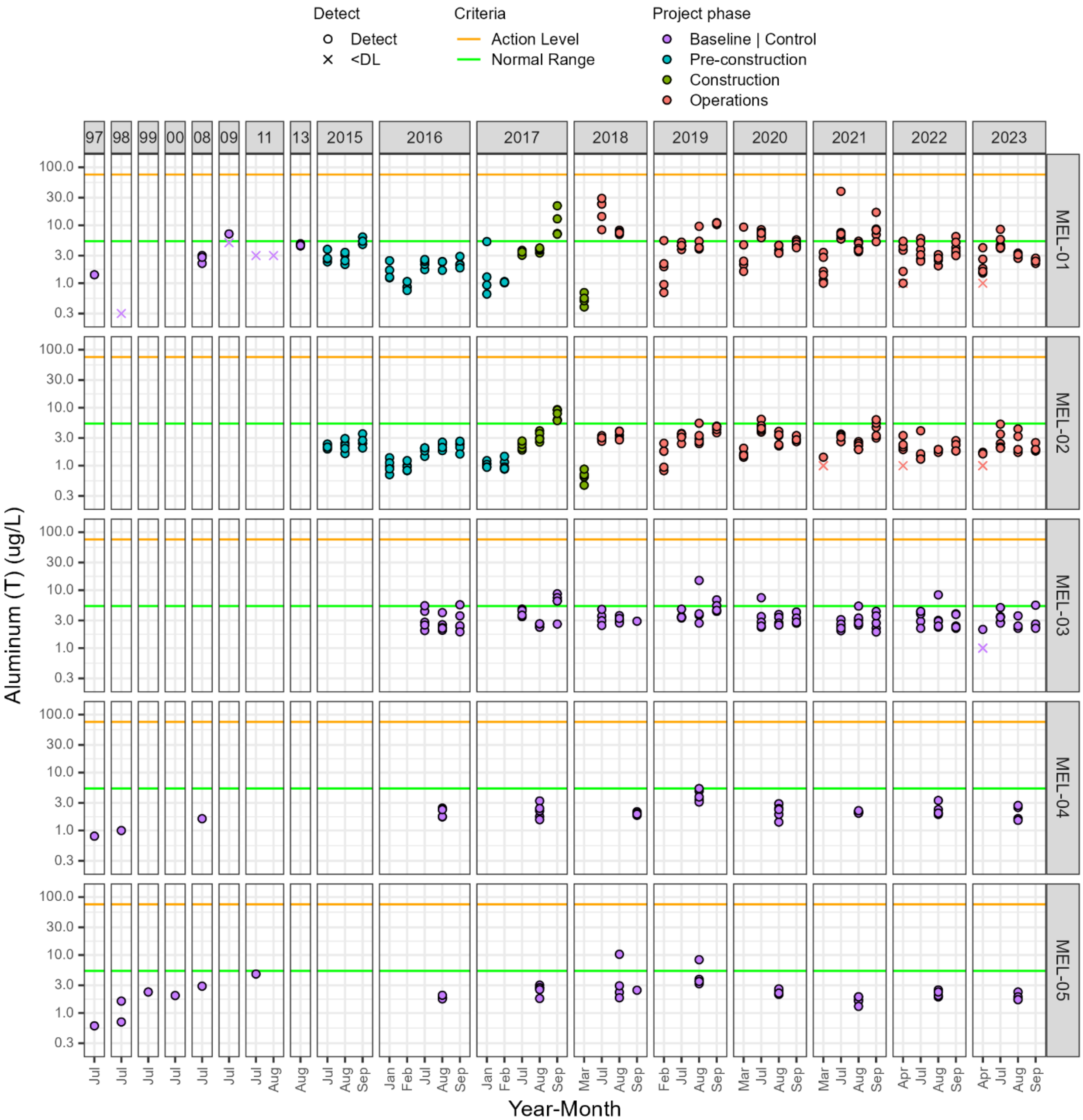


Figure C2-27. Total antimony (µg/L)

Notes: The normal range for antimony is equal to the current detection limit.

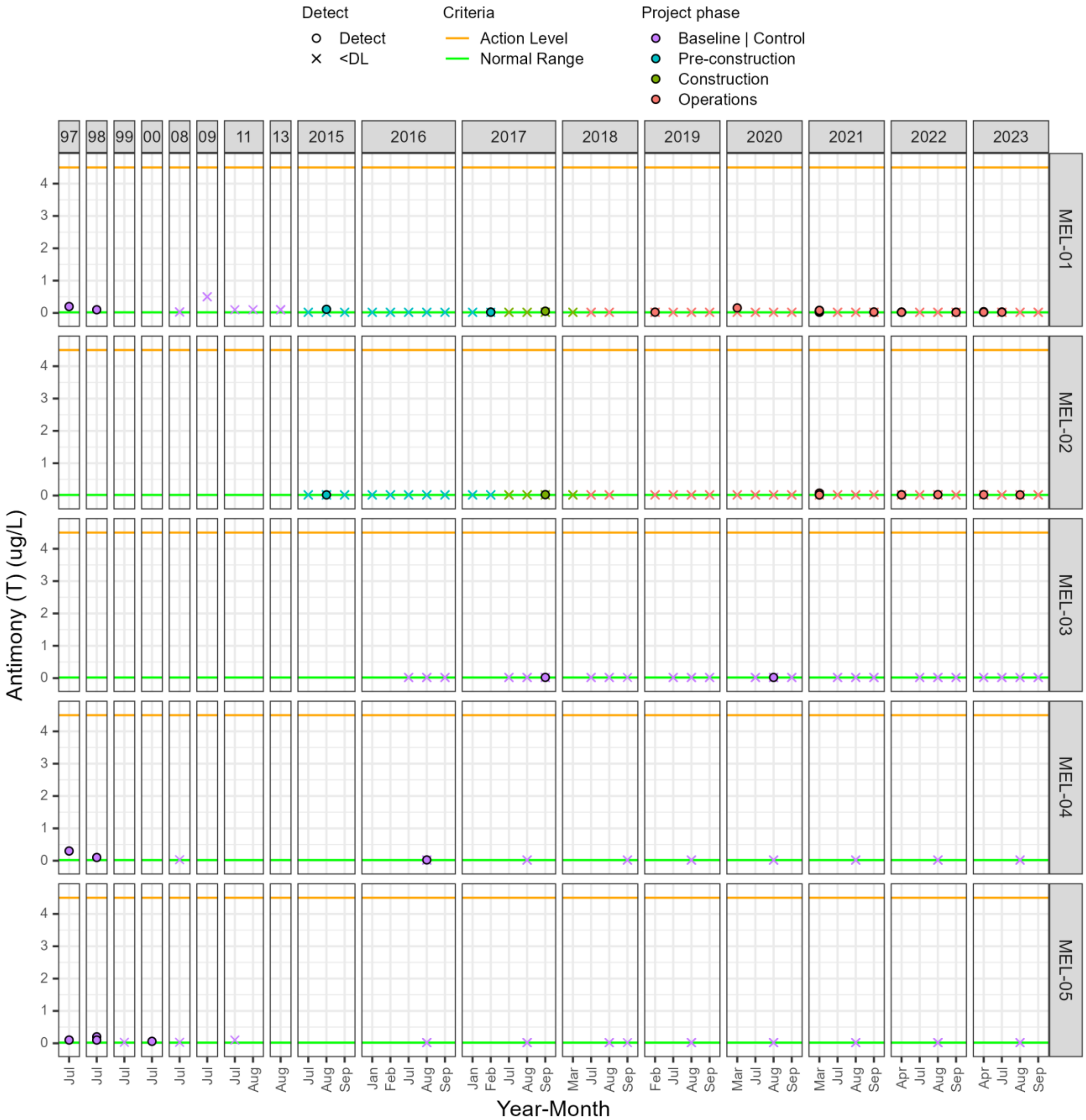


Figure C2-28. Total arsenic (µg/L)

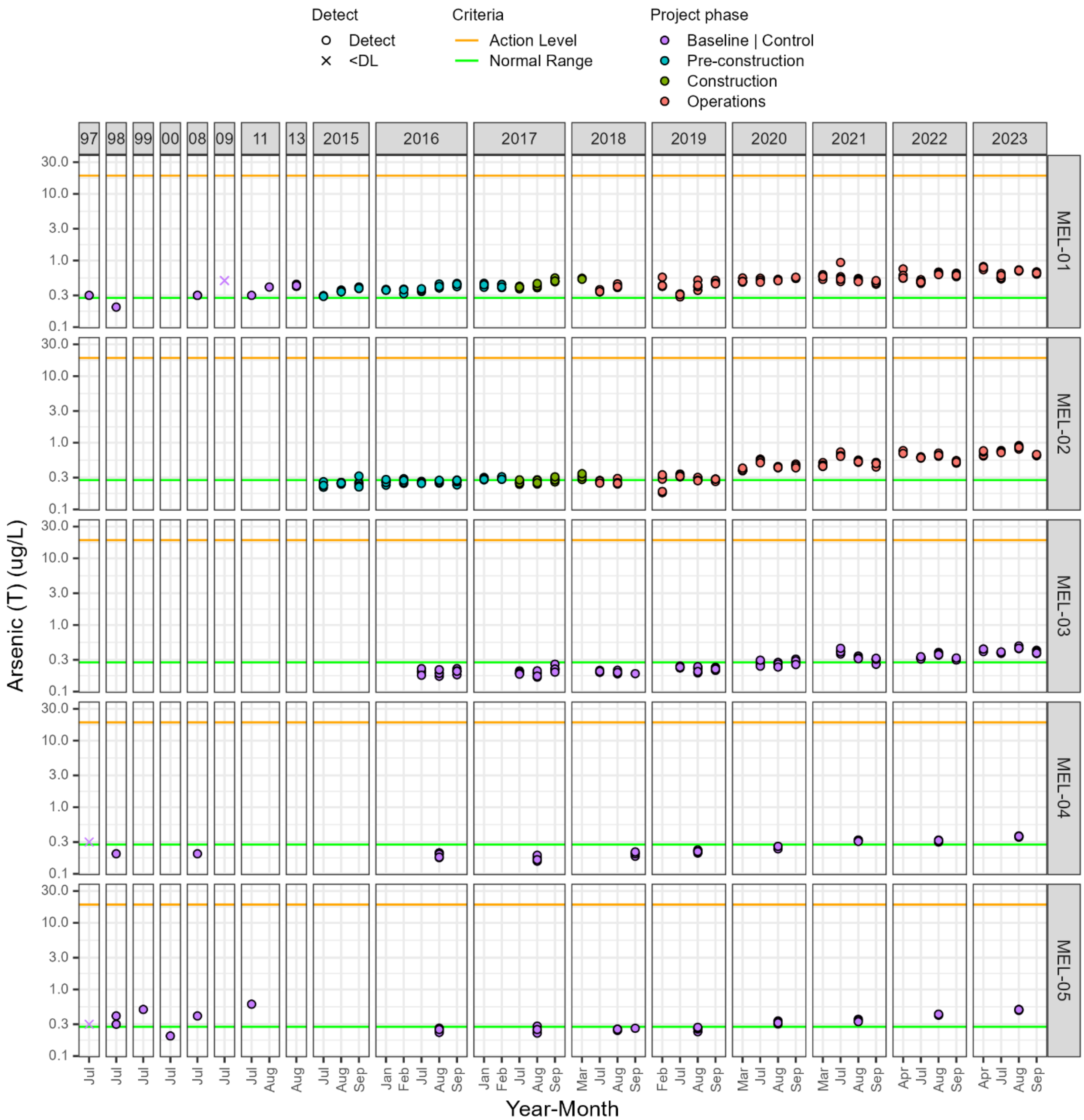


Figure C2-29. Total barium (µg/L)

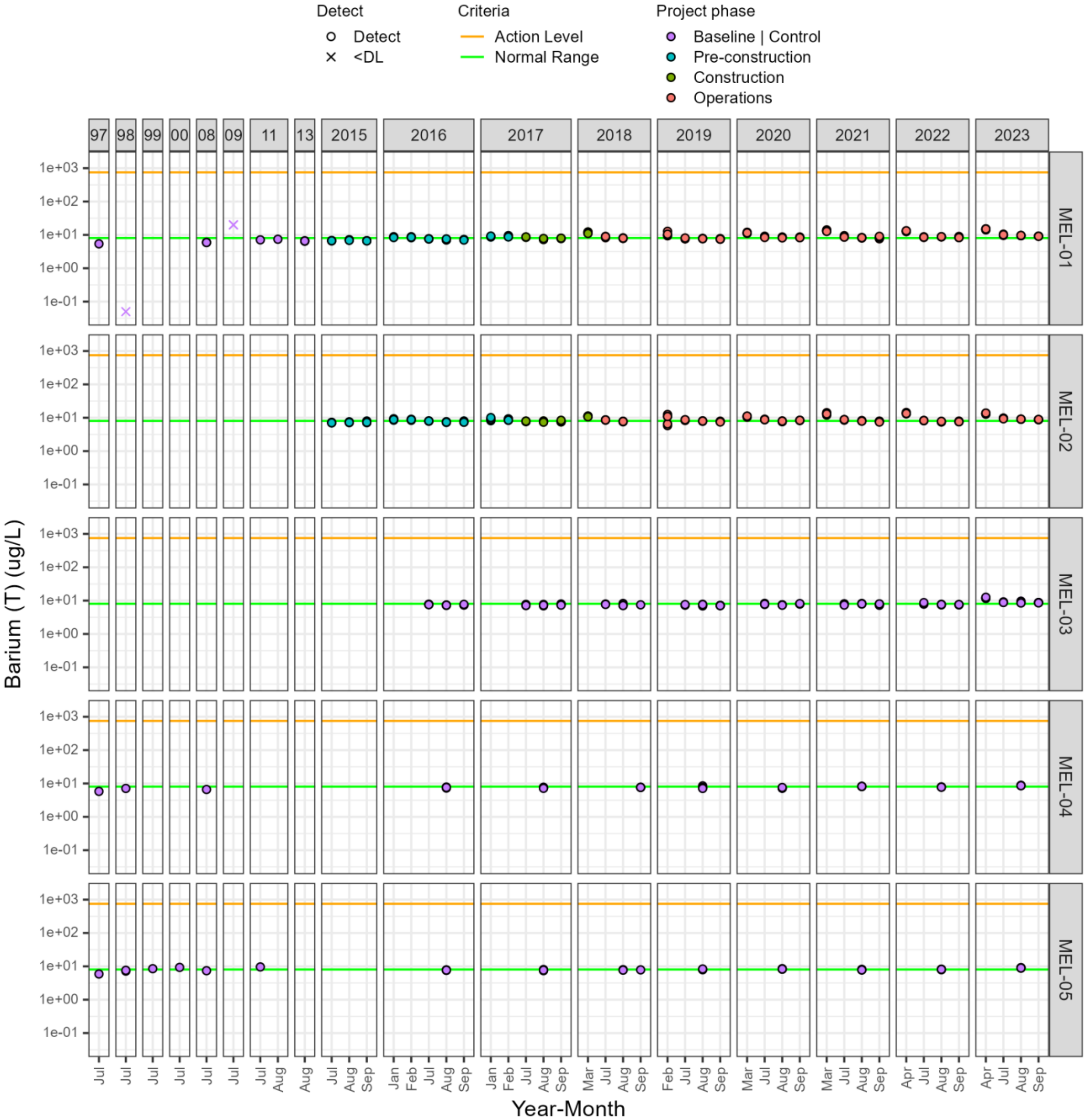


Figure C2-30. Total beryllium (µg/L)

Notes: The normal range for beryllium is equal to the current detection limit.

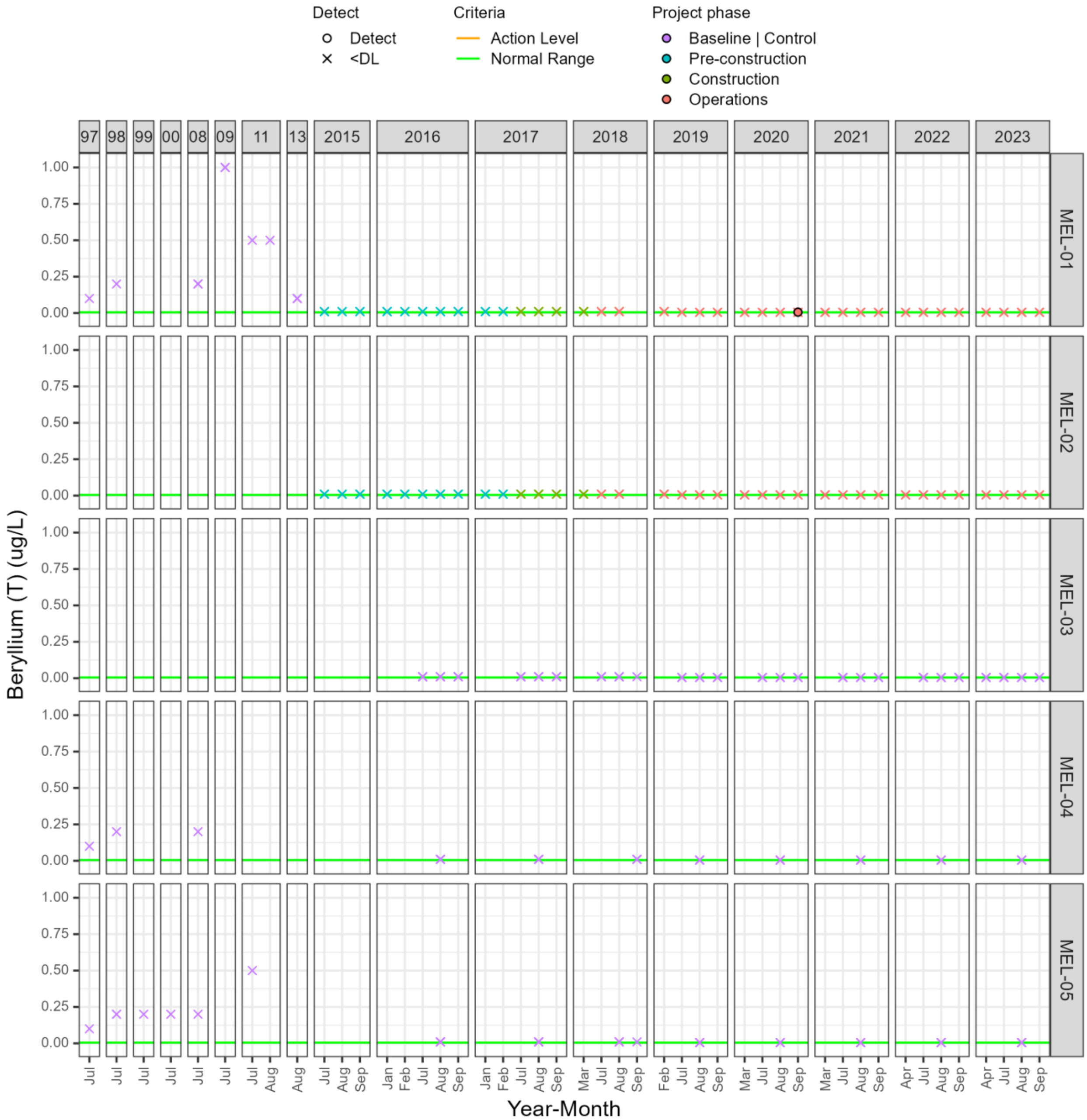


Figure C2-31. Total bismuth (µg/L)

Notes: The normal range for bismuth is equal to the current detection limit.

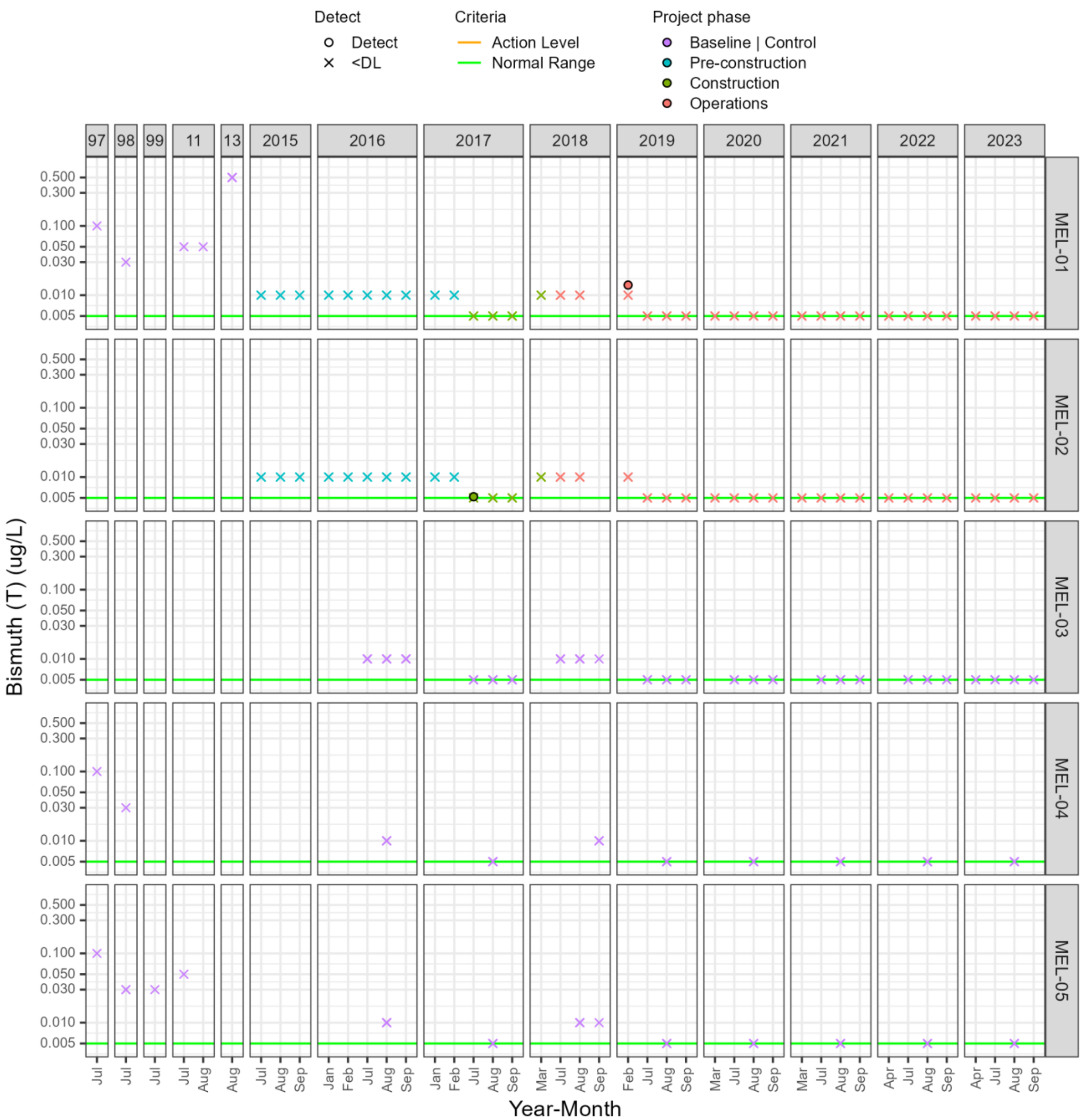


Figure C2-32. Total boron (µg/L)

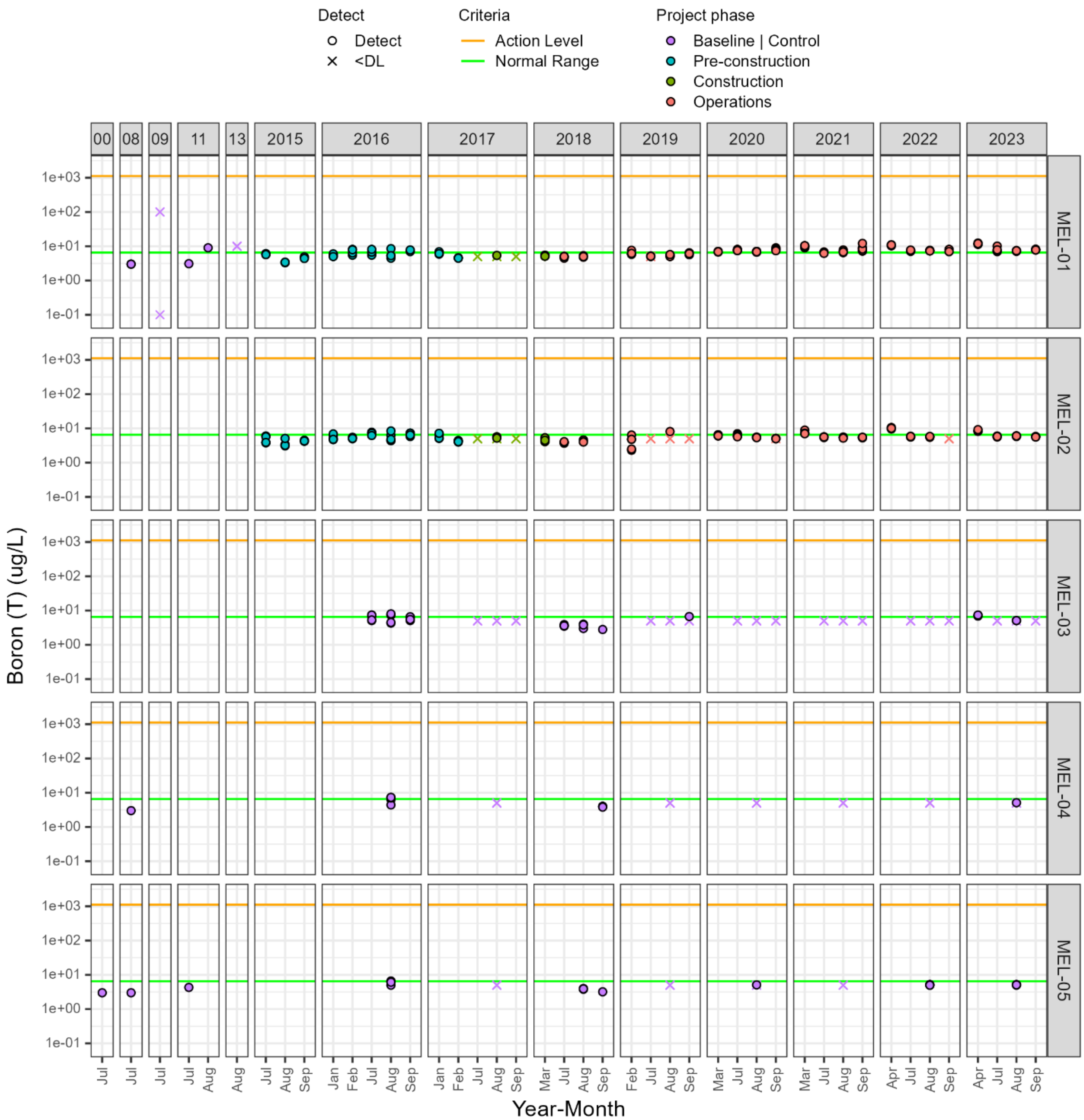


Figure C2-33. Total cadmium (µg/L)

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 2023.

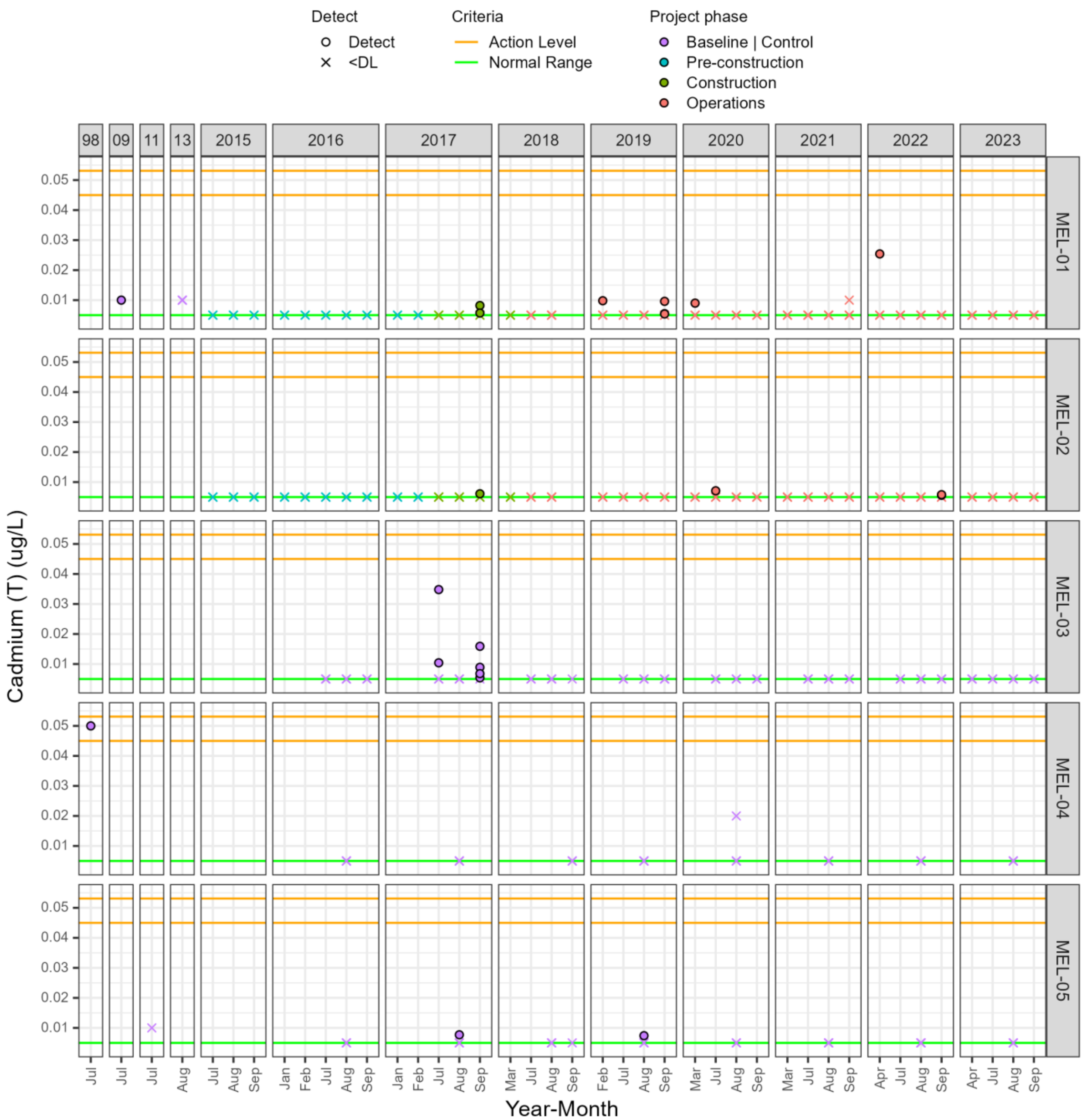


Figure C2-34. Total chromium (µg/L)

Notes: The normal range for chromium is equal to the current detection limit.

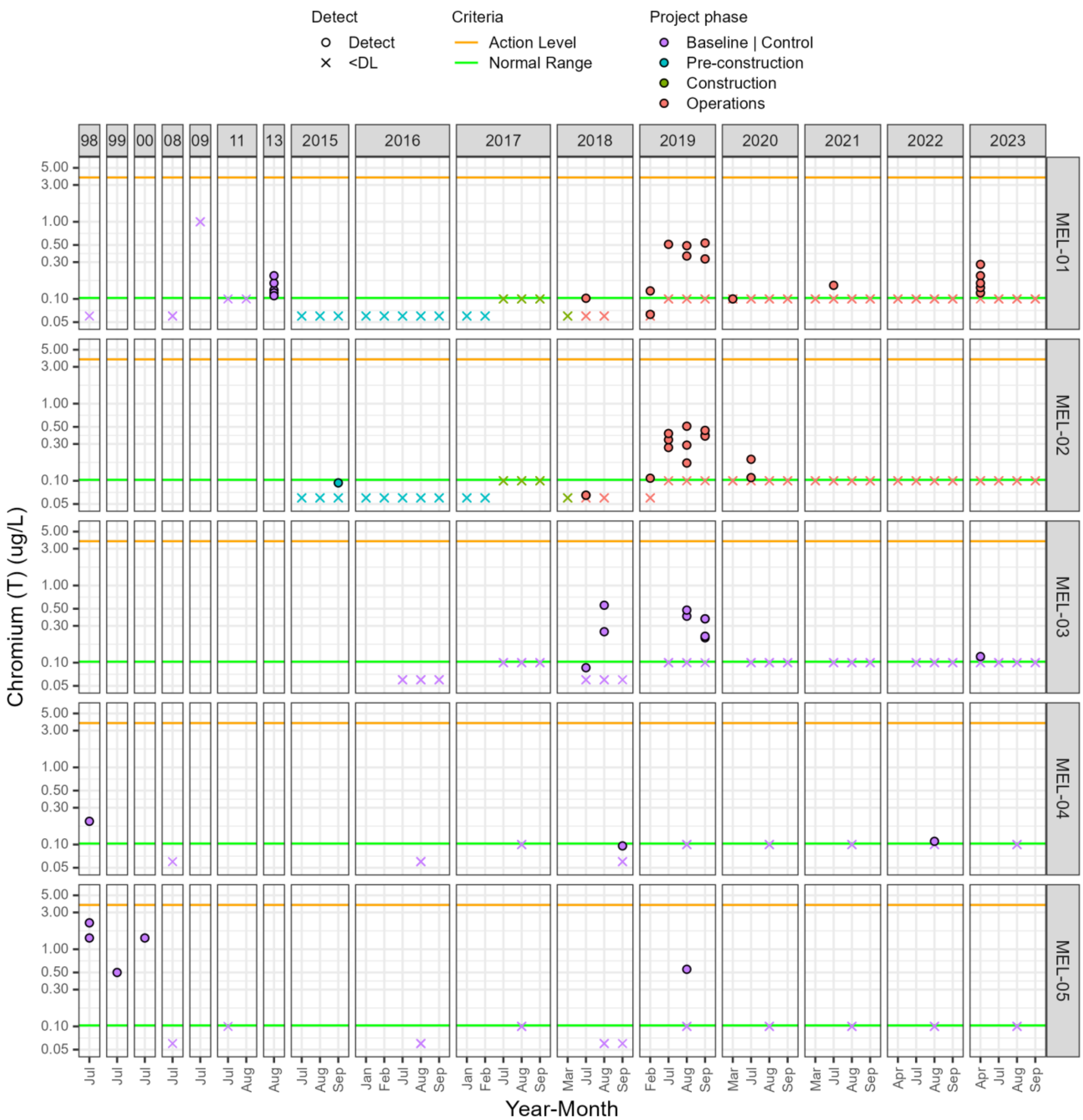


Figure C2-35. Total cobalt (µg/L)

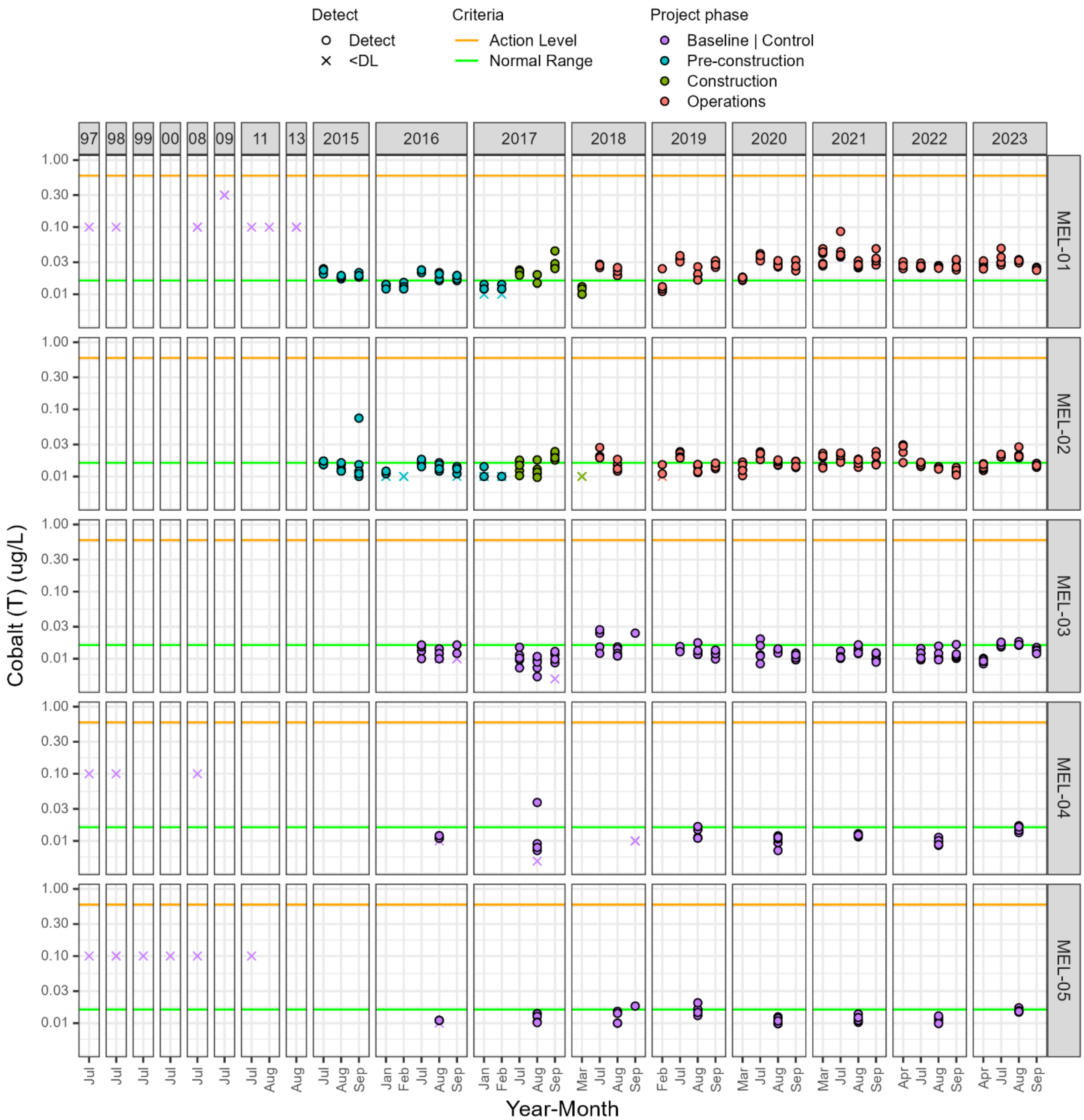


Figure C2-36. Total copper (µg/L)

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). Refer to **Appendix C1** for information on the copper BLM.

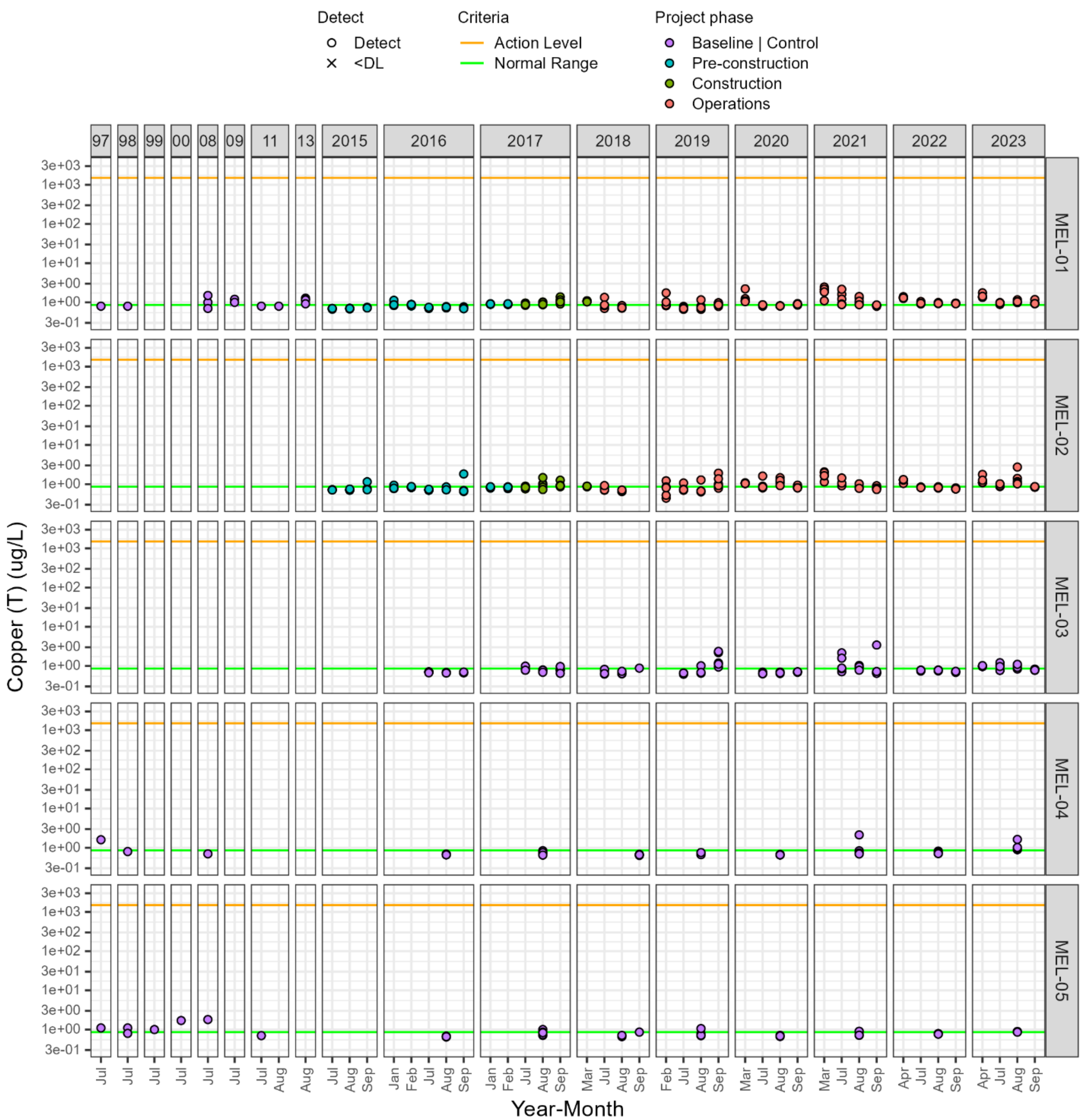


Figure C2-37. Total iron (µg/L)

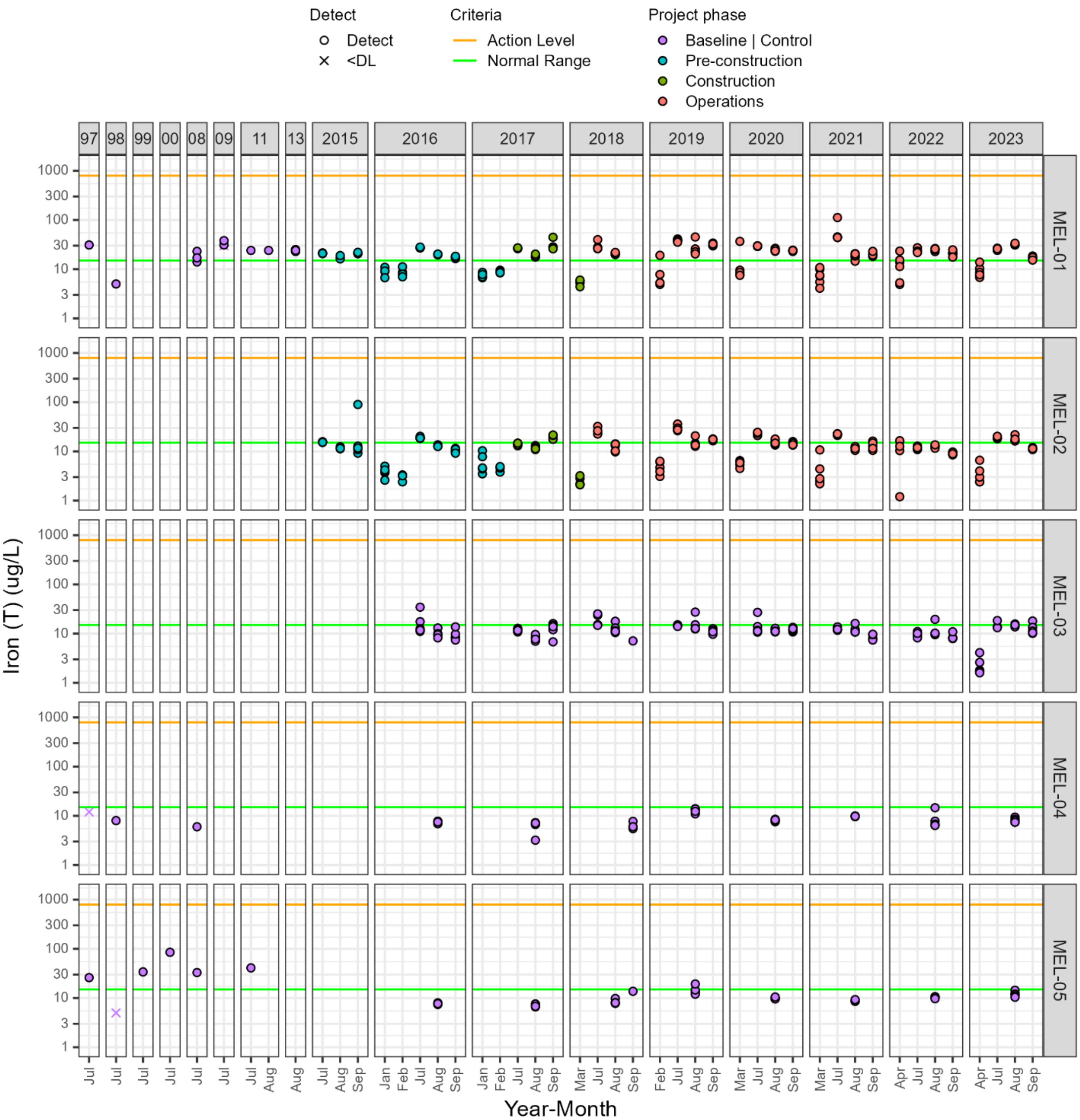


Figure C2-38. Total lead (µg/L)

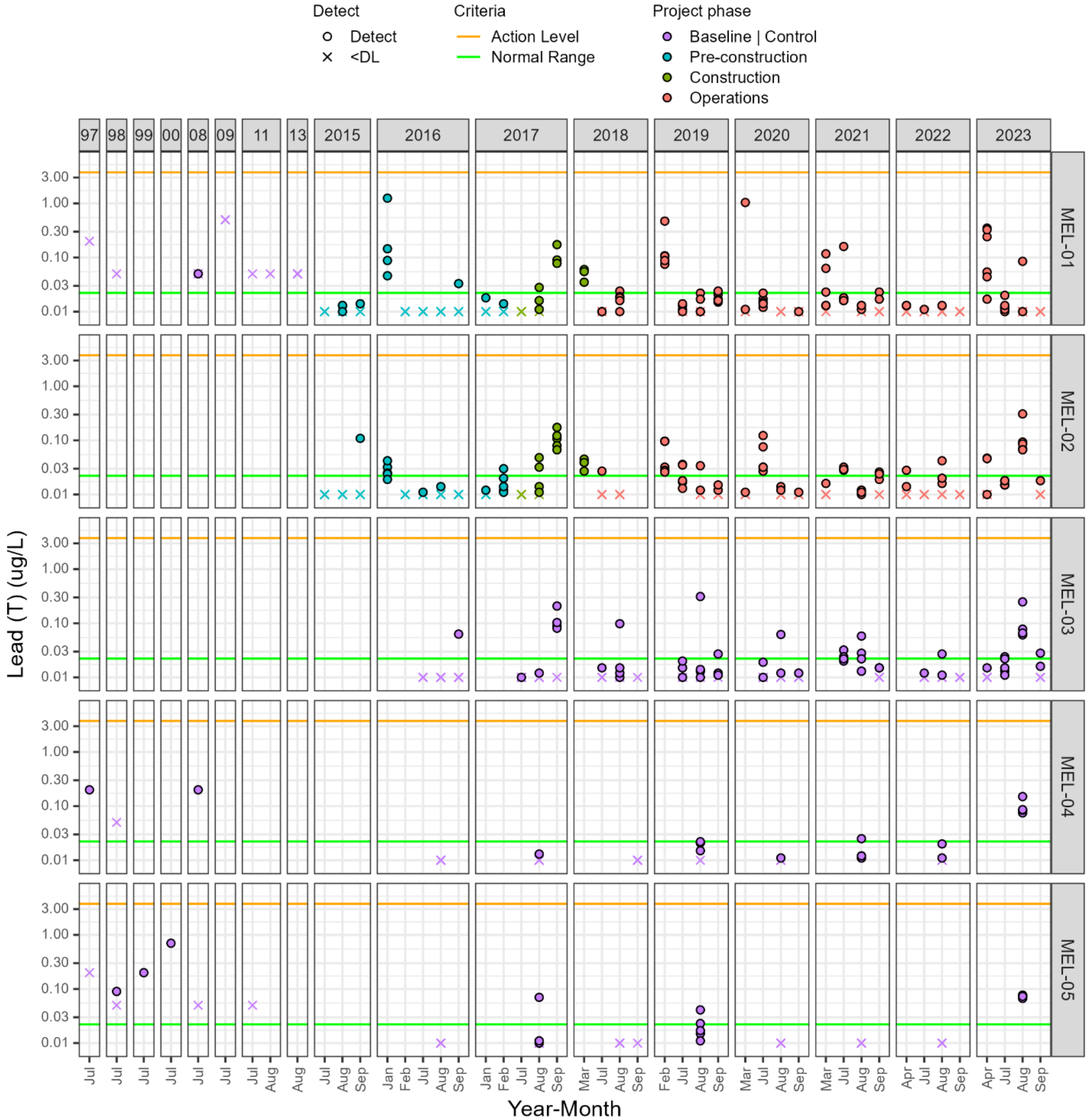


Figure C2-39. Total lithium (μg/L)

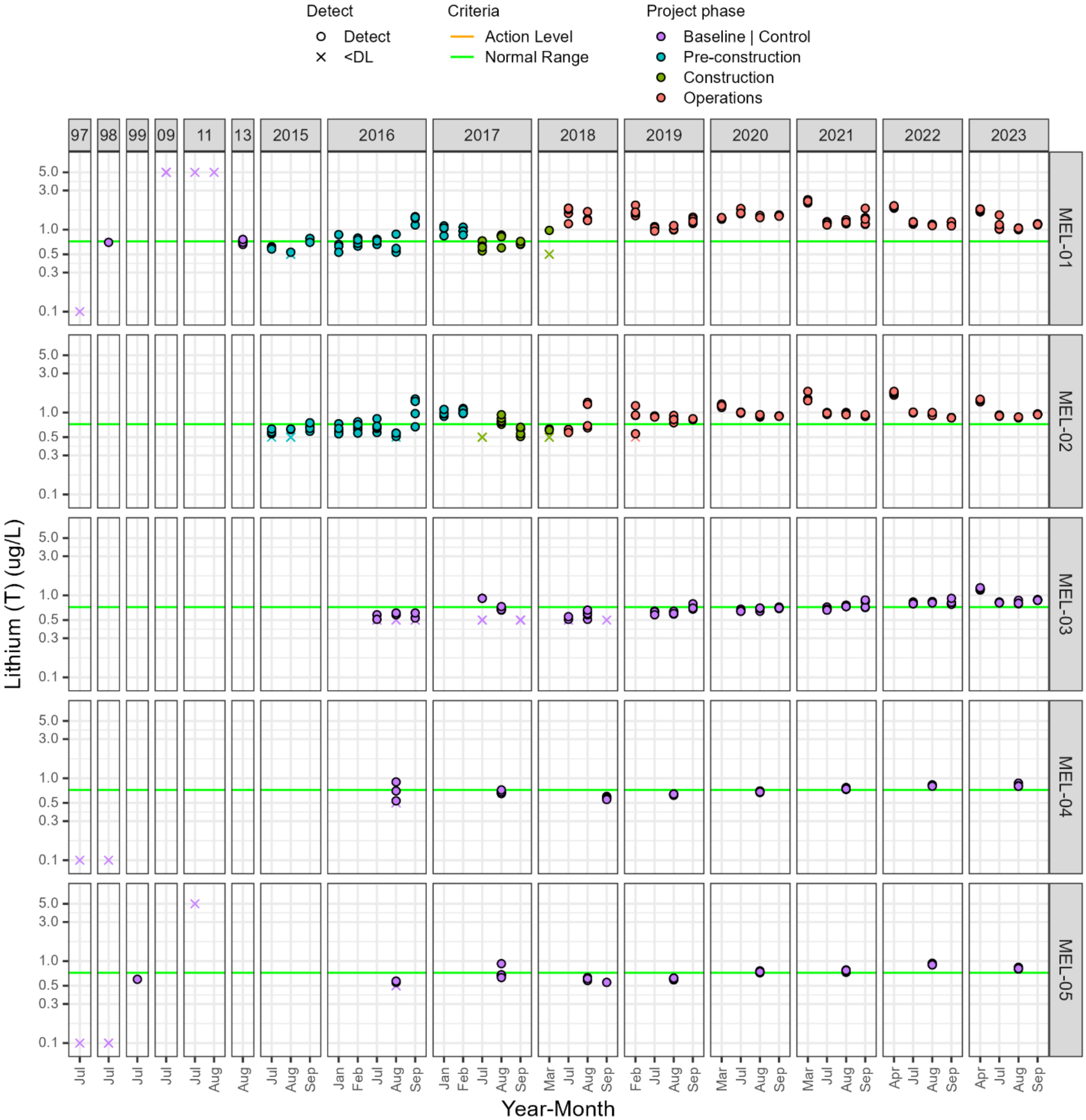


Figure C2-40. Total manganese (µg/L)

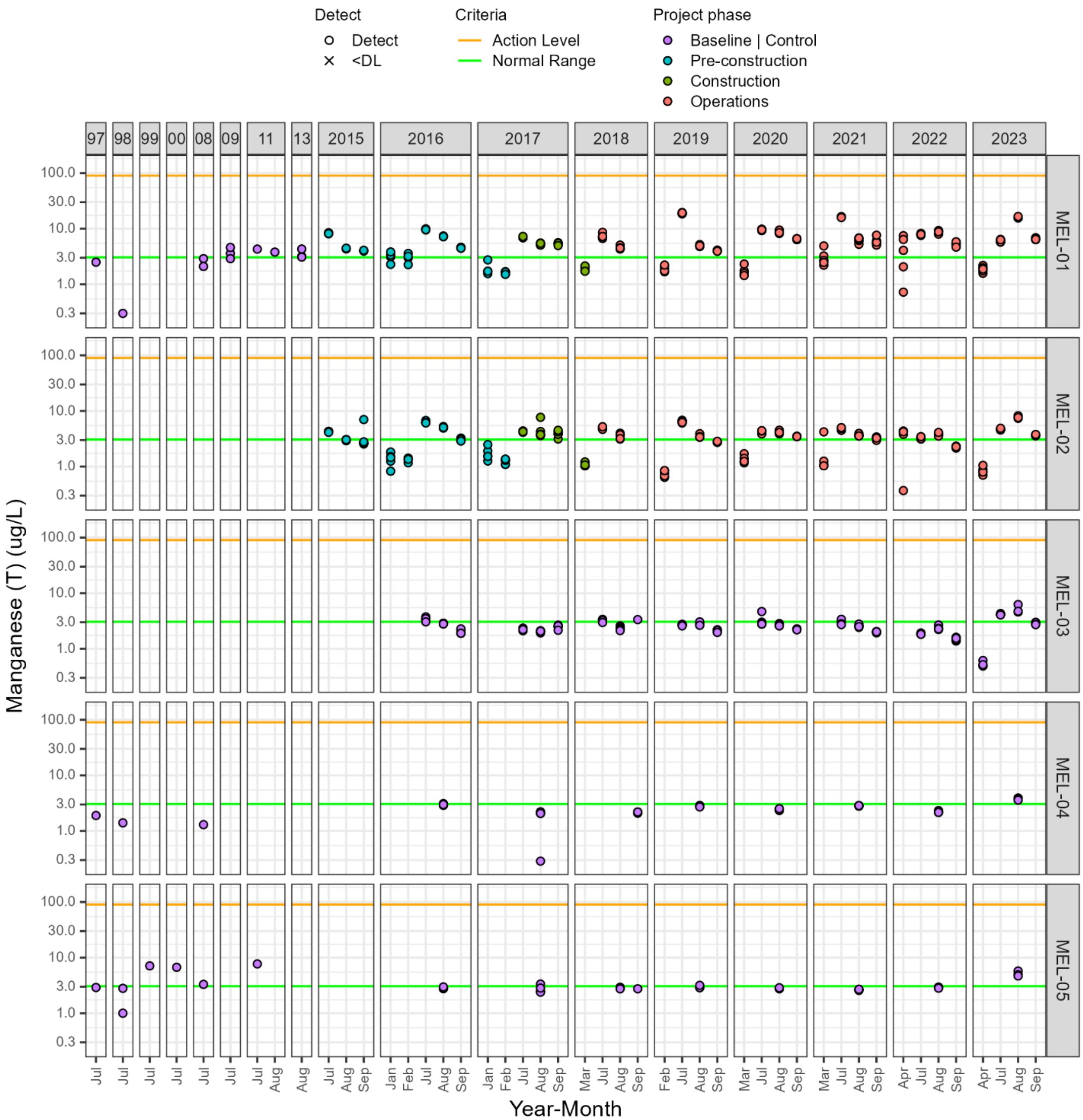


Figure C2-41. Total mercury (µg/L)

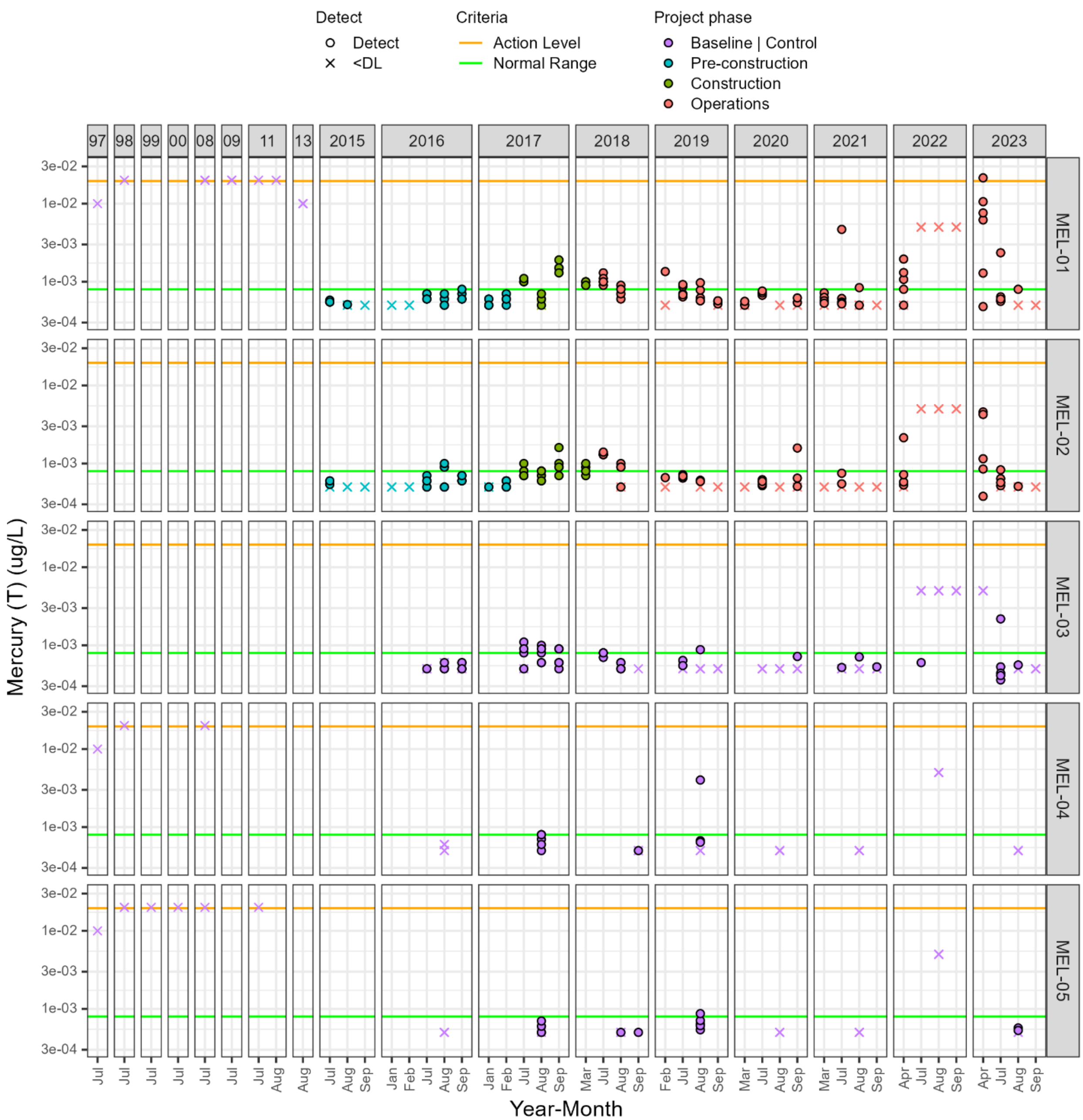


Figure C2-42. Total molybdenum (µg/L)

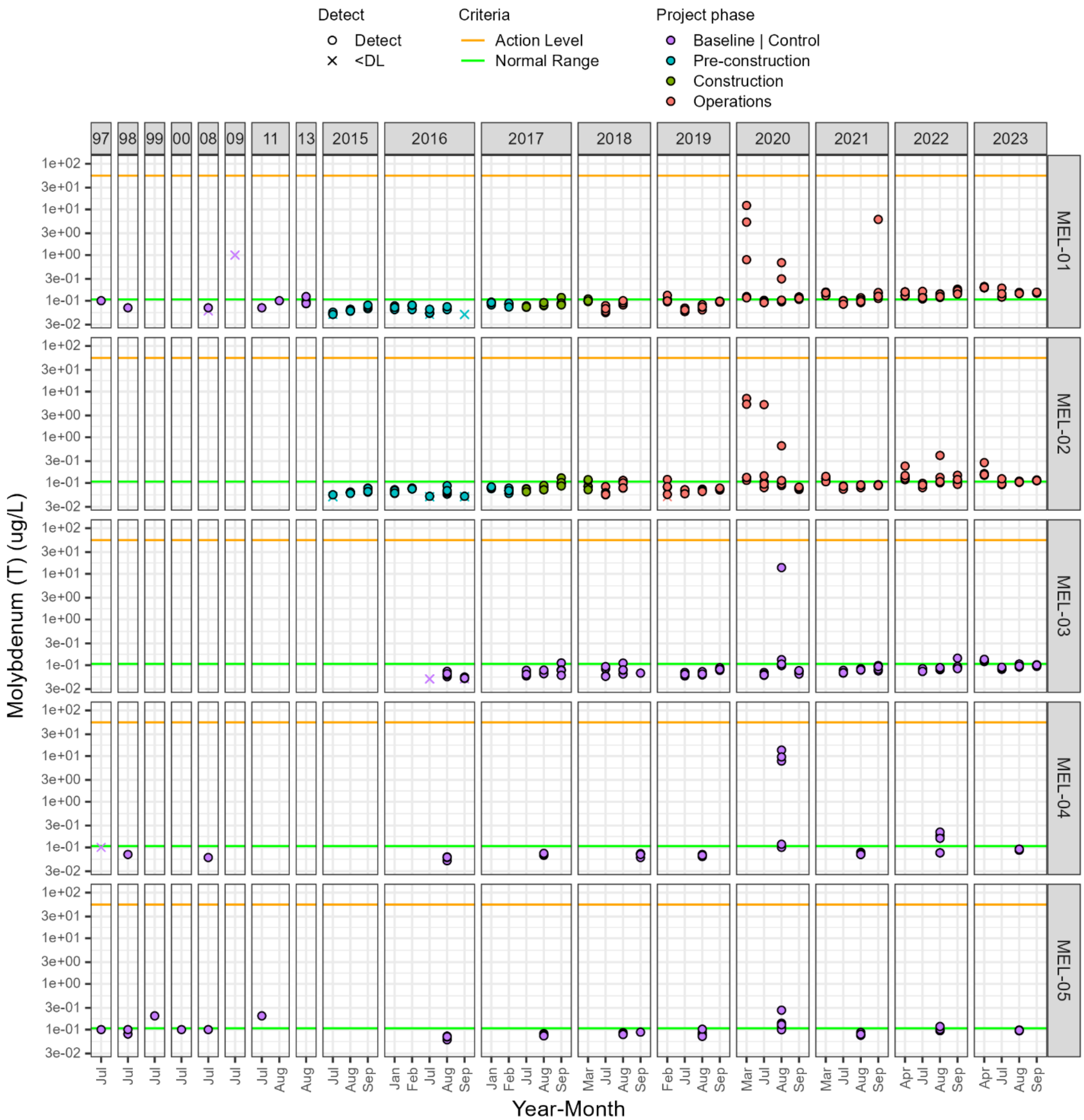


Figure C2-43. Total nickel (µg/L)

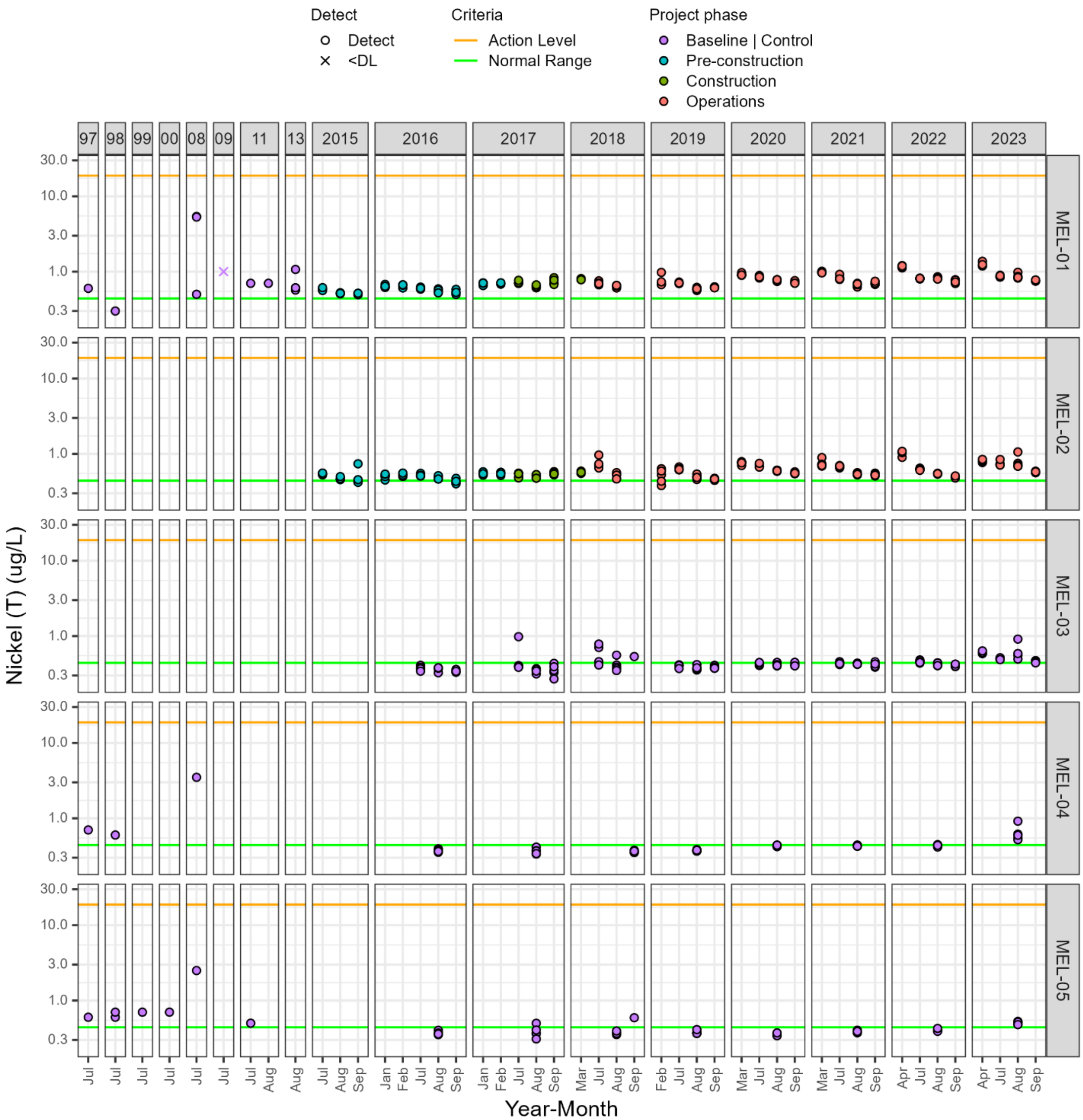


Figure C2-44. Total selenium (µg/L)

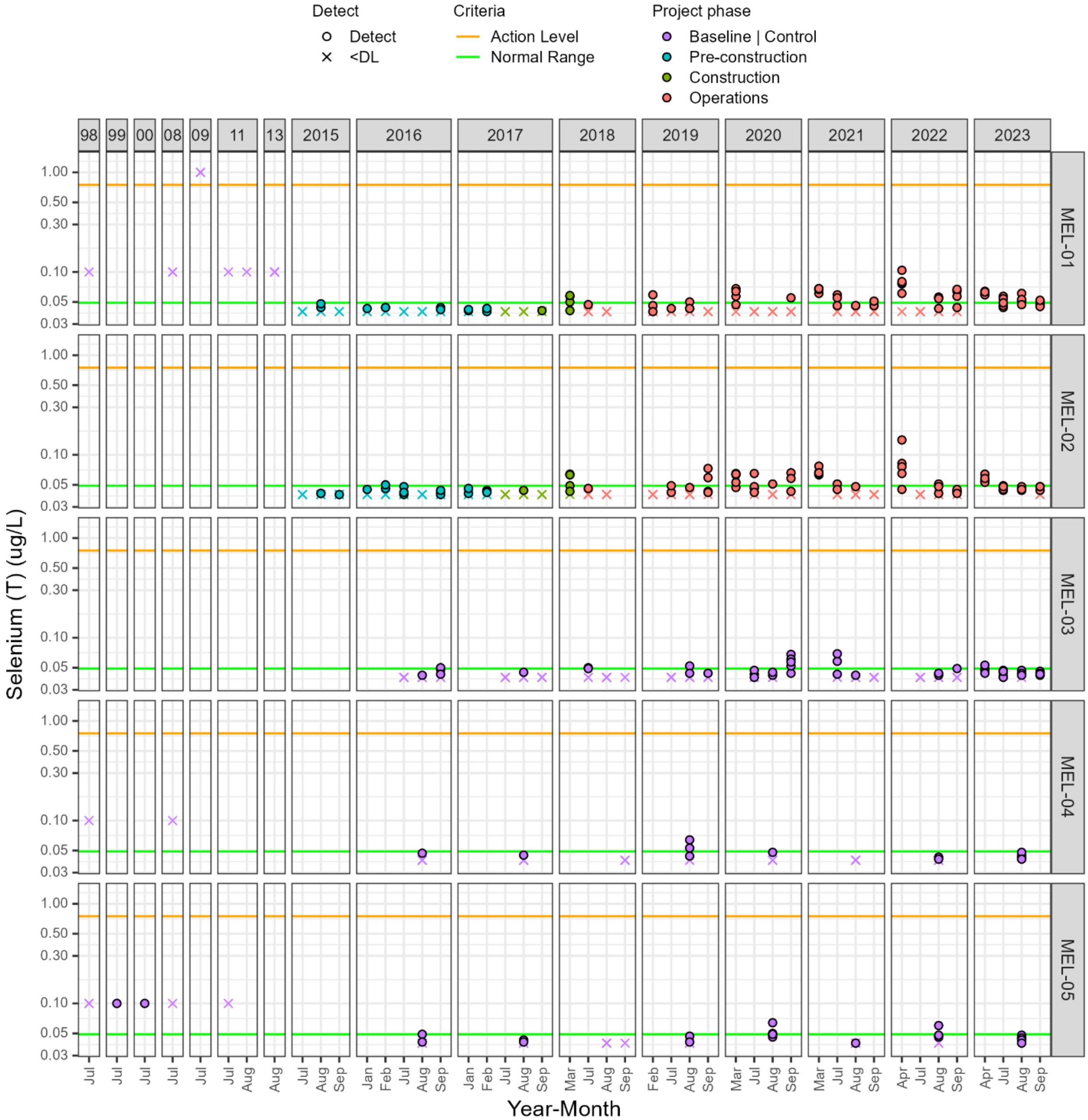


Figure C2-45. Total silver (µg/L)

Notes: The normal range for silver is equal to the current detection limit.

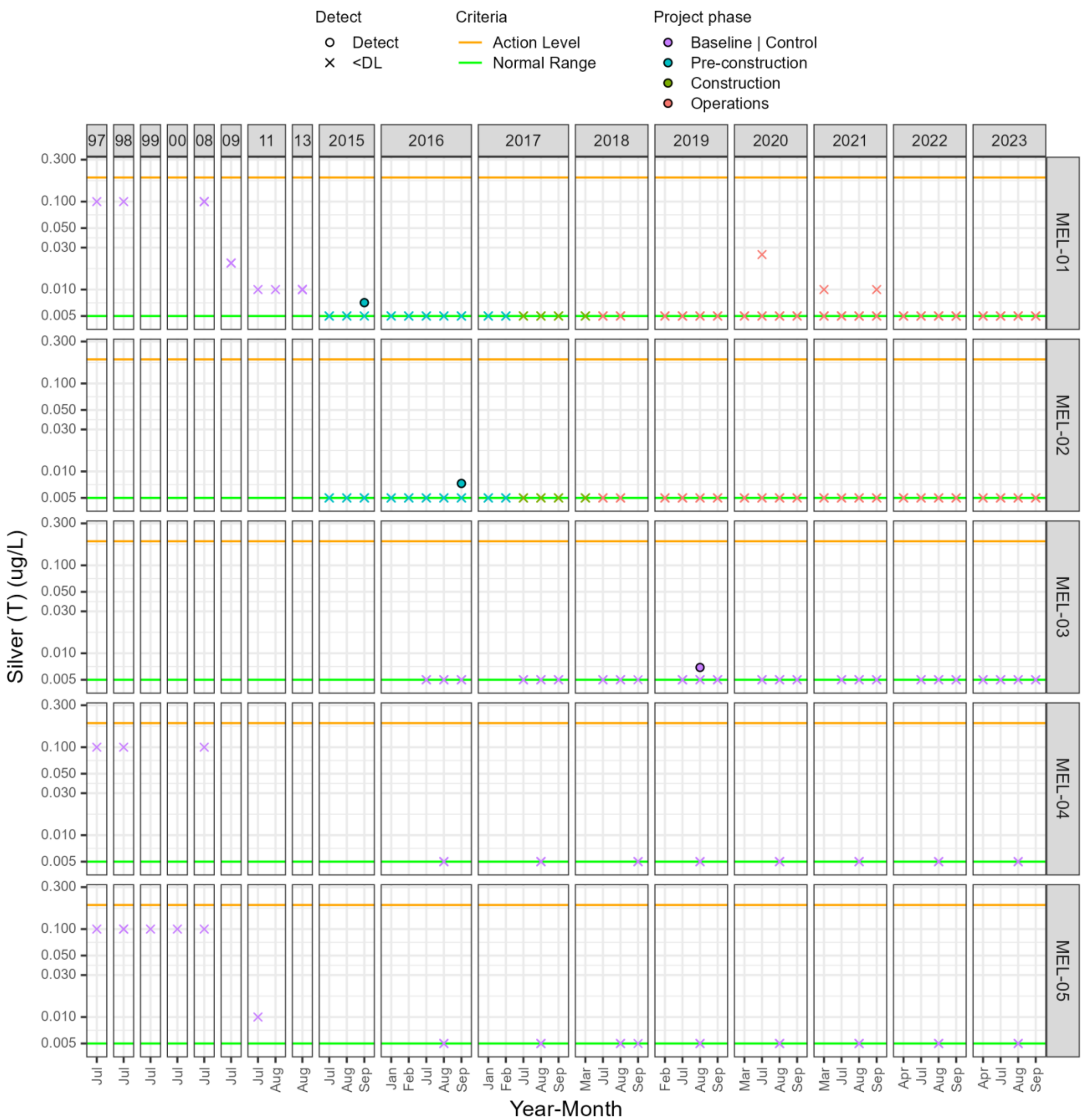


Figure C2-46. Total strontium (µg/L)

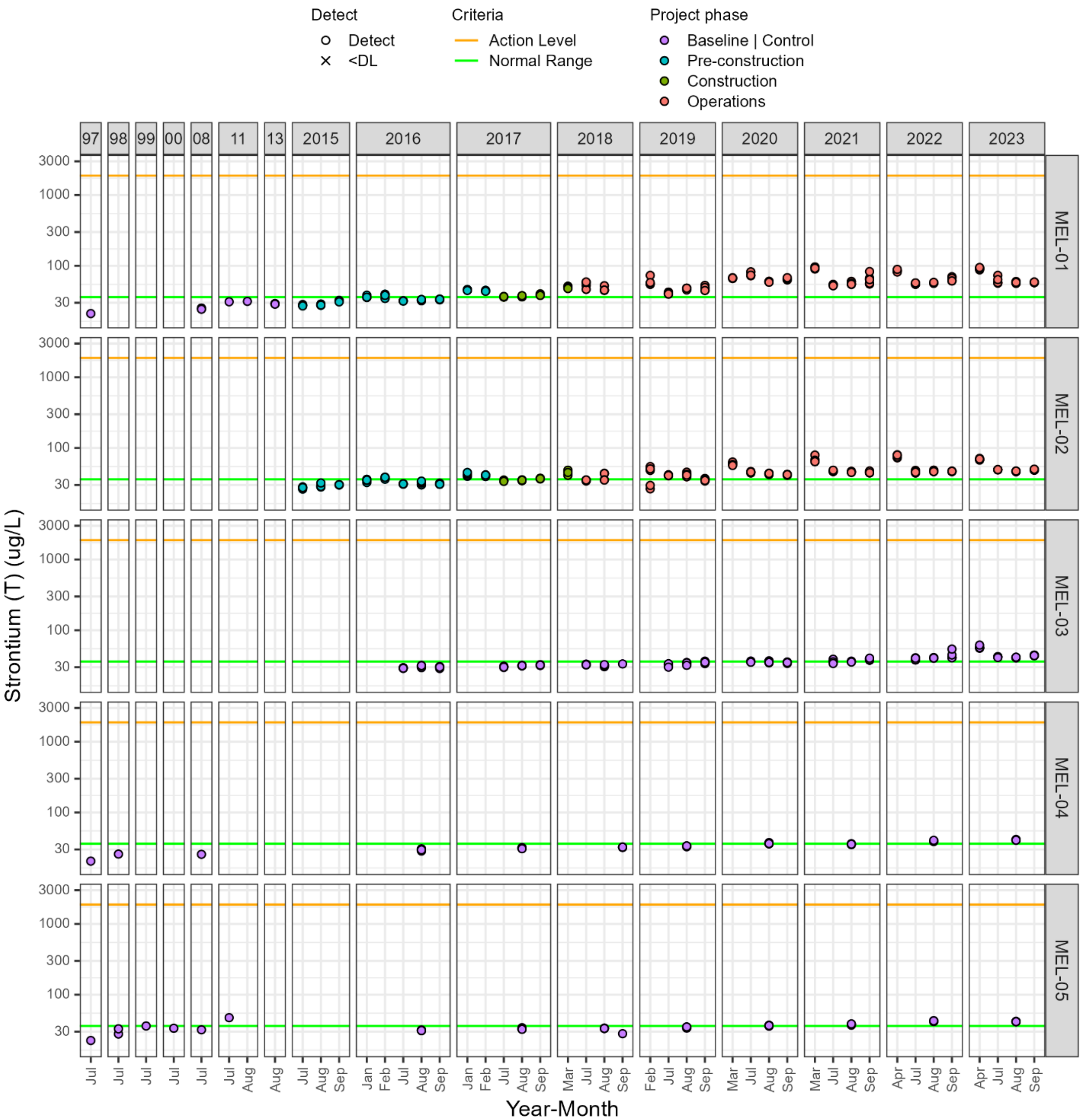


Figure C2-47. Total thallium (μg/L)

Notes: The normal range for thallium is equal to the current detection limit.

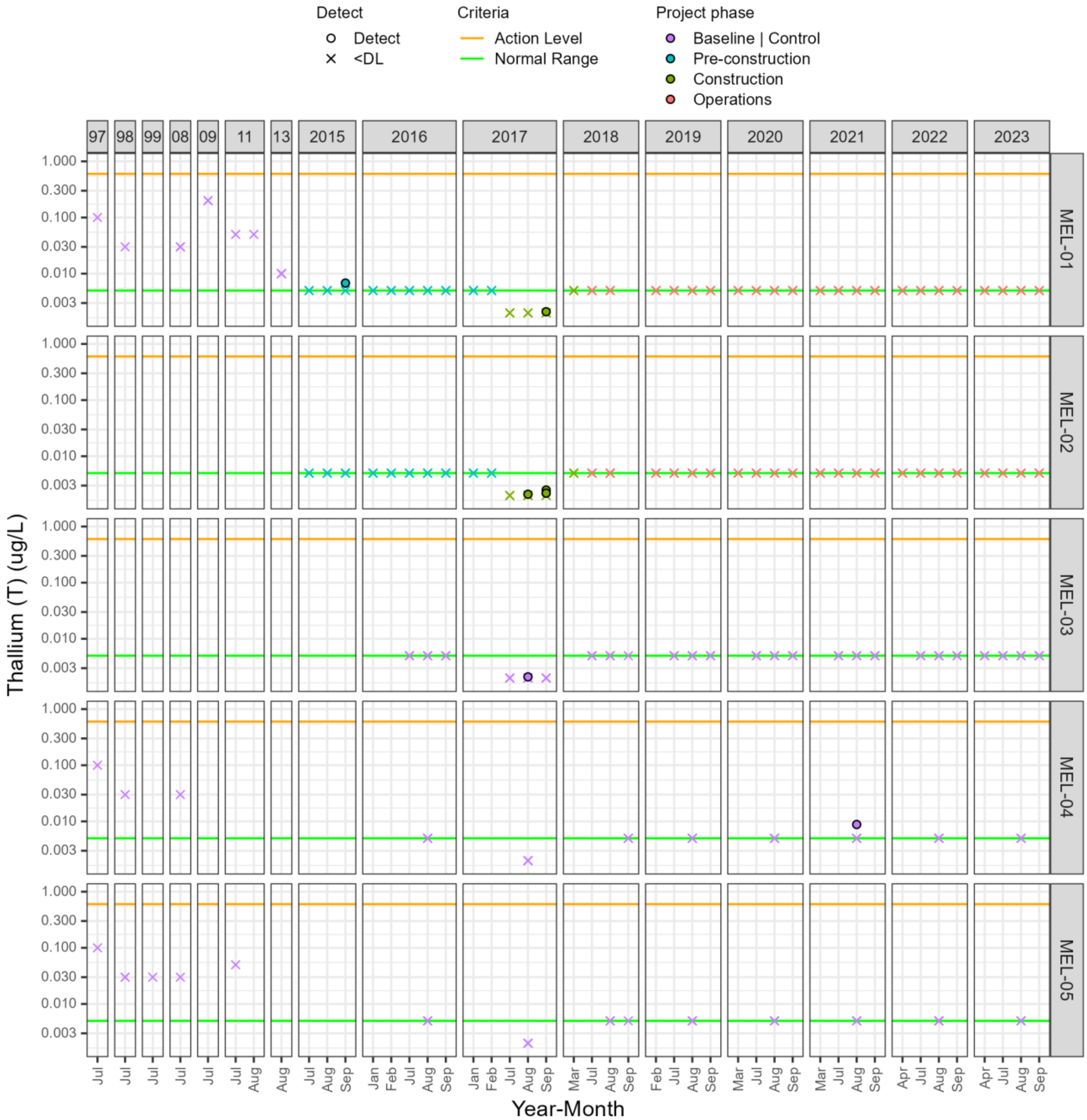


Figure C2-48. Total tin (µg/L)

Notes: The normal range for tin is equal to the current detection limit.

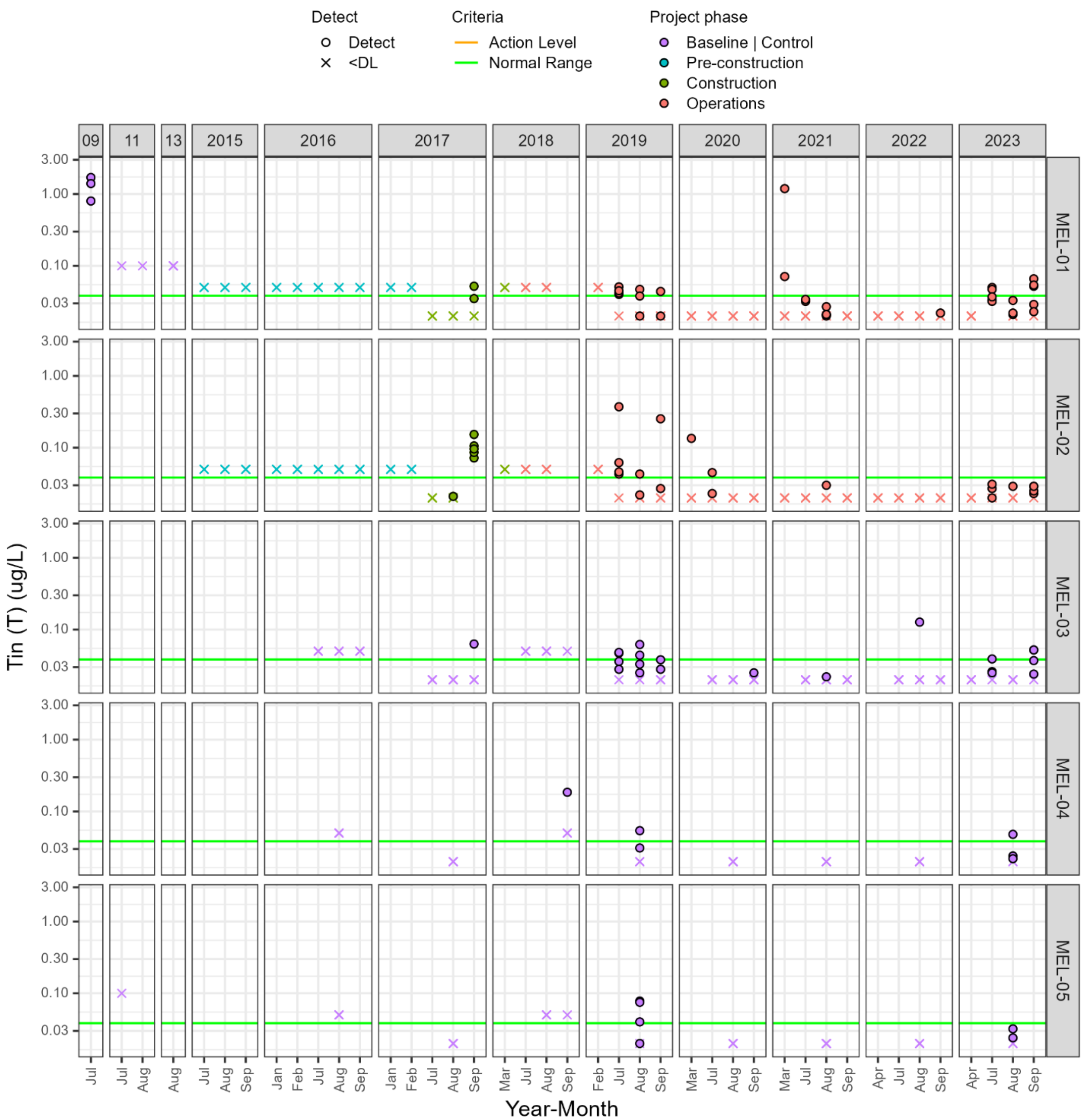


Figure C2-49. Total titanium (µg/L)

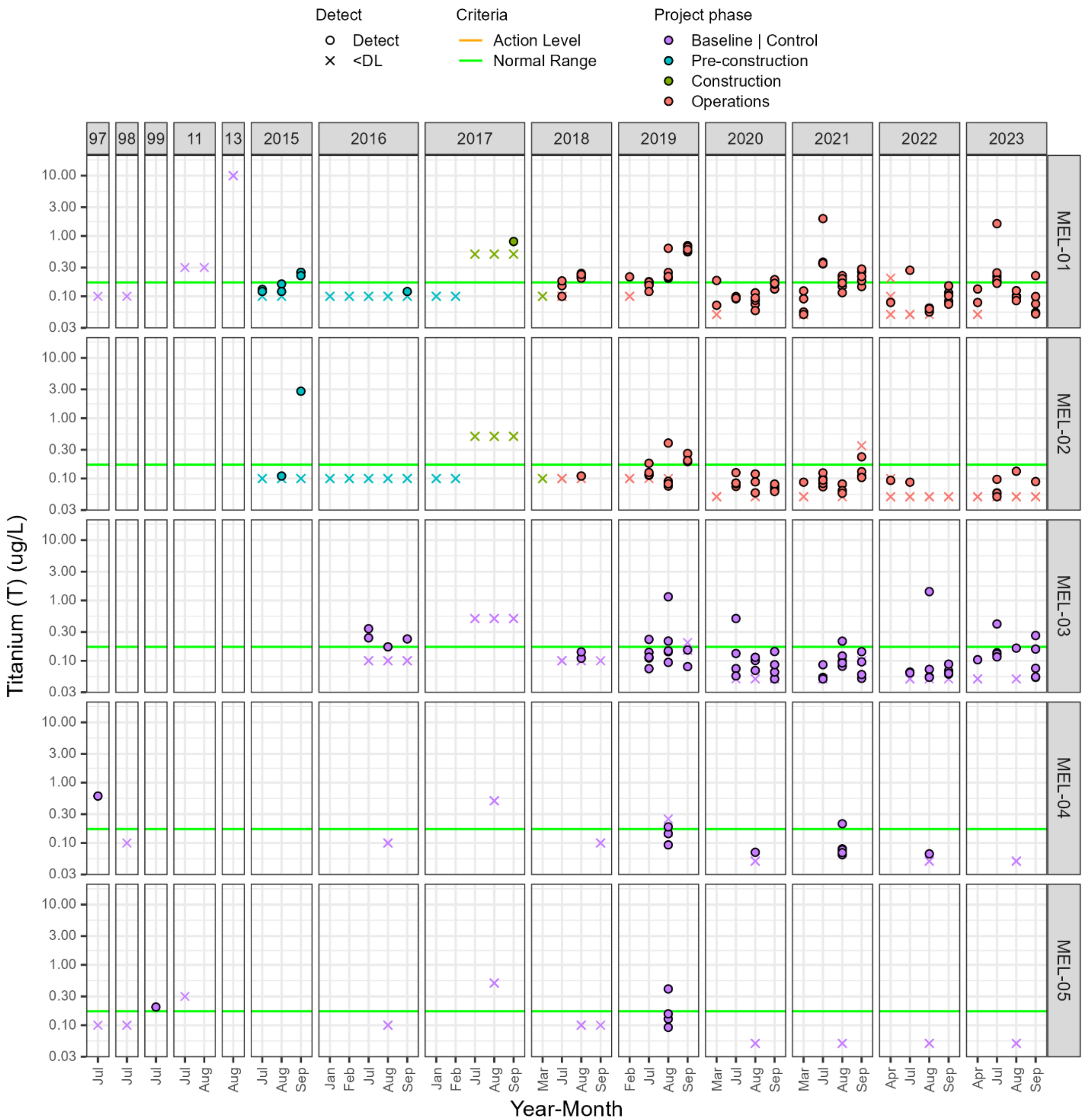


Figure C2-50. Total uranium (µg/L)

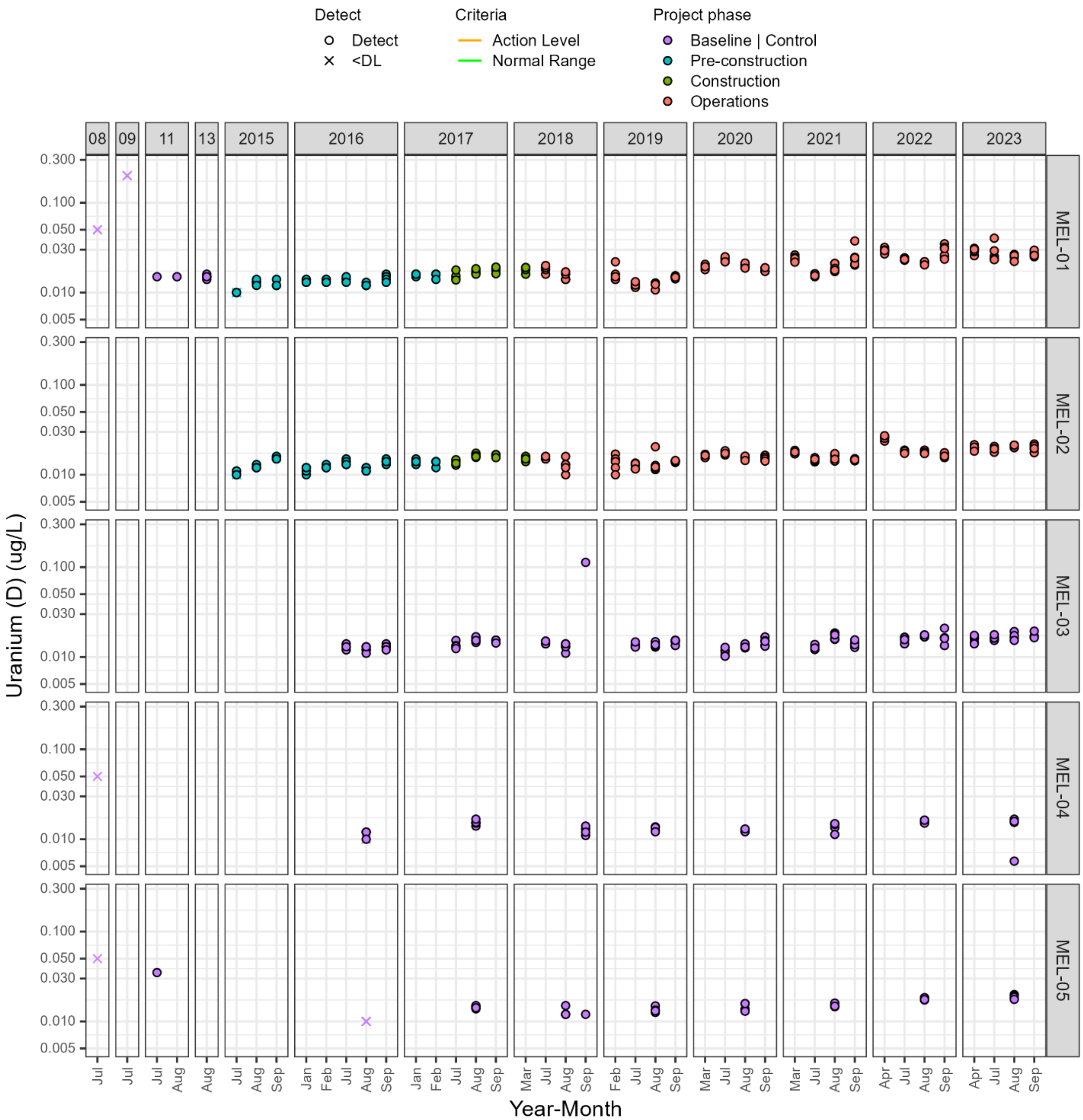


Figure C2-51. Total vanadium (µg/L)

Notes: The normal range for vanadium is equal to the current detection limit.

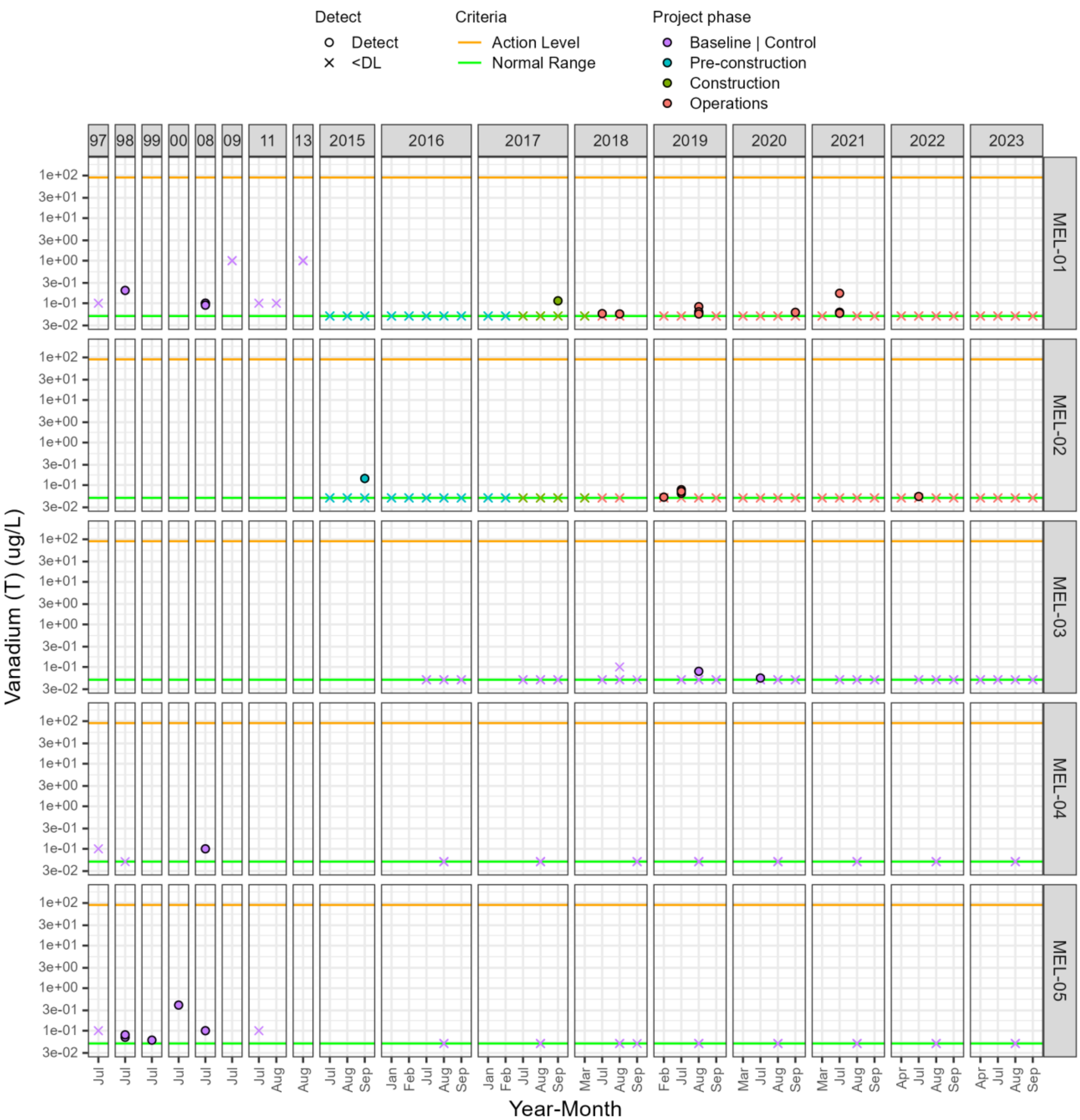


Figure C2-52. Total zinc (µg/L)

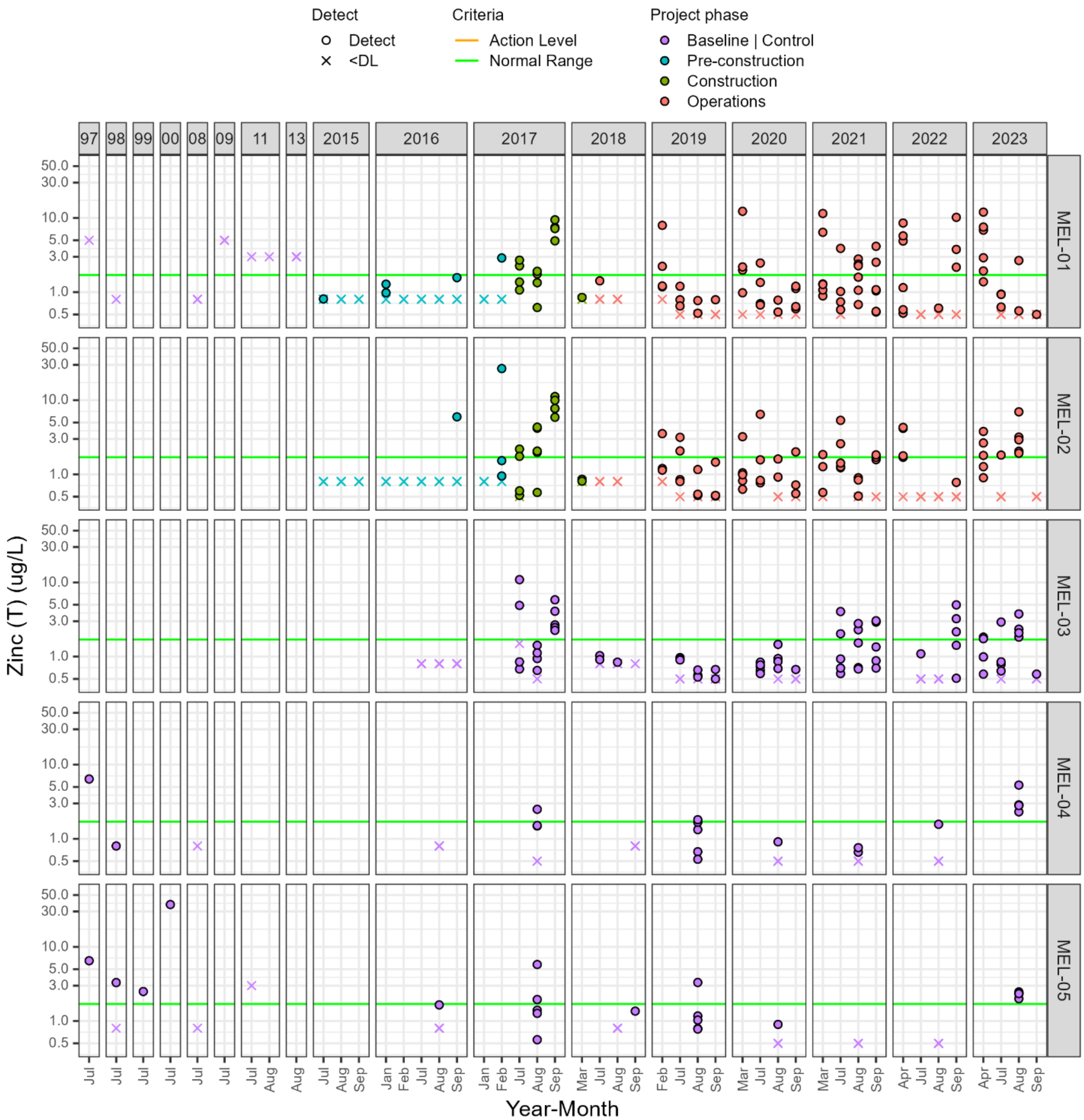


Figure C2-53. Dissolved copper (µg/L)

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 2023. Refer to **Figure 3-5** in the main report for sample-by-sample screening results for dissolved copper.

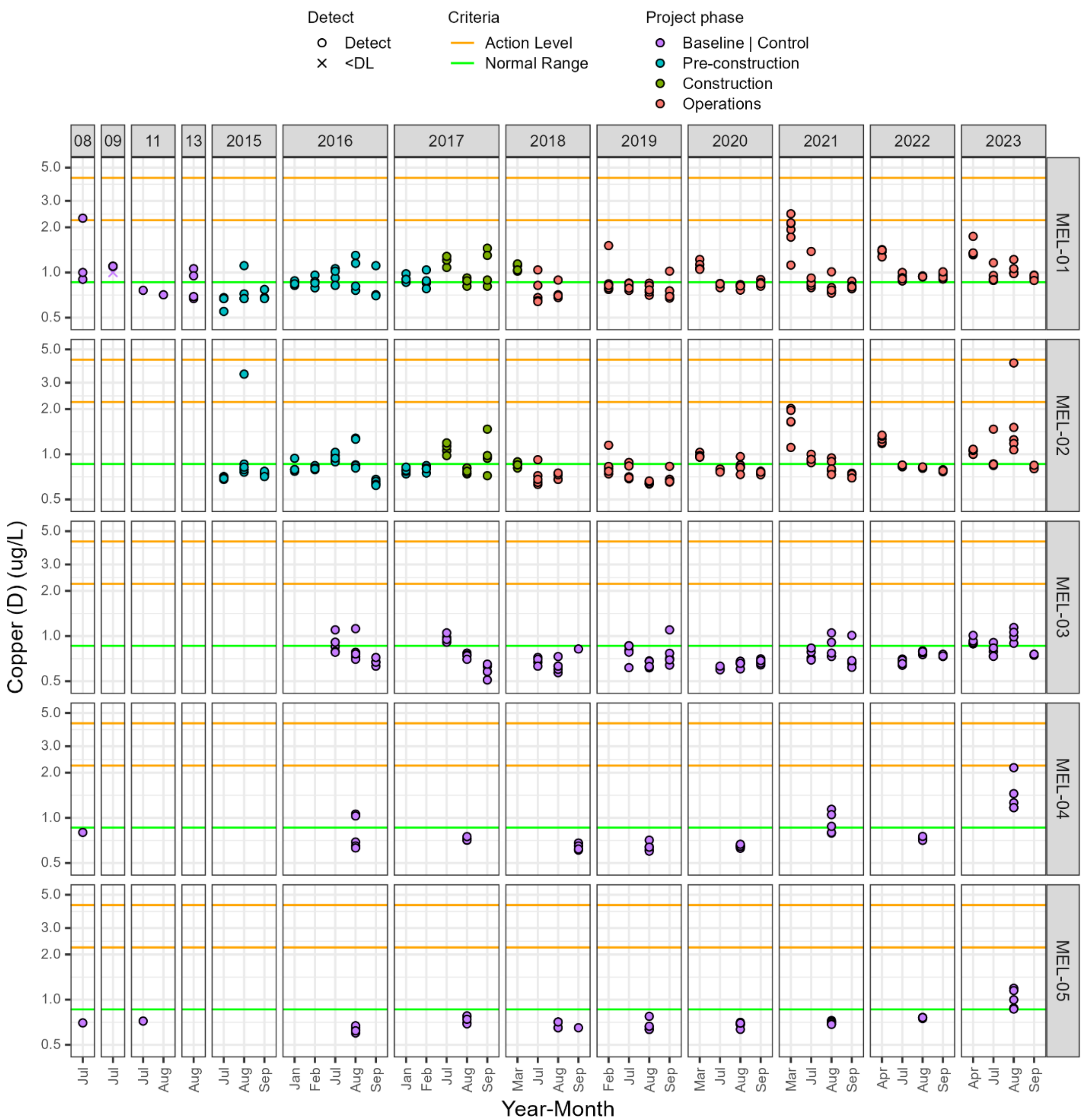


Figure C2-54. Dissolved lead (µg/L)

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 2023.

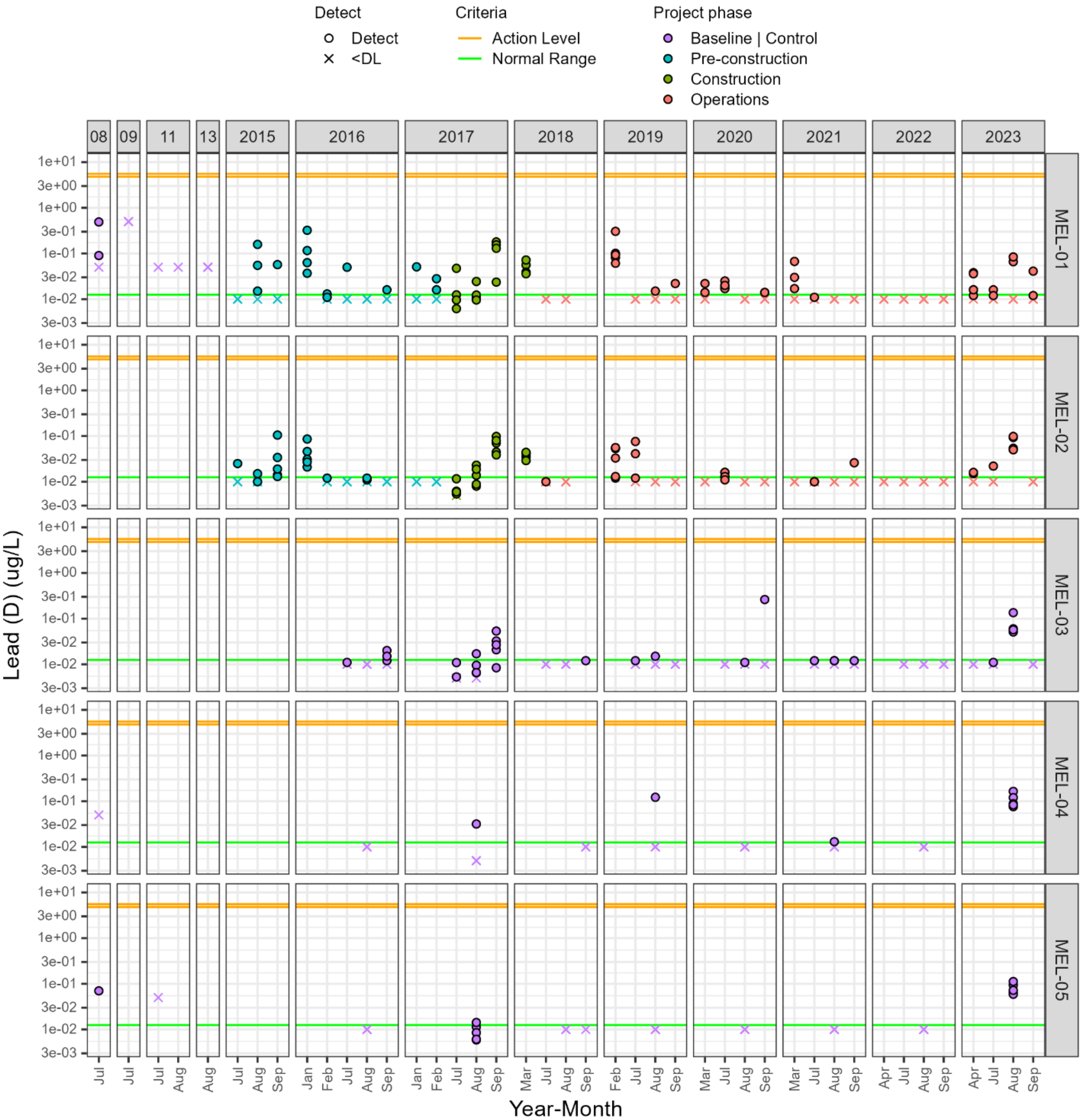


Figure C2-55. Dissolved manganese (µg/L)

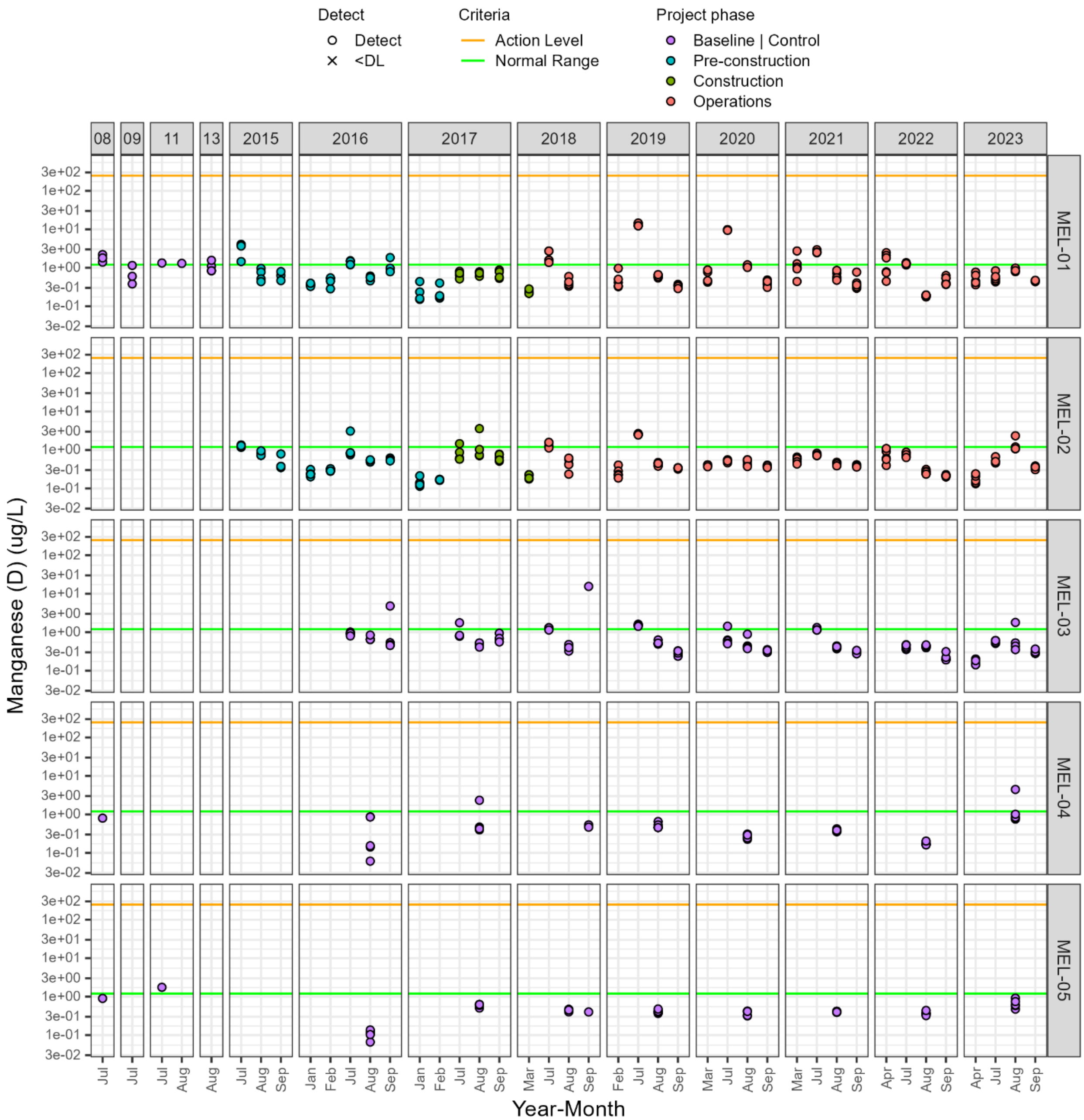
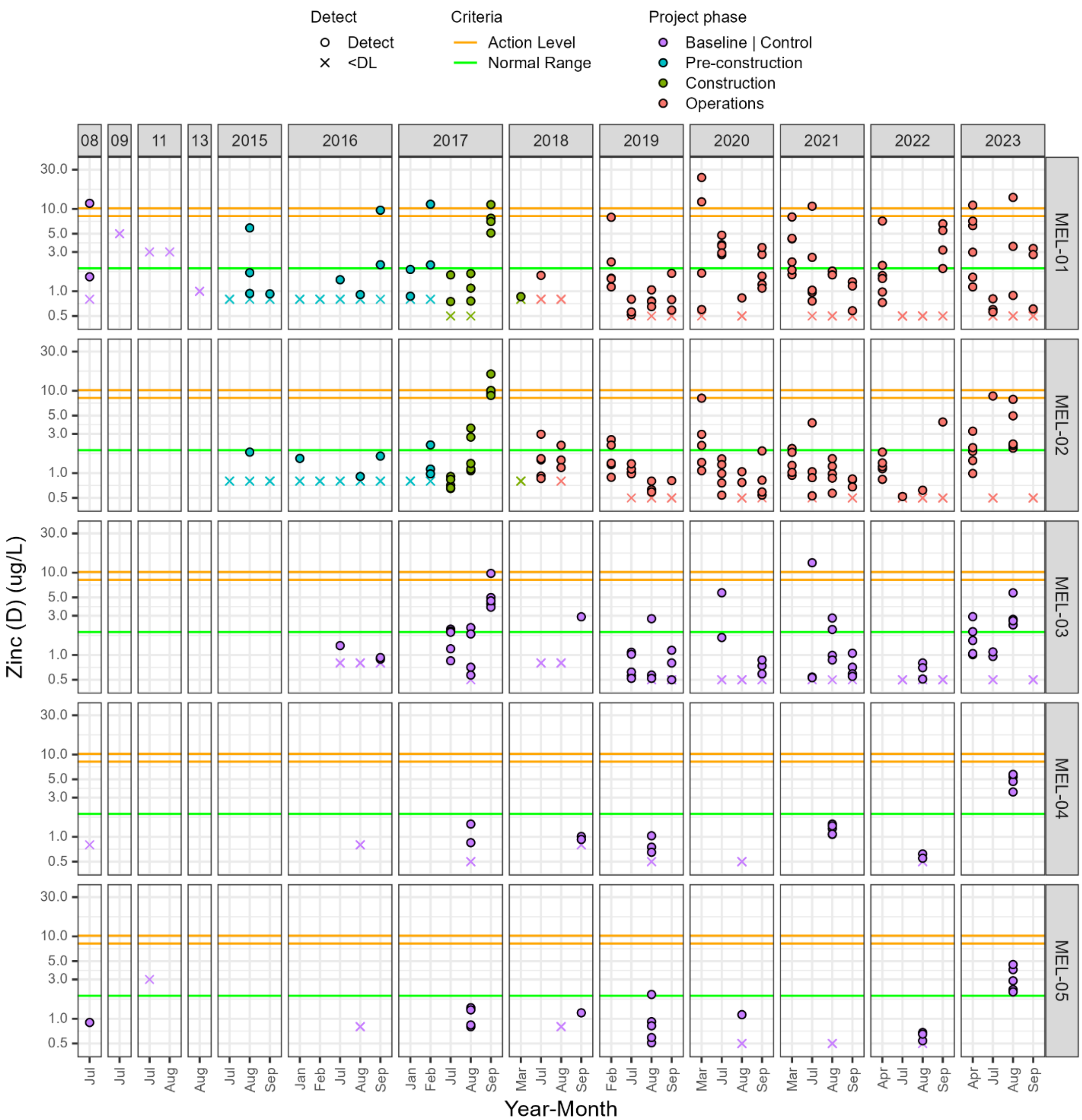


Figure C2-56. Dissolved zinc (µg/L)

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 2023. The data point above the Action Level at MEL-01 in August 2023 was flagged as an outlier (dissolved concentration > total).



Appendix C3
Meliadine Lake Water Quality – 2023 Samples

Table C3-1. Water chemistry results from Meliadine Lake in 2023

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)	April	April	April	April	April	April	April	April	April	April	April	April	April
										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-03-01	MEL-03-02
										2023-04-01	2023-04-01	2023-04-01	2023-04-01	2023-04-01	2023-04-01	2023-04-02	2023-04-02	2023-04-02	2023-04-02	2023-04-02	2023-04-03	2023-04-03
Field Measurements																						
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	6.88	7.03	6.92	7.33	6.9	6.91	7.22	7.24	7.09	7.11	7.44	7.44	7.39
Temperature	C	-	-	-	-	-	-	-	-	1.42	1.47	1.39	1.83	1.4	1.47	0.97	1.38	1.19	1.11	1.21	0.65	0.65
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	-	-	-	159.8	158.5	159.2	158	161.1	158.9	129.7	122.9	125.1	125.8	146.1	113.9	112.4
DO (mg/L)	mg/L	-	-	-	-	-	-	6.5	6.5	13.63	13.3	12.88	10.83	13.93	14.19	16.78	16.59	16.89	16.17	15.24	15.92	15.73
DO (%)	%	-	-	-	-	-	-	-	-	99.7	97.4	94.3	80.4	102	103.8	121	120.9	122.6	117	110.7	114	112.6
Conventional Parameters																						
Conductivity (lab)	uS/cm	1	77.5	-	-	-	-	-	-	179	174	179	178	178	183	144	143	143	150	145	123	122
Hardness	mg/L	0.5	23.4	-	-	-	-	-	-	52.1	50.3	51.8	53	51.7	52.4	38.7	38.7	36.9	38.9	37	32.3	32.9
Total Dissolved Solids	mg/L	10	54	68	500	-	1000	375	500	76	97	81.7	86.3	82.7	94.7	62.7	71	69.7	85	71.3	66	46.3
Total Dissolved Solids (Calculated)	mg/L	1	39.6	68	500	-	1000	375	500	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Suspended Solids	mg/L	1	1	3.1	-	-	-	-	-	<1	<1	<1	1.3	1.3	1.5	<1	<1	<1	<1	<1	<1	<1
Turbidity (lab)	NTU	0.1	-	-	-	-	-	-	-	0.35	0.34	0.26	0.46	0.28	0.34	0.12	0.15	0.16	0.2	0.23	0.15	0.12
pH (lab)	pH units	0.1	-	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.14	7.16	7.17	7.2	7.18	7.18	7.44	7.41	7.41	7.5	7.4	7.16	7.21
Major Ions																						
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	-	-	-	32.5	31.6	32.5	32.1	32.1	32.7	29	28	28.6	30.2	28.7	26.5	26.1
Alkalinity, Carbonate	mg/L	1	-	-	-	-	-	-	-	<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
Alkalinity, Hydroxide	mg/L	1	-	-	-	-	-	-	-	<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
Alkalinity, Total	mg/L	1	20.5	-	-	-	-	-	-	32.5	31.6	32.5	32.1	32.1	32.7	29	28	28.6	30.2	28.7	26.5	26.1
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
Calcium (D)	mg/L	0.01	-	-	-	-	-	-	-	16	15.5	16	16.2	15.9	16	12.2	12.1	11.6	12.3	11.6	10.2	10.4
Calcium (T)	mg/L	0.01 | 0.02	7.33	-	-	-	-	-	-	14.7	15.9	16	15.7	15.8	16.7	13.6	13.1	13.2	13.7	13.5	11.6	11.5
Chloride	mg/L	0.1	9.56	14	120	-	-	90	120	25.6	24.7	25.4	25.2	25	26.1	18.2	18.3	18.3	19.2	18.7	15.3	15.2
Fluoride	mg/L	0.02	0.028	0.0084	0.12	1.5	2.8	2.1	2.8	0.047	0.046	0.046	0.05	0.046	0.047	0.044	0.042	0.042	0.044	0.043	0.041	0.04
Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	-	2.96	2.82	2.88	3.04	2.91	3.02	2	2.06	1.92	1.99	1.94	1.67	1.69
Magnesium (T)	mg/L	0.004 | 0.01	1.18	-	-	-	-	-	-	2.76	2.95	2.98	2.95	2.91	3.05	2.3	2.3	2.32	2.33	2.36	1.96	1.97
Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-	1.87	1.83	1.85	1.95	1.84	1.88	1.5	1.47	1.42	1.52	1.46	1.3	1.33
Potassium (T)	mg/L	0.02 | 0.03	0.954	-	-	-	-	-	-	1.78	1.86	1.87	1.9	1.83	1.96	1.64	1.58	1.6	1.67	1.66	1.44	1.42
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	0.268	-	-	-	-	-	-	0.853	0.825	0.805	0.833	0.862	0.886	0.604	0.611	0.639	0.713	0.631	0.42	0.419
Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-	12.6	12.1	12.8	13.2	12.5	12.8	8.4	8.6	8	8.26	8.04	6.92	6.84
Sodium (T)	mg/L	0.02	4.85	5.3	-	-	-	-	-	12.3	12.9	13.1	13.1	12.7	13.7	9.36	9.35	9.5	10.1	9.85	7.96	7.83
Sulphate	mg/L	0.3	3.87	38	-	-	-	-	-	11	10.6	10.9	10.8	10.8	11.1	7.56	7.62	7.6	7.93	7.69	6.21	6.17
Nutrients																						
Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.41 | 12.5	-	-	0.308 | 9.38	0.41 | 12.5	0.0366	0.0321	0.0323	0.0319	0.023	0.0266	0.0268	0.0288	0.0248	0.0362	0.0331	0.0251	0.019
Nitrate (as N)	mg/L	0.005	0.018	0.25	2.9	10	-	2.17	2.9	0.023	0.0187	0.0188	0.021	0.02	0.022	0.0078	0.0089	0.0076	0.0128	0.014	<0.005	<0.005
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	-	0.023	<0.0224	<0.0224	<0.0224	<0.0224	<0.0224	<0.0224	<0.0224	<0.0224	<0.0224	<0.0224	<0.0224	<0.0224
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
Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
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
Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	-	-	-	0.0033	0.0038	0.0034	0.0031	0.0038	0.0038	0.0037	0.0026	0.0028	0.0022	0.0022	0.0021	0.0029
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.399	0.415	0.319	0.413	0.378	0.398	0.29	0.262	0.238	0.307	0.289	0.217	0.254
Total Kjeldahl Nitrogen	mg/L	0.05	0.25	-	-	-	-	-	-	0.397	0.355	0.334	0.457	0.395	0.398	0.284	0.291	0.289	0.309	0.304	0.271	0.242
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-	0.376	0.415	0.319	0.392	0.358	0.376	0.29	0.262	0.238	0.307	0.289	0.217	0.254
Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	-	0.0075	0.01	0.0071	0.0067	0.0075	0.0082	0.008	0.0067	0.0046	0.0044	0.0041	0.004	0.0051	0.005	0.004
Organic/Inorganic Carbon																						
Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	-	-	-	5.85	5.4	5.84	5.72	5.38	5.62	4.15	3.92	4.1	4.25	4.37	3.88	3.87
Total Organic Carbon	mg/L	0.5	3	-	-	-	-	-	-	5.89	5.83	5.76	5.83	5.93	6.19	4.45	4.88	4.43	4.43	5.13	3.73	3.7
Total Metals																						
Aluminum	ug/L	1	5.32	9.1	100	2900	-	75	100	2.6	1.8	1.5	4.1	<1	1.6	<1	<1	<1	1.7	1.6	<1	<1
Antimony	ug/L	0.02	0.02	0.51	-	6	-	4.5	6	0.035	0.026	0.024	0.039	0.023	0.025	<0.02	<0.02	<0.02	<0.02	0.026	<0.02	<0.02
Arsenic	ug/L	0.02	0.275	3.8	5	10	25	18.8	25	0.805	0.746	0.758	0.812	0.73	0.787	0.637	0.636	0.65	0.73	0.757	0.414	0.405
Barium	ug/L	0.02	8.05	77	-	2000	-	750	1000	15.1	14.1	15.2	14.5	14.4	15	13.1	12.8	13.1	13.8	13.8	11.6	11.9
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	6.52	23	1500	5000	-	1120	1500	11.6	11.3	11.8	12.4	11.5	12	8.2	8.6	8.3	8.4	9.2	7.3	7.3
Cadmium	ug/L	0.005	0.005	0.05	0.04 | 0.0708	7	-	0.03 | 0.0531	0.04 | 0.0708	<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	0.0092	0.0101	0.0102	0.009	0.0097	0.0117	0.0102	0.0111	0.0116	0.0108	0.0125	0.012
Chromium	ug/L	0.1	0.103	1.1	5	50	-	3.75	5	0.28	0.12	0.14	0.2	<0.1	0.16	<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	0.0286	0.0253	0.0257	0.0314	0.0251	0.0238	0.0123	0.0131	0.0136	0.0155	0.0151	0.0084	0.0101
Copper	ug/L	0.05	0.86	2	-	2000	-	1500	2000	-	1.37	1.36	1.75	1.34	1.43	1.1	1.09	1.11	1.77	1.26	0.984	0.964
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
Iron	ug/L	1	15	42	300	-	1060	795	1060	10.3	7.5	8.6	13.9	6.8	7.7	2.4	2.4	3	4	6.6	1.8	1.7
Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.027	0.028	0.028	0.031	0.025	0.027	0.017	0.018	0.018	0.019	0.02	0.014	0.014
Lead	ug/L	0.01	0.0222	0.15	-	5	-	3.75	5	0.349	0.054	0.044	0.242	0.017	0.326	<0.01	<0.01	0.01	0.047	0.046	<0.01	<0.01
Lithium	ug/L	0.5	0.72	-	-	-	-	-	-	1.79	1.65	1.78	1.76	1.71	1.78	1.36	1.38	1.35	1.42	1.45	1.21	1.18
Manganese	ug/L	0.05	3.06	5.5	-	120	-	90	120	2.19	1.58	1.75	1.99	1.96	1.88	0.7	0.8	0.879	0.798	1.05	0.493	0.498
Mercury	ug/L	0.1 | 0.5	8.00E-04	0.02	0.026	1	-	0.0195	0.026	0.00619	0.0106	0.00048	0.0214	0.00129	0.00761	0.00085	0.00038	0.00115	0.00458	0.00425	<0.005	<0.005
Molybdenum	ug/L	0.05	0.107	5.2	73	-	-	54.8	73	0.192	0.205	0.191	0.2	0.192	0.196	0.147	0.152	0.278	0.16	0.152	0.127	0.122
Nickel	ug/L	0.05	0.441	2.7	25	-	-	18.8	25	1.22	1.19	1.21	1.37	1.19	1.24	0.767	0.797	0.792	0.821	0.845	0.598	0.593
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
Phosphorus	ug/L	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
Rubidium	ug/L	0.005	-	-	-	-	-	-	-	2.25	2.31	2.37	2.37	2.31	2.42	2.13	2.07	2.1	2.26	2.16	1.97	1.96
Selenium	ug/L	0.04	0.049	0.16	1	50	-	0.75	1	0.064	0.06	0.062	0.06	0.059	0.063	0.056	0.054	0.053	0.064	0.058	0.048	0.048
Silicon	ug/L	50	-	-	-	-	-	-	-	376	359	382	375	387	390	263	270	289	284	276	189	189
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
Strontium	ug/L	0.02	36.1	-	2500	7000	-	1880	2500	87.6	91.2	94	91.2	90.1	94.5	68.2	68.3	67.6	71.3	70	56.4	56.2
Sulfur	ug/L	500	-	-	-	-	-	-	-	3870	3640	3690	3810	3760	3820	2610	2520	2620	2740	2620	2160	2100
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
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
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
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
Tin	ug/L	0.02	0.0384	-	-	-	-	-	-	<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	0.17	-	-	-	-	-	-	0.079	<0.05	<0.05	0.132	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<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
Uranium	ug/L	0.001	0.0164	1.5	15	20	-	11.2	15	0.0302	0.027	0.0286	0.0302	0.0264	0.0285	0.0206	0.0178	0.0189	0.0212	0.022	0.017	0.018
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
Yttrium	ug/L	0.01	-	-	-	-	-	-	-	0.011	<0.01	0.012	0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	ug/L	0.5	1.7	6.7	-	-	-	-	-	12	2.91	6.85	7.55	1.38	1.93	0.9	1.8	1.27	2.65	3.79	0.58	0.99
Zirconium	ug/L	0.01	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	0.015	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	1.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Antimony	ug/L	0.02	-	-	-	-	-	-	-	0.028	0.026	0.024	0.033	0.024	0.026	<0.02	<0.02	<0.02	<0.02	0.021	<0.02	<0.02
Arsenic	ug/L	0.02	-	-	-	-	-	-	-	0.729	0.709	0.704	0.755	0.697	0.73	0.638	0.626	0.617	0.665	0.683	0.394	0.402
Barium	ug/L	0.02	-	-	-	-	-	-	-	15	14.5	15.1	15.2	14.8	15.4	12.9	12.6	12.7	13.2	12.8	11.4	11.6
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
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
Boron	ug/L	5	-	-	-	-	-	-	-	11.8	11.2	11.5	12.3	11.7	12.1	8.1	8.5	8.2	8.4	8.4	6.9	7.1
Cadmium	ug/L	0.005	-	-	-	-	-	-	-	0.0051	<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	0.0096	0.01	0.0103	0.0098	0.0105	0.0113	0.0107	0.0111	0.0122	0.0108	0.0124	0.0117
Chromium	ug/L	0.1	-	-	-	-	-	-	-	0.14	<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	-	-	-	-	-	-	-	0.0257	0.0208	0.0205	0.0266	0.02	0.0211	0.0114	0.0111	0.0116	0.0109	0.0116	0.0065	0.0078
Copper	ug/L	0.05	0.861	-	-	-	-	-	-	-	1.31	1.34	1.74	1.34	1.35	1.05	1.06	0.998	1.06	1.08	0.888	0.888
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
Iron	ug/L	1	-	-	-	-	-	-	-	3.2	2.9	3.2	3.7	3.1	3.3	1.4	1.7	1.5	1.8	2.6	1.1	1
Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.021	0.023	0.023	0.024	0.022	0.024	0.018	0.017	0.017	0.018	0.017	0.014	0.014
Lead	ug/L	0.01	0.0125	-	4.48 | 7.4	-	-	3.36 | 5.55	4.48 | 7.4	0.038	0.016	0.012	0.036	<0.01	0.016	<0.01	<0.01	<0.01	0.015	0.016	<0.01	<0.01
Lithium	ug/L	0.5	-	-	-	-	-	-	-	1.75	1.71	1.76	1.8	1.76	1.82	1.28	1.29	1.25	1.3	1.26	1.13	1.13
Manganese	ug/L	0.05	1.2	-	210 | 330	-	-	158 | 248	210 | 330	0.77	0.389	0.446	0.636	0.361	0.411	0.133	0.141	0.159	0.208	0.24	0.155	0.144
Mercury	ug/L	0.1 | 0.5	-	-	-	-	-	-	-	0.00231	0.00426	0.0003	0.0112	0.00067	0.00188	0.00048	0.00032	0.00059	0.00085	0.0032	<0.005	<0.005
Molybdenum	ug/L	0.05	-	-	-	-	-	-	-	0.194	0.189	0.189	0.21	0.19	0.201	0.135	0.138	-	0.278	0.133	0.113	0.113
Nickel	ug/L	0.05	-	-	-	-	-	-	-	1.25	1.16	1.19	1.26	1.19	1.21	0.74	0.748	0.722	0.743	0.713	0.538	0.56
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
Phosphorus	ug/L	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
Rubidium	ug/L	0.005	-	-	-	-	-	-	-	2.26	2.22	2.28	2.39	2.24	2.34	2.1	2.09	1.99	2.14	1.98	1.87	1.91
Selenium	ug/L	0.04	-	-	-	-	-	-	-	0.061	0.059	0.065	0.062	0.056	0.066	0.06	0.062	0.059	0.058	0.067	0.052	0.058
Silicon	ug/L	50	-	-	-	-	-	-	-	380	376	385	380	384	386	258	265	269	269	264	189	194
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
Strontium	ug/L	0.02	-	-	2500	-	-	1880	2500	88	87.5	90.1	92.8	90.1	90.2	65.6	65.9	62.2	65.2	63.6	52.7	52.8
Sulfur	ug/L	500	-	-	-	-	-	-	-	3750	3650	3820	3820	3740	3830	2640	2700	2650	2710	2500	2300	2130
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
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
Thallium	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
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
Tin	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
Titanium	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
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
Uranium	ug/L	0.001	-	-	-	-	-	-	-	0.0298	0.0257	0.0285	0.0311	0.029	0.0303	0.0196	0.0216	0.0201	0.0203	0.0183	0.0165	0.016
Vanadium	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
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
Zinc	ug/L	0.5	1.9	-	7.88 | 13.5	-	-	5.91 | 10.2	7.88 | 13.5	11.1	2.98	6.27	7.11	1.13	1.48	0.99	1.84	1.42	2.04	3.23	1.5	1.01
Zirconium	ug/L	0.01	-	-	-	-	-	-	-	<0.01	0.01	<0.01	0.015	0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cyanides																						
Cyanide (Total)	mg/L	0.001	0.001	0.009	0.005	0.2	-	0.00375	0.005	<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
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	<0.001
Cyanide (free)	mg/L	0.001	-	0.00035	-	-	-	-	-	<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 = 2023 detection limits

x = results were flagged as outliers (refer to Table A-7 for the list of samples flagged as outliers in 2023).

[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 , copper , lead , manganese , and zinc 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 2023.

[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 C3-1. Water chemistry results from Meliadine Lake in 2023

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)	April MEL-03-03 2023-04-03	April MEL-03-04 2023-04-03	April MEL-03-05 2023-04-03	July MEL-01-01 2023-07-16	July MEL-01-06 2023-07-16	July MEL-01-07 2023-07-16	July MEL-01-08 2023-07-16	July MEL-01-09 2023-07-16	July MEL-01-10 2023-07-16	July MEL-02-02 2023-07-15	July MEL-02-03 2023-07-15	July MEL-02-05 2023-07-15	July MEL-02-06 2023-07-15
Field Measurements																						
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.37	7.62	7.95	7.69	7.61	7.55	7.59	7.85	7.61	7.6	7.54	7.6	7.57
Temperature	C	-	-	-	-	-	-	-	-	0.71	0.63	0.65	11.29	11.52	11.24	11.42	11.26	11.37	11.31	11.45	11.17	11.2
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	-	-	-	110	115.5	118.5	110.7	108.6	109.4	109.5	111.9	109.3	96.6	96.8	96.7	96.5
DO (mg/L)	mg/L	-	-	-	-	-	-	6.5	6.5	14.82	15.75	15.69	10.2	10.27	10.21	10.16	10	10.3	10.37	10.34	10.32	10.34
DO (%)	%	-	-	-	-	-	-	-	-	106.6	112.7	112.4	95.7	97	95.8	95.8	93.8	96.9	97.4	97.5	96.5	96.9
Conventional Parameters																						
Conductivity (lab)	uS/cm	1	77.5	-	-	-	-	-	-	122	124	129	114	112	144	112	112	120	98.2	100	99.4	99.1
Hardness	mg/L	0.5	23.4	-	-	-	-	-	-	33.5	34.2	38.7	32.1	31	37.9	32.1	32.9	33.5	29.3	28.9	28.8	26
Total Dissolved Solids	mg/L	10	54	68	500	-	1000	375	500	52.7	70.7	68.7	66.1	64.1	83.1	66.1	65.4	73.1	61.1	60.8	58.1	57.8
Total Dissolved Solids (Calculated)	mg/L	1	39.6	68	500	-	1000	375	500	-	-	-	74.1	72.8	93.6	72.8	72.8	78	63.8	65	64.6	64.4
Total Suspended Solids	mg/L	1	1	3.1	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1
Turbidity (lab)	NTU	0.1	-	-	-	-	-	-	-	0.12	0.19	0.14	0.5	0.49	0.57	0.46	0.46	0.45	0.3	0.24	0.28	0.25
pH (lab)	pH units	0.1	-	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.15	7.22	7.24	7.48	7.45	7.47	7.44	7.48	7.44	7.39	7.41	7.35	7.37
Major Ions																						
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	-	-	-	26.6	26.9	28.4	19.4	19.4	20.2	19.6	19.1	19.5	18.8	19.2	18.7	18.9
Alkalinity, Carbonate	mg/L	1	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Alkalinity, Hydroxide	mg/L	1	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Alkalinity, Total	mg/L	1	20.5	-	-	-	-	-	-	26.6	26.9	28.4	19.4	19.4	20.2	19.6	19.1	19.5	18.8	19.2	18.7	18.9
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
Calcium (D)	mg/L	0.01	-	-	-	-	-	-	-	10.6	10.8	12.1	9.84	9.53	11.4	9.89	10.1	10.2	9.12	9.04	8.95	8.17
Calcium (T)	mg/L	0.01 | 0.02	7.33	-	-	-	-	-	-	11.4	11.6	12.5	9.76	9.72	11.2	9.68	9.88	10.3	8.86	8.97	8.86	8.96
Chloride	mg/L	0.1	9.56	14	120	-	-	90	120	15.3	15.5	16.3	16.5	15.9	22.9	16	16	17.6	13.4	13.4	13.3	13.4
Fluoride	mg/L	0.02	0.028	0.0084	0.12	1.5	2.8	2.1	2.8	0.04	0.041	0.042	0.029	0.029	0.03	0.029	0.029	0.028	0.029	0.029	0.028	0.029
Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	-	1.7	1.77	2.07	1.82	1.76	2.3	1.81	1.87	1.95	1.58	1.54	1.57	1.36
Magnesium (T)	mg/L	0.004 | 0.01	1.18	-	-	-	-	-	-	1.93	1.98	2.09	1.8	1.77	2.25	1.78	1.82	1.97	1.54	1.54	1.53	1.54
Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-	1.34	1.38	1.52	1.17	1.11	1.37	1.22	1.21	1.26	1.18	1.05	1.06	0.96
Potassium (T)	mg/L	0.02 | 0.03	0.954	-	-	-	-	-	-	1.43	1.45	1.57	1.17	1.16	1.37	1.14	1.16	1.25	1.05	1.06	1.04	1.07
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	0.268	-	-	-	-	-	-	0.416	0.422	0.44	0.488	0.492	0.482	0.489	0.48	0.495	0.391	0.393	0.381	0.305
Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-	6.91	7.06	8.33	8.02	7.59	10.9	7.87	8.24	8.89	6.78	6.67	6.53	6.09
Sodium (T)	mg/L	0.02	4.85	5.3	-	-	-	-	-	7.81	8.05	8.6	7.93	7.84	11.1	7.8	7.9	8.91	6.54	6.64	6.61	6.6
Sulphate	mg/L	0.3	3.87	38	-	-	-	-	-	6.2	6.33	6.59	7.26	7.02	9.81	7.07	7.03	7.69	5.8	5.8	5.76	5.79
Nutrients																						
Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.41 | 12.5	-	-	0.308 | 9.38	0.41 | 12.5	0.0252	0.0215	0.0379	0.0105	<0.005	0.0145	0.0081	0.0111	0.009	0.0078	0.0279	0.005	0.0076
Nitrate (as N)	mg/L	0.005	0.018	0.25	2.9	10	-	2.17	2.9	<0.005	<0.005	<0.005	0.009	<0.005	0.0938	0.0301	0.0212	0.0384	0.0408	<0.005	<0.005	<0.005
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	-	<0.0224	<0.0224	<0.0224	0.009	<0.0051	0.0951	0.0301	0.0212	0.0384	0.0408	<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	0.0013	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	-	-	-	0.216	0.21	0.327	0.232	0.232	0.257	0.251	0.224	0.209	0.241
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
Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	-	-	-	0.0026	0.0036	0.0027	0.0018	0.0016	0.0014	0.0017	0.0018	0.0024	0.0013	0.0018	0.0012	0.0016
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.217	0.216	0.264	0.231	0.231	0.323	0.238	0.225	0.272	0.225	0.214	0.188	0.191
Total Kjeldahl Nitrogen	mg/L	0.05	0.25	-	-	-	-	-	-	0.247	0.237	0.263	0.207	0.21	0.232	0.202	0.211	0.219	0.21	0.224	0.209	0.241
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-	0.217	0.216	0.264	0.222	0.231	0.228	0.208	0.204	0.234	0.184	0.214	0.188	0.191
Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	-	0.0075	0.01	0.0034	0.0038	0.004	0.0045	0.0059	0.0042	0.005	0.0053	0.0052	0.0039	0.0039	0.0037	0.0033
Organic/Inorganic Carbon																						
Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	-	-	-	4	3.93	4.09	4.8	4.42	4.82	4.38	4.47	4.54	3.76	3.56	3.47	3.27
Total Organic Carbon	mg/L	0.5	3	-	-	-	-	-	-	3.73	3.76	4.01	4.6	3.88	4.62	3.81	3.78	3.98	3.82	3.96	3.91	3.87
Total Metals																						
Aluminum	ug/L	1	5.32	9.1	100	2900	-	75	100	<1	2.1	<1	4.6	4.3	8.5	4	4.1	5.7	2.4	2.1	2	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	0.03	<0.02	<0.02	0.023	<0.02	<0.02	<0.02	<0.02
Arsenic	ug/L	0.02	0.275	3.8	5	10	25	18.8	25	0.399	0.434	0.435	0.53	0.538	0.639	0.556	0.555	0.598	0.732	0.765	0.744	0.736
Barium	ug/L	0.02	8.05	77	-	2000	-	750	1000	11.8	12.1	12.6	9.7	9.68	10.5	9.93	9.78	10.1	9.71	9.52	9.77	9.66
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	6.52	23	1500	5000	-	1120	1500	6.9	7.1	7.4	7.4	7	10.1	7.1	7.2	7.9	5.6	6	5.8	5.8
Cadmium	ug/L	0.005	0.005	0.05	0.04 | 0.0708	7	-	0.03 | 0.0531	0.04 | 0.0708	<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	-	-	-	-	-	-	-	0.0119	0.0124	0.0122	0.0073	0.0074	0.0104	0.0074	0.0076	0.0082	0.0077	0.0078	0.0077	0.0076
Chromium	ug/L	0.1	0.103	1.1	5	50	-	3.75	5	<0.1	0.12	<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	0.0091	0.0098	0.0092	0.0297	0.0284	0.0483	0.0273	0.0298	0.0358	0.0195	0.0198	0.0202	0.0198
Copper	ug/L	0.05	0.86	2	-	2000	-	1500	2000	0.968	0.997	1.02	0.963	0.946	0.989	0.886	0.958	0.968	0.872	0.962	0.873	0.912
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
Iron	ug/L	1	15	42	300	-	1060	795	1060	1.6	4.1	2.6	25.3	24.2	26.7	24.3	24.2	26	18.5	18.1	18.8	20
Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.015	0.015	0.014	0.033	0.032	0.034	0.03	0.029	0.033	0.026	0.024	0.024	0.024
Lead	ug/L	0.01	0.0222	0.15	-	5	-	3.75	5	<0.01	0.015	<0.01	0.012	0.01	0.012	0.011	0.013	0.02	0.015	0.015	0.015	0.018
Lithium	ug/L	0.5	0.72	-	-	-	-	-	-	1.16	1.2	1.24	1.08	1.02	1.51	1.01	1.02	1.15	0.92	0.93	0.93	0.9
Manganese	ug/L	0.05	3.06	5.5	-	120	-	90	120	0.49	0.616	0.518	6.08	5.76	6.42	5.77	5.8	6.31	4.67	4.54	4.58	4.66
Mercury	ug/L	0.1 | 0.5	8.00E-04	0.02	0.026	1	-	0.0195	0.026	<0.005	<0.005	<0.005	0.00057	0.00064	0.00056	0.0006	-	0.00235	0.00052	0.00064	<5e-04	0.00083
Molybdenum	ug/L	0.05	0.107	5.2	73	-	-	54.8	73	0.12	0.127	0.134	0.122	0.121	0.189	0.12	0.121	0.142	0.094	0.095	0.092	0.095
Nickel	ug/L	0.05	0.441	2.7	25	-	-	18.8	25	0.585	0.607	0.636	0.867	0.845	0.894	0.848	0.859	0.882	0.714	0.736	0.731	0.71
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
Phosphorus	ug/L	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
Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.94	2	2.14	1.47	1.48	1.64	1.46	1.49	1.54	1.47	1.46	1.47	1.48
Selenium	ug/L	0.04	0.049	0.16	1	50	-	0.75	1	0.047	0.044	0.053	0.045	0.044	0.057	0.054	0.046	0.049	0.047	0.044	0.049	0.045
Silicon	ug/L	50	-	-	-	-	-	-	-	184	187	203	230	233	241	245	232	250	198	199	197	201
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
Strontium	ug/L	0.02	36.1	-	2500	7000	-	1880	2500	55.7	57	61.6	58.4	56.9	73.1	57.2	57.8	63.8	49	49.4	49.3	49.4
Sulfur	ug/L	500	-	-	-	-	-	-	-	2090	2180	2330	2570	2520	3420	2560	2610	2890	2060	2160	2150	2070
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
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
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
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
Tin	ug/L	0.02	0.0384	-	-	-	-	-	-	<0.02	<0.02	<0.02	0.033	0.033	0.05	0.047	0.032	0.037	0.027	0.031	-	0.02
Titanium	ug/L	0.05	0.17	-	-	-	-	-	-	<0.05	0.104	<0.05	0.176	0.213	0.245	0.186	0.164	1.6	0.058	<0.05	0.057	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
Uranium	ug/L	0.001	0.0164	1.5	15	20	-	11.2	15	0.0139	0.0177	0.0178	0.0281	0.0271	0.0443	0.0255	0.0272	0.03	0.0242	0.0225	0.022	0.0215
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
Yttrium	ug/L	0.01	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	0.01	0.011	<0.01	0.011	0.012	0.011	0.01	<0.01	<0.01	<0.01
Zinc	ug/L	0.5	1.7	6.7	-	-	-	-	-	0.99	1.83	1.74	0.94	<0.5	<0.5	<0.5	0.63	0.93	<0.5	<0.5	<0.5	<0.5
Zirconium	ug/L	0.01	-	-	-	-	-	-	-	<0.01	0.042	<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	1.9	2.2	5.2	1.7	2	4	<1	1.1	1.2	5.8
Antimony	ug/L	0.02	-	-	-	-	-	-	-	<0.02	<0.02	<0.02	<0.02	0.022	0.03	<0.02	<0.02	0.022	<0.02	<0.02	<0.02	0.023
Arsenic	ug/L	0.02	-	-	-	-	-	-	-	0.396	0.416	0.435	0.529	0.535	0.588	0.531	0.521	0.545	0.716	0.744	0.696	0.621
Barium	ug/L	0.02	-	-	-	-	-	-	-	11.5	11.9	13	9.56	9.58	10.3	9.8	9.74	9.93	9.42	9.64	9.29	8.32
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
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
Boron	ug/L	5	-	-	-	-	-	-	-	6.8	7.2	7.2	7.5	7.2	10.2	7.2	7.4	8.2	5.9	6	6.1	5.6
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
Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.0119	0.0127	0.0124	0.0072	0.0069	0.0099	0.0072	0.0076	0.0081	0.0076	0.0079	0.0075	0.0075
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
Cobalt	ug/L	0.005	-	-	-	-	-	-	-	0.0075	0.008	0.0085	0.0183	0.0162	0.0339	0.0153	0.0171	0.0248	0.0106	0.0124	0.0103	0.0171
Copper	ug/L	0.05	0.861	-	-	-	-	-	-	0.904	0.927	1.01	0.885	0.886	1.16	0.91	0.955	0.896	0.864	0.842	0.858	1.47
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
Iron	ug/L	1	-	-	-	-	-	-	-	1	1.2	1.2	7.7	8.9	9.6	6.5	7.1	9.2	6.4	7	6.3	20.8
Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.013	0.013	0.013	0.013	0.014	0.015	0.011	0.013	0.012	0.011	0.012	0.01	0.012
Lead	ug/L	0.01	0.0125	-	4.48 | 7.4	-	-	3.36 | 5.55	4.48 | 7.4	<0.01	<0.01	<0.01	<0.01	<0.01	0.016	<0.01	0.012	<0.01	<0.01	<0.01	<0.01	0.022
Lithium	ug/L	0.5	-	-	-	-	-	-	-	1.12	1.14	1.27	1.13	1.06	1.58	1.07	1.1	1.21	0.95	0.97	0.96	0.87
Manganese	ug/L	0.05	1.2	-	210 | 330	-	-	158 | 248	210 | 330	0.142	0.201	0.183	0.43	0.526	0.838	0.464	0.517	0.589	0.496	0.511	0.458	0.668
Mercury	ug/L	0.1 | 0.5	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<5e-04	<5e-04	<5e-04	<5e-04	<5e-04	<5e-04	<5e-04	0.00055	<5e-04	<5e-04
Molybdenum	ug/L	0.05	-	-	-	-	-	-	-	0.12	0.124	0.13	0.124	0.117	0.202	0.13	0.128	0.144	0.096	0.093	0.095	0.202
Nickel	ug/L	0.05	-	-	-	-	-	-	-	0.554	0.571	0.604	1	0.78	0.868	0.799	0.832	0.838	0.718	0.699	0.675	1.08
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
Phosphorus	ug/L	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
Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.92	1.98	2.11	1.49	1.45	1.66	1.49	1.55	1.53	1.46	1.47	1.41	1.25
Selenium	ug/L	0.04	-	-	-	-	-	-	-	0.061	0.06	0.048	0.05	0.044	0.058	0.043	0.048	0.044	0.044	0.045	0.041	0.041
Silicon	ug/L	50	-	-	-	-	-	-	-	190	191	198	247	243	242	244	238	245	198	207	194	180
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
Strontium	ug/L	0.02	-	-	2500	-	-	1880	2500	54	55.2	61.2	57.1	55.8	73.3	57.2	59.1	63.2	49.5	49.6	48.8	42
Sulfur	ug/L	500	-	-	-	-	-	-	-	2090	2200	2290	2650	2550	3350	2570	2580	2820	2110	2220	2140	1880
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
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
Thallium	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
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
Tin	ug/L	0.02	-	-	-	-	-	-	-	<0.02	<0.02	<0.02	<0.02	0.022	0.059	0.029	0.043	0.024	0.035	<0.02	<0.02	0.138
Titanium	ug/L	0.05	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	0.056	<0.05	<0.05	<0.05	0.195	<0.05	<0.05	<0.05	0.3
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	-
Uranium	ug/L	0.001	-	-	-	-	-	-	-	0.0145	0.014	0.0174	0.0253	0.0236	0.0403	0.0235	0.0232	0.0292	0.0195	0.0207	0.0196	0.0178
Vanadium	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	-
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
Zinc	ug/L	0.5	1.9	-	7.88 | 13.5	-	-	5.91 | 10.2	7.88 | 13.5	1.04	2.92	1.92	<0.5	0.6	0.56	0.81	<0.5	<0.5	<0.5	<0.5	<0.5	8.65
Zirconium	ug/L	0.01	-	-	-	-	-	-	-	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	<0.01	-
Cyanides																						
Cyanide (Total)	mg/L	0.001	0.001	0.009	0.005	0.2	-	0.00375	0.005	<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
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	<0.001
Cyanide (free)	mg/L	0.001	-	0.00035	-	-	-	-	-	<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 = 2023 detection limits

x = results were flagged as outliers (refer to Table A-7 for the list of samples flagged as outliers in 2023).

[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 , copper , lead , manganese , and zinc 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 2023.

[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 C3-1. Water chemistry results from Meliadine Lake in 2023

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 MEL-02-08 2023-07-15	July MEL-03-01 2023-07-15	July MEL-03-02 2023-07-15	July MEL-03-03 2023-07-15	July MEL-03-04 2023-07-15	July MEL-03-05 2023-07-15	August MEL-01-01 2023-08-22	August MEL-01-06 2023-08-22	August MEL-01-07 2023-08-22	August MEL-01-08 2023-08-22	August MEL-01-09 2023-08-22	August MEL-01-10 2023-08-22
Field Measurements																					
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.52	7.55	7.61	7.57	7.6	7.61	7.47	7.42	7.46	7.39	7.46	7.45
Temperature	C	-	-	-	-	-	-	-	-	11.33	10.02	10.03	10.06	9.97	10.33	14.6	14.6	14.59	14.53	14.65	14.6
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	-	-	-	97.5	83.3	83.4	83.4	84.1	82.8	110.5	110	111.3	110.3	111.9	110.1
DO (mg/L)	mg/L	-	-	-	-	-	-	6.5	6.5	10.32	10.46	10.75	10.67	10.74	10.65	9.5	9.46	9.51	9.45	9.52	9.51
DO (%)	%	-	-	-	-	-	-	-	-	96.9	95.9	97.9	97.3	97.7	97.7	96.1	95.6	96.1	95.3	96.3	96
Conventional Parameters																					
Conductivity (lab)	uS/cm	1	77.5	-	-	-	-	-	-	100	85.5	86	86.1	86	85.3	110	109	111	110	113	110
Hardness	mg/L	0.5	23.4	-	-	-	-	-	-	29.8	26	25.8	25.3	25.4	26	33.2	33.6	33.6	33.8	33.9	33.5
Total Dissolved Solids	mg/L	10	54	68	500	-	1000	375	500	56.1	50.4	49.8	44.1	46.8	45.8	60.3	58.7	57.7	47	60.3	58.3
Total Dissolved Solids (Calculated)	mg/L	1	39.6	68	500	-	1000	375	500	65	55.6	55.9	56	55.9	55.4	71.5	70.8	72.2	71.5	73.4	71.5
Total Suspended Solids	mg/L	1	1	3.1	-	-	-	-	-	<1	<1	<1	<1	<1	<1	1.2	<1	1.1	<1	<1	1.6
Turbidity (lab)	NTU	0.1	-	-	-	-	-	-	-	0.22	0.48	0.32	0.26	0.27	0.34	0.48	0.43	0.5	0.37	0.44	0.38
pH (lab)	pH units	0.1	-	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.37	7.45	7.48	7.47	7.48	7.47	7.35	7.4	7.43	7.4	7.37	7.43
Major Ions																					
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	-	-	-	18.7	18	18.2	18	18.2	17.9	22.8	22.7	23	22.8	22	23.2
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	20.5	-	-	-	-	-	-	18.7	18	18.2	18	18.2	17.9	22.8	22.7	23	22.8	22	23.2
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
Calcium (D)	mg/L	0.01	-	-	-	-	-	-	-	9.27	8.16	8.13	7.95	8	8.19	10.2	10.3	10.3	10.4	10.4	10.3
Calcium (T)	mg/L	0.01 | 0.02	7.33	-	-	-	-	-	-	9.03	8.13	8	8.08	8.05	7.91	9.94	10.4	10.1	10	10.2	10.1
Chloride	mg/L	0.1	9.56	14	120	-	-	90	120	13.6	10.9	10.9	10.9	10.9	10.8	15.4	15.3	15.5	15.3	15.7	15.4
Fluoride	mg/L	0.02	0.028	0.0084	0.12	1.5	2.8	2.1	2.8	0.029	0.028	0.028	0.028	0.028	0.028	0.03	0.03	0.03	0.03	0.03	0.03
Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	-	1.62	1.36	1.35	1.33	1.33	1.34	1.88	1.91	1.92	1.9	1.93	1.89
Magnesium (T)	mg/L	0.004 | 0.01	1.18	-	-	-	-	-	-	1.53	1.34	1.3	1.32	1.33	1.3	1.8	1.89	1.83	1.8	1.86	1.83
Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-	1.09	1.01	1	0.981	1.06	1.01	1.18	1.2	1.21	1.19	1.2	1.18
Potassium (T)	mg/L	0.02 | 0.03	0.954	-	-	-	-	-	-	1.06	0.994	1.03	0.992	0.999	0.972	1.16	1.21	1.19	1.16	1.2	1.18
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	0.268	-	-	-	-	-	-	0.383	0.308	0.302	0.301	0.308	0.284	0.607	0.619	0.608	0.609	0.606	0.627
Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-	6.89	5.56	5.63	5.43	5.4	5.58	7.96	7.89	8.12	7.99	8.17	7.98
Sodium (T)	mg/L	0.02	4.85	5.3	-	-	-	-	-	6.77	5.47	5.38	5.47	5.55	5.34	7.56	8.02	7.89	7.72	7.95	7.92
Sulphate	mg/L	0.3	3.87	38	-	-	-	-	-	5.9	4.44	4.4	4.39	4.44	4.38	6.76	6.71	6.82	6.7	7.52	6.78
Nutrients																					
Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.41 | 12.5	-	-	0.308 | 9.38	0.41 | 12.5	0.006	<0.005	0.0133	<0.005	0.0053	0.0058	<0.005	<0.005	0.0081	0.0112	<0.005	0.0156
Nitrate (as N)	mg/L	0.005	0.018	0.25	2.9	10	-	2.17	2.9	<0.005	<0.005	<0.005	0.0247	0.0192	<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	0.0247	0.0192	<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
Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.246	0.162	0.216	0.184	0.176	0.153	0.224	0.262	0.235	0.226	0.221	0.232
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
Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	-	-	-	0.002	0.0024	0.0017	0.0013	0.0017	0.0015	0.0033	0.0023	0.0022	0.0029	0.0025	0.0026
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.197	0.168	0.174	0.19	0.188	0.169	0.201	0.231	0.197	0.198	0.224	0.195
Total Kjeldahl Nitrogen	mg/L	0.05	0.25	-	-	-	-	-	-	0.246	0.162	0.216	0.159	0.157	0.153	0.224	0.262	0.235	0.226	0.221	0.232
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-	0.197	0.168	0.174	0.165	0.169	0.169	0.201	0.231	0.197	0.198	0.224	0.195
Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	-	0.0075	0.01	0.005	0.0031	0.0046	0.0042	0.0032	0.0039	0.0052	0.0057	0.0053	0.0056	0.006	0.0048
Organic/Inorganic Carbon																					
Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	-	-	-	4.25	3.26	3.28	3.62	3.62	3.82	4.02	3.82	4.08	4.19	4.42	4.02
Total Organic Carbon	mg/L	0.5	3	-	-	-	-	-	-	4.19	3.08	3.16	3.35	3.32	2.92	4.38	4.18	4.14	4.35	4.1	3.97
Total Metals																					
Aluminum	ug/L	1	5.32	9.1	100	2900	-	75	100	3.5	2.8	3.5	2.7	3.4	5	2.7	3	3.1	2.7	3.3	3.1
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
Arsenic	ug/L	0.02	0.275	3.8	5	10	25	18.8	25	0.711	0.381	0.385	0.375	0.386	0.394	0.706	0.696	0.703	0.706	0.724	0.71
Barium	ug/L	0.02	8.05	77	-	2000	-	750	1000	9.28	8.84	8.93	8.96	9.17	8.79	9.6	9.53	9.46	9.47	9.44	9.64
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
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
Boron	ug/L	5	6.52	23	1500	5000	-	1120	1500	5.8	<5	<5	<5	<5	<5	7.1	7.3	7.5	7.3	7.4	7.4
Cadmium	ug/L	0.005	0.005	0.05	0.04 | 0.0708	7	-	0.03 | 0.0531	0.04 | 0.0708	<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	-	-	-	-	-	-	-	0.0079	0.0084	0.009	0.009	0.0085	0.0094	0.0084	0.0086	0.0085	0.0083	0.0084	0.0087
Chromium	ug/L	0.1	0.103	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
Cobalt	ug/L	0.005	0.016	-	0.78	-	-	0.585	0.78	0.0215	0.0168	0.0162	0.015	0.0159	0.0176	0.0328	0.0313	0.0301	0.0294	0.0321	0.0319
Copper	ug/L	0.05	0.86	2	-	2000	-	1500	2000	1.02	0.774	0.771	1.07	1.21	0.968	1.16	1.04	0.995	0.986	1.04	1.04
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
Iron	ug/L	1	15	42	300	-	1060	795	1060	20.2	13.6	13.7	13.5	13.2	18.4	31	31.9	31.2	31.4	32	33.6
Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.025	0.02	0.02	0.018	0.022	0.032	0.026	0.024	0.025	0.026	0.025	0.026
Lead	ug/L	0.01	0.0222	0.15	-	5	-	3.75	5	0.018	0.013	0.015	0.011	0.024	0.022	0.085	<0.01	<0.01	<0.01	0.01	<0.01
Lithium	ug/L	0.5	0.72	-	-	-	-	-	-	0.91	0.82	0.82	0.82	0.83	0.81	1.01	1	1.05	1.02	1.04	1.04
Manganese	ug/L	0.05	3.06	5.5	-	120	-	90	120	4.88	4.13	4.14	4.15	4.31	4.06	15.9	15.8	15.7	15.6	15.9	16.6
Mercury	ug/L	0.1 | 0.5	8.00E-04	0.02	0.026	1	-	0.0195	0.026	0.00057	0.00036	0.00218	0.00053	0.00044	0.00041	<5e-04	<5e-04	<5e-04	0.0008	<5e-04	<5e-04
Molybdenum	ug/L	0.05	0.107	5.2	73	-	-	54.8	73	0.123	0.082	0.081	0.083	0.085	0.09	0.148	0.151	0.148	0.143	0.151	0.144
Nickel	ug/L	0.05	0.441	2.7	25	-	-	18.8	25	0.843	0.507	0.489	0.504	0.516	0.488	0.981	0.865	0.821	0.833	0.831	0.838
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
Phosphorus	ug/L	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
Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.46	1.38	1.37	1.36	1.37	1.36	1.55	1.6	1.57	1.55	1.57	1.57
Selenium	ug/L	0.04	0.049	0.16	1	50	-	0.75	1	0.048	0.047	0.045	0.041	0.04	0.046	0.061	0.051	0.052	0.052	0.053	0.047
Silicon	ug/L	50	-	-	-	-	-	-	-	191	148	148	148	149	142	303	359	305	314	306	306
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
Strontium	ug/L	0.02	36.1	-	2500	7000	-	1880	2500	49.5	42.3	41.8	41.9	42.2	41.1	56.4	60	58.1	57	58.7	58.2
Sulfur	ug/L	500	-	-	-	-	-	-	-	2080	1610	1570	1600	1620	1610	2340	2380	2410	2370	2460	2370
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
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
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
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
Tin	ug/L	0.02	0.0384	-	-	-	-	-	-	<0.02	0.026	<0.02	0.025	-	0.039	0.021	<0.02	<0.02	<0.02	0.022	0.033
Titanium	ug/L	0.05	0.17	-	-	-	-	-	-	0.097	0.136	0.119	0.13	0.116	0.407	0.101	0.1	0.101	0.096	0.124	0.085
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
Uranium	ug/L	0.001	0.0164	1.5	15	20	-	11.2	15	0.0223	0.0164	0.0178	0.0187	0.0154	0.0199	0.0281	0.0275	0.0262	0.0272	0.0259	0.0274
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
Yttrium	ug/L	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
Zinc	ug/L	0.5	1.7	6.7	-	-	-	-	-	1.82	<0.5	0.79	0.64	2.92	0.85	2.67	<0.5	<0.5	<0.5	0.56	<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
Dissolved Metals																					
Aluminum	ug/L	1	-	-	-	-	-	-	-	1.8	2.6	1.1	<1	<1	1.6	1.3	1.4	1.3	1.3	4.9	<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
Arsenic	ug/L	0.02	-	-	-	-	-	-	-	0.701	0.383	0.369	0.357	0.364	0.374	0.664	0.663	0.657	0.658	0.665	0.663
Barium	ug/L	0.02	-	-	-	-	-	-	-	9.26	8.82	8.76	8.69	8.68	8.65	9.29	9.19	9.28	9.28	9.41	9.31
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
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
Boron	ug/L	5	-	-	-	-	-	-	-	6	<5	<5	<5	<5	<5	7	7	7.3	7	7.1	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
Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.0076	0.0088	0.0083	0.0084	0.0084	0.0084	0.0079	0.0082	0.0078	0.0082	0.0084	0.0079
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
Cobalt	ug/L	0.005	-	-	-	-	-	-	-	0.011	0.007	0.0064	0.0065	0.0064	0.007	0.0181	0.0142	0.0135	0.0132	0.0144	0.0187
Copper	ug/L	0.05	0.861	-	-	-	-	-	-	0.855	0.788	0.735	0.733	0.906	0.833	1.22	0.985	0.987	1	0.983	1.06
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
Iron	ug/L	1	-	-	-	-	-	-	-	7.5	5.1	3.7	3.6	3.5	5.7	15.4	6.3	6.2	8.7	6.6	6.3
Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.011	0.012	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	ug/L	0.01	0.0125	-	4.48 | 7.4	-	-	3.36 | 5.55	4.48 | 7.4	<0.01	0.011	<0.01	<0.01	<0.01	<0.01	0.066	0.084	<0.01	<0.01	<0.01	<0.01
Lithium	ug/L	0.5	-	-	-	-	-	-	-	0.97	0.83	0.81	0.82	0.83	0.79	1.05	1.04	1.07	1.04	1.05	1.01
Manganese	ug/L	0.05	1.2	-	210 | 330	-	-	158 | 248	210 | 330	0.5	0.609	0.532	0.512	0.543	0.604	0.968	0.826	0.809	0.79	0.977	0.843
Mercury	ug/L	0.1 | 0.5	-	-	-	-	-	-	-	<5e-04	0.00027	0.00036	0.00026	0.00025	0.0003	<5e-04	<5e-04	<5e-04	<5e-04	<5e-04	<5e-04
Molybdenum	ug/L	0.05	-	-	-	-	-	-	-	0.095	0.082	0.08	0.08	0.083	0.088	0.151	0.152	0.154	0.153	0.16	0.154
Nickel	ug/L	0.05	-	-	-	-	-	-	-	0.717	0.484	0.488	0.474	0.479	0.539	1.01	0.809	0.808	0.806	0.817	1.18
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
Phosphorus	ug/L	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
Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.44	1.4	1.39	1.36	1.36	1.4	1.51	1.54	1.54	1.54	1.53	1.55
Selenium	ug/L	0.04	-	-	-	-	-	-	-	0.042	0.047	<0.04	0.041	0.043	<0.04	0.048	0.046	0.051	0.049	0.058	0.048
Silicon	ug/L	50	-	-	-	-	-	-	-	195	152	153	150	152	143	314	319	313	318	311	311
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
Strontium	ug/L	0.02	-	-	2500	-	-	1880	2500	50.1	42.5	42.2	41	41.4	42.4	58.5	59	59.5	59.3	60.2	59.9
Sulfur	ug/L	500	-	-	-	-	-	-	-	2180	1650	1580	1610	1610	1610	2460	2460	2490	2440	2640	2450
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
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
Thallium	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
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
Tin	ug/L	0.02	-	-	-	-	-	-	-	<0.02	0.041	0.022	0.03	0.035	0.036	0.033	0.036	0.025	0.095	-	<0.02
Titanium	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
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
Uranium	ug/L	0.001	-	-	-	-	-	-	-	0.0194	0.0159	0.0153	0.0162	0.0163	0.0177	0.0266	0.0262	0.025	0.0252	0.0258	0.0222
Vanadium	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
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
Zinc	ug/L	0.5	1.9	-	7.88 | 13.5	-	-	5.91 | 10.2	7.88 | 13.5	<0.5	0.96	<0.5	<0.5	<0.5	1.09	3.51	<0.5	<0.5	0.89	13.8	<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	0.021	<0.01
Cyanides																					
Cyanide (Total)	mg/L	0.001	0.001	0.009	0.005	0.2	-	0.00375	0.005	<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
Cyanide (free)	mg/L	0.001	-	0.00035	-	-	-	-	-	<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 = 2023 detection limits

x = results were flagged as outliers (refer to Table A-7 for the list of samples flagged as outliers in 2023).

[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 , copper , lead , manganese , and zinc 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 2023.

[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 C3-1. Water chemistry results from Meliadine Lake in 2023

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	August	August	August	August	August	August	August	August	August	August	August
										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
										2023-08-17	2023-08-17	2023-08-17	2023-08-17	2023-08-17	2023-08-18	2023-08-18	2023-08-18	2023-08-18	2023-08-18	2023-08-18	2023-08-18
Field Measurements																					
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.22	7.15	7.28	7.09	7.29	6.86	6.97	7.12	6.66	6.24	7.08	7.31
Temperature	C	-	-	-	-	-	-	-	-	16.52	16.51	16.56	16.54	16.46	16.19	16.2	16.24	16.13	16.02	16.03	15.91
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	-	-	-	99.2	99.2	98.6	99.3	99.2	85.7	85.7	85.7	85.7	85.6	84.8	84.8
DO (mg/L)	mg/L	-	-	-	-	-	-	6.5	6.5	9.49	9.51	9.54	9.46	9.59	9.45	9.45	9.39	9.46	9.47	9.44	9.46
DO (%)	%	-	-	-	-	-	-	-	-	99.9	100.1	100.5	99.7	100.8	98.8	98.7	98.3	98.7	98.6	98.4	98.4
Conventional Parameters																					
Conductivity (lab)	uS/cm	1	77.5	-	-	-	-	-	-	91.6	92.4	91.7	93.3	93.8	82.2	82.8	82.2	82.5	81.5	60.4	82
Hardness	mg/L	0.5	23.4	-	-	-	-	-	-	28.9	28.6	29.3	29.6	29.1	26	26	26.5	25.9	25.8	7.6	25.3
Total Dissolved Solids	mg/L	10	54	68	500	-	1000	375	500	55.8	53.5	52.8	57.2	47.5	50.8	48.8	54.2	53.8	51.8	39.1	48.4
Total Dissolved Solids (Calculated)	mg/L	1	39.6	68	500	-	1000	375	500	59.5	60.1	59.6	60.6	61	53.4	53.8	53.4	53.6	53	39.3	53.3
Total Suspended Solids	mg/L	1	1	3.1	-	-	-	-	-	<1	<1	<1	1.1	<1	x	x	8.7	2	1.3	2	1.1
Turbidity (lab)	NTU	0.1	-	-	-	-	-	-	-	0.28	0.28	0.27	0.33	0.31	x	x	0.3	0.27	0.3	0.4	0.27
pH (lab)	pH units	0.1	-	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.33	7.45	7.45	7.45	7.46	7.47	7.45	7.46	7.47	7.48	7.29	7.45
Major Ions																					
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	-	-	-	21.8	22	21.9	22	21.8	21.1	21	20.8	21.2	22.3	13.1	20.5
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	20.5	-	-	-	-	-	-	21.8	22	21.9	22	21.8	21.1	21	20.8	21.2	22.3	13.1	20.5
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
Calcium (D)	mg/L	0.01	-	-	-	-	-	-	-	9.04	8.91	9.17	9.25	9.09	8.17	8.19	8.37	8.15	8.13	2.38	7.95
Calcium (T)	mg/L	0.01 | 0.02	7.33	-	-	-	-	-	-	8.31	8.44	8.48	8.54	8.45	9.09	7.84	7.67	7.76	7.97	7.82	7.73
Chloride	mg/L	0.1	9.56	14	120	-	-	90	120	13.2	13.1	13	13.2	13.2	11.2	11.2	11.2	11.2	11.2	8.09	11
Fluoride	mg/L	0.02	0.028	0.0084	0.12	1.5	2.8	2.1	2.8	0.03	0.03	0.03	0.03	0.03	0.029	0.029	0.029	0.029	0.029	0.022	0.03
Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	-	1.54	1.54	1.56	1.58	1.55	1.36	1.34	1.37	1.35	1.35	0.403	1.32
Magnesium (T)	mg/L	0.004 | 0.01	1.18	-	-	-	-	-	-	1.44	1.44	1.44	1.45	1.45	2.06	1.31	1.27	1.28	1.3	1.31	1.26
Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-	1.07	1.06	1.08	1.1	1.07	1.04	0.992	1.01	0.994	1	0.291	0.969
Potassium (T)	mg/L	0.02 | 0.03	0.954	-	-	-	-	-	-	1.01	1.01	1.01	1.02	1.02	1.3	0.977	0.953	0.967	0.98	0.971	0.956
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	0.268	-	-	-	-	-	-	0.486	0.484	0.473	0.481	0.476	0.405	0.376	0.369	0.372	0.376	0.252	0.35
Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-	6.49	6.53	6.56	6.66	6.58	5.56	5.61	5.66	5.58	5.56	1.64	5.41
Sodium (T)	mg/L	0.02	4.85	5.3	-	-	-	-	-	5.92	5.95	6.03	5.98	6.04	5.97	5.25	5.09	5.19	5.32	5.2	5.14
Sulphate	mg/L	0.3	3.87	38	-	-	-	-	-	5.69	5.54	5.5	5.57	5.59	4.54	4.53	4.49	4.52	4.48	3.28	4.48
Nutrients																					
Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.41 | 12.5	-	-	0.308 | 9.38	0.41 | 12.5	0.0133	0.0098	0.0073	0.0142	0.011	0.0257	0.013	0.0181	0.0107	0.0113	0.0142	0.008
Nitrate (as N)	mg/L	0.005	0.018	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
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
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
Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.256	0.236	0.237	0.243	0.252	0.226	0.28	0.212	0.213	0.202	0.194	0.184
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
Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	-	-	-	0.0023	0.0023	0.0021	0.0021	0.0022	0.0015	<0.001	<0.001	<0.001	0.0011	<0.001	0.0014
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.214	0.232	0.235	0.226	0.228	0.198	0.213	0.21	0.208	0.205	0.139	0.195
Total Kjeldahl Nitrogen	mg/L	0.05	0.25	-	-	-	-	-	-	0.256	0.236	0.237	0.243	0.252	0.226	0.28	0.212	0.213	0.202	0.194	0.184
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-	0.214	0.232	0.235	0.226	0.228	0.198	0.213	0.21	0.208	0.205	0.139	0.195
Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	-	0.0075	0.01	0.0045	0.0041	0.0042	0.0043	0.004	x	x	0.0021	0.0024	0.0036	0.0043	0.0034
Organic/Inorganic Carbon																					
Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	-	-	-	3.86	3.74	3.69	3.9	3.88	3.4	3.44	3.58	3.46	3.55	3.54	4.64
Total Organic Carbon	mg/L	0.5	3	-	-	-	-	-	-	3.76	3.8	3.67	3.76	3.82	3.27	3.22	3.16	3.19	3.26	3.95	4.16
Total Metals																					
Aluminum	ug/L	1	5.32	9.1	100	2900	-	75	100	4.3	1.9	1.7	3.2	1.9	x	x	3.6	2.2	2.4	2.5	1.6
Antimony	ug/L	0.02	0.02	0.51	-	6	-	4.5	6	<0.02	<0.02	<0.02	0.021	<0.02	x	<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	0.854	0.904	0.804	0.866	0.852	x	0.484	0.441	0.443	0.448	0.37	0.355
Barium	ug/L	0.02	8.05	77	-	2000	-	750	1000	8.98	9.06	8.98	9.08	9.08	x	9.6	8.55	8.7	8.48	8.59	8.82
Beryllium	ug/L	0.005	0.005	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	x	<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	x	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	ug/L	5	6.52	23	1500	5000	-	1120	1500	5.8	6.1	5.9	6	6	x	5.1	<5	5.1	5.1	<5	<5
Cadmium	ug/L	0.005	0.005	0.05	0.04 | 0.0708	7	-	0.03 | 0.0531	0.04 | 0.0708	<0.005	<0.005	<0.005	<0.005	<0.005	x	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.009	0.009	0.0092	0.0092	0.0087	x	x	0.0098	0.01	0.0096	0.0092	0.009
Chromium	ug/L	0.1	0.103	1.1	5	50	-	3.75	5	<0.1	<0.1	<0.1	<0.1	<0.1	x	x	<0.1	<0.1	<0.1	<0.1	<0.1
Cobalt	ug/L	0.005	0.016	-	0.78	-	-	0.585	0.78	0.0208	0.0201	0.019	0.0275	0.0199	x	x	0.018	0.0158	0.0162	0.0168	0.0144
Copper	ug/L	0.05	0.86	2	-	2000	-	1500	2000	1.4	1.16	1.09	2.73	1.02	x	1.04	0.836	0.921	1.1	1.63	0.908
Gallium	ug/L	0.05	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	x	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron	ug/L	1	15	42	300	-	1060	795	1060	16.7	16.3	16.4	21.8	17.7	x	x	15.7	13.7	15	9.4	8.5
Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.019	0.018	0.019	0.022	0.018	x	x	0.025	0.015	0.016	0.015	0.014
Lead	ug/L	0.01	0.0222	0.15	-	5	-	3.75	5	0.093	0.07	0.086	0.308	0.067	x	0.248	0.078	0.061	0.066	0.15	0.083
Lithium	ug/L	0.5	0.72	-	-	-	-	-	-	0.87	0.86	0.88	0.88	0.88	x	0.87	0.79	0.8	0.8	0.87	0.8
Manganese	ug/L	0.05	3.06	5.5	-	120	-	90	120	7.68	7.56	7.37	8.19	7.62	x	6.24	4.63	4.59	4.73	3.87	3.92
Mercury	ug/L	0.1 | 0.5	8.00E-04	0.02	0.026	1	-	0.0195	0.026	<5e-04	<5e-04	<5e-04	0.00051	<5e-04	x	0.00056	<5e-04	<5e-04	<5e-04	<5e-04	<5e-04
Molybdenum	ug/L	0.05	0.107	5.2	73	-	-	54.8	73	0.109	0.103	0.105	0.109	0.105	x	0.106	0.094	0.091	0.096	0.088	0.087
Nickel	ug/L	0.05	0.441	2.7	25	-	-	18.8	25	0.749	0.71	0.685	1.06	0.686	x	0.912	0.556	0.496	0.587	0.916	0.552
Niobium	ug/L	0.1	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	x	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphorus	ug/L	50	-	-	-	-	-	-	-	<50	<50	<50	<50	<50	x	<50	<50	<50	<50	<50	<50
Rhenium	ug/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	x	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.38	1.39	1.4	1.42	1.4	x	1.47	1.35	1.37	1.39	1.37	1.35
Selenium	ug/L	0.04	0.049	0.16	1	50	-	0.75	1	0.046	0.046	0.044	0.048	0.045	x	<0.04	0.047	0.044	0.042	0.045	0.042
Silicon	ug/L	50	-	-	-	-	-	-	-	236	243	232	238	238	x	247	173	174	177	179	169
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	x	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ug/L	0.02	36.1	-	2500	7000	-	1880	2500	46.2	47.1	46.7	47	47.2	x	41.2	40.6	41.1	41.6	40.7	40.8
Sulfur	ug/L	500	-	-	-	-	-	-	-	1910	2000	1900	1900	1930	x	1560	1560	1570	1550	1620	1580
Tantalum	ug/L	0.1	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	x	<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	x	<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	x	<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	x	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tin	ug/L	0.02	0.0384	-	-	-	-	-	-	0.029	<0.02	<0.02	<0.02	<0.02	x	<0.02	<0.02	<0.02	<0.02	0.048	0.024
Titanium	ug/L	0.05	0.17	-	-	-	-	-	-	<0.05	<0.05	<0.05	0.132	<0.05	x	x	0.162	<0.05	<0.05	<0.05	<0.05
Tungsten	ug/L	0.01	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	x	<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	0.0225	0.0233	0.0199	0.0215	0.0196	x	0.0355	0.0204	0.0203	0.0204	0.0183	0.0197
Vanadium	ug/L	0.05	0.05	-	120	-	-	90	120	<0.05	<0.05	<0.05	<0.05	<0.05	x	x	<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	x	0.046	0.023	<0.01	<0.01	<0.01	<0.01
Zinc	ug/L	0.5	1.7	6.7	-	-	-	-	-	3.18	2.05	2.92	6.97	1.93	x	3.76	2.34	1.83	2.09	5.3	2.87
Zirconium	ug/L	0.01	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	x	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Metals																					
Aluminum	ug/L	1	-	-	-	-	-	-	-	1.9	1.2	1.4	1.4	1.3	x	2.2	2	2.6	1.7	<1	1.1
Antimony	ug/L	0.02	-	-	-	-	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	x	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	ug/L	0.02	-	-	-	-	-	-	-	0.852	0.844	0.796	0.829	0.826	x	0.458	0.426	0.435	0.452	0.198	0.367
Barium	ug/L	0.02	-	-	-	-	-	-	-	9.01	9.01	8.82	8.96	8.86	x	8.64	8.58	8.44	8.46	2.95	8.69
Beryllium	ug/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	x	<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	x	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	ug/L	5	-	-	-	-	-	-	-	6	6.2	6.1	6.1	6	x	5.3	5.3	5.2	5.2	<5	5
Cadmium	ug/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	x	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.0089	0.009	0.0086	0.0085	0.0089	x	0.0096	0.0095	0.0097	0.0098	<0.005	0.0091
Chromium	ug/L	0.1	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	0.24	<0.1	x	<0.1	<0.1	<0.1	<0.1	-	<0.1
Cobalt	ug/L	0.005	-	-	-	-	-	-	-	0.0113	0.0108	0.0111	0.0347	0.0102	x	0.0144	0.0086	0.0083	0.0076	-	0.0131
Copper	ug/L	0.05	0.861	-	-	-	-	-	-	1.51	1.25	1.18	4.06	1.07	x	1.14	0.895	0.987	1.06	2.16	1.26
Gallium	ug/L	0.05	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	x	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron	ug/L	1	-	-	-	-	-	-	-	6.9	7	8.1	9.1	9.3	x	8.2	6.8	6.8	6.9	28.3	3.8
Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	x	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead	ug/L	0.01	0.0125	-	4.48 | 7.4	-	-	3.36 | 5.55	4.48 | 7.4	0.093	0.051	0.054	0.098	0.05	x	0.135	0.06	0.051	0.057	0.164	0.12
Lithium	ug/L	0.5	-	-	-	-	-	-	-	0.95	0.93	0.93	0.94	0.92	x	0.87	0.85	0.85	0.85	<0.5	0.85
Manganese	ug/L	0.05	1.2	-	210 | 330	-	-	158 | 248	210 | 330	1.2	1.08	1.07	2.34	1.08	x	1.79	0.527	0.436	0.353	4.46	0.756
Mercury	ug/L	0.1 | 0.5	-	-	-	-	-	-	-	<5e-04	<5e-04	<5e-04	<5e-04	<5e-04	x	<5e-04	<5e-04	<5e-04	0.00059	<5e-04	<5e-04
Molybdenum	ug/L	0.05	-	-	-	-	-	-	-	0.107	0.106	0.107	0.154	0.112	x	0.098	0.095	0.096	0.096	<0.05	0.091
Nickel	ug/L	0.05	-	-	-	-	-	-	-	0.772	0.717	0.702	1.71	0.67	x	0.714	0.538	0.534	0.536	-	0.86
Niobium	ug/L	0.1	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	x	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphorus	ug/L	50	-	-	-	-	-	-	-	<50	<50	<50	<50	<50	x	<50	<50	<50	<50	<50	<50
Rhenium	ug/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	x	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.47	1.46	1.5	1.51	1.47	x	1.4	1.41	1.4	1.41	0.405	1.36
Selenium	ug/L	0.04	-	-	-	-	-	-	-	<0.04	0.041	0.045	0.047	0.046	x	<0.04	0.046	<0.04	0.046	<0.04	0.041
Silicon	ug/L	50	-	-	-	-	-	-	-	234	238	232	236	234	x	180	178	180	184	62	169
Silver	ug/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	x	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium	ug/L	0.02	-	-	2500	-	-	1880	2500	47.9	47.3	49	49.2	48.6	x	41.5	42.2	41.5	41.5	12.7	40
Sulfur	ug/L	500	-	-	-	-	-	-	-	1970	1990	1950	1960	2020	x	1600	1600	1640	1620	<500	1600
Tantalum	ug/L	0.1	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	x	<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	x	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Thallium	ug/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	x	<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	x	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tin	ug/L	0.02	-	-	-	-	-	-	-	0.113	<0.02	0.027	0.024	0.037	x	<0.02	0.045	0.059	0.022	0.026	<0.02
Titanium	ug/L	0.05	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	x	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tungsten	ug/L	0.01	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	x	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium	ug/L	0.001	-	-	-	-	-	-	-	0.0214	0.0205	0.02	0.0202	0.0214	x	0.0192	0.0164	0.0173	0.0153	0.0057	0.0167
Vanadium	ug/L	0.05	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	x	<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	x	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	ug/L	0.5	1.9	-	7.88 | 13.5	-	-	5.91 | 10.2	7.88 | 13.5	4.97	2.01	2.16	7.87	2.26	x	5.69	2.32	2.71	2.6	-	5.37
Zirconium	ug/L	0.01	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	x	<0.01	<0.01	<0.01	0.011	<0.01	<0.01
Cyanides																					
Cyanide (Total)	mg/L	0.001	0.001	0.009	0.005	0.2	-	0.00375	0.005	<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
Cyanide (free)	mg/L	0.001	-	0.00035	-	-	-	-	-	<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 = 2023 detection limits

x = results were flagged as outliers (refer to Table A-7 for the list of samples flagged as outliers in 2023).

[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 , copper , lead , manganese , and zinc 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 2023.

[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 C3-1. Water chemistry results from Meliadine Lake in 2023

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-04-03 2023-08-18	August MEL-04-04 2023-08-18	August MEL-04-05 2023-08-18	August MEL-05-01 2023-08-18	August MEL-05-02 2023-08-18	August MEL-05-03 2023-08-18	August MEL-05-04 2023-08-18	August MEL-05-05 2023-08-18	September MEL-01-01 2023-09-15	September MEL-01-06 2023-09-15	September MEL-01-07 2023-09-15	September MEL-01-08 2023-09-15	September MEL-01-09 2023-09-15
Field Measurements																						
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.25	7.24	7.18	7.35	7.43	7.48	7.46	7.44	7.35	7.45	7.33	7.56	7.35
Temperature	C	-	-	-	-	-	-	-	-	16.07	16.02	16.12	16.13	16.16	16.15	16.17	16.16	7.34	7.36	7.32	7.36	7.29
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	-	-	-	84.8	84.8	84.9	87.9	87.8	87.8	87.6	87.6	114.9	115.1	114.9	115.2	114.7
DO (mg/L)	mg/L	-	-	-	-	-	-	6.5	6.5	9.47	9.47	9.48	9.49	9.46	9.47	9.46	9.45	11.24	11.2	11.26	11.17	11.24
DO (%)	%	-	-	-	-	-	-	-	-	98.8	98.7	98.9	99	98.8	98.9	98.9	98.7	96	95.6	96.1	95.4	95.8
Conventional Parameters																						
Conductivity (lab)	uS/cm	1	77.5	-	-	-	-	-	-	82	82.2	82.7	76.7	85.2	85.2	85.2	85	120	119	119	120	118
Hardness	mg/L	0.5	23.4	-	-	-	-	-	-	25.5	25.8	25.5	27	26.8	27	26.7	27.1	33.6	35.5	34.6	33	33
Total Dissolved Solids	mg/L	10	54	68	500	-	1000	375	500	52.1	52.8	49.4	55.1	54.8	47.8	51.1	49.4	59.2	67.2	66.2	72.9	59.9
Total Dissolved Solids (Calculated)	mg/L	1	39.6	68	500	-	1000	375	500	53.3	53.4	53.8	49.8	55.4	55.4	55.4	55.2	78	77.4	77.4	78	76.7
Total Suspended Solids	mg/L	1	1	3.1	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1.1	1.1
Turbidity (lab)	NTU	0.1	-	-	-	-	-	-	-	0.31	0.28	0.41	0.29	0.3	0.31	0.3	0.29	0.49	0.41	-	0.49	0.58
pH (lab)	pH units	0.1	-	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.42	7.44	7.42	7.53	7.48	7.46	7.47	7.46	7.45	7.5	7.49	7.5	7.51
Major Ions																						
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	-	-	-	20.8	20.8	20.7	23.3	22.1	22	22.3	22.2	20.4	20.8	20.6	20.5	20.8
Alkalinity, Carbonate	mg/L	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
Alkalinity, Total	mg/L	1	20.5	-	-	-	-	-	-	20.8	20.8	20.7	23.3	22.1	22	22.3	22.2	20.4	20.8	20.6	20.5	20.8
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
Calcium (D)	mg/L	0.01	-	-	-	-	-	-	-	8.01	8.11	8.03	8.56	8.47	8.53	8.46	8.58	10.4	11	10.7	10.2	10.2
Calcium (T)	mg/L	0.01 | 0.02	7.33	-	-	-	-	-	-	7.8	8.01	7.74	8.25	8.17	8.16	8.18	8.08	10.3	10.2	10.1	10.2	10.3
Chloride	mg/L	0.1	9.56	14	120	-	-	90	120	11	11	11	11.1	11.2	11.1	11.1	11.1	16.8	16.8	16.6	16.9	16.8
Fluoride	mg/L	0.02	0.028	0.0084	0.12	1.5	2.8	2.1	2.8	0.029	0.029	0.029	0.03	0.03	0.03	0.03	0.03	0.034	0.032	0.031	0.032	0.031
Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	-	1.33	1.35	1.33	1.37	1.36	1.38	1.36	1.38	1.85	1.96	1.92	1.83	1.83
Magnesium (T)	mg/L	0.004 | 0.01	1.18	-	-	-	-	-	-	1.28	1.31	1.28	1.33	1.31	1.29	1.32	1.29	1.93	1.92	1.89	1.89	1.91
Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-	0.973	0.986	0.983	1.01	0.996	0.998	0.996	1.02	1.27	1.3	1.28	1.2	1.23
Potassium (T)	mg/L	0.02 | 0.03	0.954	-	-	-	-	-	-	0.956	0.989	0.963	0.999	0.983	0.973	0.98	0.982	1.2	1.19	1.18	1.19	1.2
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	0.268	-	-	-	-	-	-	0.364	0.336	0.351	0.419	0.418	0.4	0.399	0.41	0.575	0.3	0.559	0.654	0.55
Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-	5.49	5.5	5.45	5.62	5.54	5.6	5.53	5.63	8.3	8.57	8.39	8.1	7.92
Sodium (T)	mg/L	0.02	4.85	5.3	-	-	-	-	-	5.16	5.28	5.19	5.28	5.2	5.18	5.24	5.21	8.4	8.34	8.22	8.21	8.32
Sulphate	mg/L	0.3	3.87	38	-	-	-	-	-	4.5	4.45	4.69	4.5	4.47	4.51	4.49	4.46	7.25	7.07	6.99	7.07	7.13
Nutrients																						
Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.41 | 12.5	-	-	0.308 | 9.38	0.41 | 12.5	0.011	0.0163	0.0126	0.0098	0.0103	0.0102	0.0053	0.0074	0.005	0.0134	0.0106	0.0166	0.0158
Nitrate (as N)	mg/L	0.005	0.018	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	0.0171	<0.005	0.0126	0.0057	0.0234
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	-	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	<0.0051	0.0171	<0.0051	0.0126	0.0057	0.0234
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
Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.203	0.199	0.21	0.202	0.222	0.195	0.2	0.203	0.331	0.345	0.283	0.284	0.366
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
Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	-	-	-	0.0016	0.0014	0.0021	0.002	0.0026	0.0019	0.0021	0.0024	0.0026	0.0026	0.0028	0.0027	0.0029
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.191	0.185	0.205	0.212	0.204	0.21	0.219	0.212	0.394	0.354	0.369	0.367	0.403
Total Kjeldahl Nitrogen	mg/L	0.05	0.25	-	-	-	-	-	-	0.203	0.199	0.21	0.202	0.222	0.195	0.2	0.203	0.314	0.345	0.27	0.278	0.343
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-	0.191	0.185	0.205	0.212	0.204	0.21	0.219	0.212	0.377	0.354	0.356	0.361	0.38
Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	-	0.0075	0.01	0.0031	0.0031	0.004	0.0035	0.0035	0.0033	0.0043	0.0034	0.0068	0.0067	0.0113	0.0069	0.0066
Organic/Inorganic Carbon																						
Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	-	-	-	4.71	4.26	4.2	3.95	3.95	4.31	3.68	3.78	4.06	3.99	4.23	4.18	4.26
Total Organic Carbon	mg/L	0.5	3	-	-	-	-	-	-	4.05	3.78	4	3.88	4.09	4.25	3.81	3.6	4.36	4.38	4.18	4.16	4.19
Total Metals																						
Aluminum	ug/L	1	5.32	9.1	100	2900	-	75	100	2.7	1.6	1.5	2.3	1.8	1.7	1.9	1.7	2.5	2.2	2.5	2.5	2.7
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
Arsenic	ug/L	0.02	0.275	3.8	5	10	25	18.8	25	0.366	0.363	0.365	0.49	0.501	0.485	0.489	0.496	0.624	0.676	0.65	0.657	0.645
Barium	ug/L	0.02	8.05	77	-	2000	-	750	1000	8.61	8.67	8.61	8.81	8.98	9.11	9.13	8.94	9.12	9.11	9.06	9.18	9.11
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	6.52	23	1500	5000	-	1120	1500	<5	5.1	<5	5.2	5.2	5.1	5	5.1	7.8	7.8	8.2	8	7.8
Cadmium	ug/L	0.005	0.005	0.05	0.04 | 0.0708	7	-	0.03 | 0.0531	0.04 | 0.0708	<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	-	-	-	-	-	-	-	0.0089	0.0093	0.0093	0.0091	0.0093	0.0096	0.0101	0.0094	0.0082	0.0081	0.0081	0.0082	0.008
Chromium	ug/L	0.1	0.103	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
Cobalt	ug/L	0.005	0.016	-	0.78	-	-	0.585	0.78	0.0133	0.0144	0.0161	0.0146	0.0169	0.015	0.0153	0.0149	0.0237	0.0234	0.0252	0.0242	0.0242
Copper	ug/L	0.05	0.86	2	-	2000	-	1500	2000	0.893	0.953	1.02	0.889	0.878	0.888	0.872	0.86	0.983	0.921	0.944	1.18	0.935
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
Iron	ug/L	1	15	42	300	-	1060	795	1060	7.4	8	7.4	12.2	14.4	12.1	11.2	10.4	15.6	17.2	17.2	18.5	17.3
Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.013	0.024	0.014	0.012	0.013	0.012	0.012	0.012	0.02	0.019	0.02	0.021	0.02
Lead	ug/L	0.01	0.0222	0.15	-	5	-	3.75	5	0.075	0.084	0.086	0.077	0.073	0.067	0.076	0.073	<0.01	<0.01	<0.01	<0.01	<0.01
Lithium	ug/L	0.5	0.72	-	-	-	-	-	-	0.8	0.81	0.8	0.84	0.83	0.81	0.8	0.81	1.18	1.16	1.17	1.18	1.14
Manganese	ug/L	0.05	3.06	5.5	-	120	-	90	120	3.65	3.75	3.6	4.77	5.74	4.9	4.9	4.68	6.35	6.53	6.54	6.9	6.6
Mercury	ug/L	0.1 | 0.5	8.00E-04	0.02	0.026	1	-	0.0195	0.026	<5e-04	<5e-04	<5e-04	<5e-04	0.00057	0.00053	<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	0.087	0.092	0.091	0.094	0.096	0.097	0.098	0.096	0.152	0.149	0.146	0.149	0.152
Nickel	ug/L	0.05	0.441	2.7	25	-	-	18.8	25	0.519	0.616	0.596	0.482	0.528	0.508	0.516	0.479	0.759	0.752	0.759	0.746	0.761
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
Phosphorus	ug/L	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
Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.34	1.37	1.34	1.36	1.38	1.36	1.37	1.36	1.58	1.57	1.54	1.54	1.56
Selenium	ug/L	0.04	0.049	0.16	1	50	-	0.75	1	0.043	0.048	0.041	0.045	0.048	0.045	0.043	0.04	0.05	0.046	0.047	0.048	0.045
Silicon	ug/L	50	-	-	-	-	-	-	-	166	166	164	203	209	203	197	207	305	316	319	312	307
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
Strontium	ug/L	0.02	36.1	-	2500	7000	-	1880	2500	40.6	41.5	40.6	41.7	41.9	41.4	41.8	41.5	58.7	58.7	57.7	57.8	58.6
Sulfur	ug/L	500	-	-	-	-	-	-	-	1580	1590	1570	1620	1580	1570	1590	1620	2620	2720	2660	2610	2600
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
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
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
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
Tin	ug/L	0.02	0.0384	-	-	-	-	-	-	0.022	<0.02	<0.02	0.024	<0.02	<0.02	0.032	<0.02	0.052	0.029	0.066	0.054	0.023
Titanium	ug/L	0.05	0.17	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.052	0.054	0.075	0.22	0.099
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
Uranium	ug/L	0.001	0.0164	1.5	15	20	-	11.2	15	0.0176	0.0169	0.0166	0.0189	0.0188	0.0156	0.0199	0.0206	0.0288	0.0287	0.0257	0.0283	0.026
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
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
Zinc	ug/L	0.5	1.7	6.7	-	-	-	-	-	2.31	2.84	2.81	2.47	2.33	2	2.37	2.34	<0.5	<0.5	0.5	<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
Dissolved Metals																						
Aluminum	ug/L	1	-	-	-	-	-	-	-	4.1	1.1	1.5	1.3	1.9	1.5	1.5	2.3	1.2	1.6	1	<1	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
Arsenic	ug/L	0.02	-	-	-	-	-	-	-	0.362	0.363	0.364	0.472	0.499	0.49	0.482	0.504	0.623	0.606	0.582	0.624	0.632
Barium	ug/L	0.02	-	-	-	-	-	-	-	8.69	8.65	8.62	8.82	8.86	8.86	8.85	9.02	8.41	9	8.73	8.87	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
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
Boron	ug/L	5	-	-	-	-	-	-	-	5.2	5.1	5.2	5.4	5.4	5.4	5.4	5.4	7.3	7.2	7.4	7.8	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
Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.009	0.009	0.0095	0.0093	0.0095	0.0093	0.0092	0.0094	0.0074	0.0078	0.0077	0.0078	0.0077
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
Cobalt	ug/L	0.005	-	-	-	-	-	-	-	0.0156	0.0181	0.0122	0.007	0.0152	0.0076	0.01	0.0075	0.0145	0.015	0.0144	0.014	0.0143
Copper	ug/L	0.05	0.861	-	-	-	-	-	-	1.17	1.17	1.45	0.878	1.19	0.866	0.998	1.15	0.919	0.96	0.938	0.908	0.955
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
Iron	ug/L	1	-	-	-	-	-	-	-	4.3	4.5	4.4	6	8.4	6.3	6.5	8.2	4.2	6.3	4.9	4.6	4.6
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
Lead	ug/L	0.01	0.0125	-	4.48 | 7.4	-	-	3.36 | 5.55	4.48 | 7.4	0.088	0.076	0.083	0.065	0.094	0.059	0.072	0.112	<0.01	0.012	<0.01	0.041	<0.01
Lithium	ug/L	0.5	-	-	-	-	-	-	-	0.84	0.84	0.84	0.88	0.9	0.88	0.87	0.88	1.05	1.06	1.09	1.08	1.08
Manganese	ug/L	0.05	1.2	-	210 | 330	-	-	158 | 248	210 | 330	0.81	0.843	1.01	0.474	0.912	0.583	0.608	0.743	0.459	0.453	0.438	0.436	0.468
Mercury	ug/L	0.1 | 0.5	-	-	-	-	-	-	-	<5e-04	<5e-04	<5e-04	<5e-04	<5e-04	<5e-04	<5e-04	<5e-04	<5e-04	<5e-04	<5e-04	<5e-04	0.00057
Molybdenum	ug/L	0.05	-	-	-	-	-	-	-	0.09	0.098	0.101	0.098	0.103	0.097	0.1	0.098	0.16	0.167	0.153	0.153	0.146
Nickel	ug/L	0.05	-	-	-	-	-	-	-	0.962	1.11	0.888	0.484	0.895	0.515	0.568	0.483	0.744	0.785	0.759	0.717	0.724
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
Phosphorus	ug/L	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
Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.37	1.39	1.36	1.39	1.39	1.4	1.37	1.41	1.57	1.64	1.61	1.54	1.52
Selenium	ug/L	0.04	-	-	-	-	-	-	-	<0.04	0.041	<0.04	0.048	<0.04	<0.04	<0.04	0.041	0.058	0.057	0.052	0.054	0.052
Silicon	ug/L	50	-	-	-	-	-	-	-	168	169	169	199	203	208	204	209	300	295	303	325	304
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
Strontium	ug/L	0.02	-	-	2500	-	-	1880	2500	40.4	41.1	40.2	41.8	41.3	41.8	40.9	42.1	59.7	63.5	62	59.3	57.8
Sulfur	ug/L	500	-	-	-	-	-	-	-	1600	1600	1870	1620	1620	1660	1640	1640	2650	2450	2420	2590	2620
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
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
Thallium	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
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
Tin	ug/L	0.02	-	-	-	-	-	-	-	0.023	0.027	0.064	<0.02	0.04	0.042	0.031	0.027	<0.02	0.066	0.035	0.024	0.104
Titanium	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	0.06
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
Uranium	ug/L	0.001	-	-	-	-	-	-	-	0.0158	0.0154	0.0158	0.0182	0.0199	0.0192	0.0186	0.0176	0.025	0.0275	0.026	0.0266	0.0296
Vanadium	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
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
Zinc	ug/L	0.5	1.9	-	7.88 | 13.5	-	-	5.91 | 10.2	7.88 | 13.5	4.7	3.51	5.74	2.26	3.95	2.12	2.89	4.55	<0.5	<0.5	<0.5	0.61	3.31
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
Cyanides																						
Cyanide (Total)	mg/L	0.001	0.001	0.009	0.005	0.2	-	0.00375	0.005	<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
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	<0.001
Cyanide (free)	mg/L	0.001	-	0.00035	-	-	-	-	-	<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 = 2023 detection limits

x = results were flagged as outliers (refer to Table A-7 for the list of samples flagged as outliers in 2023).

[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 , copper , lead , manganese , and zinc 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 2023.

[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 C3-1. Water chemistry results from Meliadine Lake in 2023

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 MEL-01-10 2023-09-15	September MEL-02-02 2023-09-15	September MEL-02-03 2023-09-15	September MEL-02-05 2023-09-15	September MEL-02-06 2023-09-15	September MEL-02-08 2023-09-15	September MEL-03-01 2023-09-15	September MEL-03-02 2023-09-15	September MEL-03-03 2023-09-15	September MEL-03-04 2023-09-15	September MEL-03-05 2023-09-15
Field Measurements																				
pH (field)	pH units	-	7.1 | 7.95	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.42	7.43	7.56	7.57	7.55	7.57	7.57	7.57	7.57	7.6	7.52
Temperature	C	-	-	-	-	-	-	-	-	7.38	7.58	7.67	7.54	7.7	7.6	7.59	7.62	7.73	7.57	7.38
Sp. Conductivity (field)	uS/cm	-	-	-	-	-	-	-	-	115.1	95.6	95.6	95.1	95.1	96.1	86.7	86.6	86.7	86.7	86.7
DO (mg/L)	mg/L	-	-	-	-	-	-	6.5	6.5	11.25	11.14	11.18	11.21	11.13	11.14	11.11	11.12	11.07	11.05	11.23
DO (%)	%	-	-	-	-	-	-	-	-	96.1	95.7	96.2	96.1	96	95.7	95.5	95.6	95.4	94.9	95.9
Conventional Parameters																				
Conductivity (lab)	uS/cm	1	77.5	-	-	-	-	-	-	120	97.3	97.4	97.6	97.2	97.7	88.3	89.1	87.3	88	88.6
Hardness	mg/L	0.5	23.4	-	-	-	-	-	-	32.1	28.1	28.5	28.7	28.2	29.2	26	26.1	26	25.9	26.2
Total Dissolved Solids	mg/L	10	54	68	500	-	1000	375	500	66.9	54.2	52.2	52.6	53.2	54.9	42.6	47.2	47.2	43.6	43.9
Total Dissolved Solids (Calculated)	mg/L	1	39.6	68	500	-	1000	375	500	78	63.2	63.3	63.4	63.2	63.5	57.4	57.9	56.7	57.2	57.6
Total Suspended Solids	mg/L	1	1	3.1	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Turbidity (lab)	NTU	0.1	-	-	-	-	-	-	-	0.53	0.29	0.26	0.26	0.4	0.35	0.37	0.62	0.31	0.37	0.54
pH (lab)	pH units	0.1	-	-	6.5 | 9	-	-	6.5 | 9.0	6.5 | 9.0	7.49	7.47	7.47	7.47	7.45	7.47	7.46	7.49	7.45	7.47	7.48
Major Ions																				
Alkalinity, Bicarbonate	mg/L	1	25	-	-	-	-	-	-	21.5	19.4	19.5	19.4	19.1	19.6	18.8	18.9	18.4	18.7	18.8
Alkalinity, Carbonate	mg/L	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
Alkalinity, Total	mg/L	1	20.5	-	-	-	-	-	-	21.5	19.4	19.5	19.4	19.1	19.6	18.8	18.9	18.4	18.7	18.8
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
Calcium (D)	mg/L	0.01	-	-	-	-	-	-	-	9.93	8.8	8.91	9.02	8.86	9.15	8.18	8.22	8.19	8.16	8.25
Calcium (T)	mg/L	0.01 | 0.02	7.33	-	-	-	-	-	-	10.4	9.27	9.38	9.19	9.21	9.49	8.64	8.73	8.63	8.77	8.72
Chloride	mg/L	0.1	9.56	14	120	-	-	90	120	16.8	12.7	12.9	12.8	12.7	12.9	11.2	11.2	11.3	11.3	11.2
Fluoride	mg/L	0.02	0.028	0.0084	0.12	1.5	2.8	2.1	2.8	0.032	0.031	0.03	0.03	0.03	0.03	0.029	0.029	0.029	0.029	0.029
Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	-	1.78	1.49	1.52	1.51	1.49	1.55	1.36	1.35	1.35	1.35	1.36
Magnesium (T)	mg/L	0.004 | 0.01	1.18	-	-	-	-	-	-	1.92	1.57	1.62	1.58	1.58	1.62	1.45	1.46	1.41	1.45	1.44
Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-	1.23	1.09	1.08	1.12	1.06	1.11	1.02	1.01	1.02	1.05	1.05
Potassium (T)	mg/L	0.02 | 0.03	0.954	-	-	-	-	-	-	1.2	1.1	1.1	1.09	1.09	1.12	1.05	1.06	1.04	1.06	1.05
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	0.268	-	-	-	-	-	-	0.553	0.452	0.471	0.448	0.448	0.455	0.343	0.348	0.344	0.345	0.344
Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-	7.78	6.39	6.39	6.44	6.31	6.6	5.51	5.57	5.53	5.54	5.52
Sodium (T)	mg/L	0.02	4.85	5.3	-	-	-	-	-	8.36	6.49	6.65	6.51	6.45	6.68	5.8	5.89	5.72	5.9	5.84
Sulphate	mg/L	0.3	3.87	38	-	-	-	-	-	7.12	5.24	5.31	5.22	5.21	5.3	4.45	4.45	4.43	4.46	4.48
Nutrients																				
Ammonia (as N)	mg/L	0.005	0.0174	0.54	0.41 | 12.5	-	-	0.308 | 9.38	0.41 | 12.5	0.006	0.0176	0.0328	<0.005	<0.005	<0.005	<0.005	0.0307	<0.005	0.0115	<0.005
Nitrate (as N)	mg/L	0.005	0.018	0.25	2.9	10	-	2.17	2.9	0.0181	0.0084	0.007	0.0123	0.0154	0.0103	0.0196	0.0242	0.0132	0.0117	0.0209
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	-	0.0181	0.0084	0.007	0.0123	0.0154	0.0103	0.0196	0.0242	0.0132	0.0117	0.0209
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
Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.703	0.318	0.347	0.236	0.291	0.28	0.279	0.38	0.265	0.272	0.288
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
Total Diss Phosphorus	mg/L	0.001	0.00314	-	-	-	-	-	-	0.0028	0.0025	0.0018	0.0026	0.0026	0.0022	0.0021	0.0023	0.0024	0.0023	0.0023
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.359	0.348	0.371	0.286	0.321	0.34	0.329	0.37	0.343	0.341	0.354
Total Kjeldahl Nitrogen	mg/L	0.05	0.25	-	-	-	-	-	-	0.685	0.31	0.34	0.224	0.276	0.27	0.259	0.356	0.252	0.26	0.267
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-	0.341	0.34	0.364	0.274	0.306	0.33	0.309	0.346	0.33	0.329	0.333
Total Phosphorus	mg/L	0.001	0.006	0.0049	-	-	-	0.0075	0.01	0.0065	0.0045	0.0042	0.0066	0.0047	0.0047	0.0043	0.0048	0.0051	0.0046	0.0046
Organic/Inorganic Carbon																				
Dissolved Organic Carbon	mg/L	0.5	2.72	-	-	-	-	-	-	4.43	4.47	4.09	4.63	4.1	5.12	3.16	3.83	3.69	3.28	3.04
Total Organic Carbon	mg/L	0.5	3	-	-	-	-	-	-	4.49	3.91	3.5	3.85	3.66	3.9	3.08	3.18	3.12	3.11	3.09
Total Metals																				
Aluminum	ug/L	1	5.32	9.1	100	2900	-	75	100	2.4	1.8	2.5	1.9	1.8	1.9	5.5	-	2.3	2.6	2.2
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
Arsenic	ug/L	0.02	0.275	3.8	5	10	25	18.8	25	0.646	0.662	0.646	0.64	0.65	0.668	0.416	0.399	0.373	0.38	0.379
Barium	ug/L	0.02	8.05	77	-	2000	-	750	1000	9.08	8.72	8.78	8.82	8.79	8.89	8.64	8.64	8.76	8.76	8.55
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
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
Boron	ug/L	5	6.52	23	1500	5000	-	1120	1500	7.8	5.8	5.8	5.7	5.6	5.6	<5	<5	<5	<5	<5
Cadmium	ug/L	0.005	0.005	0.05	0.04 | 0.0708	7	-	0.03 | 0.0531	0.04 | 0.0708	<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	-	-	-	-	-	-	-	0.0079	0.0093	0.0094	0.0094	0.0092	0.0097	0.011	0.0103	0.0105	0.0105	0.0102
Chromium	ug/L	0.1	0.103	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
Cobalt	ug/L	0.005	0.016	-	0.78	-	-	0.585	0.78	0.0227	0.0157	0.0147	0.0146	0.0137	0.0145	0.0147	0.0135	0.0121	0.0132	0.0119
Copper	ug/L	0.05	0.86	2	-	2000	-	1500	2000	0.93	0.837	0.861	0.833	0.851	0.866	0.826	0.828	0.772	0.803	0.783
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
Iron	ug/L	1	15	42	300	-	1060	795	1060	15.3	11.2	11.2	12	10.9	11.4	18	13.4	10.1	11.3	10.4
Lanthanum	ug/L	0.01	-	-	-	-	-	-	-	0.02	0.016	0.016	0.017	0.017	0.016	0.021	0.018	0.016	0.017	0.016
Lead	ug/L	0.01	0.0222	0.15	-	5	-	3.75	5	<0.01	<0.01	<0.01	0.018	<0.01	<0.01	0.016	0.028	<0.01	<0.01	<0.01
Lithium	ug/L	0.5	0.72	-	-	-	-	-	-	1.16	0.96	0.96	0.94	0.95	0.94	0.89	0.88	0.87	0.87	0.87
Manganese	ug/L	0.05	3.06	5.5	-	120	-	90	120	6.45	3.62	3.6	3.69	3.57	3.78	2.99	2.96	2.82	2.94	2.72
Mercury	ug/L	0.1 | 0.5	8.00E-04	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
Molybdenum	ug/L	0.05	0.107	5.2	73	-	-	54.8	73	0.154	0.115	0.112	0.116	0.112	0.113	0.097	0.1	0.094	0.102	0.1
Nickel	ug/L	0.05	0.441	2.7	25	-	-	18.8	25	0.776	0.566	0.589	0.572	0.561	0.578	0.467	0.473	0.457	0.457	0.441
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
Phosphorus	ug/L	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
Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.59	1.53	1.53	1.53	1.53	1.56	1.5	1.51	1.48	1.52	1.5
Selenium	ug/L	0.04	0.049	0.16	1	50	-	0.75	1	0.052	<0.04	0.044	0.048	<0.04	0.048	0.046	0.042	0.044	0.043	0.043
Silicon	ug/L	50	-	-	-	-	-	-	-	307	224	221	224	223	224	176	175	171	171	169
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
Strontium	ug/L	0.02	36.1	-	2500	7000	-	1880	2500	58.9	48.6	49.7	48.8	48.7	50.2	44.2	44.6	43.5	44.4	43.8
Sulfur	ug/L	500	-	-	-	-	-	-	-	2590	1900	1940	1930	1910	1940	1640	1650	1600	1620	1650
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
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
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
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
Tin	ug/L	0.02	0.0384	-	-	-	-	-	-	<0.02	0.023	0.029	0.025	0.029	<0.02	0.052	0.052	0.037	0.024	<0.02
Titanium	ug/L	0.05	0.17	-	-	-	-	-	-	0.051	<0.05	0.089	<0.05	<0.05	<0.05	0.262	0.156	0.053	0.075	0.054
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
Uranium	ug/L	0.001	0.0164	1.5	15	20	-	11.2	15	0.0298	0.0199	0.0202	0.0214	0.0207	0.0226	0.0189	0.0205	0.0196	0.0206	0.0212
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
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
Zinc	ug/L	0.5	1.7	6.7	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.58	<0.5	<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
Dissolved Metals																				
Aluminum	ug/L	1	-	-	-	-	-	-	-	1.8	<1	<1	<1	1.2	<1	<1	<1	<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
Arsenic	ug/L	0.02	-	-	-	-	-	-	-	0.614	0.656	0.59	0.612	0.583	0.607	0.349	0.36	0.356	0.369	0.35
Barium	ug/L	0.02	-	-	-	-	-	-	-	8.81	8.75	8.7	8.79	8.59	8.95	8.51	8.59	8.36	8.33	8.36
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
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
Boron	ug/L	5	-	-	-	-	-	-	-	7.9	5.9	6	6.6	5.9	5.9	5.3	5.3	5.4	5.3	5.2
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
Cesium	ug/L	0.005	-	-	-	-	-	-	-	0.0078	0.0087	0.009	0.0088	0.0089	0.0088	0.0099	0.0096	0.0097	0.0094	0.0096
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
Cobalt	ug/L	0.005	-	-	-	-	-	-	-	0.0127	0.0089	0.0084	0.0086	0.0078	0.0086	0.0059	0.0056	0.0062	0.007	0.0065
Copper	ug/L	0.05	0.861	-	-	-	-	-	-	0.884	0.806	0.84	0.814	0.801	0.845	0.746	0.747	0.756	0.747	0.756
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
Iron	ug/L	1	-	-	-	-	-	-	-	4.2	3.2	3.5	3.5	2.8	3.2	2.7	3	2.7	3.2	3.6
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
Lead	ug/L	0.01	0.0125	-	4.48 | 7.4	-	-	3.36 | 5.55	4.48 | 7.4	<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	-	-	-	-	-	-	-	1.1	0.98	0.95	1.05	0.96	0.96	0.89	0.87	0.87	0.88	0.86
Manganese	ug/L	0.05	1.2	-	210 | 330	-	-	158 | 248	210 | 330	0.469	0.35	0.384	0.307	0.367	0.36	0.282	0.281	0.281	0.306	0.364
Mercury	ug/L	0.1 | 0.5	-	-	-	-	-	-	-	<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	-	-	-	-	-	-	-	0.155	0.113	0.113	0.109	0.105	0.114	0.089	0.091	0.09	0.094	0.094
Nickel	ug/L	0.05	-	-	-	-	-	-	-	0.72	0.574	0.579	0.557	0.529	0.593	0.424	0.438	0.435	0.432	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
Phosphorus	ug/L	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
Rubidium	ug/L	0.005	-	-	-	-	-	-	-	1.5	1.48	1.47	1.5	1.45	1.51	1.42	1.42	1.4	1.42	1.41
Selenium	ug/L	0.04	-	-	-	-	-	-	-	0.053	0.048	0.05	0.054	0.046	0.054	0.045	0.046	0.048	0.048	0.042
Silicon	ug/L	50	-	-	-	-	-	-	-	300	225	216	232	225	223	168	171	171	171	170
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
Strontium	ug/L	0.02	-	-	2500	-	-	1880	2500	57.4	47.8	47.5	48.5	47.6	49.3	42.7	42.4	42.6	42.5	42.8
Sulfur	ug/L	500	-	-	-	-	-	-	-	2530	1910	1840	1920	1860	1880	1580	1630	1620	1640	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
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
Thallium	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
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
Tin	ug/L	0.02	-	-	-	-	-	-	-	0.102	<0.02	0.051	0.032	<0.02	0.023	<0.02	0.023	<0.02	0.039	0.022
Titanium	ug/L	0.05	-	-	-	-	-	-	-	<0.05	0.067	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<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
Uranium	ug/L	0.001	-	-	-	-	-	-	-	0.0259	0.0194	0.022	0.0209	0.0176	0.0196	0.0167	0.0169	0.017	0.0164	0.0194
Vanadium	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
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
Zinc	ug/L	0.5	1.9	-	7.88 | 13.5	-	-	5.91 | 10.2	7.88 | 13.5	2.79	<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	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cyanides																				
Cyanide (Total)	mg/L	0.001	0.001	0.009	0.005	0.2	-	0.00375	0.005	<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
Cyanide (free)	mg/L	0.001	-	0.00035	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Notes

DL = 2023 detection limits

x = results were flagged as outliers (refer to Table A-7 for the list of samples flagged as outliers in 2023).

[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 , copper , lead , manganese , and zinc 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 2023.

[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.

APPENDIX D

PENINSULA LAKES WATER QUALITY – SUPPORTING INFORMATION

Appendix D1

Peninsula Lakes Water Quality – 2023 Summary Statistics

APPENDIX D1 – TABLES

Peninsula Lakes Normal Range Derivation

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 10^{th} and 90^{th} 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 10^{th} and 90^{th} 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 are provided in **Table D1-1**.

[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. Normal range values for the Peninsula Lakes water quality program

Parameter	Units	Detection Limit	Lake A8					Lake B7					Lake D7				
			N	Outliers	Method	Normal Range		N	Outliers	Method	Normal Range		N	Outliers	Method	Normal Range	
						Lower	Upper				Lower	Upper				Lower	Upper
Conventional Parameters																	
pH (field)	pH units	0.1	21	1	PI	7.7	8.3	25	0	PI(λ)	7	8.2	21	0	PI(λ)	7.6	8.3
Sp. Conductivity (field)	µS/cm	1	20	0	Percentile	100	334	24	1	Percentile	101	302	20	1	Percentile	111	159
Hardness	mg/L	0.2	20	0	Percentile	37	123	24	1	Percentile	42	118	20	1	Percentile	41	56
Alkalinity, Total	mg/L	1	15	0	PI(λ)	29	83.6	24	0	Percentile	29	110	20	1	Percentile	38	55
Total Dissolved Solids	mg/L		17	0	Percentile	57	152	19	0	Percentile	77	171	19	1	Percentile	57	81
Total Suspended Solids	mg/L	1	19	1	Percentile	0	4	24	0	PI(λ)	0	3	20	0	Percentile	0	2
Turbidity (lab)	NTU	0.1	17	0	PI(λ)	0.37	0.87	21	0	PI(λ)	0.34	0.69	18	0	PI	0.51	1.1
Alkalinity, Bicarbonate	mg/L	1.2	20	0	PI(λ)	36	91	24	0	Percentile	32	135	19	1	Percentile	46	68
Major Ions																	
Calcium (T)	mg/L	0.02	20	0	Percentile	12	40	24	1	Percentile	14	39	20	1	Percentile	13	17
Chloride	mg/L	0.1	20	0	Percentile	7	61	24	1	Percentile	5	25	20	0	Percentile	8	25
Fluoride	mg/L	0.02	13	0	PI	0.03	0.04	16	0	PI(λ)	0.02	0.04	16	0	Percentile	0.03	0.05
Magnesium (T)	mg/L	0.004	20	0	Percentile	1.7	5.6	24	0	Percentile	1.4	5.3	20	1	Percentile	2.2	3.3
Potassium (T)	mg/L	0.02	20	0	Percentile	0.7	2.5	24	0	Percentile	0.9	2.8	20	1	PI(λ)	1	1.8
Reactive Silica (SiO2)	mg/L	0.01	17	1	PI	0.18	1.3	21	0	Percentile	0.34	2.3	17	1	Percentile	0.14	0.28
Sodium (T)	mg/L	0.005	20	0	Percentile	1.9	8.4	24	0	Percentile	2.1	7.5	20	0	Percentile	5.2	17
Sulphate	mg/L	0.3	20	0	PI	2.7	9.3	24	0	Percentile	3.8	6	20	0	Percentile	2.5	10
Nutrients																	
Nitrate (as N)	mg/L	0.005	13	0	Percentile	0	0.015	16	1	Percentile	0	0.005	15	0	DL	0	0.005
Nitrite (as N)	mg/L	0.005	13	0	DL	0	0.0005	16	0	DL	0	0.005	15	0	DL	0	0.0005
Ammonia (as N)	mg/L	0.005	13	0	Percentile	0	0.011	16	0	Percentile	0	0.025	15	0	PI	0	0.009
Total Kjeldahl Nitrogen	mg/L	0.05	19	0	PI(λ)	0.22	0.63	23	0	PI(λ)	0.27	0.73	19	1	PI(λ)	0.26	0.52
Total Nitrogen	mg/L	0.05	10	0	PI	0.25	0.37	12	0	PI	0.28	0.42	12	0	PI	0.25	0.43
Total Phosphorus	mg/L	0.001	19	0	PI	0.004	0.009	23	1	PI(λ)	0.006	0.01	20	1	Percentile	0.01	0.02
Total Diss Phosphorus	mg/L	0.001	19	0	PI(λ)	0.002	0.006	24	0	PI(λ)	0.002	0.008	19	1	PI(λ)	0.003	0.008
Orthophosphate (PO4-P)	mg/L	0.001	19	0	Percentile	0	0.0023	24	1	DL	0	0.001	19	0	Percentile	0	0.003
Organic/Inorganic Carbon																	
Total Organic Carbon	mg/L	0.5	17	1	PI	3.5	4.7	23	1	PI(λ)	4.6	7.6	19	0	Percentile	3.5	14
Dissolved Organic Carbon	mg/L	0.5	14	1	PI	3.5	4.9	17	1	PI	4.8	5.5	15	0	PI(λ)	3.4	5.1
Metals																	
Aluminum (T)	µg/L	0.3	13	0	PI(λ)	1.1	3	16	0	PI(λ)	1.4	6.6	15	0	PI	3.8	6.7
Antimony (T)	µg/L	0.02	13	0	Percentile	0	0.4	16	0	DL	0	0.02	15	0	Percentile	0	0.03
Arsenic (T)	µg/L	0.02	13	0	PI	1.7	2.4	16	0	PI(λ)	1.3	1.8	15	0	PI	0.9	1.2
Barium (T)	µg/L	0.05	13	0	PI	23	32	16	0	Percentile	18	20	15	0	PI	15	17
Beryllium (T)	µg/L	0.01	13	0	DL	0	0.01	16	0	DL	0	0.01	15	0	DL	0	0.01

Table D1-1. Normal range values for the Peninsula Lakes water quality program

Parameter	Units	Detection Limit	Lake A8					Lake B7					Lake D7				
			N	Outliers	Method	Normal Range		N	Outliers	Method	Normal Range		N	Outliers	Method	Normal Range	
						Lower	Upper				Lower	Upper				Lower	Upper
Bismuth (T)	µg/L	0.01	13	0	DL	0	0.01	16	0	DL	0	0.01	15	0	DL	0	0.01
Boron (T)	µg/L	1	13	0	Percentile	2.5	5	16	0	Percentile	2.5	8	15	0	PI	9.4	17
Cadmium (T)	µg/L	0.005	13	0	DL	0	0.005	16	1	Percentile	0	0.007	15	1	DL	0	0.005
Chromium (T)	µg/L	0.06	13	0	DL	0	0.06	16	0	DL	0	0.06	15	0	DL	0	0.06
Cobalt (T)	µg/L	0.01	13	0	PI	0.02	0.05	16	1	PI	0.03	0.05	15	0	Percentile	0.04	0.05
Copper (T)	µg/L	0.1	13	0	PI	0.54	0.89	16	0	Percentile	0.6	1.13	15	0	PI	0.55	1
Iron (T)	µg/L	1	13	0	PI	18	67	16	0	PI	51	103	15	0	PI(λ)	41	112
Lead (T)	µg/L	0.01	13	0	Percentile	0.01	0.03	16	0	Percentile	0.01	0.08	15	0	Percentile	0.01	0.02
Lithium (T)	µg/L	0.5	13	0	Percentile	7.5	10	16	0	PI(λ)	4.1	7.5	15	0	PI	1.2	1.9
Manganese (T)	µg/L	0.05	13	0	PI	3	13	16	0	Percentile	4.2	8.6	15	0	PI	8.6	13
Mercury (T)	µg/L	0.0005	13	0	PI	0	0.0012	16	0	PI(λ)	0	0.004	15	0	PI	0	0.001
Molybdenum (T)	µg/L	0.05	13	0	Percentile	0.17	0.22	16	0	PI(λ)	0.14	0.24	15	0	PI(λ)	0.28	0.48
Nickel (T)	µg/L	0.06	13	0	PI	0.75	0.92	16	0	PI(λ)	0.81	1.4	15	0	PI	0.55	0.75
Selenium (T)	µg/L	0.02	13	0	DL	0	0.02	16	0	Percentile	0.02	0.04	15	0	Percentile	0.02	0.06
Silver (T)	µg/L	0.005	13	0	DL	0	0.005	16	1	DL	0	0.005	15	0	DL	0	0.005
Strontium (T)	µg/L	0.05	13	0	PI(λ)	203	273	16	0	PI	136	155	15	0	PI(λ)	63	83
Thallium (T)	µg/L	0.005	13	0	DL	0	0.005	16	0	Percentile	0	0.005	15	0	DL	0	0.005
Tin (T)	µg/L	0.05	13	0	DL	0	0.05	16	0	DL	0	0.05	15	0	DL	0	0.05
Titanium (T)	µg/L	0.1	13	0	Percentile	0.05	0.25	16	0	Percentile	0	0.25	15	0	PI(λ)	0.16	0.34
Uranium (T)	µg/L	0.01	13	0	PI(λ)	0.027	0.054	16	0	PI	0.023	0.03	15	0	PI	0.06	0.1
Vanadium (T)	µg/L	0.01	13	0	DL	0	0.01	16	1	DL	0	0.01	15	0	PI(λ)	0.04	0.07
Zinc (T)	µg/L	0.8	13	0	Percentile	0.4	1.2	16	1	Percentile	0	1.9	15	0	Percentile	0	2
Zinc (D)	µg/L	0.8	13	0	Percentile	0	8.5	16	0	Percentile	0	2.2	15	0	Percentile	0	1.4
Cyanides																	
Cyanide (Total)	mg/L	0.001	17	0	DL	0	0.001	23	0	DL	0	0.001	18	0	DL	0	0.001

Table D1-2. Lake A8 – Summary statistics and screening results for the 2023 sampling events (July and August)

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	Lake A8 July and August 2023 Sampling										
						N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Field Measurements																
Temperature	C	-	-	-	-	6	0	0	14.2	14.1	0.546	0.223	13.5	15.1	-	-
Sp. Conductivity (field)	µS/cm	-	334	-	-	6	0	0	294	297	21.6	8.81	255	313	-	-
pH (field)	pH units	-	7.7 | 8.3	-	6.5 | 9	6	0	0	8	8.06	0.195	0.0798	7.61	8.16	-	0
DO (mg/L)	mg/L	-	-	-	6.5	6	0	0	9.91	9.9	0.226	0.0924	9.66	10.2	-	0
DO (%)	%	-	-	-	-	6	0	0	99.4	99.4	3.16	1.29	96.3	102	-	-
Conventional Parameters																
Conductivity (lab)	µS/cm	1	-	-	-	6	0	0	289	291	18.8	7.67	256	307	-	-
Hardness	mg/L	0.5	-	-	-	6	0	0	114	115	8.07	3.29	105	123	-	-
pH (lab)	pH units	0.1	-	-	6.5 | 9	6	0	0	7.94	7.94	0.0726	0.0296	7.84	8.01	-	0
Total Dissolved Solids	mg/L	15	-	162	375	6	0	0	212	210	27.5	11.2	180	244	-	0
Total Dissolved Solids (Calculated)	mg/L	1	152	-	375	6	0	0	188	189	12.5	5.09	166	200	6	0
Total Suspended Solids	mg/L	1	4	2.9	-	6	2	33	1.22	1.3	0.611	0.25	1	1.9	0	-
Turbidity (lab)	NTU	0.1	0.87	-	-	6	0	0	0.458	0.485	0.11	0.0448	0.31	0.6	0	-
Major Ions																
Alkalinity, Bicarbonate	mg/L	1	91	-	-	6	0	0	58.9	58.5	5.65	2.31	52.7	66.4	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	51	-	6	0	0	58.9	58.5	5.65	2.31	52.7	66.4	0	-
Bromide	mg/L	0.1	-	-	-	6	0	0	0.23	0.245	0.029	0.0118	0.18	0.25	-	-
Calcium (D)	mg/L	0.01	-	-	-	6	0	0	37.3	37.6	2.65	1.08	34.1	40.3	-	-
Calcium (T)	mg/L	0.01	40	47	-	6	0	0	37.2	36.9	2.8	1.14	33	41.2	1	-
Chloride	mg/L	0.1	61	74	90	6	0	0	46.1	48.1	4.9	2	38.1	50.2	0	0
Fluoride	mg/L	0.02	0.04	0.038	2.1	6	0	0	0.0418	0.041	0.00325	0.00133	0.039	0.046	3	0
Magnesium (D)	mg/L	0.004	-	-	-	6	0	0	5.17	5.2	0.355	0.145	4.75	5.55	-	-
Magnesium (T)	mg/L	0.004	5.6	6.9	-	6	0	0	5.08	5.06	0.42	0.172	4.45	5.65	1	-
Potassium (D)	mg/L	0.02	-	-	-	6	0	0	2.24	2.28	0.209	0.0852	1.98	2.46	-	-
Potassium (T)	mg/L	0.02	2.5	2.3	-	6	0	0	2.23	2.2	0.255	0.104	1.83	2.56	1	-
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	1.3	-	-	6	0	0	0.845	0.78	0.662	0.27	0.226	1.81	1	-
Sodium (D)	mg/L	0.02	-	-	-	6	0	0	11.6	12.2	1.49	0.609	9.59	12.8	-	-
Sodium (T)	mg/L	0.02	8.4	8.3	-	6	0	0	11.6	11.9	1.5	0.612	9.14	13.2	6	-
Sulphate	mg/L	0.3	9.3	11.6	164	6	0	0	13.7	14.2	1.65	0.674	11.2	15.2	6	0
Nutrients																
Ammonia (as N)	mg/L	0.005	0.011	0.118	0.106	6	0	0	0.0122	0.0119	0.00231	0.000941	0.0094	0.0154	4	0
Nitrate (as N)	mg/L	0.005	0.015	0.2	2.17	6	3	50	-	0.00605	-	-	0.005	0.0178	1	0
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	6	3	50	-	0.0061	-	-	0.0051	0.0178	-	-
Nitrite (as N)	mg/L	0.001	0.0005	-	0.045	6	6	100	-	0.001	-	-	0.001	0.001	0	0
Nitrogen	mg/L	0.05	-	-	-	6	0	0	0.342	0.347	0.0503	0.0205	0.286	0.415	-	-
Orthophosphate (PO4-P)	mg/L	0.001	0.0023	0.00215	-	6	6	100	-	0.001	-	-	0.001	0.001	0	-

Table D1-2. Lake A8 – Summary statistics and screening results for the 2023 sampling events (July and August)

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	Lake A8 July and August 2023 Sampling										
						N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Total Diss Phosphorus	mg/L	0.001	0.006	0.006	-	6	0	0	0.00293	0.0029	0.000807	0.000329	0.002	0.0042	0	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	6	0	0	0.304	0.308	0.0302	0.0123	0.267	0.34	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.63	0.58	-	6	0	0	0.336	0.336	0.0485	0.0198	0.286	0.415	0	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	6	0	0	0.298	0.292	0.0292	0.0119	0.267	0.34	-	-
Total Phosphorus	mg/L	0.001	0.009	-	0.0075	6	0	0	0.00568	0.0051	0.00123	0.000504	0.0046	0.0074	0	0
Organic/Inorganic Carbon																
Dissolved Organic Carbon	mg/L	0.5	4.9	-	-	6	0	0	5.92	5.84	1.21	0.495	4.62	7.57	4	-
Total Organic Carbon	mg/L	0.5	4.7	-	-	6	0	0	5.3	5.1	1.2	0.489	4.12	7.33	3	-
Total Metals																
Aluminum	µg/L	1	3	4.6	75	6	0	0	3.63	3.45	0.944	0.385	2.5	5	4	0
Antimony	µg/L	0.02	0.4	0.2	4.5	6	0	0	0.0518	0.0545	0.0143	0.00584	0.036	0.074	0	0
Arsenic	µg/L	0.02	2.4	1.7	18.8	6	0	0	9.75	8.75	4.19	1.71	4.74	14.8	6	0
Barium	µg/L	0.02	32	23	750	6	0	0	28.2	27.9	1.67	0.682	26	30.9	0	0
Beryllium	µg/L	0.005	0.01	0.47	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Bismuth	µg/L	0.005	0.01	0.076	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Boron	µg/L	5	5	27	1120	6	1	17	6.98	7.9	2.7	1.1	5	9.4	4	0
Cadmium	µg/L	0.005	0.005	0.083	0.124	6	6	100	-	0.005	-	-	0.005	0.005	0	0
Cesium	µg/L	0.005	-	-	-	6	0	0	0.0228	0.0222	0.00566	0.00231	0.0147	0.0294	-	-
Chromium	µg/L	0.1	0.06	1.87	3.75	6	6	100	-	0.1	-	-	0.1	0.1	0	0
Cobalt	µg/L	0.005	0.05	0.24	0.78	6	0	0	0.0454	0.0445	0.00508	0.00207	0.0397	0.0533	1	0
Copper	µg/L	0.05	0.89	2.7	1.85	6	0	0	0.906	0.891	0.0505	0.0206	0.854	1	3	0
Gallium	µg/L	0.05	-	-	-	6	6	100	-	0.05	-	-	0.05	0.05	0	-
Iron	µg/L	1	67	96	795	6	0	0	67.3	69.8	21.3	8.68	41.9	88.9	3	0
Lanthanum	µg/L	0.01	-	-	-	6	2	33	0.0103	0.0105	0.0055	0.00225	0.01	0.02	-	-
Lead	µg/L	0.01	0.03	2	3.75	6	0	0	0.0433	0.046	0.0104	0.00424	0.029	0.056	5	0
Lithium	µg/L	0.5	10	5.3	-	6	0	0	9.12	9.68	1.23	0.5	7.03	10.1	1	-
Manganese	µg/L	0.05	13	30	90	6	0	0	11.5	12.2	3.25	1.32	7.67	15.6	2	0
Mercury	µg/L	0.5	0.0012	0.04	0.0195	6	1	17	0.000603	0.000535	0.000305	0.000124	0.0005	0.00117	0	0
Molybdenum	µg/L	0.05	0.22	0.59	54.8	6	0	0	0.405	0.404	0.0617	0.0252	0.308	0.478	6	0
Nickel	µg/L	0.05	0.92	2.3	74.4	6	0	0	0.821	0.802	0.0928	0.0379	0.728	0.966	1	0
Niobium	µg/L	0.1	-	-	-	6	6	100	-	0.1	-	-	0.1	0.1	0	-
Phosphorus	µg/L	50	-	-	-	6	6	100	-	50	-	-	50	50	0	-
Rhenium	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Rubidium	µg/L	0.005	-	-	-	6	0	0	2.22	2.18	0.241	0.0982	1.84	2.54	-	-
Selenium	µg/L	0.04	0.02	0.16	0.75	6	1	17	0.0383	0.042	0.00907	0.0037	0.04	0.043	6	0
Silicon	µg/L	50	-	-	-	6	0	0	424	388	335	137	116	940	-	-
Silver	µg/L	0.005	0.005	0.068	0.188	6	6	100	-	0.005	-	-	0.005	0.005	0	0
Strontium	µg/L	0.02	273	101	1880	6	0	0	243	246	25.9	10.6	202	276	1	0
Sulfur	µg/L	500	-	-	-	6	0	0	4990	5090	537	219	4070	5500	-	-
Tantalum	µg/L	0.1	-	-	-	6	6	100	-	0.1	-	-	0.1	0.1	0	-

Table D1-2. Lake A8 – Summary statistics and screening results for the 2023 sampling events (July and August)

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	Lake A8 July and August 2023 Sampling										
						N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Tellurium	µg/L	0.02	-	-	-	6	6	100	-	0.02	-	-	0.02	0.02	0	-
Thallium	µg/L	0.005	0.005	0.047	0.6	6	6	100	-	0.005	-	-	0.005	0.005	0	0
Thorium	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Tin	µg/L	0.02	0.05	0.26	-	6	1	17	0.0327	0.0335	0.0151	0.00615	0.02	0.049	0	-
Titanium	µg/L	0.05	0.25	1.25	-	6	2	33	0.0863	0.0855	0.0556	0.0227	0.05	0.15	0	-
Tungsten	µg/L	0.01	-	29	-	6	0	0	0.0945	0.124	0.0489	0.02	0.029	0.13	-	-
Uranium	µg/L	0.001	0.054	0.061	11.2	6	0	0	0.0831	0.0852	0.0113	0.00461	0.0696	0.096	6	0
Vanadium	µg/L	0.05	0.01	0.35	90	6	6	100	-	0.05	-	-	0.05	0.05	0	0
Yttrium	µg/L	0.01	-	-	-	6	5	83	-	0.01	-	-	0.01	0.01	0	-
Zinc	µg/L	0.5	1.2	5.1	-	6	4	67	-	0.5	-	-	0.5	0.58	0	-
Zirconium	µg/L	0.01	-	-	-	6	6	100	-	0.01	-	-	0.01	0.01	0	-
Dissolved Metals																
Aluminum	µg/L	1	-	-	-	6	0	0	3.5	3.6	0.97	0.396	2.3	5	-	-
Antimony	µg/L	0.02	-	-	-	6	0	0	0.0485	0.0535	0.0102	0.00417	0.035	0.057	-	-
Arsenic	µg/L	0.02	-	-	-	6	0	0	8.81	8.09	3.74	1.53	3.83	13.3	-	-
Barium	µg/L	0.02	-	-	-	6	0	0	27.7	27.5	2.19	0.896	24.6	30.2	-	-
Beryllium	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Bismuth	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Boron	µg/L	5	-	-	-	6	1	17	7.25	8.15	2.42	0.99	5	8.9	-	-
Cadmium	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Cesium	µg/L	0.005	-	-	-	6	0	0	0.0221	0.0215	0.00533	0.00218	0.0138	0.0281	-	-
Chromium	µg/L	0.1	-	-	-	6	6	100	-	0.1	-	-	0.1	0.1	0	-
Cobalt	µg/L	0.005	-	-	-	6	0	0	0.0261	0.0254	0.00303	0.00123	0.0236	0.0319	-	-
Copper	µg/L	0.05	-	-	-	6	0	0	0.922	0.928	0.0592	0.0242	0.834	1.01	-	-
Gallium	µg/L	0.05	-	-	-	6	6	100	-	0.05	-	-	0.05	0.05	0	-
Iron	µg/L	1	-	-	-	6	0	0	37.8	35.4	17.1	6.97	21.7	66.6	-	-
Lanthanum	µg/L	0.01	-	-	-	6	6	100	-	0.01	-	-	0.01	0.01	0	-
Lead	µg/L	0.01	-	-	6.88	6	0	0	0.0227	0.022	0.00665	0.00272	0.014	0.034	-	0
Lithium	µg/L	0.5	-	-	-	6	0	0	9.14	9.58	1.24	0.506	6.97	10.2	-	-
Manganese	µg/L	0.05	-	-	278	6	0	0	1.35	1.25	0.567	0.232	0.795	2.14	-	0
Mercury	µg/L	0.5	-	-	-	6	3	50	-	5.10E-04	-	-	5.00E-04	0.00343	0	-
Molybdenum	µg/L	0.05	-	-	-	6	0	0	0.42	0.43	0.0686	0.028	0.316	0.488	-	-
Nickel	µg/L	0.05	-	-	-	6	0	0	0.789	0.772	0.0595	0.0243	0.726	0.878	-	-
Niobium	µg/L	0.1	-	-	-	6	6	100	-	0.1	-	-	0.1	0.1	0	-
Phosphorus	µg/L	50	-	-	-	6	6	100	-	50	-	-	50	50	0	-
Rhenium	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Rubidium	µg/L	0.005	-	-	-	6	0	0	2.14	2.12	0.244	0.0997	1.77	2.41	-	-
Selenium	µg/L	0.04	-	-	-	6	6	100	-	0.04	-	-	0.04	0.04	0	-
Silicon	µg/L	50	-	-	-	6	0	0	428	391	336	137	124	952	-	-
Silver	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-

Table D1-2. Lake A8 – Summary statistics and screening results for the 2023 sampling events (July and August)

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	Lake A8 July and August 2023 Sampling										
						N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Strontium	µg/L	0.02	-	-	1880	6	0	0	240	244	28.6	11.7	201	270	-	0
Sulfur	µg/L	500	-	-	-	6	0	0	4990	5080	562	230	4170	5630	-	-
Tantalum	µg/L	0.1	-	-	-	6	6	100	-	0.1	-	-	0.1	0.1	0	-
Tellurium	µg/L	0.02	-	-	-	6	6	100	-	0.02	-	-	0.02	0.02	0	-
Thallium	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Thorium	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Tin	µg/L	0.02	-	-	-	6	1	17	0.0307	0.0295	0.0142	0.00579	0.02	0.053	-	-
Titanium	µg/L	0.05	-	-	-	6	4	67	-	0.05	-	-	0.05	0.057	-	-
Tungsten	µg/L	0.01	-	-	-	6	0	0	0.0913	0.118	0.0465	0.019	0.031	0.128	-	-
Uranium	µg/L	0.001	-	-	-	6	0	0	0.0855	0.0854	0.0119	0.00487	0.0709	0.0989	-	-
Vanadium	µg/L	0.05	-	-	-	6	6	100	-	0.05	-	-	0.05	0.05	0	-
Yttrium	µg/L	0.01	-	-	-	6	5	83	-	0.01	-	-	0.01	0.01	0	-
Zinc	µg/L	0.5	8.5	-	20.2	6	2	33	0.968	0.71	0.788	0.322	0.5	2.06	0	0
Zirconium	µg/L	0.01	-	-	-	6	6	100	-	0.01	-	-	0.01	0.01	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	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] 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.
Grey shading indicates an exceedance of normal range or action level thresholds.
Abbreviations: DL = detection limit, NR = normal range, Act Lvl = action level.

Table D1-3. Lake B7 – Summary statistics and screening results for 2023 sampling events (July, August, and October)

Parameter	Units	DL (min | max)	Normal Range (min | max)	Action Level[b] (min | max)	Lake B7 July, August, and October 2023 Sampling										
					N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Field Measurements															
Temperature	C	-	-	-	9	0	0	10.6	13.8	5.43	1.81	3.24	15.4	-	-
Sp. Conductivity (field)	µS/cm	-	302	-	9	0	0	284	287	12.5	4.15	266	297	-	-
pH (field)	pH units	-	7.7 | 8.3	6.5 | 9	9	0	0	7.91	8.08	0.314	0.105	7.44	8.21	-	0
DO (mg/L)	mg/L	-	-	6.5	9	0	0	11	10.2	1.35	0.449	9.84	12.8	-	0
DO (%)	%	-	-	-	9	0	0	100	98.9	2.85	0.949	96.5	105	-	-
Conventional Parameters															
Conductivity (lab)	µS/cm	1	-	-	9	0	0	282	282	15.9	5.29	262	303	-	-
Hardness	mg/L	0.5	-	-	9	0	0	112	114	5.71	1.9	100	118	-	-
pH (lab)	pH units	0.1	-	6.5 | 9	9	0	0	7.91	7.87	0.0566	0.0189	7.86	7.99	-	0
Total Dissolved Solids	mg/L	15	-	375	9	0	0	195	196	25	8.33	145	226	-	0
Total Dissolved Solids (Calculated)	mg/L	1	171	375	9	0	0	183	183	10.5	3.5	170	197	8	0
Total Suspended Solids	mg/L	1	3	-	9	6	67	-	1	-	-	1	2	0	-
Turbidity (lab)	NTU	0.1	0.69	-	9	0	0	0.563	0.47	0.16	0.0533	0.4	0.87	1	-
Major Ions															
Alkalinity, Bicarbonate	mg/L	1	135	-	9	0	0	58.6	60.2	3.5	1.17	53.5	62	0	-
Alkalinity, Carbonate	mg/L	1	-	-	9	9	100	-	1	-	-	1	1	0	-
Alkalinity, Hydroxide	mg/L	1	-	-	9	9	100	-	1	-	-	1	1	0	-
Alkalinity, Total	mg/L	1	110	-	9	0	0	58.6	60.2	3.5	1.17	53.5	62	0	-
Bromide	mg/L	0.1	-	-	9	0	0	0.177	0.17	0.01	0.00333	0.17	0.19	-	-
Calcium (D)	mg/L	0.01	-	-	9	0	0	38.1	38.9	1.87	0.624	34.4	40.1	-	-
Calcium (T)	mg/L	0.01	39	-	9	0	0	37.8	38.3	1.01	0.337	36.4	39.2	1	-
Chloride	mg/L	0.1	25	90	9	0	0	44.4	44	2.16	0.719	41.8	47.2	9	0
Fluoride	mg/L	0.02	0.04	2.1	9	0	0	0.0403	0.041	0.00206	0.000687	0.038	0.043	5	0
Magnesium (D)	mg/L	0.004	-	-	9	0	0	4.12	4.17	0.252	0.084	3.52	4.36	-	-
Magnesium (T)	mg/L	0.004	5.3	-	9	0	0	4.03	4.12	0.212	0.0708	3.74	4.31	0	-
Potassium (D)	mg/L	0.02	-	-	9	0	0	2.22	2.25	0.117	0.0389	1.96	2.32	-	-
Potassium (T)	mg/L	0.02	2.8	-	9	0	0	2.21	2.21	0.0991	0.033	2.09	2.35	0	-
Reactive Silica (SiO2)	mg/L	0.02 | 0.1	2.3	-	9	0	0	1.01	0.782	0.403	0.134	0.704	1.58	0	-
Sodium (D)	mg/L	0.02	-	-	9	0	0	10.2	10.3	0.406	0.135	9.25	10.6	-	-
Sodium (T)	mg/L	0.02	7.5	-	9	0	0	10.1	10.1	0.301	0.1	9.64	10.5	9	-
Sulphate	mg/L	0.3	6	164	9	0	0	12.3	12.2	0.801	0.267	11.4	13.4	9	0
Nutrients															
Ammonia (as N)	mg/L	0.005	0.025	0.148	9	0	0	0.0239	0.0204	0.0112	0.00374	0.0141	0.0481	2	0
Nitrate (as N)	mg/L	0.005	0.005	2.17	9	5	56	-	0.005	-	-	0.005	0.0116	4	0
Nitrate + Nitrite (as N)	mg/L	0.0051 | 0.0224	-	-	9	8	89	-	0.0051	-	-	0.0051	0.0224	-	-
Nitrite (as N)	mg/L	0.001	0.005	0.045	9	9	100	-	0.001	-	-	0.001	0.001	0	0
Nitrogen	mg/L	0.05	-	-	6	0	0	0.392	0.38	0.0463	0.0189	0.337	0.46	-	-
Orthophosphate (PO4-P)	mg/L	0.001	0.001	-	9	9	100	-	0.001	-	-	0.001	0.001	0	-

Table D1-3. Lake B7 – Summary statistics and screening results for 2023 sampling events (July, August, and October)

Parameter	Units	DL (min | max)	Normal Range (min | max)	Action Level[b] (min | max)	Lake B7 July, August, and October 2023 Sampling										
					N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Total Diss Phosphorus	mg/L	0.001	0.008	-	9	0	0	0.00313	0.0029	0.000436	0.000145	0.0026	0.0038	0	-
Total Dissolved Nitrogen	mg/L	0.05 | 0.055	-	-	9	0	0	0.376	0.377	0.0287	0.00955	0.335	0.423	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.73	-	9	0	0	0.41	0.422	0.0488	0.0163	0.337	0.48	0	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	9	0	0	0.375	0.377	0.0269	0.00897	0.335	0.414	-	-
Total Phosphorus	mg/L	0.001	0.01	0.0075	9	0	0	0.00671	0.0066	0.000966	0.000322	0.0056	0.0087	0	1
Organic/Inorganic Carbon															
Dissolved Organic Carbon	mg/L	0.5	5.5	-	9	0	0	6.43	6.27	1.04	0.345	5.13	7.81	7	-
Total Organic Carbon	mg/L	0.5	7.6	-	9	0	0	6.28	6.51	0.863	0.288	5.16	7.34	0	-
Total Metals															
Aluminum	µg/L	1	6.6	75	9	0	0	2.44	2.5	0.654	0.218	1.2	3.3	0	0
Antimony	µg/L	0.02	0.02	4.5	9	0	0	0.0437	0.045	0.00278	0.000928	0.038	0.046	9	0
Arsenic	µg/L	0.02	1.8	18.8	9	0	0	14.9	13.8	4.94	1.65	9.64	23.4	9	3
Barium	µg/L	0.02	20	750	9	0	0	29.1	28.7	1.11	0.369	28.1	31.5	9	0
Beryllium	µg/L	0.005	0.01	-	9	9	100	-	0.005	-	-	0.005	0.005	0	-
Bismuth	µg/L	0.005	0.01	-	9	9	100	-	0.005	-	-	0.005	0.005	0	-
Boron	µg/L	5	8	1120	9	0	0	16	15.4	1.44	0.479	14.6	17.9	0	0
Cadmium	µg/L	0.005	0.007	0.118	9	9	100	-	0.005	-	-	0.005	0.005	0	0
Cesium	µg/L	0.005	-	-	9	0	0	0.025	0.0237	0.00429	0.00143	0.0204	0.0307	-	-
Chromium	µg/L	0.1	0.06	3.75	9	9	100	-	0.1	-	-	0.1	0.1	0	0
Cobalt	µg/L	0.005	0.05	0.765	9	0	0	0.0645	0.0666	0.0208	0.00692	0.0381	0.0882	6	0
Copper	µg/L	0.05	1.13	1.77	9	0	0	0.891	0.863	0.106	0.0354	0.766	1.06	0	0
Gallium	µg/L	0.05	-	-	9	9	100	-	0.05	-	-	0.05	0.05	0	-
Iron	µg/L	1	103	795	9	0	0	68.7	66.6	30.1	10	37.8	132	1	0
Lanthanum	µg/L	0.01	-	-	9	0	0	0.0154	0.015	0.00194	0.000648	0.013	0.019	-	-
Lead	µg/L	0.01	0.08	3.75	9	0	0	0.0696	0.069	0.0193	0.00644	0.04	0.104	2	0
Lithium	µg/L	0.5	7.5	-	9	0	0	17.1	17.4	0.671	0.224	16.2	18	9	-
Manganese	µg/L	0.05	8.6	90	9	0	0	10.1	10.7	6.06	2.02	3.28	22.4	6	0
Mercury	µg/L	0.5	0.004	0.0195	9	6	67	-	0.0005	-	-	0.0005	0.00057	0	0
Molybdenum	µg/L	0.05	0.24	54.8	9	0	0	0.372	0.365	0.0279	0.0093	0.342	0.414	9	0
Nickel	µg/L	0.05	1.4	71.7	9	0	0	0.902	0.899	0.0392	0.0131	0.872	1	0	0
Niobium	µg/L	0.1	-	-	9	9	100	-	0.1	-	-	0.1	0.1	0	-
Phosphorus	µg/L	50	-	-	9	9	100	-	50	-	-	50	50	0	-
Rhenium	µg/L	0.005	-	-	9	9	100	-	0.005	-	-	0.005	0.005	0	-
Rubidium	µg/L	0.005	-	-	9	0	0	2.22	2.24	0.13	0.0434	2.05	2.43	-	-
Selenium	µg/L	0.04	0.04	0.75	9	0	0	0.0501	0.049	0.00486	0.00162	0.044	0.058	9	0
Silicon	µg/L	50	-	-	9	0	0	503	378	202	67.3	352	797	-	-
Silver	µg/L	0.005	0.005	0.188	9	9	100	-	0.005	-	-	0.005	0.005	0	0
Strontium	µg/L	0.02	155	1880	9	0	0	313	312	9.75	3.25	301	326	9	0
Sulfur	µg/L	500	-	-	9	0	0	4480	4510	326	109	4060	4980	0	-
Tantalum	µg/L	0.1	-	-	9	9	100	-	0.1	-	-	0.1	0.1	0	-

Table D1-3. Lake B7 – Summary statistics and screening results for 2023 sampling events (July, August, and October)

Parameter	Units	DL (min | max)	Normal Range (min | max)	Action Level[b] (min | max)	Lake B7 July, August, and October 2023 Sampling										
					N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Tellurium	µg/L	0.02	-	-	9	9	100	-	0.02	-	-	0.02	0.02	0	-
Thallium	µg/L	0.005	0.005	0.6	9	5	56	-	0.005	-	-	0.005	0.0068	4	0
Thorium	µg/L	0.005	-	-	9	8	89	-	0.005	-	-	0.005	0.0102	-	-
Tin	µg/L	0.02	0.05	-	9	1	11	0.033	0.033	0.014	0.00467	0.02	0.062	1	-
Titanium	µg/L	0.05	0.25	-	9	4	44	0.0452	0.055	0.0196	0.00652	0.05	0.069	0	-
Tungsten	µg/L	0.01	-	-	9	0	0	0.0352	0.033	0.00913	0.00304	0.025	0.047	-	-
Uranium	µg/L	0.001	0.03	11.2	9	0	0	0.0812	0.0819	0.00279	0.000931	0.0752	0.0844	9	0
Vanadium	µg/L	0.05	0.01	90	9	3	33	0.0517	0.058	0.0215	0.00717	0.05	0.081	9	0
Yttrium	µg/L	0.01	-	-	9	8	89	-	0.01	-	-	0.01	0.01	0	-
Zinc	µg/L	0.5	1.9	-	9	6	67	-	0.5	-	-	0.5	1.27	0	-
Zirconium	µg/L	0.01	-	-	9	9	100	-	0.01	-	-	0.01	0.01	0	-
Dissolved Metals															
Aluminum	µg/L	1	-	-	9	1	11	2.76	2.5	1.99	0.664	1	7.2	-	-
Antimony	µg/L	0.02 | 0.03	-	-	9	0	0	0.0453	0.046	0.00442	0.00147	0.04	0.055	-	-
Arsenic	µg/L	0.02	-	-	9	0	0	13.2	12.1	4.21	1.4	8.61	20.3	-	-
Barium	µg/L	0.02	-	-	9	0	0	28.9	28.8	1.9	0.633	26	32.5	-	-
Beryllium	µg/L	0.005	-	-	9	9	100	-	0.005	-	-	0.005	0.005	0	-
Bismuth	µg/L	0.005	-	-	9	9	100	-	0.005	-	-	0.005	0.005	0	-
Boron	µg/L	5	-	-	9	0	0	16.4	16.4	0.539	0.18	15.2	16.9	0	-
Cadmium	µg/L	0.005	-	-	9	9	100	-	0.005	-	-	0.005	0.005	0	-
Cesium	µg/L	0.005	-	-	9	0	0	0.025	0.023	0.00391	0.0013	0.0211	0.0304	-	-
Chromium	µg/L	0.1 | 0.5	-	-	9	9	100	-	0.1	-	-	0.1	0.5	-	-
Cobalt	µg/L	0.005 | 0.05	-	-	9	1	11	0.0428	0.0483	0.0127	0.00422	0.0298	0.0611	-	-
Copper	µg/L	0.05 | 0.2	-	-	9	0	0	1.24	0.972	0.926	0.309	0.786	3.7	-	-
Gallium	µg/L	0.05	-	-	9	9	100	-	0.05	-	-	0.05	0.05	0	-
Iron	µg/L	1 | 10	-	-	9	1	11	33.1	30.4	20.2	6.72	10	65.1	-	-
Lanthanum	µg/L	0.01	-	-	9	8	89	-	0.01	-	-	0.01	0.012	-	-
Lead	µg/L	0.01 | 0.05	-	7.18	9	1	11	0.0409	0.046	0.0163	0.00542	0.021	0.069	-	0
Lithium	µg/L	0.5	-	-	9	0	0	16.9	16.8	0.593	0.198	16.3	18	-	-
Manganese	µg/L	0.05 | 0.2	-	278	9	1	11	1.99	1.03	2.78	0.927	0.2	9.16	-	0
Mercury	µg/L	0.5	-	-	9	6	67	-	5.00E-04	-	-	5.00E-04	0.00055	0	-
Molybdenum	µg/L	0.05	-	-	9	0	0	0.397	0.405	0.0528	0.0176	0.321	0.466	-	-
Nickel	µg/L	0.05 | 0.2	-	-	9	0	0	0.91	0.92	0.0737	0.0246	0.803	1.02	-	-
Niobium	µg/L	0.1	-	-	9	9	100	-	0.1	-	-	0.1	0.1	0	-
Phosphorus	µg/L	50	-	-	9	9	100	-	50	-	-	50	50	0	-
Rhenium	µg/L	0.005	-	-	9	9	100	-	0.005	-	-	0.005	0.005	0	-
Rubidium	µg/L	0.005	-	-	9	0	0	2.18	2.24	0.146	0.0488	1.98	2.34	-	-
Selenium	µg/L	0.04	-	-	9	1	11	0.0444	0.048	0.0093	0.0031	0.04	0.05	-	-
Silicon	µg/L	50	-	-	9	0	0	513	387	199	66.2	359	807	-	-
Silver	µg/L	0.005	-	-	9	9	100	-	0.005	-	-	0.005	0.005	0	-

Table D1-3. Lake B7 – Summary statistics and screening results for 2023 sampling events (July, August, and October)

Parameter	Units	DL (min | max)	Normal Range (min | max)	Action Level[b] (min | max)	Lake B7 July, August, and October 2023 Sampling										
					N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Strontium	µg/L	0.02	-	1880	9	0	0	315	317	20.3	6.76	283	340	-	0
Sulfur	µg/L	500	-	-	9	0	0	4500	4550	343	114	4060	5100	-	-
Tantalum	µg/L	0.1	-	-	9	9	100	-	0.1	-	-	0.1	0.1	0	-
Tellurium	µg/L	0.02	-	-	9	9	100	-	0.02	-	-	0.02	0.02	0	-
Thallium	µg/L	0.005	-	-	9	6	67	-	0.005	-	-	0.005	0.007	-	-
Thorium	µg/L	0.005	-	-	9	9	100	-	0.005	-	-	0.005	0.005	0	-
Tin	µg/L	0.02	-	-	9	0	0	0.422	0.036	1.12	0.374	0.024	3.41	-	-
Titanium	µg/L	0.05	-	-	9	5	56	-	0.05	-	-	0.05	0.127	-	-
Tungsten	µg/L	0.01	-	-	9	0	0	0.0346	0.031	0.00873	0.00291	0.025	0.047	-	-
Uranium	µg/L	0.001	-	-	9	0	0	0.0801	0.0812	0.00667	0.00222	0.0694	0.0892	-	-
Vanadium	µg/L	0.05	-	-	9	6	67	-	0.05	-	-	0.05	0.074	-	-
Yttrium	µg/L	0.01	-	-	9	7	78	-	0.01	-	-	0.01	0.011	-	-
Zinc	µg/L	0.5 | 1	2.2	19.4	9	4	44	0.501	0.51	0.336	0.112	0.5	1.3	0	0
Zirconium	µg/L	0.01	-	-	9	8	89	-	0.01	-	-	0.01	0.019	-	-
Cyanides															
Cyanide (free)	mg/L	0.001	-	-	9	9	100	-	0.001	-	-	0.001	0.001	0	-
Cyanide (Total)	mg/L	0.001	0.001	0.00375	9	9	100	-	0.001	-	-	0.001	0.001	0	0
Cyanide (WAD)	mg/L	0.001	-	-	9	8	89	-	0.001	-	-	0.001	0.001	0	-

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.

Grey shading indicates an exceedance of normal range or action level thresholds.

Abbreviations: DL = detection limit, NR = normal range, Act Lvl = action level.

Table D1-4. Lake D7 – Summary statistics and screening results for the 2023 sampling events (July and August)

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	Lake D7 July and August 2023 Sampling										
						N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Field Measurements																
Temperature	C	-	-	-	-	6	0	0	13.8	13.7	1.95	0.798	12	15.9	-	-
Sp. Conductivity (field)	µS/cm	-	159	-	-	6	0	0	140	140	9.24	3.77	131	148	-	-
pH (field)	pH units	-	7.7 | 8.3	-	6.5 | 9	6	0	0	7.94	8.03	0.375	0.153	7.37	8.29	-	0
DO (mg/L)	mg/L	-	-	-	6.5	6	0	0	10.3	10.4	0.33	0.135	9.64	10.5	-	0
DO (%)	%	-	-	-	-	6	0	0	102	100	3.39	1.38	100	108	-	-
Conventional Parameters																
Conductivity (lab)	µS/cm	1	-	-	-	6	0	0	141	142	7.69	3.14	134	149	-	-
Hardness	mg/L	0.5	-	-	-	6	0	0	54.8	54.4	2.49	1.02	52.5	57.7	-	-
pH (lab)	pH units	0.1	-	-	6.5 | 9	6	0	0	7.85	7.86	0.0957	0.0391	7.74	7.96	-	0
Total Dissolved Solids	mg/L	10	-	136	375	6	0	0	78.3	78.9	8.11	3.31	66.1	86.8	-	0
Total Dissolved Solids (Calculated)	mg/L	1	81	-	375	6	0	0	91.9	92	4.98	2.03	87.1	96.8	6	0
Total Suspended Solids	mg/L	1	2	5.1	-	6	1	17	1.77	2.05	0.659	0.269	1	2.2	3	-
Turbidity (lab)	NTU	0.1	1.1	-	-	6	0	0	0.638	0.675	0.095	0.0388	0.49	0.75	0	-
Major Ions																
Alkalinity, Bicarbonate	mg/L	1	68	-	-	6	0	0	50.9	50.8	5.54	2.26	45.5	57	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	83	-	6	0	0	50.9	50.8	5.54	2.26	45.5	57	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	16.8	16.7	0.768	0.313	16.1	17.7	-	-
Calcium (T)	mg/L	0.01	17	36	-	6	0	0	16.5	16.4	1.09	0.443	15.4	17.6	3	-
Chloride	mg/L	0.1	25	15	90	6	0	0	9.88	9.9	0.501	0.205	9.36	10.4	0	0
Fluoride	mg/L	0.02	0.05	0.036	2.1	6	0	0	0.0485	0.0485	0.00383	0.00157	0.045	0.052	3	0
Magnesium (D)	mg/L	0.004	-	-	-	6	0	0	3.12	3.1	0.138	0.0561	2.98	3.28	-	-
Magnesium (T)	mg/L	0.004	3.3	5.2	-	6	0	0	3.03	3.03	0.264	0.108	2.76	3.29	0	-
Potassium (D)	mg/L	0.02	-	-	-	6	0	0	1.45	1.46	0.0712	0.0291	1.37	1.52	-	-
Potassium (T)	mg/L	0.02	1.8	2.3	-	6	0	0	1.4	1.4	0.123	0.0502	1.28	1.53	0	-
Reactive Silica (SiO2)	mg/L	0.01 | 0.1	0.28	-	-	6	0	0	0.394	0.394	0.185	0.0755	0.217	0.57	3	-
Sodium (D)	mg/L	0.02	-	-	-	6	0	0	8	7.92	0.296	0.121	7.73	8.37	-	-
Sodium (T)	mg/L	0.02	17	8.1	-	6	0	0	7.78	7.78	0.528	0.216	7.25	8.28	0	-
Sulphate	mg/L	0.3	10	5.5	164	6	0	0	5.22	5.22	0.111	0.0454	5.1	5.34	0	0
Nutrients																
Ammonia (as N)	mg/L	0.005	0.009	0.086	0.106	6	0	0	0.0174	0.0156	0.00804	0.00328	0.0092	0.0324	6	0
Nitrate (as N)	mg/L	0.005	0.005	1.2	2.17	6	3	50	-	0.00605	-	-	0.005	0.0208	3	0

Table D1-4. Lake D7 – Summary statistics and screening results for the 2023 sampling events (July and August)

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	Lake D7 July and August 2023 Sampling										
						N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	6	3	50	-	0.0061	-	-	0.0051	0.0208	-	-
Nitrite (as N)	mg/L	0.001	0.0005	-	0.045	6	6	100	-	0.001	-	-	0.001	0.001	0	0
Nitrogen	mg/L	0.05	-	-	-	6	0	0	0.32	0.313	0.0376	0.0153	0.27	0.378	-	-
Orthophosphate (PO4-P)	mg/L	0.001	0.003	0.00072	-	6	6	100	-	0.001	-	-	0.001	0.001	0	-
Total Diss Phosphorus	mg/L	0.001	0.008	0.0071	-	6	0	0	0.00335	0.00315	0.000653	0.000267	0.0027	0.0044	0	-
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	6	0	0	0.262	0.257	0.0146	0.00596	0.248	0.282	-	-
Total Kjeldahl Nitrogen	mg/L	0.05	0.52	0.88	-	6	0	0	0.313	0.308	0.0393	0.016	0.263	0.378	0	-
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	6	0	0	0.254	0.252	0.0103	0.0042	0.242	0.27	-	-
Total Phosphorus	mg/L	0.001	0.02	-	0.0075	6	0	0	0.00865	0.0085	0.00144	0.000588	0.0068	0.011	0	5
Organic/Inorganic Carbon																
Dissolved Organic Carbon	mg/L	0.5	5.1	-	-	6	0	0	5.49	5.5	1.05	0.428	4.01	6.65	3	-
Total Organic Carbon	mg/L	0.5	14	-	-	6	0	0	5.13	5.18	1.04	0.424	3.96	6.15	0	-
Total Metals																
Aluminum	µg/L	1	6.7	37	75	6	0	0	7.57	6.75	2.88	1.17	4.7	12.9	3	0
Antimony	µg/L	0.02	0.03	0.13	4.5	6	5	83	-	0.02	-	-	0.02	0.023	0	0
Arsenic	µg/L	0.02	1.2	1.3	18.8	6	0	0	1.57	1.63	0.122	0.0499	1.41	1.68	6	0
Barium	µg/L	0.02	17	34	750	6	0	0	17.2	17.2	0.366	0.149	16.7	17.6	3	0
Beryllium	µg/L	0.005	0.01	0.26	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Bismuth	µg/L	0.005	0.01	0.037	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Boron	µg/L	5	17	10	1120	6	0	0	14	14	1.49	0.61	12.4	15.5	0	0
Cadmium	µg/L	0.005	0.005	0.071	0.0696	6	5	83	-	0.005	-	-	0.005	0.0069	1	0
Cesium	µg/L	0.005	-	-	-	6	0	0	0.0085	0.00855	0.000867	0.000354	0.0075	0.0096	-	-
Chromium	µg/L	0.1	0.06	1.6	3.75	6	6	100	-	0.1	-	-	0.1	0.1	0	0
Cobalt	µg/L	0.005	0.05	0.33	0.586	6	0	0	0.051	0.0509	0.00552	0.00225	0.0443	0.0573	3	0
Copper	µg/L	0.05	1	2.1	1.5	6	0	0	1.05	1.07	0.0574	0.0235	0.953	1.11	5	0
Gallium	µg/L	0.05	-	-	-	6	6	100	-	0.05	-	-	0.05	0.05	0	-
Iron	µg/L	1	112	175	795	6	0	0	68.8	66.2	14	5.72	53.9	91.2	0	0
Lanthanum	µg/L	0.01	-	-	-	6	0	0	0.0282	0.0265	0.00975	0.00398	0.018	0.044	-	-
Lead	µg/L	0.01	0.02	0.14	3.75	6	0	0	0.0393	0.0225	0.045	0.0184	0.012	0.129	3	0
Lithium	µg/L	0.5	1.9	4.9	-	6	0	0	1.55	1.55	0.0983	0.0401	1.45	1.66	0	-
Manganese	µg/L	0.05	13	67	90	6	0	0	10.5	10.4	2.76	1.13	7.47	14.4	1	0
Mercury	µg/L	0.5	0.001	0.012	0.0195	6	2	33	0.000505	0.00052	0.000254	0.000104	0.0005	0.00094	0	0
Molybdenum	µg/L	0.05	0.48	0.61	54.8	6	0	0	0.631	0.629	0.123	0.0501	0.516	0.75	6	0
Nickel	µg/L	0.05	0.75	2.3	18.8	6	0	0	0.76	0.767	0.0452	0.0184	0.705	0.805	3	0
Niobium	µg/L	0.1	-	-	-	6	6	100	-	0.1	-	-	0.1	0.1	0	-
Phosphorus	µg/L	50	-	-	-	6	6	100	-	50	-	-	50	50	0	-

Table D1-4. Lake D7 – Summary statistics and screening results for the 2023 sampling events (July and August)

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	Lake D7 July and August 2023 Sampling										
						N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Rhenium	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Rubidium	µg/L	0.005	-	-	-	6	0	0	1.25	1.25	0.134	0.0547	1.12	1.39	-	-
Selenium	µg/L	0.04	0.06	0.48	0.75	6	0	0	0.0498	0.05	0.00402	0.00164	0.045	0.054	0	0
Silicon	µg/L	50	-	-	-	6	0	0	211	213	98.1	40.1	117	303	0	-
Silver	µg/L	0.005	0.005	0.025	0.188	6	6	100	-	0.005	-	-	0.005	0.005	0	0
Strontium	µg/L	0.02	83	162	1880	6	0	0	81.1	81	5.96	2.43	75.1	87	3	0
Sulfur	µg/L	500	-	-	-	6	0	0	1990	1990	38.2	15.6	1950	2050	0	-
Tantalum	µg/L	0.1	-	-	-	6	6	100	-	0.1	-	-	0.1	0.1	0	-
Tellurium	µg/L	0.02	-	-	-	6	6	100	-	0.02	-	-	0.02	0.02	0	-
Thallium	µg/L	0.005	0.005	0.039	0.6	6	6	100	-	0.005	-	-	0.005	0.005	0	0
Thorium	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Tin	µg/L	0.02	0.05	0.21	-	6	0	0	0.045	0.0365	0.0197	0.00804	0.029	0.082	2	-
Titanium	µg/L	0.05	0.34	2.38	-	6	0	0	0.358	0.296	0.184	0.0749	0.191	0.703	2	-
Tungsten	µg/L	0.01	-	13	-	6	6	100	-	0.01	-	-	0.01	0.01	0	-
Uranium	µg/L	0.001	0.1	0.13	11.2	6	0	0	0.094	0.0946	0.00426	0.00174	0.0869	0.0991	0	0
Vanadium	µg/L	0.05	0.07	0.71	90	6	0	0	0.086	0.085	0.00972	0.00397	0.074	0.102	6	0
Yttrium	µg/L	0.01	-	-	-	6	4	67	-	0.01	-	-	0.01	0.012	-	-
Zinc	µg/L	0.5	2	5.8	-	6	3	50	-	0.795	-	-	0.5	5.5	1	-
Zirconium	µg/L	0.01	-	-	-	6	3	50	-	0.01	-	-	0.01	0.012	-	-
Dissolved Metals																
Aluminum	µg/L	1	-	-	-	6	0	0	3.12	3.35	0.773	0.316	2.2	3.9	-	-
Antimony	µg/L	0.02	-	-	-	6	5	83	-	0.02	-	-	0.02	0.021	-	-
Arsenic	µg/L	0.02	-	-	-	6	0	0	1.36	1.37	0.175	0.0714	1.16	1.54	-	-
Barium	µg/L	0.02	-	-	-	6	0	0	16.6	16.5	0.44	0.18	16	17.2	-	-
Beryllium	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Bismuth	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Boron	µg/L	5	-	-	-	6	0	0	14.3	14.2	0.816	0.333	13.3	15.2	0	-
Cadmium	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Cesium	µg/L	0.005	-	-	-	6	0	0	0.00768	0.00765	0.0017	0.000694	0.0061	0.0094	-	-
Chromium	µg/L	0.1	-	-	-	6	6	100	-	0.1	-	-	0.1	0.1	0	-
Cobalt	µg/L	0.005	-	-	-	6	0	0	0.0225	0.0224	0.0013	0.00053	0.0205	0.0243	-	-
Copper	µg/L	0.05	-	-	-	6	0	0	0.99	0.971	0.0685	0.028	0.928	1.1	-	-
Gallium	µg/L	0.05	-	-	-	6	6	100	-	0.05	-	-	0.05	0.05	0	-
Iron	µg/L	1	-	-	-	6	0	0	29	28.9	7.81	3.19	21.2	39.2	-	-
Lanthanum	µg/L	0.01	-	-	-	6	3	50	-	0.011	-	-	0.01	0.016	-	-
Lead	µg/L	0.01	-	-	5.42	6	3	50	-	0.011	-	-	0.01	0.014	-	0

Table D1-4. Lake D7 – Summary statistics and screening results for the 2023 sampling events (July and August)

Parameter	Units	DL (min | max)	Normal Range (min | max)	FEIS[a]	Action Level[b] (min | max)	Lake D7 July and August 2023 Sampling										
						N	N<DL	% <DL	Mean	Median	SD	SE	Min	Max	N>NR	N>ActLvl
Lithium	µg/L	0.5	-	-	-	6	0	0	1.56	1.54	0.101	0.0411	1.46	1.69	-	-
Manganese	µg/L	0.05	-	-	240	6	0	0	0.866	0.886	0.401	0.164	0.373	1.44	-	0
Mercury	µg/L	0.5	-	-	-	6	5	83	-	5.00E-04	-	-	5.00E-04	0.00061	0	-
Molybdenum	µg/L	0.05	-	-	-	6	0	0	0.636	0.63	0.12	0.0488	0.521	0.773	-	-
Nickel	µg/L	0.05	-	-	-	6	0	0	0.725	0.724	0.0542	0.0221	0.67	0.786	-	-
Niobium	µg/L	0.1	-	-	-	6	6	100	-	0.1	-	-	0.1	0.1	0	-
Phosphorus	µg/L	50	-	-	-	6	6	100	-	50	-	-	50	50	0	-
Rhenium	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Rubidium	µg/L	0.005	-	-	-	6	0	0	1.23	1.22	0.143	0.0585	1.1	1.39	-	-
Selenium	µg/L	0.04	-	-	-	6	0	0	0.0488	0.05	0.00462	0.00189	0.042	0.053	-	-
Silicon	µg/L	50	-	-	-	6	0	0	206	205	89.8	36.6	121	294	0	-
Silver	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Strontium	µg/L	0.02	-	-	1880	6	0	0	81.3	80.4	5.94	2.42	75.8	88.4	-	0
Sulfur	µg/L	500	-	-	-	6	0	0	2000	2010	28.6	11.7	1950	2020	0	-
Tantalum	µg/L	0.1	-	-	-	6	6	100	-	0.1	-	-	0.1	0.1	0	-
Tellurium	µg/L	0.02	-	-	-	6	6	100	-	0.02	-	-	0.02	0.02	0	-
Thallium	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Thorium	µg/L	0.005	-	-	-	6	6	100	-	0.005	-	-	0.005	0.005	0	-
Tin	µg/L	0.02	-	-	-	6	1	17	0.0288	0.0275	0.0139	0.00567	0.02	0.053	-	-
Titanium	µg/L	0.05	-	-	-	6	4	67	-	0.05	-	-	0.05	0.056	-	-
Tungsten	µg/L	0.01	-	-	-	6	6	100	-	0.01	-	-	0.01	0.01	0	-
Uranium	µg/L	0.001	-	-	-	6	0	0	0.0928	0.0926	0.00192	0.000782	0.0908	0.0959	-	-
Vanadium	µg/L	0.05	-	-	-	6	1	17	0.0525	0.0585	0.0138	0.00561	0.05	0.06	-	-
Yttrium	µg/L	0.01	-	-	-	6	6	100	-	0.01	-	-	0.01	0.01	0	-
Zinc	µg/L	0.5	1.4	-	9.75	6	3	50	-	0.61	-	-	0.5	0.93	0	0
Zirconium	µg/L	0.01	-	-	-	6	3	50	-	0.0105	-	-	0.01	0.111	-	-
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	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] 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.

Grey shading indicates an exceedance of normal range or action level thresholds.

Abbreviations: DL = detection limit, NR = normal range, Act Lvl = action level.

Appendix D2
Peninsula Lakes Water Quality – 2023 Samples

Table D3-1. Lake D7 water chemistry results

Parameter	Units	DL (min | max)	Normal Range	FEIS	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July			August		
										2023-07-17			2023-08-21		
										D7-01	D7-02	D7-03	D7-01	D7-02	D7-03
Conventional Parameters															
Conductivity (lab)	µS/cm	1	-	-	-	-	-	-	-	135	134	134	149	148	148
Hardness	mg/L	0.5	-	-	-	-	-	-	-	52.6	52.8	52.5	57.4	57.7	56.1
pH (lab)	pH units	0.1	-	-	6.5 | 9.0	-	-	6.5 | 9	6.5 | 9	7.75	7.74	7.81	7.91	7.96	7.93
Total Dissolved Solids	mg/L	15	-	136	500	-	-	500	375	66.1	72.4	77.1	86.8	86.4	80.8
TDS (Calculated)	mg/L	1	81	-	500	-	-	500	375	87.8	87.1	87.1	96.8	96.2	96.2
Total Suspended Solids	mg/L	1	2	5.1	-	-	-	-	-	1.6	2.2	*<1*	2.1	2.2	2
Turbidity (lab)	NTU	0.1	1.1	-	-	-	-	-	-	0.67	0.49	0.56	0.75	0.68	0.68
Major Ions															
Alkalinity, Bicarbonate	mg/L	1	68	-	-	-	-	-	-	46.5	45.7	45.5	57	55.2	55.6
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	-	-	-	-	-	46.5	45.7	45.5	57	55.2	55.6
Bromide	mg/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
Calcium (D)	mg/L	0.01	-	-	-	-	-	-	-	16.1	16.2	16.1	17.6	17.7	17.2
Calcium (T)	mg/L	0.01	17	36	-	-	-	-	-	15.4	15.6	15.6	17.6	17.6	17.3
Chloride	mg/L	0.1	25	15	120	-	-	120	90	9.49	9.36	9.42	10.4	10.3	10.3
Fluoride	mg/L	0.02	0.05	0.036	0.12	1.5	2.8	2.8	2.1	0.045	0.045	0.045	0.052	0.052	0.052
Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	-	3.02	3.01	2.98	3.28	3.27	3.19
Magnesium (T)	mg/L	0.004	3.3	5.2	-	-	-	-	-	2.76	2.82	2.78	3.27	3.29	3.24
Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-	1.37	1.41	1.37	1.51	1.52	1.5
Potassium (T)	mg/L	0.02	1.8	2.3	-	-	-	-	-	1.31	1.28	1.29	1.53	1.52	1.5
Reactive Silica (SiO_2)	mg/L	0.01 | 0.1	0.28	-	-	-	-	-	-	0.217	0.22	0.239	0.55	0.568	0.57
Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-	7.75	7.73	7.75	8.31	8.37	8.08
Sodium (T)	mg/L	0.02	17	8.1	-	-	-	-	-	7.25	7.33	7.3	8.28	8.23	8.26
Sulphate	mg/L	0.3	10	5.5	218	-	-	218	164	5.1	5.11	5.14	5.3	5.31	5.34
Nutrients															
Ammonia (as N)	mg/L	0.005	0.009	0.086	0.141 | 1.83	-	-	0.141	0.106	0.0092	0.0324	0.0134	0.0176	0.0179	0.0136
Nitrate (as N)	mg/L	0.005	0.005	1.2	2.9	10	-	2.9	2.17	0.0071	0.0148	0.0208	*<0.005*	*<0.005*	*<0.005*
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	-	0.0071	0.0148	0.0208	*<0.0051*	*<0.0051*	*<0.0051*
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	-	-	-	-	-	-	-	0.27	0.347	0.312	0.314	0.301	0.378
Orthophosphate (PO_4-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	-	-	-	-	-	0.0029	0.0029	0.0027	0.0038	0.0044	0.0034
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.277	0.257	0.282	0.248	0.248	0.257
Total Kjeldahl Nitrogen	mg/L	0.05	0.52	0.88	-	-	-	-	-	0.263	0.332	0.291	0.314	0.301	0.378
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-	0.27	0.242	0.261	0.248	0.248	0.257
Total Phosphorus	mg/L	0.001	0.02	-	0.01	-	-	0.01	0.0075	0.0079	0.009	0.0068	0.0092	0.011	0.008
Organic/Inorganic Carbon															
Dissolved Organic Carbon	mg/L	0.5	5.1	-	-	-	-	-	-	4.9	4.86	4.01	6.65	6.09	6.41
Total Organic Carbon	mg/L	0.5	14	-	-	-	-	-	-	4.32	4.3	3.96	6.03	6.15	6.04
Total Metals															
Aluminum (T)	µg/L	1	6.7	37	100	-	-	100	75	12.9	7.2	6.3	6	8.3	4.7
Antimony (T)	µg/L	0.02	0.03	0.13	9	6	-	6	4.5	0.023	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
Arsenic (T)	µg/L	0.02	1.2	1.3	5	10	25	25	18.8	1.65	1.41	1.42	1.68	1.65	1.61
Barium (T)	µg/L	0.02	17	34	1000	2000	-	1000	750	17.5	17.4	17.6	16.9	17	16.7
Beryllium (T)	µg/L	0.005	0.01	0.26	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*

Table D3-1. Lake D7 water chemistry results

Parameter	Units	DL (min | max)	Normal Range	FEIS	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July			August		
										2023-07-17			2023-08-21		
										D7-01	D7-02	D7-03	D7-01	D7-02	D7-03
Bismuth (T)	µg/L	0.005	0.01	0.037	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron (T)	µg/L	5	17	10	1500	5000	-	1500	1120	12.4	12.6	12.9	15.1	15.5	15.4
Cadmium (T)	µg/L	0.005	0.005	0.071	0.0928 | 0.1	7	-	0.0928	0.0696	0.0069	<0.005	<0.005	<0.005	<0.005	<0.005
Cesium (T)	µg/L	0.005	-	-	-	-	-	-	-	0.0082	0.0075	0.0076	0.0096	0.0092	0.0089
Chromium (T)	µg/L	0.1	0.06	1.6	5	50	-	5	3.75	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cobalt (T)	µg/L	0.005	0.05	0.33	0.781 | 0.812	-	-	0.781	0.586	0.057	0.0457	0.0443	0.0573	0.0523	0.0496
Copper (T)	µg/L	0.05	1	2.1	2	2000	-	2	1.5	1.11	1.01	0.953	1.06	1.08	1.08
Gallium (T)	µg/L	0.05	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron (T)	µg/L	1	112	175	300	-	1060	1060	795	91.2	78	69.8	62.6	57.2	53.9
Lanthanum (T)	µg/L	0.01	-	-	-	-	-	-	-	0.044	0.033	0.031	0.022	0.021	0.018
Lead (T)	µg/L	0.01	0.02	0.14	-	5	-	5	3.75	0.129	0.036	0.03	0.014	0.015	0.012
Lithium (T)	µg/L	0.5	1.9	4.9	-	-	-	-	-	1.45	1.45	1.48	1.63	1.66	1.62
Manganese (T)	µg/L	0.05	13	67	-	120	-	120	90	9.54	7.79	7.47	14.4	12.7	11.2
Mercury (T)	µg/L	0.5	0.001	0.012	0.026	1	-	0.026	0.0195	<5e-04	0.00094	0.00055	0.00051	0.00053	<5e-04
Molybdenum (T)	µg/L	0.05	0.48	0.61	73	-	-	73	54.8	0.516	0.524	0.516	0.744	0.75	0.734
Nickel (T)	µg/L	0.05	0.75	2.3	25	-	-	25	18.8	0.748	0.711	0.705	0.805	0.804	0.786
Niobium (T)	µg/L	0.1	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphorus (T)	µg/L	50	-	-	-	-	-	-	-	<50	<50	<50	<50	<50	<50
Rhenium (T)	µg/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Rubidium (T)	µg/L	0.005	-	-	-	-	-	-	-	1.15	1.13	1.12	1.39	1.38	1.36
Selenium (T)	µg/L	0.04	0.06	0.48	1	50	-	1	0.75	0.048	0.046	0.045	0.054	0.054	0.052
Silicon (T)	µg/L	50	-	-	-	-	-	-	-	119	117	128	298	300	303
Silver (T)	µg/L	0.005	0.005	0.025	0.25	-	-	0.25	0.188	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium (T)	µg/L	0.02	83	162	2500	7000	-	2500	1880	75.1	76.5	75.5	87	87	85.5
Sulfur (T)	µg/L	500	-	-	-	-	-	-	-	1960	1970	1950	2010	2050	2010
Tantalum (T)	µg/L	0.1	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tellurium (T)	µg/L	0.02	-	-	-	-	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Thallium (T)	µg/L	0.005	0.005	0.039	0.8	-	-	0.8	0.6	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thorium (T)	µg/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tin (T)	µg/L	0.02	0.05	0.21	-	-	-	-	-	0.037	0.052	0.029	0.082	0.034	0.036
Titanium (T)	µg/L	0.05	0.34	2.38	-	-	-	-	-	0.703	0.3	0.411	0.291	0.254	0.191
Tungsten (T)	µg/L	0.01	-	13	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Uranium (T)	µg/L	0.001	0.1	0.13	15	20	-	15	11.2	0.0869	0.0968	0.0936	0.0991	0.0921	0.0957
Vanadium (T)	µg/L	0.05	0.07	0.71	120	-	-	120	90	0.102	0.09	0.088	0.082	0.08	0.074
Yttrium (T)	µg/L	0.01	-	-	-	-	-	-	-	0.012	0.01	<0.01	<0.01	<0.01	<0.01
Zinc (T)	µg/L	0.5	2	5.8	-	-	-	-	-	5.5	1.28	1.09	<0.5	<0.5	<0.5
Zirconium (T)	µg/L	0.01	-	-	-	-	-	-	-	0.012	0.011	0.01	<0.01	<0.01	<0.01
Dissolved Metals															
Aluminum (D)	µg/L	1	-	-	-	-	-	-	-	3.9	3.7	3	3.7	2.2	2.2
Antimony (D)	µg/L	0.02	-	-	-	-	-	-	-	<0.02	<0.02	<0.02	0.021	<0.02	<0.02
Arsenic (D)	µg/L	0.02	-	-	-	-	-	-	-	1.25	1.19	1.16	1.54	1.51	1.49
Barium (D)	µg/L	0.02	-	-	-	-	-	-	-	16	16.4	16.4	17.2	17	16.7
Beryllium (D)	µg/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bismuth (D)	µg/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron (D)	µg/L	5	-	-	-	-	-	-	-	13.5	13.3	13.9	14.6	15.1	15.2
Cadmium (D)	µg/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cesium (D)	µg/L	0.005	-	-	-	-	-	-	-	0.0062	0.0061	0.0061	0.0091	0.0094	0.0092

Table D3-1. Lake D7 water chemistry results

Parameter	Units	DL (min | max)	Normal Range	FEIS	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July			August		
										2023-07-17			2023-08-21		
										D7-01	D7-02	D7-03	D7-01	D7-02	D7-03
Chromium (D)	µg/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
Cobalt (D)	µg/L	0.005	-	-	-	-	-	-	-	0.0234	0.0224	0.0225	0.0243	0.0205	0.0219
Copper (D)	µg/L	0.05	-	-	-	-	-	-	-	0.928	0.952	0.93	1.1	1.04	0.99
Gallium (D)	µg/L	0.05	-	-	-	-	-	-	-	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*	*<0.05*
Iron (D)	µg/L	1	-	-	-	-	-	-	-	39.2	34.9	33.6	24.2	21.2	21.2
Lanthanum (D)	µg/L	0.01	-	-	-	-	-	-	-	0.014	0.016	0.012	*<0.01*	*<0.01*	*<0.01*
Lead (D)	µg/L	0.01	-	-	7.22 | 9.54	-	-	7.22	5.42	0.014	0.012	0.012	*<0.01*	*<0.01*	*<0.01*
Lithium (D)	µg/L	0.5	-	-	-	-	-	-	-	1.48	1.46	1.48	1.59	1.69	1.66
Manganese (D)	µg/L	0.05	-	-	320 | 390	-	-	320	240	1.44	1.11	1.03	0.741	0.373	0.504
Mercury (D)	µg/L	0.5	-	-	-	-	-	-	-	0.00061	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*	*<5e-04*
Molybdenum (D)	µg/L	0.05	-	-	-	-	-	-	-	0.521	0.53	0.532	0.773	0.732	0.727
Nickel (D)	µg/L	0.05	-	-	-	-	-	-	-	0.689	0.671	0.67	0.786	0.775	0.76
Niobium (D)	µg/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
Phosphorus (D)	µg/L	50	-	-	-	-	-	-	-	*<50*	*<50*	*<50*	*<50*	*<50*	*<50*
Rhenium (D)	µg/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Rubidium (D)	µg/L	0.005	-	-	-	-	-	-	-	1.1	1.1	1.1	1.35	1.39	1.34
Selenium (D)	µg/L	0.04	-	-	-	-	-	-	-	0.042	0.045	0.048	0.052	0.053	0.053
Silicon (D)	µg/L	50	-	-	-	-	-	-	-	128	121	124	288	282	294
Silver (D)	µg/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Strontium (D)	µg/L	0.02	-	-	2500	-	-	2500	1880	76.6	75.8	75.8	88.4	87.2	84.2
Sulfur (D)	µg/L	500	-	-	-	-	-	-	-	2020	2020	1950	2020	1980	2000
Tantalum (D)	µg/L	0.1	-	-	-	-	-	-	-	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*	*<0.1*
Tellurium (D)	µg/L	0.02	-	-	-	-	-	-	-	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*	*<0.02*
Thallium (D)	µg/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Thorium (D)	µg/L	0.005	-	-	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*
Tin (D)	µg/L	0.02	-	-	-	-	-	-	-	0.026	0.025	*<0.02*	0.053	0.03	0.029
Titanium (D)	µg/L	0.05	-	-	-	-	-	-	-	0.056	*<0.05*	*<0.05*	0.05	*<0.05*	*<0.05*
Tungsten (D)	µg/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
Uranium (D)	µg/L	0.001	-	-	-	-	-	-	-	0.0908	0.0937	0.0959	0.0912	0.0918	0.0934
Vanadium (D)	µg/L	0.05	-	-	-	-	-	-	-	0.06	0.06	0.06	0.057	0.053	*<0.05*
Yttrium (D)	µg/L	0.01	-	-	-	-	-	-	-	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*	*<0.01*
Zinc (D)	µg/L	0.5	1.4	-	13 | 15.9	-	-	13	9.75	0.72	0.9	*<0.5*	0.93	*<0.5*	*<0.5*
Zirconium (D)	µg/L	0.01	-	-	-	-	-	-	-	0.011	0.011	*<0.01*	0.111	*<0.01*	*<0.01*
Cyanides															
Cyanide (free)	mg/L	0.001	-	-	-	-	-	-	-	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Cyanide (Total)	mg/L	0.001	0.001	-	0.005	0.2	-	0.005	0.00375	*<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 = 2023 detection limits

Normal Range = upper limit of baseline concentrations (see Table D1-1)

FEIS = predicted concentrations for Lake D7 (Agnico Eagle, 2014). Median predicted concentration during operations.

FWAL = chronic freshwater aquatic life guideline

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

AEMP Action Level = 75 % of the AEMP Benchmark

Table D3-2. Lake A8 water chemistry results

Parameter	Units	DL (min | max)	Normal Range	FEIS	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July			August		
										2023-07-17			2023-08-19		
										A8-01	A8-02	A8-03	A8-01	A8-02	A8-03
Conventional Parameters															
Conductivity (lab)	µS/cm	1	-	-	-	-	-	-	-	289	293	256	307	306	282
Hardness	mg/L	0.5	-	-	-	-	-	-	-	115	115	105	123	123	105
pH (lab)	pH units	0.1	-	-	6.5 | 9.0	-	-	6.5 | 9	6.5 | 9	7.89	7.89	7.84	8.01	7.98	8.01
Total Dissolved Solids	mg/L	15	-	162	500	-	-	500	375	206	214	180	242	244	184
TDS (Calculated)	mg/L	1	152	-	500	-	-	500	375	188	190	166	200	199	183
Total Suspended Solids	mg/L	1	4	2.9	-	-	-	-	-	*<1*	1.4	1.9	1.8	1.2	*<1*
Turbidity (lab)	NTU	0.1	0.87	-	-	-	-	-	-	0.31	0.35	0.46	0.51	0.52	0.6
Major Ions															
Alkalinity, Bicarbonate	mg/L	1	91	-	-	-	-	-	-	52.7	54.4	54.8	62.2	63	66.4
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	51	-	-	-	-	-	52.7	54.4	54.8	62.2	63	66.4
Bromide	mg/L	0.1	-	-	-	-	-	-	-	0.24	0.25	0.18	0.25	0.25	0.21
Calcium (D)	mg/L	0.01	-	-	-	-	-	-	-	37.6	37.5	34.1	40	40.3	34.4
Calcium (T)	mg/L	0.01	40	47	-	-	-	-	-	36.3	37.4	33	41.2	39.2	36.4
Chloride	mg/L	0.1	61	74	120	-	-	120	90	48	48.2	38.1	50.1	50.2	42.2
Fluoride	mg/L	0.02	0.04	0.038	0.12	1.5	2.8	2.8	2.1	0.039	0.039	0.039	0.046	0.043	0.045
Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	-	5.17	5.23	4.75	5.55	5.54	4.76
Magnesium (T)	mg/L	0.004	5.6	6.9	-	-	-	-	-	4.88	5.01	4.45	5.65	5.42	5.1
Potassium (D)	mg/L	0.02	-	-	-	-	-	-	-	2.28	2.29	2	2.44	2.46	1.98
Potassium (T)	mg/L	0.02	2.5	2.3	-	-	-	-	-	2.18	2.22	1.83	2.56	2.44	2.13
Reactive Silica (SiO_2)	mg/L	0.01 | 0.1	1.3	-	-	-	-	-	-	0.226	0.232	0.371	1.24	1.19	1.81
Sodium (D)	mg/L	0.02	-	-	-	-	-	-	-	12.1	12.4	9.59	12.8	12.7	9.71
Sodium (T)	mg/L	0.02	8.4	8.3	-	-	-	-	-	11.8	12	9.14	13.2	12.7	10.5
Sulphate	mg/L	0.3	9.3	11.6	218	-	-	218	164	15.1	15.2	12.1	14.3	14.2	11.2
Nutrients															
Ammonia (as N)	mg/L	0.005	0.011	0.118	0.141 | 0.588	-	-	0.141	0.106	0.0094	0.0102	0.0123	0.0142	0.0154	0.0115
Nitrate (as N)	mg/L	0.005	0.015	0.2	2.9	10	-	2.9	2.17	*<0.005*	*<0.005*	0.0178	0.0071	0.0136	*<0.005*
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	-	*<0.0051*	*<0.0051*	0.0178	0.0071	0.0136	*<0.0051*
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	-	-	-	-	-	-	-	0.286	0.286	0.373	0.352	0.342	0.415
Orthophosphate (PO_4-P)	mg/L	0.001	0.0023	0.00215	-	-	-	-	-	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*	*<0.001*
Total Diss Phosphorus	mg/L	0.001	0.006	0.006	-	-	-	-	-	0.002	0.0022	0.003	0.0028	0.0034	0.0042
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	-	0.271	0.267	0.304	0.331	0.313	0.34
Total Kjeldahl Nitrogen	mg/L	0.05	0.63	0.58	-	-	-	-	-	0.286	0.286	0.355	0.345	0.328	0.415
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	-	0.271	0.267	0.286	0.324	0.299	0.34
Total Phosphorus	mg/L	0.001	0.009	-	0.01	-	-	0.01	0.0075	0.0046	0.005	0.0071	0.0052	0.0048	0.0074
Organic/Inorganic Carbon															
Dissolved Organic Carbon	mg/L	0.5	4.9	-	-	-	-	-	-	4.7	4.62	5.41	6.96	6.26	7.57
Total Organic Carbon	mg/L	0.5	4.7	-	-	-	-	-	-	4.41	4.12	4.54	5.71	5.66	7.33
Total Metals															
Aluminum (T)	µg/L	1	3	4.6	100	-	-	100	75	3.1	4.4	5	3.8	2.5	3
Antimony (T)	µg/L	0.02	0.4	0.2	9	6	-	6	4.5	0.056	0.055	0.036	0.074	0.054	0.036
Arsenic (T)	µg/L	0.02	2.4	1.7	5	10	25	25	18.8	8.83	8.67	4.74	14.8	14.8	6.64
Barium (T)	µg/L	0.02	32	23	1000	2000	-	1000	750	27.6	27.4	26	30.9	29.1	28.2
Beryllium (T)	µg/L	0.005	0.01	0.47	-	-	-	-	-	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*	*<0.005*

Table D3-2. Lake A8 water chemistry results

Parameter	Units	DL (min | max)	Normal Range	FEIS	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July			August		
										2023-07-17			2023-08-19		
										A8-01	A8-02	A8-03	A8-01	A8-02	A8-03
Bismuth (T)	µg/L	0.005	0.01	0.076	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron (T)	µg/L	5	5	27	1500	5000	-	1500	1120	7.8	8	<5	9.2	9.4	5
Cadmium (T)	µg/L	0.005	0.005	0.083	0.165 | 0.188	7	-	0.165	0.124	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cesium (T)	µg/L	0.005	-	-	-	-	-	-	-	0.0223	0.0222	0.0147	0.0294	0.0289	0.0192
Chromium (T)	µg/L	0.1	0.06	1.87	5	50	-	5	3.75	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cobalt (T)	µg/L	0.005	0.05	0.24	1.04 | 1.11	-	-	1.04	0.78	0.0397	0.0426	0.0533	0.0464	0.0417	0.0488
Copper (T)	µg/L	0.05	0.89	2.7	2.47 | 2.82	2000	-	2.47	1.85	0.854	0.898	0.916	1	0.883	0.883
Gallium (T)	µg/L	0.05	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron (T)	µg/L	1	67	96	300	-	1060	1060	795	41.9	45.3	59.5	88.9	80.1	88.3
Lanthanum (T)	µg/L	0.01	-	-	-	-	-	-	-	<0.01	0.011	0.02	0.011	<0.01	0.01
Lead (T)	µg/L	0.01	0.03	2	-	5	-	5	3.75	0.044	0.05	0.056	0.048	0.033	0.029
Lithium (T)	µg/L	0.5	10	5.3	-	-	-	-	-	9.59	9.76	7.03	10	10.1	8.24
Manganese (T)	µg/L	0.05	13	30	-	120	-	120	90	7.68	7.67	12.6	13.8	11.8	15.6
Mercury (T)	µg/L	0.5	0.0012	0.04	0.026	1	-	0.026	0.0195	0.00051	0.00117	0.00062	0.00052	<5e-04	0.00055
Molybdenum (T)	µg/L	0.05	0.22	0.59	73	-	-	73	54.8	0.376	0.392	0.308	0.478	0.461	0.416
Nickel (T)	µg/L	0.05	0.92	2.3	99.2 | 112	-	-	99.2	74.4	0.728	0.745	0.883	0.84	0.763	0.966
Niobium (T)	µg/L	0.1	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphorus (T)	µg/L	50	-	-	-	-	-	-	-	<50	<50	<50	<50	<50	<50
Rhenium (T)	µg/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Rubidium (T)	µg/L	0.005	-	-	-	-	-	-	-	2.17	2.2	1.84	2.54	2.41	2.16
Selenium (T)	µg/L	0.04	0.02	0.16	1	50	-	1	0.75	0.043	0.043	0.04	<0.04	0.041	0.043
Silicon (T)	µg/L	50	-	-	-	-	-	-	-	116	117	195	582	597	940
Silver (T)	µg/L	0.005	0.005	0.068	0.25	-	-	0.25	0.188	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium (T)	µg/L	0.02	273	101	2500	7000	-	2500	1880	243	250	202	276	259	226
Sulfur (T)	µg/L	500	-	-	-	-	-	-	-	5480	5500	4720	5070	5110	4070
Tantalum (T)	µg/L	0.1	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tellurium (T)	µg/L	0.02	-	-	-	-	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Thallium (T)	µg/L	0.005	0.005	0.047	0.8	-	-	0.8	0.6	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thorium (T)	µg/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tin (T)	µg/L	0.02	0.05	0.26	-	-	-	-	-	0.022	0.035	0.032	0.048	0.049	<0.02
Titanium (T)	µg/L	0.05	0.25	1.25	-	-	-	-	-	<0.05	0.096	0.147	0.15	<0.05	0.075
Tungsten (T)	µg/L	0.01	-	29	-	-	-	-	-	0.126	0.13	0.034	0.124	0.124	0.029
Uranium (T)	µg/L	0.001	0.054	0.061	15	20	-	15	11.2	0.096	0.0924	0.0696	0.0815	0.0888	0.0702
Vanadium (T)	µg/L	0.05	0.01	0.35	120	-	-	120	90	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Yttrium (T)	µg/L	0.01	-	-	-	-	-	-	-	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Zinc (T)	µg/L	0.5	1.2	5.1	-	-	-	-	-	<0.5	0.58	0.5	<0.5	<0.5	<0.5
Zirconium (T)	µg/L	0.01	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Metals															
Aluminum (D)	µg/L	1	-	-	-	-	-	-	-	3.5	3.9	2.6	2.3	3.7	5
Antimony (D)	µg/L	0.02	-	-	-	-	-	-	-	0.052	0.056	0.035	0.057	0.055	0.036
Arsenic (D)	µg/L	0.02	-	-	-	-	-	-	-	8.05	8.13	3.83	13.3	13.1	6.44
Barium (D)	µg/L	0.02	-	-	-	-	-	-	-	26.4	26.6	24.6	30.2	29.9	28.4
Beryllium (D)	µg/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bismuth (D)	µg/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron (D)	µg/L	5	-	-	-	-	-	-	-	8.1	8.2	<5	8.9	8.8	7
Cadmium (D)	µg/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cesium (D)	µg/L	0.005	-	-	-	-	-	-	-	0.0218	0.0212	0.0138	0.0278	0.0281	0.0201

Table D3-2. Lake A8 water chemistry results

Parameter	Units	DL (min | max)	Normal Range	FEIS	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July			August		
										2023-07-17			2023-08-19		
										A8-01	A8-02	A8-03	A8-01	A8-02	A8-03
Chromium (D)	µg/L	0.1	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cobalt (D)	µg/L	0.005	-	-	-	-	-	-	-	0.024	0.0236	0.025	0.0265	0.0258	0.0319
Copper (D)	µg/L	0.05	-	-	-	-	-	-	-	0.834	1.01	0.946	0.937	0.919	0.887
Gallium (D)	µg/L	0.05	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron (D)	µg/L	1	-	-	-	-	-	-	-	23.2	21.7	28.2	44.2	42.6	66.6
Lanthanum (D)	µg/L	0.01	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Lead (D)	µg/L	0.01	-	-	9.18 | 11.6	-	-	9.18	6.88	0.02	0.034	0.014	0.02	0.024	0.024
Lithium (D)	µg/L	0.5	-	-	-	-	-	-	-	9.52	9.64	6.97	10.1	10.2	8.41
Manganese (D)	µg/L	0.05	-	-	370	-	-	370	278	0.837	0.795	0.954	2.14	1.54	1.82
Mercury (D)	µg/L	0.5	-	-	-	-	-	-	-	<5e-04	0.00088	0.00343	<5e-04	<5e-04	0.00052
Molybdenum (D)	µg/L	0.05	-	-	-	-	-	-	-	0.384	0.488	0.316	0.473	0.474	0.387
Nickel (D)	µg/L	0.05	-	-	-	-	-	-	-	0.742	0.726	0.843	0.78	0.764	0.878
Niobium (D)	µg/L	0.1	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphorus (D)	µg/L	50	-	-	-	-	-	-	-	<50	<50	<50	<50	<50	<50
Rhenium (D)	µg/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Rubidium (D)	µg/L	0.005	-	-	-	-	-	-	-	2.14	2.11	1.77	2.41	2.41	2.02
Selenium (D)	µg/L	0.04	-	-	-	-	-	-	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Silicon (D)	µg/L	50	-	-	-	-	-	-	-	124	124	195	587	587	952
Silver (D)	µg/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium (D)	µg/L	0.02	-	-	2500	-	-	2500	1880	244	244	201	270	270	213
Sulfur (D)	µg/L	500	-	-	-	-	-	-	-	5490	5630	4510	5110	5050	4170
Tantalum (D)	µg/L	0.1	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tellurium (D)	µg/L	0.02	-	-	-	-	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Thallium (D)	µg/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Thorium (D)	µg/L	0.005	-	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tin (D)	µg/L	0.02	-	-	-	-	-	-	-	<0.02	0.037	0.053	0.025	0.031	0.028
Titanium (D)	µg/L	0.05	-	-	-	-	-	-	-	<0.05	0.057	0.053	<0.05	<0.05	<0.05
Tungsten (D)	µg/L	0.01	-	-	-	-	-	-	-	0.116	0.128	0.031	0.12	0.121	0.032
Uranium (D)	µg/L	0.001	-	-	-	-	-	-	-	0.0986	0.0989	0.0709	0.0874	0.0833	0.0737
Vanadium (D)	µg/L	0.05	-	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Yttrium (D)	µg/L	0.01	-	-	-	-	-	-	-	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Zinc (D)	µg/L	0.5	8.5	-	27 | 30.8	-	-	27	20.2	0.67	0.75	1.83	2.06	<0.5	<0.5
Zirconium (D)	µg/L	0.01	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cyanides															
Cyanide (free)	mg/L	0.001	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cyanide (Total)	mg/L	0.001	0.001	-	0.005	0.2	-	0.005	0.00375	<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 = 2023 detection limits

Normal Range = upper limit of baseline concentrations (see Table D1-1)

FEIS = predicted concentrations for Lake A8 (Agnico Eagle, 2014). Median concentrations at post-closure; no predictions were developed for operations because Lake A8 was scheduled to be dewatered.

FWAL = freshwater aquatic life guideline

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

AEMP Action Level = 75 % of the AEMP Benchmark

Table D3-3. Lake B7 water chemistry results

Parameter	Units	DL (min | max)	Normal Range	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July			August			October		
									2023-07-16			2023-08-19			2023-10-14		
									B7-01	B7-02	B7-03	B7-01	B7-02	B7-03	B7-01	B7-02	B7-03
Conventional Parameters																	
Conductivity (lab)	µS/cm	1	-	-	-	-	-	-	268	265	262	282	282	279	303	301	300
Hardness	mg/L	0.5	-	-	-	-	-	-	109	109	100	117	116	114	118	115	109
pH (lab)	pH units	0.1	-	6.5 | 9.0	-	-	6.5 | 9	6.5 | 9	7.87	7.87	7.87	7.99	7.96	7.99	7.87	7.87	7.86
Total Dissolved Solids	mg/L	15	-	500	-	-	500	375	199	194	171	226	216	217	196	191	145
TDS (Calculated)	mg/L	1	171	500	-	-	500	375	174	172	170	183	183	181	197	196	195
Total Suspended Solids	mg/L	1	3	-	-	-	-	-	<1	<1	<1	1.8	2	1.8	<1	<1	<1
Turbidity (lab)	NTU	0.1	0.69	-	-	-	-	-	0.69	0.47	0.45	0.87	0.61	0.69	0.44	0.45	0.4
Major Ions																	
Alkalinity, Bicarbonate	mg/L	1	135	-	-	-	-	-	54.9	53.8	53.5	61.2	62	59.7	61.6	60.6	60.2
Alkalinity, Carbonate	mg/L	1	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Alkalinity, Hydroxide	mg/L	1	-	-	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1
Alkalinity, Total	mg/L	1	110	-	-	-	-	-	54.9	53.8	53.5	61.2	62	59.7	61.6	60.6	60.2
Bromide	mg/L	0.1	-	-	-	-	-	-	0.17	0.17	0.17	0.19	0.19	0.19	0.17	0.17	0.17
Calcium (D)	mg/L	0.01	-	-	-	-	-	-	37	37.1	34.4	39.9	39.5	38.9	40.1	38.9	36.8
Calcium (T)	mg/L	0.01	39	-	-	-	-	-	36.6	36.8	36.4	38.7	39.2	38.3	38.3	37.7	38.5
Chloride	mg/L	0.1	25	120	-	-	120	90	42.3	41.9	41.8	44.5	44	44	46.6	47.2	47
Fluoride	mg/L	0.02	0.04	0.12	1.5	2.8	2.8	2.1	0.039	0.038	0.038	0.043	0.042	0.042	0.042	0.038	0.041
Magnesium (D)	mg/L	0.004	-	-	-	-	-	-	4.06	4.04	3.52	4.31	4.26	4.17	4.36	4.26	4.07
Magnesium (T)	mg/L	0.004	5.3	-	-	-	-	-	3.74	3.79	3.76	4.15	4.2	4.12	4.15	4.08	4.31
Potassium (D)	mg/L	0.02	-	-	-	-	-	-	2.19	2.17	1.96	2.32	2.32	2.3	2.32	2.25	2.19
Potassium (T)	mg/L	0.02	2.8	-	-	-	-	-	2.1	2.11	2.09	2.3	2.35	2.31	2.21	2.18	2.27
Reactive Silica (SiO_2)	mg/L	0.01 | 0.1	2.3	-	-	-	-	-	0.704	0.715	0.71	1.58	1.51	1.54	0.729	0.782	0.799
Sodium (D)	mg/L	0.02	-	-	-	-	-	-	10.3	10.2	9.25	10.6	10.4	10.3	10.6	10.4	10.1
Sodium (T)	mg/L	0.02	7.5	-	-	-	-	-	9.75	9.82	9.64	10.3	10.4	10.2	10.1	9.96	10.5
Sulphate	mg/L	0.3	6	218	-	-	218	164	12.2	12.2	12.3	11.4	11.4	11.5	13.1	13.4	13.3
Nutrients																	
Ammonia (as N)	mg/L	0.005	0.025	0.197 | 3.98	-	-	0.197	0.148	0.0225	0.0152	0.017	0.0229	0.0204	0.0141	0.0481	0.0187	0.0366
Nitrate (as N)	mg/L	0.005	0.005	2.9	10	-	2.9	2.17	<0.005	<0.005	<0.005	0.0091	<0.005	<0.005	0.0116	0.0107	0.0069
Nitrate + Nitrite (as N)	mg/L	0.0051	-	-	-	-	-	-	<0.0051	<0.0051	<0.0051	0.0091	<0.0051	<0.0051	<0.0224	<0.0224	<0.0224
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	<0.001	<0.001	<0.001
Nitrogen	mg/L	0.05	-	-	-	-	-	-	0.359	0.378	0.337	0.433	0.46	0.382	-	-	-
Orthophosphate (PO_4-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
Total Diss Phosphorus	mg/L	0.001	0.008	-	-	-	-	-	0.0028	0.0026	0.0028	0.0035	0.0035	0.0035	0.0038	0.0028	0.0029
Total Dissolved Nitrogen	mg/L	0.05	-	-	-	-	-	-	0.379	0.356	0.365	0.423	0.335	0.349	0.412	0.387	0.377
Total Kjeldahl Nitrogen	mg/L	0.05	0.73	-	-	-	-	-	0.359	0.378	0.337	0.424	0.46	0.382	0.45	0.422	0.48
Total Kjeldahl Nitrogen (diss)	mg/L	0.05	-	-	-	-	-	-	0.379	0.356	0.365	0.414	0.335	0.349	0.412	0.387	0.377
Total Phosphorus	mg/L	0.001	0.01	0.01	-	-	0.01	0.0075	0.0057	0.0066	0.0087	0.0074	0.0072	0.0066	0.0056	0.006	0.0066
Organic/Inorganic Carbon																	
Dissolved Organic Carbon	mg/L	0.5	5.5	-	-	-	-	-	5.52	5.13	5.5	7.71	7.61	7.81	6.27	5.93	6.43
Total Organic Carbon	mg/L	0.5	7.6	-	-	-	-	-	5.16	5.27	5.18	7.34	7.24	6.79	6.54	6.51	6.51
Total Metals																	
Aluminum (T)	µg/L	1	6.6	100	-	-	100	75	2.9	3.1	3.3	2.6	2.2	2.5	1.2	1.8	2.4
Antimony (T)	µg/L	0.02	0.02	9	6	-	6	4.5	0.045	0.045	0.044	0.046	0.046	0.046	0.042	0.038	0.041
Arsenic (T)	µg/L	0.02	1.8	5	10	25	25	18.8	15.6	13.8	12.9	23.4	20	19	10.2	9.64	9.91
Barium (T)	µg/L	0.02	20	1000	2000	-	1000	750	28.7	28.4	28.1	31.5	30.1	29.6	28.5	28.2	29.1
Beryllium (T)	µg/L	0.005	0.01	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Table D3-3. Lake B7 water chemistry results

Parameter	Units	DL (min | max)	Normal Range	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July			August			October		
									2023-07-16			2023-08-19			2023-10-14		
									B7-01	B7-02	B7-03	B7-01	B7-02	B7-03	B7-01	B7-02	B7-03
Bismuth (T)	µg/L	0.005	0.01	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron (T)	µg/L	5	8	1500	5000	-	1500	1120	14.8	14.9	14.6	17.9	17.9	17.9	15.4	15.5	15.3
Cadmium (T)	µg/L	0.005	0.007	0.158 | 0.182	7	-	0.158	0.118	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cesium (T)	µg/L	0.005	-	-	-	-	-	-	0.0242	0.0237	0.023	0.0305	0.0303	0.0307	0.0205	0.0204	0.0221
Chromium (T)	µg/L	0.1	0.06	5	50	-	5	3.75	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Cobalt (T)	µg/L	0.005	0.05	1.02 | 1.09	-	-	1.02	0.765	0.0882	0.0852	0.083	0.0781	0.0666	0.0618	0.04	0.0381	0.0395
Copper (T)	µg/L	0.05	1.13	2.36 | 2.72	2000	-	2.36	1.77	1.06	1.01	0.998	0.877	0.863	0.85	0.817	0.781	0.766
Gallium (T)	µg/L	0.05	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron (T)	µg/L	1	103	300	-	1060	1060	795	78.2	66.6	61	132	88.1	75.8	39.1	37.8	39.9
Lanthanum (T)	µg/L	0.01	-	-	-	-	-	-	0.017	0.014	0.015	0.014	0.013	0.014	0.016	0.017	0.019
Lead (T)	µg/L	0.01	0.08	-	5	-	5	3.75	0.089	0.075	0.076	0.104	0.052	0.04	0.062	0.069	0.059
Lithium (T)	µg/L	0.5	7.5	-	-	-	-	-	16.2	16.5	16.2	17.6	17.3	17.4	17.7	17.4	18
Manganese (T)	µg/L	0.05	8.6	-	120	-	120	90	13.4	11.4	10.2	22.4	12	10.7	4.06	3.28	3.53
Mercury (T)	µg/L	0.5	0.004	0.026	1	-	0.026	0.0195	0.00057	<5e-04	0.00051	<5e-04	<5e-04	0.00052	<5e-04	<5e-04	<5e-04
Molybdenum (T)	µg/L	0.05	0.24	73	-	-	73	54.8	0.344	0.342	0.344	0.414	0.408	0.396	0.364	0.365	0.375
Nickel (T)	µg/L	0.05	1.4	95.6 | 108	-	-	95.6	71.7	0.904	0.905	0.875	1	0.905	0.877	0.899	0.872	0.882
Niobium (T)	µg/L	0.1	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphorus (T)	µg/L	50	-	-	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50
Rhenium (T)	µg/L	0.005	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Rubidium (T)	µg/L	0.005	-	-	-	-	-	-	2.1	2.08	2.05	2.3	2.33	2.31	2.24	2.18	2.43
Selenium (T)	µg/L	0.04	0.04	1	50	-	1	0.75	0.05	0.058	0.056	0.049	0.054	0.046	0.048	0.046	0.044
Silicon (T)	µg/L	50	-	-	-	-	-	-	360	369	364	797	767	750	352	378	391
Silver (T)	µg/L	0.005	0.005	0.25	-	-	0.25	0.188	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium (T)	µg/L	0.02	155	2500	7000	-	2500	1880	301	305	301	324	326	323	316	310	312
Sulfur (T)	µg/L	500	-	-	-	-	-	-	4510	4530	4480	4110	4130	4060	4770	4760	4980
Tantalum (T)	µg/L	0.1	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tellurium (T)	µg/L	0.02	-	-	-	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Thallium (T)	µg/L	0.005	0.005	0.8	-	-	0.8	0.6	<0.005	0.0051	<0.005	0.0068	0.0063	0.0064	<0.005	<0.005	<0.005
Thorium (T)	µg/L	0.005	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0102	<0.005
Tin (T)	µg/L	0.02	0.05	-	-	-	-	-	0.033	0.062	0.031	0.035	0.04	0.032	0.033	0.021	<0.02
Titanium (T)	µg/L	0.05	0.25	-	-	-	-	-	0.061	0.069	<0.05	0.055	<0.05	0.058	<0.05	<0.05	0.064
Tungsten (T)	µg/L	0.01	-	-	-	-	-	-	0.032	0.034	0.033	0.046	0.047	0.047	0.026	0.027	0.025
Uranium (T)	µg/L	0.001	0.03	15	20	-	15	11.2	0.0828	0.0799	0.0819	0.0752	0.0808	0.0793	0.0824	0.0844	0.0837
Vanadium (T)	µg/L	0.05	0.01	120	-	-	120	90	0.057	0.06	0.06	0.058	0.074	0.081	<0.05	<0.05	<0.05
Yttrium (T)	µg/L	0.01	-	-	-	-	-	-	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc (T)	µg/L	0.5	1.9	-	-	-	-	-	0.81	0.51	1.27	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Zirconium (T)	µg/L	0.01	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Dissolved Metals																	
Aluminum (D)	µg/L	1	-	-	-	-	-	-	3	2.5	3.6	3.5	7.2	2.2	<1	1.1	1.2
Antimony (D)	µg/L	0.02	-	-	-	-	-	-	0.043	0.042	0.046	0.047	0.046	0.047	0.04	0.042	0.055
Arsenic (D)	µg/L	0.02	-	-	-	-	-	-	13.8	12.1	11.3	20.3	17.3	17.2	9.81	8.66	8.61
Barium (D)	µg/L	0.02	-	-	-	-	-	-	26.9	26	28.1	32.5	29.9	30.2	28.8	28.8	28.5
Beryllium (D)	µg/L	0.005	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Bismuth (D)	µg/L	0.005	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron (D)	µg/L	5	-	-	-	-	-	-	16.4	16.2	15.2	16.8	16.6	16.4	16.9	15.9	16.8
Cadmium (D)	µg/L	0.005	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Cesium (D)	µg/L	0.005	-	-	-	-	-	-	0.0226	0.0211	0.0232	0.0304	0.0295	0.0304	0.023	0.0222	0.0222

Table D3-3. Lake B7 water chemistry results

Parameter	Units	DL (min | max)	Normal Range	FWAL (min | max)	HH DW	SSWQO	AEMP Benchmark (min | max)	AEMP Action Level (min | max)	July			August			October		
									2023-07-16			2023-08-19			2023-10-14		
									B7-01	B7-02	B7-03	B7-01	B7-02	B7-03	B7-01	B7-02	B7-03
Chromium (D)	µg/L	0.1	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5
Cobalt (D)	µg/L	0.005	-	-	-	-	-	-	0.0556	0.0502	0.0478	0.0611	0.0483	0.0373	0.0298	0.0303	<0.05
Copper (D)	µg/L	0.05	-	-	-	-	-	-	1.01	0.992	0.923	0.972	1.01	0.941	3.7	0.786	0.82
Gallium (D)	µg/L	0.05	-	-	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Iron (D)	µg/L	1	-	-	-	-	-	-	38.4	30.9	26.6	65.1	63.9	30.4	19.7	18	<10
Lanthanum (D)	µg/L	0.01	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	0.012	<0.01	<0.01	<0.01	<0.01
Lead (D)	µg/L	0.01	-	9.58 | 12	-	-	9.58	7.18	0.058	0.035	0.052	0.069	0.046	0.021	0.029	0.033	<0.05
Lithium (D)	µg/L	0.5	-	-	-	-	-	-	16.8	16.3	16.8	17.1	16.3	16.6	16.6	17.7	18
Manganese (D)	µg/L	0.05	-	370	-	-	370	278	2.44	1.03	0.621	9.16	1.88	0.671	1.24	0.74	<0.2
Mercury (D)	µg/L	0.5	-	-	-	-	-	-	0.00055	<5e-04	0.00055	<5e-04	0.00053	<5e-04	<5e-04	<5e-04	<5e-04
Molybdenum (D)	µg/L	0.05	-	-	-	-	-	-	0.338	0.339	0.321	0.425	0.431	0.405	0.451	0.393	0.466
Nickel (D)	µg/L	0.05	-	-	-	-	-	-	0.934	0.838	0.803	1.01	0.926	0.856	0.92	0.881	1.02
Niobium (D)	µg/L	0.1	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phosphorus (D)	µg/L	50	-	-	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50
Rhenium (D)	µg/L	0.005	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Rubidium (D)	µg/L	0.005	-	-	-	-	-	-	2.03	2	1.98	2.34	2.31	2.32	2.28	2.24	2.15
Selenium (D)	µg/L	0.04	-	-	-	-	-	-	0.049	0.046	0.048	0.046	0.045	0.048	0.048	0.05	<0.04
Silicon (D)	µg/L	50	-	-	-	-	-	-	386	393	359	807	767	758	379	387	384
Silver (D)	µg/L	0.005	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Strontium (D)	µg/L	0.02	-	2500	-	-	2500	1880	303	299	283	340	337	335	323	317	298
Sulfur (D)	µg/L	500	-	-	-	-	-	-	4640	4550	4380	4210	4060	4100	5100	4810	4610
Tantalum (D)	µg/L	0.1	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tellurium (D)	µg/L	0.02	-	-	-	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Thallium (D)	µg/L	0.005	-	-	-	-	-	-	<0.005	<0.005	<0.005	0.007	0.0055	0.0059	<0.005	<0.005	<0.005
Thorium (D)	µg/L	0.005	-	-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tin (D)	µg/L	0.02	-	-	-	-	-	-	0.027	0.037	0.024	0.036	0.165	0.028	0.024	0.045	3.41
Titanium (D)	µg/L	0.05	-	-	-	-	-	-	0.056	<0.05	0.127	0.064	0.06	<0.05	<0.05	<0.05	<0.05
Tungsten (D)	µg/L	0.01	-	-	-	-	-	-	0.031	0.031	0.033	0.044	0.046	0.047	0.028	0.025	0.026
Uranium (D)	µg/L	0.001	-	-	-	-	-	-	0.0812	0.0748	0.0844	0.0737	0.0694	0.0831	0.0892	0.0876	0.0779
Vanadium (D)	µg/L	0.05	-	-	-	-	-	-	<0.05	<0.05	0.05	<0.05	0.074	0.067	<0.05	<0.05	<0.05
Yttrium (D)	µg/L	0.01	-	-	-	-	-	-	0.01	0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc (D)	µg/L	0.5	2.2	25.8 | 31.8	-	-	25.8	19.4	0.57	<0.5	0.56	0.51	<0.5	<0.5	0.57	<0.5	1.3
Zirconium (D)	µg/L	0.01	-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.019
Cyanides																	
Cyanide (free)	mg/L	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	0.001	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
Cyanide (WAD)	mg/L	0.001	-	-	-	-	-	-	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Notes
DL = 2023 detection limits
Normal Range = upper limit of baseline concentrations (see Table D1-1)
FWAL = freshwater aquatic life guideline
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
AEMP Action Level = 75 % of the AEMP Benchmark

APPENDIX E

PHYTOPLANKTON – SUPPORTING INFORMATION

Appendix E1
Phytoplankton Community – 2023 Summary Statistics

APPENDIX E1 – TABLES

Table E1-1. Phytoplankton richness, biomass, and density by major taxa group for individual samples, 2013 to 2023

Year	Area	Sample ID	Date	Designation	Richness (taxa per sample)							Biomass (mg/m³)							Density (cells/L)						
					Chloro	Chryso	Diatoms	Crypto	Dinoflag	Cyano	Eugleno	Chloro	Chryso	Diatoms	Crypto	Dinoflag	Cyano	Eugleno	Chloro	Chryso	Diatoms	Crypto	Dinoflag	Cyano	Eugleno
2013	MEL-01	MEL-01-1D	2013-08-14	Control	7	2	9	4	14	2	0	16.34	4.73	6.79	31.14	78.2	27.45	0	121576	7800	256040	310328	1365760	2000	0
2013	MEL-01	MEL-01-1S	2013-08-14	Control	6	4	9	5	11	2	0	15.99	7.93	6.53	21.42	78.53	15.04	0	103608	153864	404104	199768	1524208	1200	0
2013	MEL-01	MEL-01-2D	2013-08-14	Control	5	3	5	5	13	3	0	13.26	2.47	7.68	24.97	74.29	23.02	0	133544	24152	316896	266224	834544	2200	0
2013	MEL-01	MEL-01-2S	2013-08-14	Control	5	3	11	5	12	3	0	18.09	4.18	5.28	38.58	72.84	9.51	0	88640	89408	289360	387352	1415248	800	0
2013	MEL-01	MEL-01-3S	2013-08-14	Control	5	2	11	5	12	2	0	16	2.91	5.43	22.91	104.94	5.01	0	153680	17768	302928	249456	1654920	400	0
2013	MEL-01	MEL-01-4S	2013-08-14	Control	6	2	7	3	13	2	0	21.54	2.31	7.61	28.22	70.62	34.75	0	125776	3600	346032	252456	1022728	2200	0
2013	MEL-01	MEL-01-5S	2013-08-14	Control	5	3	7	5	12	2	0	15.37	2.29	4.22	27.44	85.7	13.98	0	96624	10984	316896	327880	1459352	1200	0
2015	MEL-01	MEL-01-01	2015-08-18	Impact	6	0	12	6	14	4	0	18.57	0	9.23	13.89	182.21	65.41	0	271624	0	166832	68056	1890792	5800	0
2015	MEL-01	MEL-01-02	2015-08-18	Impact	9	1	13	5	18	2	1	30.91	1.6	31.74	19.6	239.12	27.4	1.68	345480	28736	331264	86424	2425608	5600	200
2015	MEL-01	MEL-01-03	2015-08-18	Impact	9	1	10	5	20	3	0	78.59	1.11	16.8	19.6	206.31	41.11	0	317528	28736	216720	126128	2088560	6600	0
2015	MEL-01	MEL-01-04	2015-08-18	Impact	8	0	8	5	21	3	0	22.6	0	34.18	18.42	240.69	33.95	0	175864	0	287960	85824	2337200	5000	0
2015	MEL-01	MEL-01-05	2015-08-18	Impact	8	0	10	5	18	4	0	17.29	0	24.93	16.3	184.54	83.52	0	191600	0	152864	64672	1726160	9200	0
2015	MEL-02	MEL-02-01	2015-08-18	Impact	9	0	11	4	16	3	0	14.87	0	19.26	16.52	116.79	33.06	0	125944	0	155264	76840	1236048	9784	0
2015	MEL-02	MEL-02-02	2015-08-18	Impact	8	1	9	5	18	4	0	26.18	0.14	15	40.07	151.8	28.47	0	156880	200	232888	236688	1639152	9584	0
2015	MEL-02	MEL-02-03	2015-08-18	Impact	9	0	9	4	19	3	0	18.33	0	18.13	42.46	149.53	22.57	0	194600	0	202552	220336	1638952	5400	0
2015	MEL-02	MEL-02-04	2015-08-18	Impact	7	1	13	4	16	3	0	14.94	0.4	14.7	35.15	101.74	10.71	0	69488	400	168432	250456	1244432	1800	0
2015	MEL-02	MEL-02-05	2015-08-18	Impact	8	2	13	5	15	4	0	27.79	2.05	21.95	30.24	110.61	14.92	0	217568	1600	221720	184400	1308488	2600	0
2016	MEL-01	MEL-01-01	2016-08-16	Impact	6	1	9	5	19	2	0	14.5	0.15	22.54	24.17	228.74	24.62	0	95824	200	246856	150880	2122280	5800	0
2016	MEL-01	MEL-01-02	2016-08-16	Impact	6	1	10	5	19	3	0	12.59	13	17.86	24.94	230.97	28.54	0	140112	114944	245856	163048	2746688	11384	0
2016	MEL-01	MEL-01-03	2016-08-16	Impact	4	2	10	5	18	3	0	5.8	0.64	25.74	27.51	227.05	51.92	0	93208	3000	325080	150480	1987484	12984	0
2016	MEL-01	MEL-01-04	2016-08-16	Impact	7	1	11	4	18	3	0	27.65	0.2	23.65	35.76	300.89	57.88	0	136344	400	239472	201568	2452344	15184	0
2016	MEL-01	MEL-01-05	2016-08-16	Impact	6	0	11	4	21	3	0	12.72	0	16.28	18.11	226.78	50.31	0	130944	0	231088	85624	2430592	7400	0
2016	MEL-02	MEL-02-01	2016-08-16	Impact	9	0	8	5	17	3	0	30.69	0	16.02	28.87	102.2	14	0	81456	0	238472	172232	1530792	9584	0
2016	MEL-02	MEL-02-02	2016-08-16	Impact	8	2	8	5	16	3	0	54.15	0.28	11.17	31.21	126.9	19.32	0	101208	7384	152464	185400	1537976	4600	0
2016	MEL-02	MEL-02-03	2016-08-16	Impact	6	2	11	5	20	3	0	21.82	1.03	11.22	31.51	172.5	65.96	0	41136	14968	174016	181816	1855672	18800	0
2016	MEL-02	MEL-02-04	2016-08-16	Impact	7	0	10	5	19	2	0	23.74	0	16.78	47.87	120.65	27.98	0	69472	0	239872	288976	1596048	6000	0
2016	MEL-02	MEL-02-05	2016-08-16	Impact	7	0	10	5	16	3	0	29.03	0	12.51	42.23	170.68	29.97	0	125344	0	187784	235904	1847688	18368	0
2016	MEL-03	MEL-03-01	2016-08-16	Control	5	0	7	4	17	3	0	13.38	0	7.65	16.59	160.03	9.77	0	15384	0	100976	110160	1632168	1000	0
2016	MEL-03	MEL-03-02	2016-08-16	Control	6	1	8	4	18	2	0	15.83	0.36	10.53	16.36	165.68	9.25	0	86024	7184	191184	103776	1575696	2000	0
2016	MEL-03	MEL-03-03	2016-08-16	Control	7	0	8	4	18	2	0	8.71	0	12.88	39.19	175.45	12.48	0	105176	0	213736	296544	1625584	2600	0
2016	MEL-03	MEL-03-04	2016-08-16	Control	6	1	11	4	18	3	0	5.84	0.28	14.36	24.85	163.24	27.73	0	53288	7184	303128	191184	1525008	4600	0
2016	MEL-03	MEL-03-05	2016-08-16	Control	4	0	10	4	19	3	0	7.6	0	12.9	32.04	157.19	31.57	0	96592	0	181000	187600	1798800	20968	0
2016	MEL-04	MEL-04-01	2016-08-16	Control	4	2	10	3	17	3	0	6.44	0.88	8.68	28.43	101.06	13.55	0	32336	14568	216920	181200	949488	2400	0
2016	MEL-04	MEL-04-02	2016-08-16	Control	5	1	13	4	17	2	0	11.83	0.25	13.63	31.98	124.17	10.31	0	91608	7184	288760	213736	1438800	8184	0
2016	MEL-04	MEL-04-03	2016-08-16	Control	5	0	7	2	11	0	0	9.37	0	4.58	1.25	27.14	0	0	96052.5	0	188143.3	24922.7	634951.9	0	0
2016	MEL-04	MEL-04-04	2016-08-16	Control	6	1	9	3	19	2	0	11.7	0.25	11.57	30.93	145.41	3.58	0	71856	7184	208736	212736	1346208	400	0
2016	MEL-04	MEL-04-05	2016-08-16	Control	6	1	10	3	18	2	0	19.08	0.75	7.68	27.67	117.05	8.3	0	62072	21552	253640	203352	1366360	7984	0
2016	MEL-05	MEL-05-01	2016-08-16	Control	5	0	11	4	18	4	0	24.98	0	11.58	82.14	195.22	37.85	0	100992	0	153864	498928	2158000	5800	0
2016	MEL-05	MEL-05-02	2016-08-16	Control	5	1	8	3	13	3	0	9.52	0.25	6.31	41.26	102.87	29.48	0	56088	7184	129912	260440	1350792	10584	0
2016	MEL-05	MEL-05-03	2016-08-16	Control	6	1	6	4	18	2	0	6.79	1.83	7.06	35.81	137.11	3.34	0	48304	35920	165932	248856	1495672	1800	0
2016	MEL-05	MEL-05-04	2016-08-16	Control	5	0	9	5	18	2	0	17.63	0	10.23	34.52	114.47	9.11	0	41720	0	123928	192384	1243432	3000	0
2016	MEL-05	MEL-05-05	2016-08-16	Control	6	1	9	4	18	2	0	14.51	1.07	20.38	44.41	118.34	15.32	0	62072	21552	266608	281992	1165608	3200	0
2017	MEL-01	MEL-01-01	2017-08-15	Impact	7	1	10	4	19	3	0	20.48	0.11	23.8	29.53	164.21	55.06	0	108824	200	259824	196768	1905560	8200	0
2017	MEL-01	MEL-01-02	2017-08-15	Impact	6	1	10	5	17	2	0	8.63	0.77	22.35	36.54	171.01	19.22	0	55536	1400	210936	239272	2027688	25552	0
2017	MEL-01	MEL-01-03	2017-08-15	Impact	8	1	9	5	16	4	0	28.8	0.11	9.46	44.34	199.52	60.02	0	105656	200	131512	270608	1913344	9200	0
2017	MEL-01	MEL-01-04	2017-08-15	Impact	6	1	12	5	19	4	0	9.18	0.11	9.68	52.54	195.29	82.31	0	85256	200	138096	348832	2108912	19984	0
2017	MEL-01	MEL-01-05	2017-08-15	Impact	7	1	10	5	16	4	0	15.61	0.66	30.96	27.1	211.92	50.29	0	137560	1200	339848	162248	2357552	15584	0
2017	MEL-02	MEL-02-01	2017-08-15	Impact	7	1	12	5	18	2	0	19.35	0.2	14.78	32.5	120.62	21.33	0	156664	200	274992	197568	1465736	16568	0
2017	MEL-02	MEL-02-02	2017-08-15	Impact	8	1	13	4	15	2	0	21.93	0.3	16.16	35.56	115.75	18.04	0	88624	600	324280	224904	1523408	17568	0
2017	MEL-02	MEL-02-03	2017-08-15	Impact	4	1	12	5	17	2	0	9.67	10.59	24.44	33.89	127.24	13.29	0	27352	28736	389536	217920	1466536	2400	0
2017	MEL-02	MEL-02-04	2017-08-15	Impact	7	1	11	4	18	3	0	17.47	0.1	58.5	40.37	146.86	28.21	0	101192	200	353816	254640	1553544	11784	0

Table E1-1. Phytoplankton richness, biomass, and density by major taxa group for individual samples, 2013 to 2023

Year	Area	Sample ID	Date	Designation	Richness (taxa per sample)							Biomass (mg/m³)							Density (cells/L)						
					Chloro	Chryso	Diatoms	Crypto	Dinoflag	Cyano	Eugleno	Chloro	Chryso	Diatoms	Crypto	Dinoflag	Cyano	Eugleno	Chloro	Chryso	Diatoms	Crypto	Dinoflag	Cyano	Eugleno
2017	MEL-02	MEL-02-05	2017-08-15	Impact	7	0	12	4	17	2	0	7.97	0	13.6	36.49	100.59	21.9	0	61872	0	153064	219520	1394496	5200	0
2017	MEL-03	MEL-03-01	2017-08-15	Control	5	0	9	5	17	2	0	4.15	0	5.24	28.46	137.12	27.49	0	26352	0	137696	189184	1310288	18768	0
2017	MEL-03	MEL-03-02	2017-08-15	Control	6	0	13	4	17	2	0	6.44	0	9.12	36.21	120.15	30.3	0	54088	0	131312	252640	1396296	4600	0
2017	MEL-03	MEL-03-03	2017-08-15	Control	6	0	8	4	18	2	1	5.24	0	8.13	22.83	122.39	20.61	2.07	66656	0	166032	146080	1480504	3600	200
2017	MEL-03	MEL-03-04	2017-08-15	Control	6	1	10	4	20	2	0	7.22	0.1	5.21	19.64	150.58	12.02	0	54688	200	102176	124128	1684056	10984	0
2017	MEL-03	MEL-03-05	2017-08-15	Control	8	1	7	4	18	3	0	13.41	0.92	13.07	34.03	149.76	36.88	0	67072	200	109360	217920	1950464	5400	0
2017	MEL-04	MEL-04-01	2017-08-15	Control	8	0	12	3	17	2	0	8.08	0	7.26	48.86	102.35	5.87	0	47504	0	146280	318696	1351392	1000	0
2017	MEL-04	MEL-04-02	2017-08-15	Control	6	1	9	3	17	2	0	11.34	19.25	8.14	37.33	119.28	6.38	0	53888	57472	131112	231688	1523408	1000	0
2017	MEL-04	MEL-04-03	2017-08-15	Control	6	0	9	5	16	3	0	10.38	0	5.19	55.06	110.79	10.32	0	76040	0	116344	368984	1523608	2000	0
2017	MEL-04	MEL-04-04	2017-08-15	Control	6	1	11	3	16	2	0	10.18	38.51	10.43	32.05	129.91	12.04	0	69456	114944	231688	210136	1667888	7784	0
2017	MEL-04	MEL-04-05	2017-08-15	Control	5	1	8	4	18	2	0	3.92	0.43	8.59	35.41	141.59	14.12	0	38720	200	181000	231888	1761680	2200	0
2017	MEL-05	MEL-05-01	2017-08-15	Control	6	1	13	5	18	2	0	12.98	0.2	9.44	57.06	155.71	19.34	0	119944	400	196368	364200	2012720	10384	0
2017	MEL-05	MEL-05-02	2017-08-15	Control	5	0	12	5	20	2	0	14.76	0	13.8	28.13	155.79	13.1	0	126128	0	319096	183600	1776048	2200	0
2017	MEL-05	MEL-05-03	2017-08-15	Control	7	0	13	5	19	2	0	9.68	0	10.71	37.76	127.74	10.7	0	46104	0	102776	240872	1444584	3200	0
2017	MEL-05	MEL-05-04	2017-08-15	Control	7	0	11	5	17	2	0	10.28	0	8.19	35.01	124.24	19.01	0	48904	0	159448	225904	1660304	9984	0
2017	MEL-05	MEL-05-05	2017-08-15	Control	5	0	7	4	18	2	0	7.31	0	4.3	51.91	129.84	10.12	0	67456	0	108760	321496	1329840	1800	0
2018	MEL-01	MEL-01-01	2018-08-31	Impact	9	2	14	5	14	2	0	60.66	1.48	28.38	42.36	165.36	40.63	0	448784	29336	683680	179032	2321032	4800	0
2018	MEL-01	MEL-01-06	2018-08-31	Impact	8	1	10	5	16	3	0	55.55	0.6	23.47	58.79	179.5	38.26	0	343792	800	690864	267640	2450744	4400	0
2018	MEL-01	MEL-01-07	2018-08-31	Impact	8	2	16	5	16	4	0	60.86	7.29	25.05	46.33	138.64	57.95	0	367712	1000	698848	147312	2227440	5800	0
2018	MEL-01	MEL-01-08	2018-08-31	Impact	6	1	11	5	17	3	0	69.98	0.45	21.17	45.17	141.14	18.82	0	319904	600	339448	168064	2163384	2600	0
2018	MEL-01	MEL-01-09	2018-08-31	Impact	9	1	11	5	17	3	0	63.04	0.75	40.22	58.12	166.06	38.32	0	424448	1000	620424	213568	2385488	4200	0
2018	MEL-02	MEL-02-02	2018-08-31	Impact	6	0	9	1	9	3	0	35.06	0	8.3	5.47	35.73	20.62	0	366032	0	252240	3200	538800	2600	0
2018	MEL-02	MEL-02-03	2018-08-31	Impact	10	0	11	4	18	4	0	29.07	0	33.62	50.62	155.77	59.58	0	215352	0	598272	229320	1998352	7200	0
2018	MEL-02	MEL-02-05	2018-08-31	Impact	7	1	8	4	16	3	0	31.07	0.15	26.58	31.51	119.94	37.57	0	272024	200	367584	164248	2004336	11384	0
2018	MEL-02	MEL-02-06	2018-08-31	Impact	8	1	8	3	12	2	0	39.99	1.28	17.44	15.13	56.89	11.74	0	279456	28736	260624	88008	820576	1800	0
2018	MEL-02	MEL-02-08	2018-08-31	Impact	8	0	11	3	14	2	0	37.77	0	12.83	27.24	108.75	21.91	0	261088	0	196168	134712	1401480	3600	0
2018	MEL-03	MEL-03-01	2018-08-31	Control	9	0	7	3	17	4	0	17.94	0	28.44	32.9	192.87	33.2	0	153080	0	195368	184800	2746488	3400	0
2018	MEL-03	MEL-03-02	2018-08-31	Control	9	1	9	5	17	2	0	17.11	0.15	16.41	44.35	144.25	31.61	0	139912	200	239272	251656	1933696	4000	0
2018	MEL-03	MEL-03-03	2018-08-31	Control	8	0	10	5	17	4	0	17.86	0	9.53	31.73	186.65	54.71	0	118760	0	138696	191384	3313424	5600	0
2018	MEL-03	MEL-03-04	2018-08-31	Control	7	1	8	5	15	1	0	15.13	0.89	13.54	59.96	172.9	5.83	0	73856	28736	159648	359416	2150416	1600	0
2018	MEL-03	MEL-03-05	2018-08-31	Control	9	1	10	4	18	2	0	21.15	0.43	22.28	35.43	157.49	14.64	0	129128	200	175616	205952	2364536	2600	0
2018	MEL-04	MEL-04-01	2018-08-31	Control	8	0	10	3	18	3	0	20.82	0	31.76	31.58	119.49	24.58	0	130328	0	143096	203552	1904960	2000	0
2018	MEL-04	MEL-04-02	2018-08-31	Control	8	0	7	5	16	3	0	26.58	0	30.88	48.54	130.49	13.45	0	81640	0	260424	326080	1811168	1200	0
2018	MEL-04	MEL-04-03	2018-08-31	Control	5	1	7	4	17	3	0	14.81	4.92	7.73	63.02	124.96	11.69	0	162648	1400	181400	426456	1810768	800	0
2018	MEL-04	MEL-04-05	2018-08-31	Control	7	0	9	5	16	3	0	18.17	0	20.66	57.2	132.21	27.93	0	135312	0	296144	390336	2054824	2600	0
2018	MEL-05	MEL-05-01	2018-08-31	Control	7	0	8	3	18	2	0	16.22	0	16.64	26.67	130.77	18.84	0	108376	0	145280	174016	2400056	1200	0
2018	MEL-05	MEL-05-02	2018-08-31	Control	7	0	6	2	11	1	0	35.85	0	11.08	15.75	69.84	22.57	0	206768	0	118744	75240	1078800	1200	0
2018	MEL-05	MEL-05-03	2018-08-31	Control	5	0	8	2	14	2	0	21.95	0	18.49	29.42	84.45	7.9	0	229704	0	176216	182200	1056248	800	0
2018	MEL-05	MEL-05-04	2018-08-31	Control	9	1	6	2	13	1	0	24.8	0.6	24.82	13.62	67.72	8.48	0	167448	800	232088	74040	1070816	600	0
2018	MEL-05	MEL-05-05	2018-08-31	Control	6	2	6	2	13	1	0	25.37	2.3	9.1	16.17	72.39	6.23	0	232504	15168	159848	88608	1020128	400	0
2019	MEL-01	MEL-01-01	2019-08-16	Impact	8	1	12	4	20	4	0	28.39	0.3	29.76	28.19	294.92	63.2	0	149712	600	304528	38952	2363952	7800	0
2019	MEL-01	MEL-01-06	2019-08-16	Impact	7	1	8	4	19	4	0	20.59	0.3	14.02	35.29	254.3	61.83	0	110592	600	144680	40952	2181752	8400	0
2019	MEL-01	MEL-01-07	2019-08-16	Impact	9	1	9	4	19	5	0	35.09	0.4	26.38	37.85	241.88	79.16	0	164864	800	231488	91040	2334416	10200	0
2019	MEL-01	MEL-01-08	2019-08-16	Impact	8	1	8	4	20	4	0	30.07	0.3	19.26	27.67	319.65	40.16	0	176464	600	239472	69672	2715368	5600	0
2019	MEL-01	MEL-01-09	2019-08-16	Impact	8	1	8	4	18	3	0	42.51	0.3	24.36	42.89	279.27	49.15	0	268256	600	339248	145312	2267160	8000	0
2019	MEL-02	MEL-02-01	2019-08-16	Impact	8	0	8	3	16	4	0	30.79	0	12.03	6.74	195.56	21.23	0	129328	0	117144	52288	1553944	2600	0
2019	MEL-02	MEL-02-02	2019-08-16	Impact	9	0	9	5	16	2	0	19.52	0	10.26	7.41	124.02	20.12	0	108576	0	173816	67256	1286936	2600	0
2019	MEL-02	MEL-02-03	2019-08-16	Impact	10	0	11	5	16	2	0	35.17	0	8.87	10.63	173.52	16.73	0	111192	0	140096	68056	1683256	2400	0
2019	MEL-02	MEL-02-04	2019-08-16	Impact	9	0	9	5	16	3	0	19.9	0	19.2	118.73	168.38	17.32	0	75056	0	166632	1331240	1535192	2200	0
2019	MEL-02	MEL-02-05	2019-08-16	Impact	9	1	11	4	17	3	0	29.12	0.1	13.75	10.29	187.06	23.34	0	117960	200	155064	75240	1935896	9384	0
2019	MEL-03	MEL-03-01	2019-08-16	Control	9	0	6	4	16	3	0	19.88	0	3.21	6.65	154.08	25.3	0	105176	0	122728	37720	1281952	3000	0

Table E1-1. Phytoplankton richness, biomass, and density by major taxa group for individual samples, 2013 to 2023

Year	Area	Sample ID	Date	Designation	Richness (taxa per sample)							Biomass (mg/m³)							Density (cells/L)						
					Chloro	Chryso	Diatoms	Crypto	Dinoflag	Cyano	Eugleno	Chloro	Chryso	Diatoms	Crypto	Dinoflag	Cyano	Eugleno	Chloro	Chryso	Diatoms	Crypto	Dinoflag	Cyano	Eugleno
2019	MEL-03	MEL-03-02	2019-08-16	Control	6	0	7	5	19	4	0	13.25	0	7.9	5.43	201.84	14.83	0	159248	0	65456	24352	1749312	2000	0
2019	MEL-03	MEL-03-03	2019-08-16	Control	7	1	8	3	18	3	0	11.33	0.1	12.98	3.93	205.53	10.99	0	138496	200	102176	29736	1455568	1600	0
2019	MEL-03	MEL-03-04	2019-08-16	Control	6	1	9	3	16	1	0	4.96	0.14	12.42	7.67	184.88	1.37	0	53688	200	74040	53088	1705208	200	0
2019	MEL-03	MEL-03-05	2019-08-16	Control	8	1	7	5	16	3	0	27.1	1.46	7.56	8.17	181.26	11.62	0	154264	28736	87408	32936	1719976	1400	0
2019	MEL-04	MEL-04-01	2019-08-16	Control	6	1	7	5	18	3	0	11.06	0.1	11.28	15.65	199.51	6.53	0	89408	200	137296	152664	1626384	1000	0
2019	MEL-04	MEL-04-02	2019-08-16	Control	8	0	8	4	19	2	0	13.14	0	4.98	11.38	182.82	4.73	0	67872	0	166232	82024	1906960	800	0
2019	MEL-04	MEL-04-03	2019-08-16	Control	8	0	6	4	15	2	0	15.12	0	2.17	9.62	176.65	11.97	0	70256	0	52288	88408	1804984	600	0
2019	MEL-04	MEL-04-04	2019-08-16	Control	7	1	8	4	16	1	0	9.06	0.57	4.92	6.48	143.56	3.64	0	110360	57472	67056	65856	1337424	1000	0
2019	MEL-04	MEL-04-05	2019-08-16	Control	8	0	6	4	17	2	0	13.51	0	10.66	7.78	187.24	6.55	0	98992	0	88008	80024	1661904	800	0
2019	MEL-05	MEL-05-01	2019-08-16	Control	8	0	8	4	17	3	0	10	0	6.47	7.91	133.36	24.36	0	61072	0	123528	80424	1101152	3400	0
2019	MEL-05	MEL-05-02	2019-08-16	Control	10	0	9	3	16	3	0	18.8	0	5.37	20.87	171.5	32.65	0	93008	0	87608	197368	1676872	2400	0
2019	MEL-05	MEL-05-03	2019-08-16	Control	6	1	11	4	17	2	0	19.92	3.54	6.27	8.28	114.19	6.16	0	132512	57472	104176	80024	921752	600	0
2019	MEL-05	MEL-05-04	2019-08-16	Control	6	1	6	4	15	2	0	14.59	0.6	21.43	13.49	163.87	11.87	0	48104	1200	109760	117344	1352392	1800	0
2019	MEL-05	MEL-05-05	2019-08-16	Control	9	2	5	4	18	3	0	17.49	1.87	1.58	8.82	162.69	13.56	0	107176	28936	29936	87408	1676472	2400	0
2020	MEL-01	MEL-01-01	2020-08-23	Impact	7	1	9	5	10	2	0	51.08	1.3	7.07	84.3	50.49	11.73	0	328904	2600	100192	187296	714416	2400	0
2020	MEL-01	MEL-01-06	2020-08-23	Impact	6	1	6	5	11	2	0	26.93	1.5	23.26	79.01	68.62	17.69	0	341160	3000	970840	206848	1066432	23952	0
2020	MEL-01	MEL-01-07	2020-08-23	Impact	7	3	11	5	11	3	0	35.51	8.61	14.18	66.89	102.24	18.41	0	425816	75440	444624	301808	1970616	3200	0
2020	MEL-01	MEL-01-08	2020-08-23	Impact	6	1	8	4	12	3	0	34.09	1.5	15.48	72.05	34.9	16.63	0	330024	3000	460976	229784	441224	10384	0
2020	MEL-01	MEL-01-09	2020-08-23	Impact	6	1	9	4	11	1	0	24.74	1.5	18.8	80.02	78.91	8.12	0	252952	3000	540000	413568	1094168	2000	0
2020	MEL-02	MEL-02-01	2020-08-23	Impact	7	1	8	4	13	1	0	35	0.4	27.44	37.28	78.01	3.25	0	258088	800	500296	368600	1078400	800	0
2020	MEL-02	MEL-02-02	2020-08-23	Impact	7	1	7	4	12	2	0	79.12	0.4	4.57	36.19	60.5	7.74	0	275000	800	348232	278008	1200128	1400	0
2020	MEL-02	MEL-02-03	2020-08-23	Impact	7	1	6	5	13	1	0	22.06	0.5	3.6	25.45	66.25	4.87	0	230920	1000	65456	147696	977824	1200	0
2020	MEL-02	MEL-02-04	2020-08-23	Impact	8	1	7	4	8	2	0	31.93	0.5	5.69	43.37	100.54	6.52	0	158512	1000	130712	352048	1487088	600	0
2020	MEL-02	MEL-02-05	2020-08-23	Impact	7	1	4	5	9	2	0	20.8	0.1	27.45	34.76	77.77	7.53	0	261856	200	567736	265240	1221880	1600	0
2020	MEL-03	MEL-03-01	2020-08-23	Control	5	1	9	4	13	3	0	9.59	0.1	5.71	19.7	151.54	14.01	0	51888	200	135512	233488	2040656	2400	0
2020	MEL-03	MEL-03-02	2020-08-23	Control	4	0	4	3	9	2	0	10.15	0	8.19	24.57	176.38	7.32	0	145680	0	97392	305528	1559128	1400	0
2020	MEL-03	MEL-03-03	2020-08-23	Control	5	0	11	3	14	2	0	5.77	0	22.71	26.52	195.77	4.02	0	108760	0	604656	348032	1883608	800	0
2020	MEL-03	MEL-03-04	2020-08-23	Control	5	0	8	4	11	3	0	11.26	0	6.11	18.04	126.37	18.45	0	132312	0	131712	224704	1817752	2400	0
2020	MEL-03	MEL-03-05	2020-08-23	Control	7	1	4	4	12	1	0	23.43	0.1	1.69	18.67	103.15	8.02	0	95592	200	14968	232088	1587664	2200	0
2020	MEL-04	MEL-04-01	2020-08-23	Control	5	1	4	4	14	1	0	8.56	0.2	2.06	21.4	103.38	1.84	0	88208	400	8784	192784	1107336	200	0
2020	MEL-04	MEL-04-02	2020-08-23	Control	5	0	3	5	11	1	0	6.66	0	0.75	14.22	141.25	0.81	0	182600	0	29136	98392	1731744	200	0
2020	MEL-04	MEL-04-03	2020-08-23	Control	7	1	7	4	13	3	0	11.86	0.4	11.05	18.06	101.83	8.34	0	80040	800	132712	184000	1351192	600	0
2020	MEL-04	MEL-04-04	2020-08-23	Control	5	0	7	4	14	1	0	10.7	0	7.13	19.81	115.43	2.43	0	158648	0	59272	178016	1228864	600	0
2020	MEL-04	MEL-04-05	2020-08-23	Control	6	1	6	4	11	1	0	6.9	0.1	3.36	17.57	61.95	1.62	0	66056	200	152464	183400	1106736	400	0
2020	MEL-05	MEL-05-01	2020-08-23	Control	6	2	5	4	10	3	0	14.14	2.8	3.63	15.44	128.89	4.36	0	69656	29336	31536	140896	1501856	600	0
2020	MEL-05	MEL-05-02	2020-08-23	Control	5	1	9	3	11	3	0	8.62	0.3	4.67	15.94	93.2	12.03	0	103376	600	123528	189184	1221880	1600	0
2020	MEL-05	MEL-05-03	2020-08-23	Control	5	1	5	5	14	3	0	11.57	3.58	2.53	13.46	103.46	15.18	0	175216	28736	252440	146480	1243432	1000	0
2020	MEL-05	MEL-05-04	2020-08-23	Control	5	0	9	4	10	2	0	16.95	0	5.38	16.74	101.82	16.14	0	103776	0	138296	175616	1544560	2600	0
2020	MEL-05	MEL-05-05	2020-08-23	Control	5	1	3	3	11	2	0	10.36	0.5	1.91	9.05	90.46	11.7	0	68856	1000	29936	75440	1623584	2600	0
2021	MEL-01	MEL-01-01	2021-08-16	Impact	9	2	14	5	14	5	0	41.19	4.55	21.9	9.43	219.32	77.06	0	394968	64656	456792	33336	1994368	10400	0
2021	MEL-01	MEL-01-06	2021-08-16	Impact	10	1	12	6	15	3	0	39.45	0.8	22.09	21.27	227.11	75.12	0	437088	1600	325680	79840	1999352	12000	0
2021	MEL-01	MEL-01-07	2021-08-16	Impact	11	1	9	4	18	3	0	93.42	0.6	29.12	16.94	223.48	66.14	0	951984	1200	256040	16784	1972016	10400	0
2021	MEL-01	MEL-01-08	2021-08-16	Impact	9	1	8	4	13	5	0	52.92	0.3	13.54	17.52	209.57	60.22	0	382400	600	234288	15584	1814168	9000	0
2021	MEL-01	MEL-01-09	2021-08-16	Impact	11	1	12	4	18	3	0	45.8	0.4	42.45	16.21	200.95	50.85	0	449872	800	714416	63872	1885208	7200	0
2021	MEL-01	MEL-01-10	2021-08-16	Impact	10	1	11	6	15	5	0	84.02	0.5	51.08	12.67	268.68	52.55	0	880712	1000	1029912	20568	2460328	7000	0
2021	MEL-02	MEL-02-02	2021-08-16	Impact	10	2	10	4	14	3	0	37.95	0.48	10.95	6.74	77.6	13.61	0	176448	800	268208	24952	1006560	2200	0
2021	MEL-02	MEL-02-03	2021-08-16	Impact	9	2	14	5	17	3	0	31.16	0.61	18.72	8.87	93.39	15.26	0	212768	7384	397720	46904	1230064	3200	0
2021	MEL-02	MEL-02-05	2021-08-16	Impact	10	2	10	4	14	4	1	54.61	1.13	23.43	13.72	148.42	22.42	0.95	221784	28936	210736	63672	1459352	3200	200
2021	MEL-02	MEL-02-06	2021-08-16	Impact	11	1	10	5	17	3	0	64.97	0.18	10.89	12.2	111.77	13.67	0	344480	200	181400	90008	1300904	2200	0
2021	MEL-02	MEL-02-08	2021-08-16	Impact	10	0	11	6	13	5	0	69.58	0	11.89	13.05	95.93	38.11	0	475608	0	367984	69456	1050264	4600	0
2021	MEL-03	MEL-03-01	2021-08-16	Control	9	0	8	3	18	4	0	14.16	0	26.91	4.18	106.88	52.63	0	184000	0	195368	2600	1294520	3000	0

Table E1-1. Phytoplankton richness, biomass, and density by major taxa group for individual samples, 2013 to 2023

Year	Area	Sample ID	Date	Designation	Richness (taxa per sample)							Biomass (mg/m³)							Density (cells/L)						
					Chloro	Chryso	Diatoms	Crypto	Dinoflag	Cyano	Eugleno	Chloro	Chryso	Diatoms	Crypto	Dinoflag	Cyano	Eugleno	Chloro	Chryso	Diatoms	Crypto	Dinoflag	Cyano	Eugleno
2021	MEL-03	MEL-03-02	2021-08-16	Control	8	1	10	5	12	3	0	42.29	2.83	16.52	18.83	174.35	6.98	0	278408	35920	208936	203552	1991368	1000	0
2021	MEL-03	MEL-03-03	2021-08-16	Control	7	0	7	5	12	4	0	15	0	2.71	7.61	66.92	23.48	0	136712	0	73840	52688	886432	2600	0
2021	MEL-03	MEL-03-04	2021-08-16	Control	7	0	8	3	11	4	0	11.39	0	6.84	12.79	87.74	23.48	0	119744	0	31536	130912	971840	2600	0
2021	MEL-03	MEL-03-05	2021-08-16	Control	9	0	10	3	10	4	0	30.06	0	8.8	7.65	109.9	45.61	0	184016	0	68056	59472	960272	2000	0
2021	MEL-04	MEL-04-01	2021-08-16	Control	6	1	6	4	9	3	0	14.72	0.2	4.25	7.28	116.1	13.25	0	100592	400	116744	23952	1028912	1800	0
2021	MEL-04	MEL-04-02	2021-08-16	Control	9	0	5	6	15	2	0	16.18	0	4.28	7.63	92.98	12.81	0	201968	0	324880	38520	814592	1400	0
2021	MEL-04	MEL-04-03	2021-08-16	Control	9	1	11	3	14	3	0	26.14	2.3	7.53	3.16	105.74	21.7	0	182616	200	203752	8584	1662904	2600	0
2021	MEL-04	MEL-04-04	2021-08-16	Control	7	1	12	3	16	4	0	12.61	0.51	29.26	7.53	124.02	15.34	0	177616	7184	311112	24552	1340824	1600	0
2021	MEL-04	MEL-04-05	2021-08-16	Control	5	1	7	4	14	3	0	15.26	0.1	6.66	9.82	86.35	19.83	0	127728	200	267608	33536	993592	2400	0
2021	MEL-05	MEL-05-01	2021-08-16	Control	9	0	7	4	17	3	0	55.11	0	7.26	4.43	90.31	24.69	0	187000	0	316696	23952	822176	3200	0
2021	MEL-05	MEL-05-02	2021-08-16	Control	6	1	8	4	13	3	0	32.56	0.51	5.89	5.08	83.89	22.38	0	300744	7184	152664	10584	864080	2600	0
2021	MEL-05	MEL-05-03	2021-08-16	Control	8	1	9	5	13	2	0	18.14	0.1	6.31	16.61	94.64	11.79	0	96408	200	226104	78840	935920	1400	0
2021	MEL-05	MEL-05-04	2021-08-16	Control	6	1	8	3	12	3	0	14.06	0.51	11.87	8.47	89.87	7.4	0	118144	7184	173616	54288	713216	1400	0
2021	MEL-05	MEL-05-05	2021-08-16	Control	10	3	5	4	11	4	0	17.82	5.28	6.36	13.37	106.96	14.98	0	131528	57872	231888	83624	1309688	1800	0
2022	MEL-01	MEL-01-01	2022-08-20	Impact	8	2	10	2	13	3	0	32.54	0.56	7.62	19.85	50.02	47.99	0	197776	14968	313112	77240	908784	7600	0
2022	MEL-01	MEL-01-06	2022-08-20	Impact	8	1	6	3	14	4	0	43.29	0.3	10.77	9.03	82.92	53.69	0	271648	400	108560	18568	1067232	9400	0
2022	MEL-01	MEL-01-07	2022-08-20	Impact	8	1	9	2	14	3	0	51.52	0.45	7.14	14.66	109.48	78.77	0	318552	600	145480	54488	1707408	12800	0
2022	MEL-01	MEL-01-08	2022-08-20	Impact	8	1	8	2	13	4	0	51.7	0.75	13.46	24.71	98.99	72.91	0	306736	1000	169032	119744	1492288	10000	0
2022	MEL-01	MEL-01-09	2022-08-20	Impact	10	1	10	3	12	4	1	79.31	0.15	15.11	30.54	128.11	87.32	0.4	388344	200	418472	129528	1993768	12600	200
2022	MEL-01	MEL-01-10	2022-08-20	Impact	8	1	9	3	12	4	0	58.83	0.6	10.15	8.08	91.3	94.77	0	280800	800	253240	10984	1468336	12800	0
2022	MEL-02	MEL-02-02	2022-08-20	Impact	7	1	3	2	11	3	0	14.52	0.15	0.65	8.44	159.84	21.51	0	77472	200	7584	73240	1143872	4200	0
2022	MEL-02	MEL-02-03	2022-08-20	Impact	5	1	6	2	15	2	0	9.04	0.15	5.38	8.32	190.47	21.95	0	74272	200	173416	80024	1438432	4400	0
2022	MEL-02	MEL-02-05	2022-08-20	Impact	6	1	9	2	11	3	0	14.09	0.15	7.26	4.15	126.85	35.3	0	101008	200	84624	29736	866896	6600	0
2022	MEL-02	MEL-02-06	2022-08-20	Impact	6	1	9	2	11	3	0	10.1	0.15	7.4	4.14	86.33	42.92	0	143896	200	195368	9184	613256	8200	0
2022	MEL-02	MEL-02-08	2022-08-20	Impact	6	1	9	3	10	3	0	11.97	0.2	15.41	8.51	103.77	39.13	0	28968	400	510864	52888	910000	8000	0
2022	MEL-03	MEL-03-01	2022-08-20	Control	4	0	11	2	11	4	0	2.84	0	4.2	7.37	94.67	23.62	0	45104	0	75440	72640	1008360	4000	0
2022	MEL-03	MEL-03-02	2022-08-20	Control	6	0	5	1	10	3	0	9.19	0	1.53	3.57	104.06	23.94	0	112360	0	50688	43104	944304	4400	0
2022	MEL-03	MEL-03-03	2022-08-20	Control	4	1	7	2	14	3	0	5.74	0.1	6.69	4.74	86.19	28.18	0	10984	200	93592	36920	1038696	5000	0
2022	MEL-03	MEL-03-04	2022-08-20	Control	4	0	5	2	9	3	0	11.09	0	4.11	9.04	103.3	19.91	0	51688	0	79424	80424	1017144	3600	0
2022	MEL-03	MEL-03-05	2022-08-20	Control	3	1	4	1	11	4	0	3.19	0.1	1.24	1.06	66.16	30.4	0	8984	200	29136	600	756120	5200	0
2022	MEL-04	MEL-04-01	2022-08-20	Control	5	1	8	2	10	4	0	4.18	1.46	5.15	3.57	52.53	14.35	0	67056	28736	158648	22552	662328	2000	0
2022	MEL-04	MEL-04-02	2022-08-20	Control	4	0	9	2	9	4	0	3.08	0	10.74	4.78	82.55	14.56	0	31136	0	317296	36920	944104	1600	0
2022	MEL-04	MEL-04-03	2022-08-20	Control	4	0	7	2	10	3	0	3.26	0	5.14	6.56	64.85	42.98	0	75840	0	72640	37920	705632	6800	0
2022	MEL-04	MEL-04-04	2022-08-20	Control	5	1	11	2	10	3	0	9.33	5.28	14.39	10.26	82.81	16.61	0	126328	57472	176016	88008	1037096	2800	0
2022	MEL-04	MEL-04-05	2022-08-20	Control	5	1	7	1	7	2	1	3.57	0.1	4.44	1.42	27.62	15.7	1.5	39720	200	130712	800	511264	2600	200
2022	MEL-05	MEL-05-01	2022-08-20	Control	6	0	7	2	12	3	0	10.69	0	4.78	8.42	80.32	17.49	0	87424	0	145080	87008	727184	3400	0
2022	MEL-05	MEL-05-02	2022-08-20	Control	5	0	5	2	8	4	0	3.14	0	2.04	4.49	98.44	24.67	0	52688	0	23152	9384	634992	4200	0
2022	MEL-05	MEL-05-03	2022-08-20	Control	4	0	5	2	9	3	0	2.81	0	1.59	4.29	42.41	16.24	0	66856	0	94192	22952	319896	3400	0
2022	MEL-05	MEL-05-04	2022-08-20	Control	6	0	4	2	8	4	0	6.83	0	1.01	3.88	84.83	30.7	0	37136	0	7984	22752	585704	5000	0
2022	MEL-05	MEL-05-05	2022-08-20	Control	4	0	5	2	7	2	0	5.48	0	3.14	2.35	63.4	12.79	0	52688	0	100976	8184	428656	2800	0
2023	MEL-01	MEL-01-01	2023-08-22	Impact	8	2	10	4	15	3	0	40.64	1.16	10.89	25.69	256.14	37.23	0	175880	29136	288760	99792	3117488	6400	0
2023	MEL-01	MEL-01-06	2023-08-22	Impact	8	2	6	4	16	3	0	15.53	0.33	8.74	33.82	181.56	55.86	0	166496	800	324280	157264	2983176	10000	0
2023	MEL-01	MEL-01-07	2023-08-22	Impact	8	2	8	2	16	5	0	21.14	2.5	5.3	9.14	189.83	40	0	179096	87008	188784	37920	2183368	6000	0
2023	MEL-01	MEL-01-08	2023-08-22	Impact	8	1	6	4	18	3	0	50.54	0.5	4.15	35.54	118.7	51.52	0	1381976	1000	138296	184400	1740944	10600	0
2023	MEL-01	MEL-01-09	2023-08-22	Impact	8	2	9	5	15	4	0	16.69	1.35	7.08	19.32	146.4	50.54	0	221384	43704	245456	84024	1943896	9400	0
2023	MEL-01	MEL-01-10	2023-08-22	Impact	7	2	10	3	16	4	1	12.76	0.19	8.95	39.7	183.41	59.9	1.88	99824	800	195368	179616	2772840	10600	200
2023	MEL-02	MEL-02-02	2023-08-22	Impact	7	1	9	2	9	4	0	17.17	0.1	14.63	25.75	28	27.18	0	189032	200	577120	139296	518248	4400	0
2023	MEL-02	MEL-02-03	2023-08-22	Impact	6	1	9	4	8	3	0	13.35	0.3	15.82	22	32.47	18.11	0	112408	600	561352	92008	611040	3600	0
2023	MEL-02	MEL-02-05	2023-08-22	Impact	5	2	7	4	12	3	0	14.42	1.64	13.89	10.9	46.99	30.95	0	199400	30936	732768	52288	840928	5600	0
2023	MEL-02	MEL-02-06	2023-08-22	Impact	7	1	10	4	11	3	0	15.76	0.2	16.73	32.43	39.75	20.35	0	113008	400	1157824	176816	978224	3800	0
2023	MEL-02	MEL-02-08	2023-08-22	Impact	7	1	9	4	10	3	0	17.56	0.8	15.23	30.97	22.19	34.59	0	122176	1600	826760	155864	338848	6400	0

Table E1-1. Phytoplankton richness, biomass, and density by major taxa group for individual samples, 2013 to 2023

Year	Area	Sample ID	Date	Designation	Richness (taxa per sample)							Biomass (mg/m³)							Density (cells/L)						
					Chloro	Chryso	Diatoms	Crypto	Dinoflag	Cyano	Eugleno	Chloro	Chryso	Diatoms	Crypto	Dinoflag	Cyano	Eugleno	Chloro	Chryso	Diatoms	Crypto	Dinoflag	Cyano	Eugleno
2023	MEL-03	MEL-03-02	2023-08-22	Control	7	0	8	4	10	4	0	10.76	0	9.67	23.59	60.59	47.45	0	22368	0	618024	105576	783256	9800	0
2023	MEL-03	MEL-03-03	2023-08-22	Control	6	0	5	3	15	2	0	9.3	0	11.92	30.94	56.87	16.91	0	99192	0	380952	188784	985208	3800	0
2023	MEL-03	MEL-03-04	2023-08-22	Control	7	0	9	5	10	2	0	16.91	0	9.47	27.66	99.48	22.92	0	202568	0	403704	160648	1056248	5200	0
2023	MEL-03	MEL-03-05	2023-08-22	Control	6	1	8	3	10	2	0	13.78	0.1	10.14	13.13	49.14	22.43	0	105376	200	482128	40720	797624	5200	0
2023	MEL-03	MEL-03-01	2023-08-22	Control	8	0	10	4	12	2	0	5.85	0	9.45	25.49	90.69	28.92	0	31152	0	331864	146280	1107136	6600	0
2023	MEL-04	MEL-04-01	2023-08-22	Control	7	0	9	5	11	4	0	14.14	0	10.52	24.4	65.34	30.81	0	148880	0	496496	126728	862080	6400	0
2023	MEL-04	MEL-04-02	2023-08-22	Control	6	0	5	4	8	2	0	7.95	0	5.82	24.87	43.45	15.94	0	127528	0	438624	120544	926736	3800	0
2023	MEL-04	MEL-04-03	2023-08-22	Control	7	0	7	4	8	2	0	14.9	0	11.44	23.9	81.13	7.57	0	139112	0	719200	119544	775872	1800	0
2023	MEL-04	MEL-04-04	2023-08-22	Control	6	0	6	4	8	2	0	13.17	0	5.38	53.16	112.4	15.04	0	99192	0	330864	261440	1602232	3200	0
2023	MEL-04	MEL-04-05	2023-08-22	Control	4	1	7	5	10	2	0	8.06	0.2	5.94	64	61.15	14.85	0	33536	400	331264	365600	1107136	3400	0
2023	MEL-05	MEL-05-01	2023-08-22	Control	7	0	10	5	9	2	0	15.53	0	22.05	50.83	39.93	24.01	0	128728	0	1236248	293760	711216	5600	0
2023	MEL-05	MEL-05-02	2023-08-22	Control	8	2	11	4	8	2	0	10.74	0.19	35.41	46.86	21.95	24.38	0	104176	600	776872	232704	431040	5200	0
2023	MEL-05	MEL-05-03	2023-08-22	Control	6	2	10	4	10	3	0	27.5	5.38	27.52	26.9	27.13	29.39	0	60104	57672	1387112	101992	452792	5600	0
2023	MEL-05	MEL-05-04	2023-08-22	Control	7	0	9	4	9	2	0	11.06	0	12.3	55.58	52.27	28.51	0	97992	0	532616	304144	933920	6000	0
2023	MEL-05	MEL-05-05	2023-08-22	Control	7	1	10	4	9	2	0	25.96	0.1	14.33	37.37	61.74	17.28	0	98392	200	705032	175232	625008	3400	0

Table E1-2. Phytoplankton biomass (mg/m^3) for the top 5 taxa in 2023

			Biomass Results			Dominant Taxa No. 1			Dominant Taxa No. 2			Dominant Taxa No. 3			Dominant Taxa No. 4			Dominant Taxa No. 5		
Area	Station	Date	Total (mg/m^3)	Top 5 taxa (mg/m^3)	% biomass from top 5 taxa	Species	MTG	Biomass	Species	MTG	Biomass	Species	MTG	Biomass	Species	MTG	Biomass	Species	MTG	Biomass
MEL-01	MEL-01-01	2023-08-22	372	189	51%	Dinobryon sertularia Ehrenberg	CHRYSO	48.89	Chrysochromulina parva Lackey	CHRYSO	43.69	Dinobryon bavaricum Imhof	CHRYSO	38.62	Chrysococcus sp.	CHRYSO	29.59	Chrysochromulina laurentiana Kling	CHRYSO	28.34
	MEL-01-06	2023-08-22	296	139	47%	Chrysococcus sp.	CHRYSO	41.34	Chrysochromulina parva Lackey	CHRYSO	28.19	Dinobryon bavaricum Imhof	CHRYSO	24.37	Rhodomonas minuta Skuja	CRYPTO	22.75	Peridinium pusillum (Penard) Lemmermann	DINOFLG	22.28
	MEL-01-07	2023-08-22	268	173	65%	Tabellaria fenestrata (Lyngbye) Kutzing	DIATOMS	60.94	Dinobryon sociale Ehrenberg	CHRYSO	30.87	Chrysochromulina laurentiana Kling	CHRYSO	28.34	Dinobryon sertularia Ehrenberg	CHRYSO	27	Chrysochromulina parva Lackey	CHRYSO	26.31
	MEL-01-08	2023-08-22	261	132	51%	Peridinium pusillum (Penard) Lemmermann	DINOFLG	31.35	Cyclotella michiganiana Skvortzow	DIATOMS	28.21	Chrysococcus sp.	CHRYSO	28.19	Rhodomonas minuta Skuja	CRYPTO	27.08	Dinobryon sertularia Ehrenberg	CHRYSO	17.64
	MEL-01-09	2023-08-22	241	104	43%	Peridinium pusillum (Penard) Lemmermann	DINOFLG	26.4	Chrysococcus sp.	CHRYSO	26.31	Chrysochromulina parva Lackey	CHRYSO	19.26	Chrysochromulina laurentiana Kling	CHRYSO	17	Dinobryon bavaricum Imhof	CHRYSO	14.87
	MEL-01-10	2023-08-22	307	158	52%	Chrysococcus sp.	CHRYSO	45.57	Gymnodinium sp.	DINOFLG	29.3	Chrysochromulina parva Lackey	CHRYSO	29.12	Chrysochromulina laurentiana Kling	CHRYSO	28.34	Rhodomonas minuta Skuja	CRYPTO	26
MEL-02	MEL-02-02	2023-08-22	113	61	54%	Rhodomonas minuta Skuja	CRYPTO	20.58	Chrysococcus sp.	CHRYSO	14.09	Gymnodinium sp.	DINOFLG	10.19	Peridinium pusillum (Penard) Lemmermann	DINOFLG	8.67	Oocystis lacustris Chodat	CHLORO	7.72
	MEL-02-03	2023-08-22	102	58	56%	Oocystis lacustris Chodat	CHLORO	13.82	Rhodomonas minuta Skuja	CRYPTO	13	Chrysochromulina laurentiana Kling	CHRYSO	11.33	Chrysococcus sp.	CHRYSO	10.8	Peridinium pusillum (Penard) Lemmermann	DINOFLG	8.67
	MEL-02-05	2023-08-22	119	59	49%	Gymnodinium sp.	DINOFLG	15.28	Chrysococcus sp.	CHRYSO	14.09	Peridinium pusillum (Penard) Lemmermann	DINOFLG	10.25	Dinobryon sociale Ehrenberg	CHRYSO	9.75	Oocystis lacustris Chodat	CHLORO	9.35
	MEL-02-06	2023-08-22	125	71	57%	Rhodomonas minuta Skuja	CRYPTO	26	Chrysococcus sp.	CHRYSO	17.38	Gymnodinium sp.	DINOFLG	11.46	Chrysochromulina laurentiana Kling	CHRYSO	8.5	Sphaerocystis schroeteri Chodat	CHLORO	8
	MEL-02-08	2023-08-22	121	67	55%	Rhodomonas minuta Skuja	CRYPTO	22.75	Gymnodinium sp.	DINOFLG	16.56	Peridinium pusillum (Penard) Lemmermann	DINOFLG	12.61	Oocystis lacustris Chodat	CHLORO	8.13	Stichogloea sp.	CHRYSO	7.22
MEL-03	MEL-03-01	2023-08-22	160	150	94%	Chrysococcus sp.	CHRYSO	34.76	Dinobryon sociale Ehrenberg	CHRYSO	34.12	Chrysococcus sp.	CHRYSO	31.94	Dinobryon sociale Ehrenberg	CHRYSO	27.62	Rhodomonas minuta Skuja	CRYPTO	21.66
	MEL-03-02	2023-08-22	152	91	60%	Peridinium pusillum (Penard) Lemmermann	DINOFLG	30.75	Chrysococcus sp.	CHRYSO	19.26	Rhodomonas minuta Skuja	CRYPTO	15.16	Dinobryon sociale Ehrenberg	CHRYSO	14.62	Chrysostephanosphaera globulifera Scherffel	CHRYSO	11.12
	MEL-03-03	2023-08-22	126	84	67%	Rhodomonas minuta Skuja	CRYPTO	28.16	Chrysococcus sp.	CHRYSO	21.61	Dinobryon sociale Ehrenberg	CHRYSO	14.62	Peridinium pusillum (Penard) Lemmermann	DINOFLG	11.82	Planctonema lauterbornii Schmidle	CHLORO	7.61
	MEL-03-04	2023-08-22	176	128	72%	Chrysochromulina laurentiana Kling	CHRYSO	39.68	Chrysococcus sp.	CHRYSO	28.19	Rhodomonas minuta Skuja	CRYPTO	23.83	Dinobryon sociale Ehrenberg	CHRYSO	19.5	Peridinium pusillum (Penard) Lemmermann	DINOFLG	16.55
	MEL-03-05	2023-08-22	109	75	69%	Chrysococcus sp.	CHRYSO	31.94	Peridinium pusillum (Penard) Lemmermann	DINOFLG	17.34	Dinobryon sociale Ehrenberg	CHRYSO	9.75	Cyclotella stelligera Cleve and Grunow	DIATOMS	9.07	Cryptomonas erosa Ehrenberg	CRYPTO	6.99
MEL-04	MEL-04-01	2023-08-22	145	92	63%	Dinobryon sociale Ehrenberg	CHRYSO	29.25	Peridinium pusillum (Penard) Lemmermann	DINOFLG	22.86	Rhodomonas minuta Skuja	CRYPTO	17.33	Chrysococcus sp.	CHRYSO	13.62	Chrysochromulina laurentiana Kling	CHRYSO	8.5
	MEL-04-02	2023-08-22	98	84	85%	Chrysococcus sp.	CHRYSO	22.55	Chrysococcus sp.	CHRYSO	18.32	Rhodomonas minuta Skuja	CRYPTO	17.33	Peridinium pusillum (Penard) Lemmermann	DINOFLG	13.4	Rhodomonas minuta Skuja	CRYPTO	11.91
	MEL-04-03	2023-08-22	139	103	74%	Chrysochromulina laurentiana Kling	CHRYSO	34.01	Dinobryon sociale Ehrenberg	CHRYSO	27.62	Rhodomonas minuta Skuja	CRYPTO	17.33	Chrysococcus sp.	CHRYSO	15.03	Cyclotella stelligera Cleve and Grunow	DIATOMS	9.07
	MEL-04-04	2023-08-22	199	151	76%	Chrysococcus sp.	CHRYSO	43.22	Rhodomonas minuta Skuja	CRYPTO	37.91	Chrysochromulina laurentiana Kling	CHRYSO	34.01	Dinobryon sociale Ehrenberg	CHRYSO	22.75	Cryptomonas erosa Ehrenberg	CRYPTO	12.96
	MEL-04-05	2023-08-22	154	117	76%	Rhodomonas minuta Skuja	CRYPTO	54.16	Chrysococcus sp.	CHRYSO	28.19	Dinobryon sociale Ehrenberg	CHRYSO	16.5	Peridinium pusillum (Penard) Lemmermann	DINOFLG	11.03	Cyclotella stelligera Cleve and Grunow	DIATOMS	6.68
MEL-05	MEL-05-01	2023-08-22	152	98	65%	Rhodomonas minuta Skuja	CRYPTO	41.16	Chrysococcus sp.	CHRYSO	20.67	Peridinium pusillum (Penard) Lemmermann	DINOFLG	18.92	Oocystis lacustris Chodat	CHLORO	9.55	Dinobryon sociale Ehrenberg	CHRYSO	8.12
	MEL-05-02	2023-08-22	140	86	61%	Rhodomonas minuta Skuja	CRYPTO	33.58	Peridinium pusillum (Penard) Lemmermann	DINOFLG	14.19	Botryococcus braunii Kutzing	CHLORO	13	Chrysococcus sp.	CHRYSO	12.68	Oocystis lacustris Chodat	CHLORO	12.19
	MEL-05-03	2023-08-22	144	68	48%	Peridinium pusillum (Penard) Lemmermann	DINOFLG	15.77	Cyclotella stelligera Cleve and Grunow	DIATOMS	14.81	Rhodomonas minuta Skuja	CRYPTO	14.08	Oocystis lacustris Chodat	CHLORO	12.19	Sphaerocystis schroeteri Chodat	CHLORO	11.54
	MEL-05-04	2023-08-22	160	108	68%	Rhodomonas minuta Skuja	CRYPTO	44.41	Chrysococcus sp.	CHRYSO	22.55	Peridinium pusillum (Penard) Lemmermann	DINOFLG	15.77	Dinobryon sociale Ehrenberg	CHRYSO	13	Gymnodinium sp.	DINOFLG	12.74
	MEL-05-05	2023-08-22	156.78	87	55%	Chrysochromulina laurentiana Kling	CHRYSO	28.34	Rhodomonas minuta Skuja	CRYPTO	24.91	Cyclotella pseudostelligera	DIATOMS	11.86	Dinobryon sociale Ehrenberg	CHRYSO	11.37	Chrysococcus sp.	CHRYSO	10.33

Notes

MTG = major taxa group

Appendix E2
2023 Chlorophyll-a Results

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Analytical Report

Date Reported On: November 16, 2023

ATTN: Randy Schwandt

Reported To: Agnico Ealge

Date Received: August 24, 2023

Project Name: AEM Meliadine 2022
Client Name: Agnico Ealge
Supervisor: Randy Schwandt
Billing Address or Speed Code:
Rankin Inlet, NU, X0C 0G0

Other Information: Not available.

Comments: Not available.

Reviewed by:

Alvin Kwan, BSc.
Quality Assurance Officer

Approved by:

Mingsheng Ma, Ph. D
Laboratory Manager

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Algae Parameters

UA-BASL Sample ID	Received Date	Site Info	Sampling Date	Analyzed Date	**Chlorophyll-a (µg/L)**
261044	08/24/2023	MEL-01-01-PC	08/22/2023	10/24/2023	3.68
261045	08/24/2023	MEL-01-01-PC	08/22/2023	10/24/2023	3.33
261046	08/24/2023	MEL-01-01-PC	08/22/2023	10/24/2023	4.37
261047	08/24/2023	MEL-01-06-PC	08/22/2023	10/24/2023	3.40
261048	08/24/2023	MEL-01-06-PC	08/22/2023	10/24/2023	4.65
261049	08/24/2023	MEL-01-06-PC	08/22/2023	10/24/2023	4.18
261050	08/24/2023	MEL-01-07-PC	08/22/2023	10/24/2023	4.65
261051	08/24/2023	MEL-01-07-PC	08/22/2023	10/24/2023	3.84
261052	08/24/2023	MEL-01-07-PC	08/22/2023	10/24/2023	3.88
261053	08/24/2023	MEL-01-08-PC	08/22/2023	10/24/2023	4.80
261054	08/24/2023	MEL-01-08-PC	08/22/2023	10/24/2023	3.96
261055	08/24/2023	MEL-01-08-PC	08/22/2023	10/24/2023	4.17
261056	08/24/2023	MEL-01-09-PC	08/22/2023	10/24/2023	3.38
261057	08/24/2023	MEL-01-09-PC	08/22/2023	10/24/2023	3.91
261058	08/24/2023	MEL-01-09-PC	08/22/2023	10/24/2023	3.89
261059	08/24/2023	MEL-01-10-PC	08/22/2023	10/24/2023	3.90
261060	08/24/2023	MEL-01-10-PC	08/22/2023	10/24/2023	4.38
261061	08/24/2023	MEL-01-10-PC	08/22/2023	10/24/2023	3.63
261062	08/24/2023	MEL-02-02-PC	08/17/2023	10/24/2023	1.33
261063	08/24/2023	MEL-02-02-PC	08/17/2023	10/24/2023	1.51
261064	08/24/2023	MEL-02-02-PC	08/17/2023	10/24/2023	1.31
261065	08/24/2023	MEL-02-03-PC	08/17/2023	10/24/2023	1.62
261066	08/24/2023	MEL-02-03-PC	08/17/2023	10/24/2023	1.66
261067	08/24/2023	MEL-02-03-PC	08/17/2023	10/24/2023	1.05
261068	08/24/2023	MEL-02-05-PC	08/17/2023	10/24/2023	1.35
261069	08/24/2023	MEL-02-05-PC	08/17/2023	10/24/2023	1.95
261070	08/24/2023	MEL-02-05-PC	08/17/2023	10/24/2023	1.39
261071	08/24/2023	MEL-02-06-PC	08/17/2023	10/24/2023	2.06
261072	08/24/2023	MEL-02-06-PC	08/17/2023	10/24/2023	1.32
261073	08/24/2023	MEL-02-06-PC	08/17/2023	10/24/2023	1.38
261074	08/24/2023	MEL-02-08-PC	08/17/2023	10/24/2023	1.38
261075	08/24/2023	MEL-02-08-PC	08/17/2023	10/24/2023	1.13
261076	08/24/2023	MEL-02-08-PC	08/17/2023	10/24/2023	1.86
261077	08/24/2023	MEL-03-01-PC	08/18/2023	10/24/2023	0.75
261078	08/24/2023	MEL-03-01-PC	08/18/2023	10/24/2023	0.55
261079	08/24/2023	MEL-03-01-PC	08/18/2023	10/24/2023	0.43

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UA-BASL Sample ID	Received Date	Site Info	Sampling Date	Analyzed Date	**Chlorophyll-a (µg/L)**
261080	08/24/2023	MEL-03-02-PC	08/18/2023	10/24/2023	<0.04
261081	08/24/2023	MEL-03-02-PC	08/18/2023	10/24/2023	0.86
261082	08/24/2023	MEL-03-02-PC	08/18/2023	10/24/2023	0.59
261083	08/24/2023	MEL-03-03-PC	08/18/2023	10/24/2023	0.39
261084	08/24/2023	MEL-03-03-PC	08/18/2023	10/24/2023	0.69
261085	08/24/2023	MEL-03-03-PC	08/18/2023	10/24/2023	0.51
261086	08/24/2023	MEL-03-04-PC	08/18/2023	10/24/2023	0.42
261087	08/24/2023	MEL-03-04-PC	08/18/2023	10/24/2023	0.68
261088	08/24/2023	MEL-03-04-PC	08/18/2023	10/24/2023	0.48
261089	08/24/2023	MEL-03-05-PC	08/18/2023	10/24/2023	0.61
261090	08/24/2023	MEL-03-05-PC	08/18/2023	10/24/2023	0.51
261091	08/24/2023	MEL-03-05-PC	08/18/2023	10/24/2023	0.65
261092	08/24/2023	MEL-04-01-PC	08/18/2023	10/24/2023	0.98
261093	08/24/2023	MEL-04-01-PC	08/18/2023	10/24/2023	1.11
261094	08/24/2023	MEL-04-01-PC	08/18/2023	10/24/2023	0.94
261095	08/24/2023	MEL-04-02-PC	08/18/2023	10/24/2023	1.30
261096	08/24/2023	MEL-04-02-PC	08/18/2023	10/24/2023	0.84
261097	08/24/2023	MEL-04-02-PC	08/18/2023	10/26/2023	1.01
261098	08/24/2023	MEL-04-03-PC	08/18/2023	10/26/2023	0.89
261099	08/24/2023	MEL-04-03-PC	08/18/2023	10/26/2023	0.62
261100	08/24/2023	MEL-04-03-PC	08/18/2023	10/26/2023	0.58
261101	08/24/2023	MEL-04-04-PC	08/18/2023	10/26/2023	0.54
261102	08/24/2023	MEL-04-04-PC	08/18/2023	10/26/2023	0.72
261103	08/24/2023	MEL-04-04-PC	08/18/2023	10/26/2023	0.94
261104	08/24/2023	MEL-04-05-PC	08/18/2023	10/26/2023	0.78
261105	08/24/2023	MEL-04-05-PC	08/18/2023	10/26/2023	0.99
261106	08/24/2023	MEL-04-05-PC	08/18/2023	10/26/2023	0.97
261107	08/24/2023	MEL-05-01-PC	08/18/2023	10/26/2023	0.93
261108	08/24/2023	MEL-05-01-PC	08/18/2023	10/26/2023	0.79
261109	08/24/2023	MEL-05-01-PC	08/18/2023	10/26/2023	0.68
261110	08/24/2023	MEL-05-02-PC	08/18/2023	10/26/2023	0.67
261111	08/24/2023	MEL-05-02-PC	08/18/2023	10/26/2023	0.87
261112	08/24/2023	MEL-05-02-PC	08/18/2023	10/26/2023	0.83
261113	08/24/2023	MEL-05-03-PC	08/18/2023	10/26/2023	0.66
261114	08/24/2023	MEL-05-03-PC	08/18/2023	10/26/2023	0.59
261115	08/24/2023	MEL-05-03-PC	08/18/2023	10/26/2023	0.75
261116	08/24/2023	MEL-05-04-PC	08/18/2023	10/26/2023	0.52
261117	08/24/2023	MEL-05-04-PC	08/18/2023	10/26/2023	0.75

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UA-BASL Sample ID	Received Date	Site Info	Sampling Date	Analyzed Date	**Chlorophyll-a (µg/L)**
261118	08/24/2023	MEL-05-04-PC	08/18/2023	10/26/2023	0.83
261119	08/24/2023	MEL-05-05-PC	08/18/2023	10/26/2023	0.69
261120	08/24/2023	MEL-05-05-PC	08/18/2023	10/26/2023	1.24
261121	08/24/2023	MEL-05-05-PC	08/18/2023	10/26/2023	0.99
261122	08/24/2023	DUP-MEL-AUG-01-PC	08/18/2023	10/26/2023	0.66
261123	08/24/2023	DUP-MEL-AUG-02-PC	08/22/2023	10/26/2023	3.99
261124	08/24/2023	DUP-MEL-AUG-03-PC	08/18/2023	10/26/2023	0.81
261125	08/24/2023	MEL-BLANK-01	08/24/2023	10/26/2023	<0.04
261126	08/24/2023	MEL-BLANK-02	08/24/2023	10/26/2023	<0.04
261127	08/24/2023	MEL-BLANK-03	08/24/2023	10/26/2023	<0.04
261229	08/24/2023	DUP-MEL-AUG-01-PC	08/30/2023	10/26/2023	0.90
261230	08/24/2023	DUP-MEL-AUG-01-PC	08/30/2023	10/26/2023	0.45
261231	08/24/2023	DUP-MEL-AUG-02-PC	08/30/2023	10/26/2023	3.11
261232	08/24/2023	DUP-MEL-AUG-02-PC	08/30/2023	10/26/2023	3.44
261233	08/24/2023	DUP-MEL-AUG-03-PC	08/30/2023	10/26/2023	0.87
261234	08/24/2023	DUP-MEL-AUG-03-PC	08/30/2023	10/26/2023	0.83
		Reportable Detection Limit (µg/L)			0.04

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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.

Appendix E3
2023 Phytoplankton Taxonomy Results

Phytoplankton species data for Meliadine 2023 (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

** total daily biomass is sum of all species on a date.

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^3
MEL -0101	22-Aug-23	1014	Chroococcus limneticus Lemmermann	28736	0.96266	4	4	33.5
MEL -0101	22-Aug-23	1073	Snowella sp	400	0.2	0	0	500
MEL -0101	22-Aug-23	2101	Carteria spp.	7184	3.76154	10	10	523.6
MEL -0101	22-Aug-23	2112	Sphaerocystis schroeteri Chodat	64656	0.91165	3	3	14.1
MEL -0101	22-Aug-23	2121	Oocystis lacustris Chodat	35920	1.38292	6	3.5	38.5
MEL -0101	22-Aug-23	2145	Crucigenia quadrata Morr.	28736	0.04023	2	2	1.4
MEL -0101	22-Aug-23	2167	Elakatothrix gelatinosa Willen	100576	1.73996	11	2	17.3
MEL -0101	22-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	400	0.15496	13.6	12	387.4
MEL -0101	22-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	21552	0.81251	6	6	37.7
MEL -0101	22-Aug-23	2206	Botryococcus braunii Kutzing	1000	0.9048	12	12	904.8
MEL -0101	22-Aug-23	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.03376	3	3	4.7
MEL -0101	22-Aug-23	2235	Ankistrodesmus spiralis Lemmermann	21552	1.18536	35	2	55
MEL -0101	22-Aug-23	4351	Small chrysophyceae	955472	6.11502	2.3	2.3	6.4
MEL -0101	22-Aug-23	4352	Large chrysophyceae	7184	1.29025	7	7	179.6
MEL -0101	22-Aug-23	4355	Chrysochromulina parva Lackey	668112	43.69452	5	5	65.4
MEL -0101	22-Aug-23	4357	Chrysococcus sp.	452592	29.59952	5	5	65.4
MEL -0101	22-Aug-23	4358	Chrysostephanosphaera globulifera Scherffel	64656	21.53045	8.6	8.6	333
MEL -0101	22-Aug-23	4361	Kephyrion boreale Skuja	21552	2.56038	6.1	6.1	118.8
MEL -0101	22-Aug-23	4362	Kephyrion sp.	172416	2.20692	2.9	2.9	12.8
MEL -0101	22-Aug-23	4378	Dinobryon borgei Lemmermann	79024	3.35062	9	3	42.4
MEL -0101	22-Aug-23	4383	Dinobryon bavaricum Imhof	150864	34.12544	12	6	226.2
MEL -0101	22-Aug-23	4383	Dinobryon bavaricum Imhof	3600	4.5	0	0	1250
MEL -0101	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	158048	35.75046	12	6	226.2
MEL -0101	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	6600	13.1406	0	0	1991
MEL -0101	22-Aug-23	4390	Dinobryon sociale Ehrenberg	21552	4.87506	12	6	226.2
MEL -0101	22-Aug-23	4390	Dinobryon sociale Ehrenberg	200	0.19	0	0	950
MEL -0101	22-Aug-23	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.19612	5.8	3	27.3
MEL -0101	22-Aug-23	4413	Chrysochromulina laurentiana Kling	71840	28.34806	9.1	9.1	394.6
MEL -0101	22-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	272992	13.7315	6	4	50.3
MEL -0101	22-Aug-23	4448	Rhizochrysis scherffelii Pascher	3600	10.99296	18	18	3053.6
MEL -0101	22-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	1000	2.4203	11.55	23.1	2420.3
MEL -0101	22-Aug-23	5509	Cyclotella ocellata Pant.	57472	5.99433	4.05	8.1	104.3
MEL -0101	22-Aug-23	5511	Rhizosolenia eriense H.L. Smith	21552	1.67675	11	3	77.8
MEL -0101	22-Aug-23	5513	Tabellaria fenestrata (Lyngbye) Kutzing	2400	1.69656	75	6	706.9
MEL -0101	22-Aug-23	5514	Tabellaria flocculosa (Roth) Kutzing	4200	24.7842	115	14	5901
MEL -0101	22-Aug-23	5524	Asterionella formosa Hassall	23400	2.44998	100	2	104.7
MEL -0101	22-Aug-23	5528	Large diatoms	1200	0.25632	51	4	213.6
MEL -0101	22-Aug-23	5551	Cyclotella michiganiana Skvortzow	64656	1.40304	2.4	4.8	21.7
MEL -0101	22-Aug-23	6554	Rhodomonas minuta Skuja	93392	14.08351	12	6	150.8
MEL -0101	22-Aug-23	6558	Cryptomonas erosa Ehrenberg	5600	10.45968	27.3	14	1867.8
MEL -0101	22-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	400	0.2932	21	10	733
MEL -0101	22-Aug-23	6565	Cryptomonas rostratiformis Skuja	400	0.87572	32	14	2189.3
MEL -0101	22-Aug-23	7632	Gymnodinium sp.	2200	14.01532	23	23	6370.6
MEL -0101	22-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	3000	12.3789	19.9	19.9	4126.3
MEL -0101	22-Aug-23	7641	Peridinium aciculiferum Lemmermann	1200	10.85736	30	24	9047.8
MEL -0106	22-Aug-23	1054	Planktolyngbya limnetica	200	0.03392	150	1.2	169.6
MEL -0106	22-Aug-23	1073	Snowella sp	600	0.3	0	0	500
MEL -0106	22-Aug-23	2112	Sphaerocystis schroeteri Chodat	201152	2.83624	3	3	14.1
MEL -0106	22-Aug-23	2121	Oocystis lacustris Chodat	79024	3.04242	6	3.5	38.5
MEL -0106	22-Aug-23	2167	Elakatothrix gelatinosa Willen	7184	0.12428	11	2	17.3
MEL -0106	22-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27084	6	6	37.7
MEL -0106	22-Aug-23	2206	Botryococcus braunii Kutzing	1000	0.9048	12	12	904.8
MEL -0106	22-Aug-23	2235	Ankistrodesmus spiralis Lemmermann	28736	1.58048	35	2	55
MEL -0106	22-Aug-23	4351	Small chrysophyceae	1084784	6.94262	2.3	2.3	6.4
MEL -0106	22-Aug-23	4352	Large chrysophyceae	71840	12.90246	7	7	179.6
MEL -0106	22-Aug-23	4355	Chrysochromulina parva Lackey	431040	28.19002	5	5	65.4
MEL -0106	22-Aug-23	4357	Chrysococcus sp.	632192	41.34536	5	5	65.4
MEL -0106	22-Aug-23	4358	Chrysostephanosphaera globulifera Scherffel	57472	15.99446	8.1	8.1	278.3
MEL -0106	22-Aug-23	4361	Kephyrion boreale Skuja	43104	5.12076	6.1	6.1	118.8
MEL -0106	22-Aug-23	4362	Kephyrion sp.	222704	2.85061	2.9	2.9	12.8
MEL -0106	22-Aug-23	4363	Spiniferomonas serrata	14368	1.67962	6	6.1	116.9
MEL -0106	22-Aug-23	4364	Mallomonas caudata Ivanov	200	1.07234	40	16	5361.7
MEL -0106	22-Aug-23	4378	Dinobryon borgei Lemmermann	35920	1.52301	9	3	42.4
MEL -0106	22-Aug-23	4383	Dinobryon bavaricum Imhof	93392	21.12527	12	6	226.2
MEL -0106	22-Aug-23	4383	Dinobryon bavaricum Imhof	2600	3.25	0	0	1250
MEL -0106	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	7184	1.62502	12	6	226.2
MEL -0106	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	4000	7.964	0	0	1991
MEL -0106	22-Aug-23	4396	Chrysolykos skuja (Nauwerck) Willen	28736	0.78449	5.8	3	27.3
MEL -0106	22-Aug-23	4413	Chrysochromulina laurentiana Kling	28736	11.33923	9.1	9.1	394.6
MEL -0106	22-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	222704	11.20201	6	4	50.3
MEL -0106	22-Aug-23	4448	Rhizochrysis scherffelii Pascher	2200	6.71792	18	18	3053.6
MEL -0106	22-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	1200	2.90436	11.55	23.1	2420.3

Station	Date	Species Code	Speceis name	density cells/L-1	biomass mg/m-3	length µ	width µ	cell volume µ3
MEL -0106	22-Aug-23	5509	Cyclotella ocellata Pant.	35920	3.74646	4.05	8.1	104.3
MEL -0106	22-Aug-23	5511	Rhizosolenia eriense H.L. Smith	21552	1.67675	11	3	77.8
MEL -0106	22-Aug-23	5513	Tabellaria fenestrata (Lyngbye) Kutzing	2600	1.83794	75	6	706.9
MEL -0106	22-Aug-23	5518	Synedra acus Kutzing	6000	0.7224	115	2	120.4
MEL -0106	22-Aug-23	5523	Synedra ulna (Nitzsch) Ehrenberg	200	0.87126	260	8	4356.3
MEL -0106	22-Aug-23	5524	Asterionella formosa Hassall	20000	2.094	100	2	104.7
MEL -0106	22-Aug-23	5551	Cyclotella michiganiana Skvortzow	79024	1.71482	2.4	4.8	21.7
MEL -0106	22-Aug-23	6554	Rhodomonas minuta Skuja	150864	22.75029	12	6	150.8
MEL -0106	22-Aug-23	6558	Cryptomonas erosa Ehrenberg	4600	8.59188	27.3	14	1867.8
MEL -0106	22-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	1000	0.733	21	10	733
MEL -0106	22-Aug-23	6565	Cryptomonas rostratiformis Skuja	800	1.75144	32	14	2189.3
MEL -0106	22-Aug-23	7632	Gymnodinium sp.	3000	19.1118	23	23	6370.6
MEL -0106	22-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	5400	22.28202	19.9	19.9	4126.3
MEL -0106	22-Aug-23	7641	Peridinium aciculiferum Lemmermann	1600	14.47648	30	24	9047.8
MEL -0107	22-Aug-23	1014	Chroococcus limneticus Lemmermann	86208	2.10348	3.6	3.6	24.4
MEL -0107	22-Aug-23	1073	Snowella sp	800	0.4	0	0	500
MEL -0107	22-Aug-23	2112	Sphaerocystis schroeteri Chodat	114944	1.62071	3	3	14.1
MEL -0107	22-Aug-23	2121	Oocystis lacustris Chodat	50288	0.98564	6	2.5	19.6
MEL -0107	22-Aug-23	2178	Cosmarium sp.	200	0.27926	20	20	1396.3
MEL -0107	22-Aug-23	2191	Staurodesmus cuspidatus (Brebisson and Ralfs) Teiling	200	0.18096	18	16	904.8
MEL -0107	22-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27084	6	6	37.7
MEL -0107	22-Aug-23	2205	Mougeotia sp.	7184	0.1523	3	3	21.2
MEL -0107	22-Aug-23	2206	Botryococcus braunii Kutzing	1600	1.44768	12	12	904.8
MEL -0107	22-Aug-23	2235	Ankistrodesmus spiralis Lemmermann	7184	0.39512	35	2	55
MEL -0107	22-Aug-23	4351	Small chrysophyceae	689664	4.41385	2.3	2.3	6.4
MEL -0107	22-Aug-23	4352	Large chrysophyceae	7184	1.29025	7	7	179.6
MEL -0107	22-Aug-23	4355	Chrysochromulina parva Lackey	301728	19.73301	5	5	65.4
MEL -0107	22-Aug-23	4357	Chrysococcus sp.	380752	24.90118	5	5	65.4
MEL -0107	22-Aug-23	4358	Chrysostephanosphaera globulifera Scherffel	28736	7.99723	8.1	8.1	278.3
MEL -0107	22-Aug-23	4361	Kephyrion boreale Skuja	14368	1.70692	6.1	6.1	118.8
MEL -0107	22-Aug-23	4362	Kephyrion sp.	186784	2.39084	2.9	2.9	12.8
MEL -0107	22-Aug-23	4368	Mallomonas crassisquama (Asmund) Fott	200	0.20944	20	10	1047.2
MEL -0107	22-Aug-23	4378	Dinobryon borgei Lemmermann	136496	5.78743	9	3	42.4
MEL -0107	22-Aug-23	4383	Dinobryon bavaricum Imhof	71840	16.25021	12	6	226.2
MEL -0107	22-Aug-23	4383	Dinobryon bavaricum Imhof	1600	2	0	0	1250
MEL -0107	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	43104	9.75012	12	6	226.2
MEL -0107	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	7000	13.937	0	0	1991
MEL -0107	22-Aug-23	4390	Dinobryon sociale Ehrenberg	136496	30.8754	12	6	226.2
MEL -0107	22-Aug-23	4413	Chrysochromulina laurentiana Kling	71840	28.34806	9.1	9.1	394.6
MEL -0107	22-Aug-23	4414	Stichogloea spp.	50288	2.52949	6	4	50.3
MEL -0107	22-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	50288	2.52949	6	4	50.3
MEL -0107	22-Aug-23	4448	Rhizochrysis scherffelii Pascher	5000	15.268	18	18	3053.6
MEL -0107	22-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	2400	5.80872	11.55	23.1	2420.3
MEL -0107	22-Aug-23	5509	Cyclotella ocellata Pant.	43104	4.49575	4.05	8.1	104.3
MEL -0107	22-Aug-23	5511	Rhizosolenia eriense H.L. Smith	21552	1.67675	11	3	77.8
MEL -0107	22-Aug-23	5513	Tabellaria fenestrata (Lyngbye) Kutzing	4400	3.11036	75	6	706.9
MEL -0107	22-Aug-23	5514	Tabellaria flocculosa (Roth) Kutzing	600	0.80046	26	14	1334.1
MEL -0107	22-Aug-23	5518	Synedra acus Kutzing	2600	0.31304	115	2	120.4
MEL -0107	22-Aug-23	5524	Asterionella formosa Hassall	32600	3.41322	100	2	104.7
MEL -0107	22-Aug-23	5551	Cyclotella michiganiana Skvortzow	71840	1.55893	2.4	4.8	21.7
MEL -0107	22-Aug-23	6554	Rhodomonas minuta Skuja	35920	5.41674	12	6	150.8
MEL -0107	22-Aug-23	6558	Cryptomonas erosa Ehrenberg	2000	3.7356	27.3	14	1867.8
MEL -0107	22-Aug-23	7631	Gymnodinium helveticum Penard	200	4.71238	50	30	23561.9
MEL -0107	22-Aug-23	7632	Gymnodinium sp.	2200	14.01532	23	23	6370.6
MEL -0107	22-Aug-23	7635	Peridinium willei Huitfeldt-Kaas	200	5.30436	37	37	26521.8
MEL -0107	22-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	3000	12.3789	19.9	19.9	4126.3
MEL -0107	22-Aug-23	7641	Peridinium aciculiferum Lemmermann	400	3.61912	30	24	9047.8
MEL -0107R	22-Aug-23	1014	Chroococcus limneticus Lemmermann	172416	4.20695	3.6	3.6	24.4
MEL -0107R	22-Aug-23	1073	Snowella sp	400	0.2	0	0	500
MEL -0107R	22-Aug-23	2112	Sphaerocystis schroeteri Chodat	57472	0.81036	3	3	14.1
MEL -0107R	22-Aug-23	2121	Oocystis lacustris Chodat	28736	0.92243	5	3.5	32.1
MEL -0107R	22-Aug-23	2145	Crucigenia quadrata Morr.	28736	0.04023	2	2	1.4
MEL -0107R	22-Aug-23	2167	Elakatothrix gelatinosa Willen	21552	0.37285	11	2	17.3
MEL -0107R	22-Aug-23	2178	Cosmarium sp.	200	0.27926	20	20	1396.3
MEL -0107R	22-Aug-23	2206	Botryococcus braunii Kutzing	800	0.41888	10	10	523.6
MEL -0107R	22-Aug-23	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.03376	3	3	4.7
MEL -0107R	22-Aug-23	2235	Ankistrodesmus spiralis Lemmermann	7184	0.39512	35	2	55
MEL -0107R	22-Aug-23	4351	Small chrysophyceae	826160	5.28742	2.3	2.3	6.4
MEL -0107R	22-Aug-23	4352	Large chrysophyceae	21552	3.87074	7	7	179.6
MEL -0107R	22-Aug-23	4355	Chrysochromulina parva Lackey	402304	26.31068	5	5	65.4
MEL -0107R	22-Aug-23	4357	Chrysococcus sp.	337648	22.08218	5	5	65.4
MEL -0107R	22-Aug-23	4358	Chrysostephanosphaera globulifera Scherffel	14368	3.99861	8.1	8.1	278.3
MEL -0107R	22-Aug-23	4361	Kephyrion boreale Skuja	21552	2.56038	6.1	6.1	118.8
MEL -0107R	22-Aug-23	4362	Kephyrion sp.	136496	1.74715	2.9	2.9	12.8
MEL -0107R	22-Aug-23	4378	Dinobryon borgei Lemmermann	43104	1.82761	9	3	42.4
MEL -0107R	22-Aug-23	4383	Dinobryon bavaricum Imhof	79024	17.87523	12	6	226.2
MEL -0107R	22-Aug-23	4383	Dinobryon bavaricum Imhof	600	0.75	0	0	1250
MEL -0107R	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	71840	16.25021	12	6	226.2
MEL -0107R	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	5400	10.7514	0	0	1991
MEL -0107R	22-Aug-23	4390	Dinobryon sociale Ehrenberg	107760	24.37531	12	6	226.2
MEL -0107R	22-Aug-23	4396	Chrysolykos skuja (Nauwerck) Willen	21552	0.58837	5.8	3	27.3
MEL -0107R	22-Aug-23	4411	Bitrichia chodatii (Reverdin) Chodat	14368	0.72271	6	4	50.3
MEL -0107R	22-Aug-23	4413	Chrysochromulina laurentiana Kling	43104	17.00884	9.1	9.1	394.6

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^3
MEL -0107R	22-Aug-23	4414	Stichogloea spp.	21552	1.08407	6	4	50.3
MEL -0107R	22-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	100576	5.05897	6	4	50.3
MEL -0107R	22-Aug-23	4448	Rhizochrysis scherffelii Pascher	4200	12.82512	18	18	3053.6
MEL -0107R	22-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	3200	7.74496	11.55	23.1	2420.3
MEL -0107R	22-Aug-23	5509	Cyclotella ocellata Pant.	28736	2.99716	4.05	8.1	104.3
MEL -0107R	22-Aug-23	5513	Tabellaria fenestrata (Lyngbye) Kutzing	86208	60.94044	75	6	706.9
MEL -0107R	22-Aug-23	5514	Tabellaria flocculosa (Roth) Kutzing	1200	1.60092	26	14	1334.1
MEL -0107R	22-Aug-23	5518	Synedra acus Kutzing	1800	0.21672	115	2	120.4
MEL -0107R	22-Aug-23	5524	Asterionella formosa Hassall	28200	2.95254	100	2	104.7
MEL -0107R	22-Aug-23	5551	Cyclotella michiganiana Skvortzow	122128	2.65018	2.4	4.8	21.7
MEL -0107R	22-Aug-23	6554	Rhodomonas minuta Skuja	64656	9.75012	12	6	150.8
MEL -0107R	22-Aug-23	6558	Cryptomonas erosa Ehrenberg	3200	5.97696	27.3	14	1867.8
MEL -0107R	22-Aug-23	6565	Cryptomonas rostratiformis Skuja	400	0.87572	32	14	2189.3
MEL -0107R	22-Aug-23	7631	Gymnodinium helveticum Penard	400	9.42476	50	30	23561.9
MEL -0107R	22-Aug-23	7632	Gymnodinium sp.	2200	14.01532	23	23	6370.6
MEL -0107R	22-Aug-23	7635	Peridinium willei Huitfeldt-Kaas	200	5.30436	37	37	26521.8
MEL -0107R	22-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	2200	9.07786	19.9	19.9	4126.3
MEL -0107R	22-Aug-23	7641	Peridinium aciculiferum Lemmermann	200	1.80956	30	24	9047.8
MEL -0108	22-Aug-23	1073	Snowella sp	1000	0.5	0	0	500
MEL -0108	22-Aug-23	2112	Sphaerocystis schroeteri Chodat	122128	1.722	3	3	14.1
MEL -0108	22-Aug-23	2121	Oocystis lacustris Chodat	7184	0.27658	6	3.5	38.5
MEL -0108	22-Aug-23	2126	Chodatella sp.	7184	0.36136	6	4	50.3
MEL -0108	22-Aug-23	2178	Cosmarium sp.	600	0.83778	20	20	1396.3
MEL -0108	22-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	200	0.07634	13.5	12	381.7
MEL -0108	22-Aug-23	2206	Botryococcus braunii Kutzing	1000	0.9048	12	12	904.8
MEL -0108	22-Aug-23	4351	Small chrysophyceae	617824	3.95407	2.3	2.3	6.4
MEL -0108	22-Aug-23	4352	Large chrysophyceae	21552	3.87074	7	7	179.6
MEL -0108	22-Aug-23	4355	Chrysochromulina parva Lackey	114944	7.51734	5	5	65.4
MEL -0108	22-Aug-23	4357	Chrysococcus sp.	431040	28.19002	5	5	65.4
MEL -0108	22-Aug-23	4358	Chrysostephanosphaera globulifera Scherffel	28736	7.99723	8.1	8.1	278.3
MEL -0108	22-Aug-23	4361	Kephyrion boreale Skuja	14368	1.70692	6.1	6.1	118.8
MEL -0108	22-Aug-23	4362	Kephyrion sp.	143680	1.8391	2.9	2.9	12.8
MEL -0108	22-Aug-23	4378	Dinobryon borgei Lemmermann	57472	2.43681	9	3	42.4
MEL -0108	22-Aug-23	4383	Dinobryon bavaricum Imhof	14368	3.25004	12	6	226.2
MEL -0108	22-Aug-23	4383	Dinobryon bavaricum Imhof	2600	3.25	0	0	1250
MEL -0108	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	28736	6.50008	12	6	226.2
MEL -0108	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	5600	11.1496	0	0	1991
MEL -0108	22-Aug-23	4390	Dinobryon sociale Ehrenberg	57472	13.00017	12	6	226.2
MEL -0108	22-Aug-23	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.19612	5.8	3	27.3
MEL -0108	22-Aug-23	4411	Bitrichia chodatii (Reverdin) Chodat	7184	0.36136	6	4	50.3
MEL -0108	22-Aug-23	4413	Chrysochromulina laurentiana Kling	28736	11.33923	9.1	9.1	394.6
MEL -0108	22-Aug-23	4414	Stichogloea spp.	28736	1.44542	6	4	50.3
MEL -0108	22-Aug-23	4415	Bicosoeca lacustris Clark	7184	0.36638	4.6	4.6	51
MEL -0108	22-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	122128	6.14304	6	4	50.3
MEL -0108	22-Aug-23	4448	Rhizochrysis scherffelii Pascher	1400	4.27504	18	18	3053.6
MEL -0108	22-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	1800	4.35654	11.55	23.1	2420.3
MEL -0108	22-Aug-23	5508	Cyclotella pseudostelligera	14368	7.90815	7.05	14.1	550.4
MEL -0108	22-Aug-23	5509	Cyclotella ocellata Pant.	21552	2.24787	4.05	8.1	104.3
MEL -0108	22-Aug-23	5511	Rhizosolenia eriense H.L. Smith	21552	1.82761	12	3	84.8
MEL -0108	22-Aug-23	5513	Tabellaria fenestrata (Lyngbye) Kutzing	6000	4.2414	75	6	706.9
MEL -0108	22-Aug-23	5518	Synedra acus Kutzing	4400	0.5302	115.1	2	120.5
MEL -0108	22-Aug-23	5524	Asterionella formosa Hassall	12000	1.2564	100	2	104.7
MEL -0108	22-Aug-23	5551	Cyclotella michiganiana Skvortzow	1300304	28.2166	2.4	4.8	21.7
MEL -0108	22-Aug-23	6554	Rhodomonas minuta Skuja	179600	27.08368	12	6	150.8
MEL -0108	22-Aug-23	6558	Cryptomonas erosa Ehrenberg	3600	6.72408	27.3	14	1867.8
MEL -0108	22-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	600	0.4398	21	10	733
MEL -0108	22-Aug-23	6565	Cryptomonas rostratiformis Skuja	600	1.31358	32	14	2189.3
MEL -0108	22-Aug-23	7632	Gymnodinium sp.	2600	16.56356	23	23	6370.6
MEL -0108	22-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	7600	31.35988	19.9	19.9	4126.3
MEL -0108	22-Aug-23	7641	Peridinium aciculiferum Lemmermann	400	3.61912	30	24	9047.8
MEL -0109	22-Aug-23	1014	Chroococcus limneticus Lemmermann	43104	1.05174	3.6	3.6	24.4
MEL -0109	22-Aug-23	1073	Snowella sp	600	0.3	0	0	500
MEL -0109	22-Aug-23	2105	Chlamydomonas spp.	28736	1.44542	6	4	50.3
MEL -0109	22-Aug-23	2112	Sphaerocystis schroeteri Chodat	86208	1.21553	3	3	14.1
MEL -0109	22-Aug-23	2121	Oocystis lacustris Chodat	21552	0.82975	6	3.5	38.5
MEL -0109	22-Aug-23	2130	Scenedesmus quadricauda (Turp.) Brebisson	28736	1.29887	8.1	4	45.2
MEL -0109	22-Aug-23	2145	Crucigenia quadrata Morr.	57472	0.08046	2	2	1.4
MEL -0109	22-Aug-23	2178	Cosmarium sp.	200	0.27926	20	20	1396.3
MEL -0109	22-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	200	0.07748	13.6	12	387.4
MEL -0109	22-Aug-23	2206	Botryococcus braunii Kutzing	800	0.72384	12	12	904.8
MEL -0109	22-Aug-23	2235	Ankistrodesmus spiralis Lemmermann	21552	1.18536	35	2	55
MEL -0109	22-Aug-23	4351	Small chrysophyceae	689664	4.41385	2.3	2.3	6.4
MEL -0109	22-Aug-23	4352	Large chrysophyceae	14368	2.58049	7	7	179.6
MEL -0109	22-Aug-23	4355	Chrysochromulina parva Lackey	294544	19.26318	5	5	65.4
MEL -0109	22-Aug-23	4357	Chrysococcus sp.	402304	26.31068	5	5	65.4
MEL -0109	22-Aug-23	4358	Chrysostephanosphaera globulifera Scherffel	43104	11.99584	8.1	8.1	278.3
MEL -0109	22-Aug-23	4362	Kephyrion sp.	100576	1.28737	2.9	2.9	12.8
MEL -0109	22-Aug-23	4378	Dinobryon borgei Lemmermann	50288	2.13221	9	3	42.4
MEL -0109	22-Aug-23	4383	Dinobryon bavaricum Imhof	50288	11.37515	12	6	226.2
MEL -0109	22-Aug-23	4383	Dinobryon bavaricum Imhof	2800	3.5	0	0	1250
MEL -0109	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	21552	4.87506	12	6	226.2
MEL -0109	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	4200	8.3622	0	0	1991
MEL -0109	22-Aug-23	4390	Dinobryon sociale Ehrenberg	64656	14.62519	12	6	226.2

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length μ	width μ	cell volume μ^3
MEL -0109	22-Aug-23	4411	Bitrichia chodatii (Reverdin) Chodat	14368	0.72271	6	4	50.3
MEL -0109	22-Aug-23	4413	Chrysochromulina laurentiana Kling	43104	17.00884	9.1	9.1	394.6
MEL -0109	22-Aug-23	4414	Stichogloea spp.	28736	1.44542	6	4	50.3
MEL -0109	22-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	114944	3.13797	5.8	3	27.3
MEL -0109	22-Aug-23	4448	Rhizochrysis scherffelii Pascher	4400	13.43584	18	18	3053.6
MEL -0109	22-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	3000	7.2609	11.55	23.1	2420.3
MEL -0109	22-Aug-23	5513	Tabellaria fenestrata (Lyngbye) Kutzing	1200	0.84828	75	6	706.9
MEL -0109	22-Aug-23	5514	Tabellaria flocculosa (Roth) Kutzing	200	0.26682	26	14	1334.1
MEL -0109	22-Aug-23	5515	Fragilaria crotonensis Kitton	3000	0.8922	71	4	297.4
MEL -0109	22-Aug-23	5518	Synedra acus Kutzing	3800	0.45752	115	2	120.4
MEL -0109	22-Aug-23	5523	Synedra ulna (Nitzsch) Ehrenberg	200	0.52778	280	6	2638.9
MEL -0109	22-Aug-23	5524	Asterionella formosa Hassall	23200	2.42904	100	2	104.7
MEL -0109	22-Aug-23	5551	Cyclotella michiganiana Skvortzow	186784	4.05321	2.4	4.8	21.7
MEL -0109	22-Aug-23	6554	Rhodomonas minuta Skuja	64656	9.75012	12	6	150.8
MEL -0109	22-Aug-23	6558	Cryptomonas erosa Ehrenberg	4200	7.84476	27.3	14	1867.8
MEL -0109	22-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	400	0.2932	21	10	733
MEL -0109	22-Aug-23	6565	Cryptomonas rostratiformis Skuja	400	0.87572	32	14	2189.3
MEL -0109	22-Aug-23	6568	Katablepharis ovalis Skuja	14368	0.57903	7.6	4	40.3
MEL -0109	22-Aug-23	7631	Gymnodinium helveticum Penard	200	4.71238	50	30	23561.9
MEL -0109	22-Aug-23	7632	Gymnodinium sp.	2200	14.01532	23	23	6370.6
MEL -0109	22-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	6400	26.40832	19.9	19.9	4126.3
MEL -0109	22-Aug-23	7641	Peridinium aciculiferum Lemmermann	600	5.42868	30	24	9047.8
MEL -0110	22-Aug-23	1054	Planktolyngbya limnetica	600	0.09906	146	1.2	165.1
MEL -0110	22-Aug-23	1073	Snowella sp	200	0.1	0	0	500
MEL -0110	22-Aug-23	2100	Pyramidomonas tetrarhynchus Schmarda	400	0.26548	15	13	663.7
MEL -0110	22-Aug-23	2101	Carteria spp.	7184	3.76154	10	10	523.6
MEL -0110	22-Aug-23	2112	Sphaerocystis schroeteri Chodat	114944	1.62071	3	3	14.1
MEL -0110	22-Aug-23	2121	Oocystis lacustris Chodat	21552	0.82975	6	3.5	38.5
MEL -0110	22-Aug-23	2130	Scenedesmus quadricauda (Turp.) Brebisson	28736	1.2845	8	4	44.7
MEL -0110	22-Aug-23	2178	Cosmarium sp.	200	0.27926	20	20	1396.3
MEL -0110	22-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	200	0.07748	13.6	12	387.4
MEL -0110	22-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27084	6	6	37.7
MEL -0110	22-Aug-23	2206	Botryococcus braunii Kutzing	600	0.54288	12	12	904.8
MEL -0110	22-Aug-23	2215	Tetraedron caudatum (Corda) Hansgrig	14368	0.06753	3	3	4.7
MEL -0110	22-Aug-23	3301	Euglena acus Ehrenberg	200	1.88496	125	12	9424.8
MEL -0110	22-Aug-23	4351	Small chrysophyceae	969840	6.20698	2.3	2.3	6.4
MEL -0110	22-Aug-23	4352	Large chrysophyceae	35920	6.45123	7	7	179.6
MEL -0110	22-Aug-23	4355	Chrysochromulina parva Lackey	445408	29.12968	5	5	65.4
MEL -0110	22-Aug-23	4357	Chrysococcus sp.	696848	45.57386	5	5	65.4
MEL -0110	22-Aug-23	4358	Chrysostephanosphaera globulifera Scherffel	28736	7.99723	8.1	8.1	278.3
MEL -0110	22-Aug-23	4362	Kephyrion sp.	93392	1.19542	2.9	2.9	12.8
MEL -0110	22-Aug-23	4363	Spiniferomonas serrata	21552	2.56038	6.1	6.1	118.8
MEL -0110	22-Aug-23	4378	Dinobryon borgei Lemmermann	86208	3.65522	9	3	42.4
MEL -0110	22-Aug-23	4383	Dinobryon bavaricum Imhof	14368	3.25004	12	6	226.2
MEL -0110	22-Aug-23	4383	Dinobryon bavaricum Imhof	1200	1.5	0	0	1250
MEL -0110	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	14368	3.25004	12	6	226.2
MEL -0110	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	3200	6.3712	0	0	1991
MEL -0110	22-Aug-23	4390	Dinobryon sociale Ehrenberg	93392	21.12527	12	6	226.2
MEL -0110	22-Aug-23	4396	Chrysolykos skuja (Nauwerck) Willen	35920	0.98062	5.8	3	27.3
MEL -0110	22-Aug-23	4411	Bitrichia chodatii (Reverdin) Chodat	7184	0.36136	6	4	50.3
MEL -0110	22-Aug-23	4413	Chrysochromulina laurentiana Kling	71840	28.34806	9.1	9.1	394.6
MEL -0110	22-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	150864	7.58846	6	4	50.3
MEL -0110	22-Aug-23	4448	Rhizochrysis scherffelii Pascher	2600	7.93936	18	18	3053.6
MEL -0110	22-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	1600	3.87248	11.55	23.1	2420.3
MEL -0110	22-Aug-23	5508	Cyclotella pseudostelligera	200	0.11008	7.05	14.1	550.4
MEL -0110	22-Aug-23	5511	Rhizosolenia eriense H.L. Smith	21552	1.67675	11	3	77.8
MEL -0110	22-Aug-23	5513	Tabellaria fenestrata (Lyngbye) Kutzing	6400	4.52416	75	6	706.9
MEL -0110	22-Aug-23	5518	Synedra acus Kutzing	2800	0.33712	115	2	120.4
MEL -0110	22-Aug-23	5524	Asterionella formosa Hassall	9800	1.02606	100	2	104.7
MEL -0110	22-Aug-23	5551	Cyclotella michiganiana Skvortzow	57472	1.24714	2.4	4.8	21.7
MEL -0110	22-Aug-23	6554	Rhodomonas minuta Skuja	172416	26.00033	12	6	150.8
MEL -0110	22-Aug-23	6558	Cryptomonas erosa Ehrenberg	6400	11.95392	27.3	14	1867.8
MEL -0110	22-Aug-23	6565	Cryptomonas rostratiformis Skuja	800	1.75144	32	14	2189.3
MEL -0110	22-Aug-23	7631	Gymnodinium helveticum Penard	200	4.71238	50	30	23561.9
MEL -0110	22-Aug-23	7632	Gymnodinium sp.	4600	29.30476	23	23	6370.6
MEL -0110	22-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	5400	22.28202	19.9	19.9	4126.3
MEL -0110	22-Aug-23	7641	Peridinium aciculiferum Lemmermann	400	3.61912	30	24	9047.8
MEL -0202	17-Aug-23	1073	Snowella sp	200	0.1	0	0	500
MEL -0202	17-Aug-23	2112	Sphaerocystis schroeteri Chodat	215520	3.03883	3	3	14.1
MEL -0202	17-Aug-23	2113	Pediastrum duplex Meyen	200	0.28	0	0	1400
MEL -0202	17-Aug-23	2121	Oocystis lacustris Chodat	272992	7.72567	6	3	28.3
MEL -0202	17-Aug-23	2137	Dictyosphaerium simplex Sukja	86208	0.36207	2	2	4.2
MEL -0202	17-Aug-23	2178	Cosmarium sp.	200	0.27926	20	20	1396.3
MEL -0202	17-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	400	0.16188	13.9	12	404.7
MEL -0202	17-Aug-23	2193	Staurodesmus paradoxum Meyen	400	1.13264	26	24	2831.6
MEL -0202	17-Aug-23	2206	Botryococcus braunii Kutzing	800	0.72384	12	12	904.8
MEL -0202	17-Aug-23	2247	Oocystis gigas Archer	400	0.96508	18	16	2412.7
MEL -0202	17-Aug-23	4351	Small chrysophyceae	179600	1.00576	2.2	2.2	5.6
MEL -0202	17-Aug-23	4357	Chrysococcus sp.	215520	14.09501	5	5	65.4
MEL -0202	17-Aug-23	4362	Kephyrion sp.	64656	0.8276	2.9	2.9	12.8
MEL -0202	17-Aug-23	4368	Mallomonas crassisquama (Asmund) Fott	200	0.20734	19.8	10	1036.7
MEL -0202	17-Aug-23	4369	Mallomonas pseudocoronata Prescott	400	0.69368	23	12	1734.2
MEL -0202	17-Aug-23	4388	Dinobryon sertularia Ehrenberg	21552	4.87506	12	6	226.2

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^3
MEL -0202	17-Aug-23	4388	Dinobryon sertularia Ehrenberg	400	0.7964	0	0	1991
MEL -0202	17-Aug-23	4390	Dinobryon sociale Ehrenberg	7184	1.62502	12	6	226.2
MEL -0202	17-Aug-23	4413	Chrysochromulina laurentiana Kling	7184	2.83481	9.1	9.1	394.6
MEL -0202	17-Aug-23	4414	Stichogloea spp.	21552	1.08407	6	4	50.3
MEL -0202	17-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	3200	7.6448	11.5	23	2389
MEL -0202	17-Aug-23	5509	Cyclotella ocellata Pant.	21552	2.33408	4.1	8.2	108.3
MEL -0202	17-Aug-23	5513	Tabellaria fenestrata (Lyngbye) Kutzing	1200	0.84828	75	6	706.9
MEL -0202	17-Aug-23	5514	Tabellaria flocculosa (Roth) Kutzing	1000	1.3341	26	14	1334.1
MEL -0202	17-Aug-23	5518	Synedra acus Kutzing	400	0.04816	115	2	120.4
MEL -0202	17-Aug-23	5524	Asterionella formosa Hassall	18000	1.8846	100	2	104.7
MEL -0202	17-Aug-23	5551	Cyclotella michiganiana Skvortzow	143680	3.11786	2.4	4.8	21.7
MEL -0202	17-Aug-23	6554	Rhodomonas minuta Skuja	136496	20.5836	12	6	150.8
MEL -0202	17-Aug-23	6558	Cryptomonas erosa Ehrenberg	2800	5.17244	27	14	1847.3
MEL -0202	17-Aug-23	7631	Gymnodinium helveticum Penard	200	4.71238	50	30	23561.9
MEL -0202	17-Aug-23	7632	Gymnodinium sp.	1600	10.19296	23	23	6370.6
MEL -0202	17-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	2200	8.6735	19.6	19.6	3942.5
MEL -0202	17-Aug-23	7641	Peridinium aciculiferum Lemmermann	400	3.61912	30	24	9047.8
MEL -0203	17-Aug-23	1073	Snowella sp	600	0.3	0	0	500
MEL -0203	17-Aug-23	2112	Sphaerocystis schroeteri Chodat	28736	0.40518	3	3	14.1
MEL -0203	17-Aug-23	2113	Pediastrum duplex Meyen	200	0.28	0	0	1400
MEL -0203	17-Aug-23	2121	Oocystis lacustris Chodat	488512	13.82489	6	3	28.3
MEL -0203	17-Aug-23	2137	Dictyosphaerium simplex Sukja	7184	0.03017	2	2	4.2
MEL -0203	17-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.34771	7.7	4	48.4
MEL -0203	17-Aug-23	2145	Crucigenia quadrata Morr.	28736	0.04023	2	2	1.4
MEL -0203	17-Aug-23	2182	Euastrum spp.	200	0.27926	20	20	1396.3
MEL -0203	17-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	400	0.16188	13.9	12	404.7
MEL -0203	17-Aug-23	2247	Oocystis gigas Archer	200	0.48254	18	16	2412.7
MEL -0203	17-Aug-23	4351	Small chrysophyceae	287360	1.8391	2.3	2.3	6.4
MEL -0203	17-Aug-23	4357	Chrysococcus sp.	165232	10.80617	5	5	65.4
MEL -0203	17-Aug-23	4383	Dinobryon bavaricum Imhof	200	0.19	0	0	950
MEL -0203	17-Aug-23	4388	Dinobryon sertularia Ehrenberg	200	0.25	0	0	1250
MEL -0203	17-Aug-23	4390	Dinobryon sociale Ehrenberg	21552	4.87506	12	6	226.2
MEL -0203	17-Aug-23	4413	Chrysochromulina laurentiana Kling	28736	11.33923	9.1	9.1	394.6
MEL -0203	17-Aug-23	4414	Stichogloea spp.	7184	0.36136	6	4	50.3
MEL -0203	17-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	100576	2.8463	6	3	28.3
MEL -0203	17-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	3200	7.6448	11.5	23	2389
MEL -0203	17-Aug-23	5509	Cyclotella ocellata Pant.	7184	0.77803	4.1	8.2	108.3
MEL -0203	17-Aug-23	5513	Tabellaria fenestrata (Lyngbye) Kutzing	1400	0.98966	75	6	706.9
MEL -0203	17-Aug-23	5518	Synedra acus Kutzing	600	0.06912	110	2	115.2
MEL -0203	17-Aug-23	5524	Asterionella formosa Hassall	21000	2.1987	100	2	104.7
MEL -0203	17-Aug-23	5551	Cyclotella michiganiana Skvortzow	79024	1.71482	2.4	4.8	21.7
MEL -0203	17-Aug-23	6554	Rhodomonas minuta Skuja	86208	13.00017	12	6	150.8
MEL -0203	17-Aug-23	6558	Cryptomonas erosa Ehrenberg	4000	7.3892	27	14	1847.3
MEL -0203	17-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	1600	1.1728	21	10	733
MEL -0203	17-Aug-23	6565	Cryptomonas rostratiformis Skuja	200	0.45156	33	14	2257.8
MEL -0203	17-Aug-23	7632	Gymnodinium sp.	1200	7.64472	23	23	6370.6
MEL -0203	17-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	2200	8.6735	19.6	19.6	3942.5
MEL -0203	17-Aug-23	7641	Peridinium aciculiferum Lemmermann	200	1.80956	30	24	9047.8
MEL -0205	17-Aug-23	1014	Chroococcus limneticus Lemmermann	28736	0.54024	3.3	3.3	18.8
MEL -0205	17-Aug-23	1073	Snowella sp	2200	1.1	0	0	500
MEL -0205	17-Aug-23	2105	Chlamydomonas spp.	14368	0.35202	5.2	3	24.5
MEL -0205	17-Aug-23	2112	Sphaerocystis schroeteri Chodat	143680	2.02589	3	3	14.1
MEL -0205	17-Aug-23	2121	Oocystis lacustris Chodat	330464	9.35213	6	3	28.3
MEL -0205	17-Aug-23	2137	Dictyosphaerium simplex Sukja	143680	0.60346	2	2	4.2
MEL -0205	17-Aug-23	2145	Crucigenia quadrata Morr.	28736	0.13506	3	3	4.7
MEL -0205	17-Aug-23	2167	Elakatothrix gelatinosa Willen	57472	0.90231	10	2	15.7
MEL -0205	17-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	14368	0.54167	6	6	37.7
MEL -0205	17-Aug-23	4351	Small chrysophyceae	193968	1.2414	2.3	2.3	6.4
MEL -0205	17-Aug-23	4352	Large chrysophyceae	7184	1.29025	7	7	179.6
MEL -0205	17-Aug-23	4357	Chrysococcus sp.	215520	14.09501	5	5	65.4
MEL -0205	17-Aug-23	4362	Kephyrion sp.	122128	1.56324	2.9	2.9	12.8
MEL -0205	17-Aug-23	4368	Mallomonas crassisquama (Asmund) Fott	200	0.20526	19.6	10	1026.3
MEL -0205	17-Aug-23	4378	Dinobryon borgei Lemmermann	7184	0.3046	9	3	42.4
MEL -0205	17-Aug-23	4381	Dinobryon mucronatom Nygaard	21552	2.82116	10	5	130.9
MEL -0205	17-Aug-23	4388	Dinobryon sertularia Ehrenberg	200	0.25	0	0	1250
MEL -0205	17-Aug-23	4390	Dinobryon sociale Ehrenberg	43104	9.75012	12	6	226.2
MEL -0205	17-Aug-23	4413	Chrysochromulina laurentiana Kling	21552	8.50442	9.1	9.1	394.6
MEL -0205	17-Aug-23	4414	Stichogloea spp.	50288	2.52949	6	4	50.3
MEL -0205	17-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	158048	4.47276	6	3	28.3
MEL -0205	17-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	2400	5.7336	11.5	23	2389
MEL -0205	17-Aug-23	5509	Cyclotella ocellata Pant.	35920	3.77519	4.08	8.1	105.1
MEL -0205	17-Aug-23	5518	Synedra acus Kutzing	400	0.04816	115	2	120.4
MEL -0205	17-Aug-23	5524	Asterionella formosa Hassall	17000	1.7799	100	2	104.7
MEL -0205	17-Aug-23	5551	Cyclotella michiganiana Skvortzow	143680	3.11786	2.4	4.8	21.7
MEL -0205	17-Aug-23	6554	Rhodomonas minuta Skuja	50288	7.58343	12	6	150.8
MEL -0205	17-Aug-23	6558	Cryptomonas erosa Ehrenberg	1400	2.58622	27	14	1847.3
MEL -0205	17-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	400	0.2932	21	10	733
MEL -0205	17-Aug-23	6565	Cryptomonas rostratiformis Skuja	200	0.45156	33	14	2257.8
MEL -0205	17-Aug-23	7632	Gymnodinium sp.	2400	15.28944	23	23	6370.6
MEL -0205	17-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	2600	10.2505	19.6	19.6	3942.5
MEL -0205	17-Aug-23	7641	Peridinium aciculiferum Lemmermann	600	5.42868	30	24	9047.8
MEL -0206	17-Aug-23	1073	Snowella sp	400	0.2	0	0	500
MEL -0206	17-Aug-23	2105	Chlamydomonas spp.	7184	0.0819	4.1	2.3	11.4

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^3
MEL -0206	17-Aug-23	2112	Sphaerocystis schroeteri Chodat	567536	8.00226	3	3	14.1
MEL -0206	17-Aug-23	2121	Oocystis lacustris Chodat	172416	4.87937	6	3	28.3
MEL -0206	17-Aug-23	2137	Dictyosphaerium simplex Sukja	79024	0.3319	2	2	4.2
MEL -0206	17-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	21552	1.04312	7.7	4	48.4
MEL -0206	17-Aug-23	2145	Crucigenia quadrata Morr.	287360	1.35059	3	3	4.7
MEL -0206	17-Aug-23	2182	Euastrum spp.	200	0.37168	22	22	1858.4
MEL -0206	17-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	600	0.23244	13.6	12	387.4
MEL -0206	17-Aug-23	2206	Botryococcus braunii Kutzing	400	0.36192	12	12	904.8
MEL -0206	17-Aug-23	2215	Tetraedron caudatum (Corda) Hansgrig	21552	0.10129	3	3	4.7
MEL -0206	17-Aug-23	4351	Small chrysophyceae	481328	2.69544	2.2	2.2	5.6
MEL -0206	17-Aug-23	4355	Chrysochromulina parva Lackey	21552	1.4095	5	5	65.4
MEL -0206	17-Aug-23	4357	Chrysococcus sp.	265808	17.38384	5	5	65.4
MEL -0206	17-Aug-23	4362	Kephyrion sp.	100576	1.28737	2.9	2.9	12.8
MEL -0206	17-Aug-23	4383	Dinobryon bavaricum Imhof	200	0.25	0	0	1250
MEL -0206	17-Aug-23	4388	Dinobryon sertularia Ehrenberg	7184	1.62502	12	6	226.2
MEL -0206	17-Aug-23	4388	Dinobryon sertularia Ehrenberg	800	1.5928	0	0	1991
MEL -0206	17-Aug-23	4390	Dinobryon sociale Ehrenberg	7184	1.62502	12	6	226.2
MEL -0206	17-Aug-23	4413	Chrysochromulina laurentiana Kling	21552	8.50442	9.1	9.1	394.6
MEL -0206	17-Aug-23	4414	Stichogloea spp.	35920	1.80678	6	4	50.3
MEL -0206	17-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	35920	1.01654	6	3	28.3
MEL -0206	17-Aug-23	4448	Rhizochrysis scherffelii Pascher	200	0.61072	18	18	3053.6
MEL -0206	17-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	1800	4.3002	11.5	23	2389
MEL -0206	17-Aug-23	5509	Cyclotella ocellata Pant.	57472	5.99433	4.05	8.1	104.3
MEL -0206	17-Aug-23	5513	Tabellaria fenestrata (Lyngbye) Kutzing	1600	1.13104	75	6	706.9
MEL -0206	17-Aug-23	5515	Fragilaria crotonensis Kitton	6800	1.99376	70	4	293.2
MEL -0206	17-Aug-23	5518	Synedra acus Kutzing	600	0.06912	110	2	115.2
MEL -0206	17-Aug-23	5524	Asterionella formosa Hassall	16000	1.6752	100	2	104.7
MEL -0206	17-Aug-23	5551	Cyclotella michiganiana Skvortzow	28736	0.62357	2.4	4.8	21.7
MEL -0206	17-Aug-23	6554	Rhodomonas minuta Skuja	172416	26.00033	12	6	150.8
MEL -0206	17-Aug-23	6558	Cryptomonas erosa Ehrenberg	2200	3.91336	26	14	1778.8
MEL -0206	17-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	1600	1.1728	21	10	733
MEL -0206	17-Aug-23	6565	Cryptomonas rostratiformis Skuja	600	1.35468	33	14	2257.8
MEL -0206	17-Aug-23	7632	Gymnodinium sp.	1800	11.46708	23	23	6370.6
MEL -0206	17-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	1800	7.0965	19.6	19.6	3942.5
MEL -0206	17-Aug-23	7641	Peridinium aciculiferum Lemmermann	200	1.80956	30	24	9047.8
MEL -0208	17-Aug-23	1073	Snowella sp	1600	0.8	0	0	500
MEL -0208	17-Aug-23	2112	Sphaerocystis schroeteri Chodat	272992	3.84919	3	3	14.1
MEL -0208	17-Aug-23	2121	Oocystis lacustris Chodat	287360	8.13229	6	3	28.3
MEL -0208	17-Aug-23	2137	Dictyosphaerium simplex Sukja	136496	0.57328	2	2	4.2
MEL -0208	17-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	28736	1.39082	7.7	4	48.4
MEL -0208	17-Aug-23	2145	Crucigenia quadrata Morr.	57472	0.08046	2	2	1.4
MEL -0208	17-Aug-23	2167	Elakatothrix gelatinosa Willen	35920	0.56394	10	2	15.7
MEL -0208	17-Aug-23	2178	Cosmarium sp.	200	0.27926	20	20	1396.3
MEL -0208	17-Aug-23	2206	Botryococcus braunii Kutzing	400	0.36192	12	12	904.8
MEL -0208	17-Aug-23	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.03376	3	3	4.7
MEL -0208	17-Aug-23	4351	Small chrysophyceae	100576	0.56323	2.2	2.2	5.6
MEL -0208	17-Aug-23	4362	Kephyrion sp.	7184	0.09196	2.9	2.9	12.8
MEL -0208	17-Aug-23	4368	Mallomonas crassisquama (Asmund) Fott	200	0.20734	19.8	10	1036.7
MEL -0208	17-Aug-23	4388	Dinobryon sertularia Ehrenberg	800	1.5928	0	0	1991
MEL -0208	17-Aug-23	4390	Dinobryon sociale Ehrenberg	21552	4.87506	12	6	226.2
MEL -0208	17-Aug-23	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.18966	5.6	3	26.4
MEL -0208	17-Aug-23	4413	Chrysochromulina laurentiana Kling	14368	5.66961	9.1	9.1	394.6
MEL -0208	17-Aug-23	4414	Stichogloea spp.	143680	7.2271	6	4	50.3
MEL -0208	17-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	43104	1.21984	6	3	28.3
MEL -0208	17-Aug-23	4448	Rhizochrysis scherffelii Pascher	200	0.61072	18	18	3053.6
MEL -0208	17-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	1800	4.3002	11.5	23	2389
MEL -0208	17-Aug-23	5509	Cyclotella ocellata Pant.	57472	5.99433	4.05	8.1	104.3
MEL -0208	17-Aug-23	5513	Tabellaria fenestrata (Lyngbye) Kutzing	7000	4.9483	75	6	706.9
MEL -0208	17-Aug-23	5515	Fragilaria crotonensis Kitton	400	0.11728	70	4	293.2
MEL -0208	17-Aug-23	5518	Synedra acus Kutzing	600	0.06912	110	2	115.2
MEL -0208	17-Aug-23	5524	Asterionella formosa Hassall	11800	1.23546	100	2	104.7
MEL -0208	17-Aug-23	5551	Cyclotella michiganiana Skvortzow	43104	0.93536	2.4	4.8	21.7
MEL -0208	17-Aug-23	6554	Rhodomonas minuta Skuja	150864	22.75029	12	6	150.8
MEL -0208	17-Aug-23	6558	Cryptomonas erosa Ehrenberg	3200	5.69216	26	14	1778.8
MEL -0208	17-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	1000	0.733	21	10	733
MEL -0208	17-Aug-23	6565	Cryptomonas rostratiformis Skuja	800	1.80624	33	14	2257.8
MEL -0208	17-Aug-23	7632	Gymnodinium sp.	2600	16.56356	23	23	6370.6
MEL -0208	17-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	3200	12.616	19.6	19.6	3942.5
MEL -0208	17-Aug-23	7641	Peridinium aciculiferum Lemmermann	600	5.42868	30	24	9047.8
MEL -0301	18-Aug-23	2105	Chlamydomonas spp.	7184	0.19325	5.7	3	26.9
MEL -0301	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	43104	0.60777	3	3	14.1
MEL -0301	18-Aug-23	2121	Oocystis lacustris Chodat	150864	3.98281	5.6	3	26.4
MEL -0301	18-Aug-23	2137	Dictyosphaerium simplex Sukja	64656	0.27156	2	2	4.2
MEL -0301	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.34771	7.7	4	48.4
MEL -0301	18-Aug-23	2182	Euastrum spp.	400	0.74336	22	22	1858.4
MEL -0301	18-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	200	0.07748	13.6	12	387.4
MEL -0301	18-Aug-23	2193	Staurodesmus paradoxum Meyen	200	0.56632	26	24	2831.6
MEL -0301	18-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	57472	2.16669	6	6	37.7
MEL -0301	18-Aug-23	2206	Botryococcus braunii Kutzing	600	0.54288	12	12	904.8
MEL -0301	18-Aug-23	4351	Small chrysophyceae	172416	0.96553	2.2	2.2	5.6
MEL -0301	18-Aug-23	4355	Chrysochromulina parva Lackey	7184	0.46983	5	5	65.4
MEL -0301	18-Aug-23	4357	Chrysococcus sp.	531616	34.76769	5	5	65.4
MEL -0301	18-Aug-23	4361	Kephyrion boreale Skuja	7184	0.85346	6.1	6.1	118.8

Station	Date	Species Code	Speceis name	density cells/L-1	biomass mg/m-3	length µ	width µ	cell volume µ3
MEL -0301	18-Aug-23	4362	Kephyrion sp.	71840	0.91955	2.9	2.9	12.8
MEL -0301	18-Aug-23	4368	Mallomonas crassisquama (Asmund) Fott	200	0.20944	20	10	1047.2
MEL -0301	18-Aug-23	4378	Dinobryon borgei Lemmermann	28736	1.21841	9	3	42.4
MEL -0301	18-Aug-23	4383	Dinobryon bavaricum Imhof	600	0.75	0	0	1250
MEL -0301	18-Aug-23	4390	Dinobryon sociale Ehrenberg	122128	27.62535	12	6	226.2
MEL -0301	18-Aug-23	4413	Chrysochromulina laurentiana Kling	43104	17.00884	9.1	9.1	394.6
MEL -0301	18-Aug-23	4414	Stichogloea spp.	114944	5.78168	6	4	50.3
MEL -0301	18-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	7184	0.19972	5.9	3	27.8
MEL -0301	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	800	1.9112	11.5	23	2389
MEL -0301	18-Aug-23	5509	Cyclotella ocellata Pant.	7184	0.74929	4.05	8.1	104.3
MEL -0301	18-Aug-23	5511	Rhizosolenia eriense H.L. Smith	7184	0.6092	12	3	84.8
MEL -0301	18-Aug-23	5515	Fragilaria crotonensis Kitton	800	0.23456	70	4	293.2
MEL -0301	18-Aug-23	5518	Synedra acus Kutzing	400	0.04608	110	2	115.2
MEL -0301	18-Aug-23	5524	Asterionella formosa Hassall	7400	0.77478	100	2	104.7
MEL -0301	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	7184	0.15589	2.4	4.8	21.7
MEL -0301	18-Aug-23	5720	Cyclotella bodanica Eulenst.	200	1.41124	16.5	33	7056.2
MEL -0301	18-Aug-23	6554	Rhodomonas minuta Skuja	143680	21.66694	12	6	150.8
MEL -0301	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	1200	2.20848	26.9	14	1840.4
MEL -0301	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	1000	0.7679	22	10	767.9
MEL -0301	18-Aug-23	6565	Cryptomonas rostratiformis Skuja	400	0.87572	32	14	2189.3
MEL -0301	18-Aug-23	7632	Gymnodinium sp.	1200	7.64472	23	23	6370.6
MEL -0301	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	5400	21.2895	19.6	19.6	3942.5
MEL -0301R	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	28736	0.40518	3	3	14.1
MEL -0301R	18-Aug-23	2121	Oocystis lacustris Chodat	86208	2.27589	5.6	3	26.4
MEL -0301R	18-Aug-23	2137	Dictyosphaerium simplex Sukja	86208	0.36207	2	2	4.2
MEL -0301R	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.34771	7.7	4	48.4
MEL -0301R	18-Aug-23	2182	Euastrum spp.	200	0.37168	22	22	1858.4
MEL -0301R	18-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	43104	1.62502	6	6	37.7
MEL -0301R	18-Aug-23	2206	Botryococcus braunii Kutzing	400	0.36192	12	12	904.8
MEL -0301R	18-Aug-23	4351	Small chrysophyceae	136496	0.76438	2.2	2.2	5.6
MEL -0301R	18-Aug-23	4352	Large chrysophyceae	14368	2.58049	7	7	179.6
MEL -0301R	18-Aug-23	4357	Chrysococcus sp.	488512	31.94868	5	5	65.4
MEL -0301R	18-Aug-23	4358	Chrysostephanosphaera globulifera Scherffel	14368	3.99861	8.1	8.1	278.3
MEL -0301R	18-Aug-23	4361	Kephyrion boreale Skuja	7184	0.85346	6.1	6.1	118.8
MEL -0301R	18-Aug-23	4362	Kephyrion sp.	114944	1.47128	2.9	2.9	12.8
MEL -0301R	18-Aug-23	4368	Mallomonas crassisquama (Asmund) Fott	600	0.62832	20	10	1047.2
MEL -0301R	18-Aug-23	4378	Dinobryon borgei Lemmermann	7184	0.3046	9	3	42.4
MEL -0301R	18-Aug-23	4383	Dinobryon bavaricum Imhof	400	0.5	0	0	1250
MEL -0301R	18-Aug-23	4390	Dinobryon sociale Ehrenberg	150864	34.12544	12	6	226.2
MEL -0301R	18-Aug-23	4411	Bitrichia chodatii (Reverdin) Chodat	7184	0.36136	6	4	50.3
MEL -0301R	18-Aug-23	4413	Chrysochromulina laurentiana Kling	35920	14.17403	9.1	9.1	394.6
MEL -0301R	18-Aug-23	4414	Stichogloea spp.	136496	6.86575	6	4	50.3
MEL -0301R	18-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	7184	0.19972	5.9	3	27.8
MEL -0301R	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	600	1.4334	11.5	23	2389
MEL -0301R	18-Aug-23	5509	Cyclotella ocellata Pant.	21552	2.24787	4.05	8.1	104.3
MEL -0301R	18-Aug-23	5511	Rhizosolenia eriense H.L. Smith	14368	1.21841	12	3	84.8
MEL -0301R	18-Aug-23	5515	Fragilaria crotonensis Kitton	1600	0.46912	70	4	293.2
MEL -0301R	18-Aug-23	5518	Synedra acus Kutzing	200	0.02304	110	2	115.2
MEL -0301R	18-Aug-23	5524	Asterionella formosa Hassall	9800	1.02606	100	2	104.7
MEL -0301R	18-Aug-23	5720	Cyclotella bodanica Eulenst.	200	1.41124	16.5	33	7056.2
MEL -0301R	18-Aug-23	6554	Rhodomonas minuta Skuja	114944	17.33356	12	6	150.8
MEL -0301R	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	600	1.10424	26.9	14	1840.4
MEL -0301R	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	600	0.46074	22	10	767.9
MEL -0301R	18-Aug-23	6565	Cryptomonas rostratiformis Skuja	600	1.31358	32	14	2189.3
MEL -0301R	18-Aug-23	7632	Gymnodinium sp.	2000	12.7412	23	23	6370.6
MEL -0301R	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	4800	18.924	19.6	19.6	3942.5
MEL -0302	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	258624	3.6466	3	3	14.1
MEL -0302	18-Aug-23	2121	Oocystis lacustris Chodat	143680	4.06614	6	3	28.3
MEL -0302	18-Aug-23	2137	Dictyosphaerium simplex Sukja	143680	0.60346	2	2	4.2
MEL -0302	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.34771	7.7	4	48.4
MEL -0302	18-Aug-23	2145	Crucigenia quadrata Morr.	28736	0.04023	2	2	1.4
MEL -0302	18-Aug-23	2167	Elakatothrix gelatinosa Willen	28736	0.45116	10	2	15.7
MEL -0302	18-Aug-23	2178	Cosmarium sp.	200	0.27926	20	20	1396.3
MEL -0302	18-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27084	6	6	37.7
MEL -0302	18-Aug-23	4351	Small chrysophyceae	258624	1.44829	2.2	2.2	5.6
MEL -0302	18-Aug-23	4352	Large chrysophyceae	7184	1.29025	7	7	179.6
MEL -0302	18-Aug-23	4357	Chrysococcus sp.	294544	19.26318	5	5	65.4
MEL -0302	18-Aug-23	4358	Chrysostephanosphaera globulifera Scherffel	43104	11.12945	7.9	7.9	258.2
MEL -0302	18-Aug-23	4361	Kephyrion boreale Skuja	7184	0.85346	6.1	6.1	118.8
MEL -0302	18-Aug-23	4362	Kephyrion sp.	35920	0.45978	2.9	2.9	12.8
MEL -0302	18-Aug-23	4383	Dinobryon bavaricum Imhof	7184	1.62502	12	6	226.2
MEL -0302	18-Aug-23	4383	Dinobryon bavaricum Imhof	200	0.25	0	0	1250
MEL -0302	18-Aug-23	4390	Dinobryon sociale Ehrenberg	64656	14.62519	12	6	226.2
MEL -0302	18-Aug-23	4413	Chrysochromulina laurentiana Kling	21552	8.50442	9.1	9.1	394.6
MEL -0302	18-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	43104	1.19829	5.9	3	27.8
MEL -0302	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	2600	6.2114	11.5	23	2389
MEL -0302	18-Aug-23	5509	Cyclotella ocellata Pant.	7184	0.69541	3.95	7.9	96.8
MEL -0302	18-Aug-23	5515	Fragilaria crotonensis Kitton	600	0.17592	70	4	293.2
MEL -0302	18-Aug-23	5518	Synedra acus Kutzing	1200	0.13824	110	2	115.2
MEL -0302	18-Aug-23	5524	Asterionella formosa Hassall	3200	0.33504	100	2	104.7
MEL -0302	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	7184	0.15589	2.4	4.8	21.7
MEL -0302	18-Aug-23	5720	Cyclotella bodanica Eulenst.	400	3.08692	17	34	7717.3
MEL -0302	18-Aug-23	6554	Rhodomonas minuta Skuja	100576	15.16686	12	6	150.8

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^3
MEL -0302	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	3000	5.5212	26.9	14	1840.4
MEL -0302	18-Aug-23	6559	Cryptomonas ovata Ehrenberg	1000	2.1893	32	14	2189.3
MEL -0302	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	1000	0.733	21	10	733
MEL -0302	18-Aug-23	7631	Gymnodinium helveticum Penard	200	4.71238	50	30	23561.9
MEL -0302	18-Aug-23	7632	Gymnodinium sp.	1600	10.19296	23	23	6370.6
MEL -0302	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	7800	30.7515	19.6	19.6	3942.5
MEL -0302	18-Aug-23	7641	Peridinium aciculiferum Lemmermann	200	1.80956	30	24	9047.8
MEL -0303	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	35920	0.50647	3	3	14.1
MEL -0303	18-Aug-23	2121	Oocystis lacustris Chodat	79024	2.23638	6	3	28.3
MEL -0303	18-Aug-23	2137	Dictyosphaerium simplex Sukja	244256	1.02588	2	2	4.2
MEL -0303	18-Aug-23	2169	Planctonema lauterbornii Schmidle	21552	7.61648	18	5	353.4
MEL -0303	18-Aug-23	2193	Staurodesmus paradoxum Meyen	200	0.56632	26	24	2831.6
MEL -0303	18-Aug-23	4351	Small chrysophyceae	316096	1.77014	2.2	2.2	5.6
MEL -0303	18-Aug-23	4352	Large chrysophyceae	35920	6.45123	7	7	179.6
MEL -0303	18-Aug-23	4355	Chrysochromulina parva Lackey	28736	1.87933	5	5	65.4
MEL -0303	18-Aug-23	4357	Chrysococcus sp.	330464	21.61235	5	5	65.4
MEL -0303	18-Aug-23	4358	Chrysostephanosphaera globulifera Scherffel	7184	1.99931	8.1	8.1	278.3
MEL -0303	18-Aug-23	4362	Kephyrion sp.	114944	1.47128	2.9	2.9	12.8
MEL -0303	18-Aug-23	4368	Mallomonas crassisquama (Asmund) Fott	600	0.62832	20	10	1047.2
MEL -0303	18-Aug-23	4378	Dinobryon borgei Lemmermann	21552	0.9138	9	3	42.4
MEL -0303	18-Aug-23	4388	Dinobryon sertularia Ehrenberg	400	0.5	0	0	1250
MEL -0303	18-Aug-23	4390	Dinobryon sociale Ehrenberg	64656	14.62519	12	6	226.2
MEL -0303	18-Aug-23	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.19972	5.9	3	27.8
MEL -0303	18-Aug-23	4411	Bitrichia chodatii (Reverdin) Chodat	7184	0.36136	6	4	50.3
MEL -0303	18-Aug-23	4413	Chrysochromulina laurentiana Kling	7184	2.83481	9.1	9.1	394.6
MEL -0303	18-Aug-23	4414	Stichogloea spp.	21552	1.08407	6	4	50.3
MEL -0303	18-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	21552	0.60992	6	3	28.3
MEL -0303	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	2200	5.2558	11.5	23	2389
MEL -0303	18-Aug-23	5509	Cyclotella ocellata Pant.	21552	2.24787	4.05	8.1	104.3
MEL -0303	18-Aug-23	5515	Fragilaria crotonensis Kitton	400	0.11728	70	4	293.2
MEL -0303	18-Aug-23	5518	Synedra acus Kutzing	1200	0.13824	110	2	115.2
MEL -0303	18-Aug-23	5524	Asterionella formosa Hassall	2000	0.2094	100	2	104.7
MEL -0303	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	71840	1.37214	2.3	4.6	19.1
MEL -0303	18-Aug-23	6554	Rhodomonas minuta Skuja	186784	28.16703	12	6	150.8
MEL -0303	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	1200	2.20848	26.9	14	1840.4
MEL -0303	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	800	0.5864	21	10	733
MEL -0303	18-Aug-23	7632	Gymnodinium sp.	800	5.09648	23	23	6370.6
MEL -0303	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	3000	11.8275	19.6	19.6	3942.5
MEL -0304	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	21552	0.30388	3	3	14.1
MEL -0304	18-Aug-23	2121	Oocystis lacustris Chodat	172416	4.87937	6	3	28.3
MEL -0304	18-Aug-23	2137	Dictyosphaerium simplex Sukja	150864	0.63363	2	2	4.2
MEL -0304	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.34771	7.7	4	48.4
MEL -0304	18-Aug-23	2178	Cosmarium sp.	400	0.55852	20	20	1396.3
MEL -0304	18-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	400	0.15496	13.6	12	387.4
MEL -0304	18-Aug-23	2193	Staurodesmus paradoxum Meyen	600	1.69896	26	24	2831.6
MEL -0304	18-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	21552	0.81251	6	6	37.7
MEL -0304	18-Aug-23	2215	Tetraedron caudatum (Corda) Hansgrig	28736	0.13506	3	3	4.7
MEL -0304	18-Aug-23	4351	Small chrysophyceae	294544	1.64945	2.2	2.2	5.6
MEL -0304	18-Aug-23	4352	Large chrysophyceae	35920	6.45123	7	7	179.6
MEL -0304	18-Aug-23	4357	Chrysococcus sp.	431040	28.19002	5	5	65.4
MEL -0304	18-Aug-23	4361	Kephyrion boreale Skuja	7184	0.85346	6.1	6.1	118.8
MEL -0304	18-Aug-23	4362	Kephyrion sp.	86208	1.10346	2.9	2.9	12.8
MEL -0304	18-Aug-23	4383	Dinobryon bavaricum Imhof	7184	1.62502	12	6	226.2
MEL -0304	18-Aug-23	4388	Dinobryon sertularia Ehrenberg	200	0.25	0	0	1250
MEL -0304	18-Aug-23	4390	Dinobryon sociale Ehrenberg	86208	19.50025	12	6	226.2
MEL -0304	18-Aug-23	4413	Chrysochromulina laurentiana Kling	100576	39.68729	9.1	9.1	394.6
MEL -0304	18-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	7184	0.20331	6	3	28.3
MEL -0304	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	2400	5.7336	11.5	23	2389
MEL -0304	18-Aug-23	5509	Cyclotella ocellata Pant.	50288	5.24504	4.05	8.1	104.3
MEL -0304	18-Aug-23	5515	Fragilaria crotonensis Kitton	4000	1.1392	68	4	284.8
MEL -0304	18-Aug-23	5518	Synedra acus Kutzing	600	0.06282	100	2	104.7
MEL -0304	18-Aug-23	5524	Asterionella formosa Hassall	1400	0.14658	100	2	104.7
MEL -0304	18-Aug-23	5540	Aulacoseira italica v subarctica (O. Muller) Simonsen	200	1.50954	250	6.2	7547.7
MEL -0304	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	143680	3.11786	2.4	4.8	21.7
MEL -0304	18-Aug-23	6554	Rhodomonas minuta Skuja	158048	23.83364	12	6	150.8
MEL -0304	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	600	1.10424	26.9	14	1840.4
MEL -0304	18-Aug-23	6559	Cryptomonas ovata Ehrenberg	200	1.11702	40	20	5585.1
MEL -0304	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	1600	1.1728	21	10	733
MEL -0304	18-Aug-23	6565	Cryptomonas rostratiformis Skuja	200	0.45156	33	14	2257.8
MEL -0304	18-Aug-23	7632	Gymnodinium sp.	1000	6.3706	23	23	6370.6
MEL -0304	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	4200	16.5585	19.6	19.6	3942.5
MEL -0305	18-Aug-23	1073	Snowella sp	200	0.1	0	0	500
MEL -0305	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	136496	1.92459	3	3	14.1
MEL -0305	18-Aug-23	2121	Oocystis lacustris Chodat	201152	5.6926	6	3	28.3
MEL -0305	18-Aug-23	2137	Dictyosphaerium simplex Sukja	114944	0.48276	2	2	4.2
MEL -0305	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	21552	1.04312	7.7	4	48.4
MEL -0305	18-Aug-23	2178	Cosmarium sp.	200	0.27926	20	20	1396.3
MEL -0305	18-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	400	0.15496	13.6	12	387.4
MEL -0305	18-Aug-23	2193	Staurodesmus paradoxum Meyen	200	0.56632	26	24	2831.6
MEL -0305	18-Aug-23	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.03376	3	3	4.7
MEL -0305	18-Aug-23	4351	Small chrysophyceae	165232	0.9253	2.2	2.2	5.6
MEL -0305	18-Aug-23	4352	Large chrysophyceae	7184	1.29025	7	7	179.6
MEL -0305	18-Aug-23	4357	Chrysococcus sp.	488512	31.94868	5	5	65.4

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^3
MEL -0305	18-Aug-23	4361	Kephyrion boreale Skuja	7184	0.85346	6.1	6.1	118.8
MEL -0305	18-Aug-23	4362	Kephyrion sp.	64656	0.8276	2.9	2.9	12.8
MEL -0305	18-Aug-23	4378	Dinobryon borgei Lemmermann	7184	0.30819	9.1	3	42.9
MEL -0305	18-Aug-23	4383	Dinobryon bavaricum Imhof	200	0.25	0	0	1250
MEL -0305	18-Aug-23	4390	Dinobryon sociale Ehrenberg	43104	9.75012	12	6	226.2
MEL -0305	18-Aug-23	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.19612	5.8	3	27.3
MEL -0305	18-Aug-23	4413	Chrysochromulina laurentiana Kling	7184	2.83481	9.1	9.1	394.6
MEL -0305	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	3800	9.0782	11.5	23	2389
MEL -0305	18-Aug-23	5509	Cyclotella ocellata Pant.	28736	2.99716	4.05	8.1	104.3
MEL -0305	18-Aug-23	5515	Fragilaria crotonensis Kitton	400	0.1156	69	4	289
MEL -0305	18-Aug-23	5518	Synedra acus Kutzing	400	0.04188	100	2	104.7
MEL -0305	18-Aug-23	5524	Asterionella formosa Hassall	200	0.02094	100	2	104.7
MEL -0305	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	71840	1.55893	2.4	4.8	21.7
MEL -0305	18-Aug-23	6554	Rhodomonas minuta Skuja	35920	5.41674	12	6	150.8
MEL -0305	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	3800	6.99352	26.9	14	1840.4
MEL -0305	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	1000	0.733	21	10	733
MEL -0305	18-Aug-23	7632	Gymnodinium sp.	800	5.09648	23	23	6370.6
MEL -0305	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	4400	17.347	19.6	19.6	3942.5
MEL -0401	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	64656	0.91165	3	3	14.1
MEL -0401	18-Aug-23	2121	Oocystis lacustris Chodat	294544	7.77596	5.6	3	26.4
MEL -0401	18-Aug-23	2137	Dictyosphaerium simplex Sukja	114944	0.48276	2	2	4.2
MEL -0401	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.34771	7.7	4	48.4
MEL -0401	18-Aug-23	2178	Cosmarium sp.	400	0.55852	20	20	1396.3
MEL -0401	18-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	200	0.07634	13.5	12	381.7
MEL -0401	18-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27084	6	6	37.7
MEL -0401	18-Aug-23	2206	Botryococcus braunii Kutzing	200	0.10472	10	10	523.6
MEL -0401	18-Aug-23	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.03376	3	3	4.7
MEL -0401	18-Aug-23	4351	Small chrysophyceae	272992	1.52876	2.2	2.2	5.6
MEL -0401	18-Aug-23	4352	Large chrysophyceae	7184	1.29025	7	7	179.6
MEL -0401	18-Aug-23	4355	Chrysochromulina parva Lackey	43104	2.819	5	5	65.4
MEL -0401	18-Aug-23	4357	Chrysococcus sp.	208336	13.62517	5	5	65.4
MEL -0401	18-Aug-23	4358	Chrysostephanosphaera globulifera Scherffel	7184	1.65088	7.6	7.6	229.8
MEL -0401	18-Aug-23	4361	Kephyrion boreale Skuja	21552	2.56038	6.1	6.1	118.8
MEL -0401	18-Aug-23	4362	Kephyrion sp.	71840	0.91955	2.9	2.9	12.8
MEL -0401	18-Aug-23	4378	Dinobryon borgei Lemmermann	71840	3.04602	9	3	42.4
MEL -0401	18-Aug-23	4390	Dinobryon sociale Ehrenberg	129312	29.25037	12	6	226.2
MEL -0401	18-Aug-23	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.19612	5.8	3	27.3
MEL -0401	18-Aug-23	4413	Chrysochromulina laurentiana Kling	21552	8.50442	9.1	9.1	394.6
MEL -0401	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	3000	7.167	11.5	23	2389
MEL -0401	18-Aug-23	5509	Cyclotella ocellata Pant.	35920	3.74646	4.05	8.1	104.3
MEL -0401	18-Aug-23	5511	Rhizosolenia eriense H.L. Smith	7184	0.6092	12	3	84.8
MEL -0401	18-Aug-23	5518	Synedra acus Kutzing	1000	0.1152	110	2	115.2
MEL -0401	18-Aug-23	5523	Synedra ulna (Nitzsch) Ehrenberg	200	0.51836	275	6	2591.8
MEL -0401	18-Aug-23	5524	Asterionella formosa Hassall	1000	0.1047	100	2	104.7
MEL -0401	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	100576	1.921	2.3	4.6	19.1
MEL -0401	18-Aug-23	6554	Rhodomonas minuta Skuja	114944	17.33356	12	6	150.8
MEL -0401	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	3000	5.2545	25.6	14	1751.5
MEL -0401	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	1400	1.07506	22	10	767.9
MEL -0401	18-Aug-23	6565	Cryptomonas rostratiformis Skuja	200	0.43786	32	14	2189.3
MEL -0401	18-Aug-23	6568	Katablepharis ovalis Skuja	7184	0.32112	8	4	44.7
MEL -0401	18-Aug-23	7632	Gymnodinium sp.	200	1.27412	23	23	6370.6
MEL -0401	18-Aug-23	7635	Peridinium willei Huitfeldt-Kaas	200	4.8858	36	36	24429
MEL -0401	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	5800	22.8665	19.6	19.6	3942.5
MEL -0401	18-Aug-23	7641	Peridinium aciculiferum Lemmermann	200	1.80956	30	24	9047.8
MEL -0402	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	179600	2.53236	3	3	14.1
MEL -0402	18-Aug-23	2121	Oocystis lacustris Chodat	64656	1.70692	5.6	3	26.4
MEL -0402	18-Aug-23	2137	Dictyosphaerium simplex Sukja	179600	0.75432	2	2	4.2
MEL -0402	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	14368	0.69541	7.7	4	48.4
MEL -0402	18-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	400	0.15268	13.5	12	381.7
MEL -0402	18-Aug-23	4351	Small chrysophyceae	359200	2.01152	2.2	2.2	5.6
MEL -0402	18-Aug-23	4352	Large chrysophyceae	7184	1.29025	7	7	179.6
MEL -0402	18-Aug-23	4357	Chrysococcus sp.	344832	22.55201	5	5	65.4
MEL -0402	18-Aug-23	4358	Chrysostephanosphaera globulifera Scherffel	7184	2.39227	8.6	8.6	333
MEL -0402	18-Aug-23	4362	Kephyrion sp.	107760	1.37933	2.9	2.9	12.8
MEL -0402	18-Aug-23	4390	Dinobryon sociale Ehrenberg	35920	8.1251	12	6	226.2
MEL -0402	18-Aug-23	4413	Chrysochromulina laurentiana Kling	7184	2.83481	9.1	9.1	394.6
MEL -0402	18-Aug-23	4414	Stichogloea spp.	57472	2.89084	6	4	50.3
MEL -0402	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	1800	4.3002	11.5	23	2389
MEL -0402	18-Aug-23	5511	Rhizosolenia eriense H.L. Smith	7184	0.6092	12	3	84.8
MEL -0402	18-Aug-23	5518	Synedra acus Kutzing	400	0.04608	110	2	115.2
MEL -0402	18-Aug-23	5523	Synedra ulna (Nitzsch) Ehrenberg	200	0.51836	275	6	2591.8
MEL -0402	18-Aug-23	5524	Asterionella formosa Hassall	3000	0.3141	100	2	104.7
MEL -0402	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	114944	2.19543	2.3	4.6	19.1
MEL -0402	18-Aug-23	6554	Rhodomonas minuta Skuja	114944	17.33356	12	6	150.8
MEL -0402	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	3000	5.2545	25.6	14	1751.5
MEL -0402	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	2400	1.84296	22	10	767.9
MEL -0402	18-Aug-23	6565	Cryptomonas rostratiformis Skuja	200	0.45156	33	14	2257.8
MEL -0402	18-Aug-23	7632	Gymnodinium sp.	400	2.54824	23	23	6370.6
MEL -0402	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	3400	13.4045	19.6	19.6	3942.5
MEL -0402R	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	201152	2.83624	3	3	14.1
MEL -0402R	18-Aug-23	2121	Oocystis lacustris Chodat	64656	1.70692	5.6	3	26.4
MEL -0402R	18-Aug-23	2137	Dictyosphaerium simplex Sukja	114944	0.48276	2	2	4.2
MEL -0402R	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	43104	2.08623	7.7	4	48.4

Station	Date	Species Code	Speceis name	density cells/L-1	biomass mg/m-3	length µ	width µ	cell volume µ3
MEL -0402R	18-Aug-23	2178	Cosmarium sp.	600	0.83778	20	20	1396.3
MEL -0402R	18-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	200	0.07634	13.5	12	381.7
MEL -0402R	18-Aug-23	2235	Ankistrodesmus spiralis Lemmermann	14368	0.81179	36	2	56.5
MEL -0402R	18-Aug-23	4351	Small chrysophyceae	510064	2.85636	2.2	2.2	5.6
MEL -0402R	18-Aug-23	4352	Large chrysophyceae	7184	1.29025	7	7	179.6
MEL -0402R	18-Aug-23	4357	Chrysococcus sp.	280176	18.32351	5	5	65.4
MEL -0402R	18-Aug-23	4362	Kephyrion sp.	64656	0.8276	2.9	2.9	12.8
MEL -0402R	18-Aug-23	4381	Dinobryon mucronatom Nygaard	14368	1.88077	10	5	130.9
MEL -0402R	18-Aug-23	4390	Dinobryon sociale Ehrenberg	50288	11.37515	12	6	226.2
MEL -0402R	18-Aug-23	4411	Bitrichia chodatii (Reverdin) Chodat	7184	0.36136	6	4	50.3
MEL -0402R	18-Aug-23	4413	Chrysochromulina laurentiana Kling	7184	2.83481	9.1	9.1	394.6
MEL -0402R	18-Aug-23	4414	Stichogloea spp.	50288	2.52949	6	4	50.3
MEL -0402R	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	1400	3.3446	11.5	23	2389
MEL -0402R	18-Aug-23	5509	Cyclotella ocellata Pant.	21552	2.24787	4.05	8.1	104.3
MEL -0402R	18-Aug-23	5518	Synedra acus Kutzing	1200	0.13824	110	2	115.2
MEL -0402R	18-Aug-23	5524	Asterionella formosa Hassall	5400	0.56538	100	2	104.7
MEL -0402R	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	107760	2.05822	2.3	4.6	19.1
MEL -0402R	18-Aug-23	6554	Rhodomonas minuta Skuja	79024	11.91682	12	6	150.8
MEL -0402R	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	6400	11.2096	25.6	14	1751.5
MEL -0402R	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	3200	2.45728	22	10	767.9
MEL -0402R	18-Aug-23	7632	Gymnodinium sp.	400	2.54824	23	23	6370.6
MEL -0402R	18-Aug-23	7635	Peridinium willei Huitfeldt-Kaas	200	4.8858	36	36	24429
MEL -0402R	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	2400	9.462	19.6	19.6	3942.5
MEL -0403	18-Aug-23	2121	Oocystis lacustris Chodat	201152	5.6926	6	3	28.3
MEL -0403	18-Aug-23	2137	Dictyosphaerium simplex Sukja	409488	1.71985	2	2	4.2
MEL -0403	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	21552	1.04312	7.7	4	48.4
MEL -0403	18-Aug-23	2145	Crucigenia quadrata Morr.	28736	0.13506	3	3	4.7
MEL -0403	18-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	600	0.23244	13.6	12	387.4
MEL -0403	18-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	57472	2.16669	6	6	37.7
MEL -0403	18-Aug-23	2247	Oocystis gigas Archer	200	0.48254	18	16	2412.7
MEL -0403	18-Aug-23	4351	Small chrysophyceae	308912	1.97704	2.3	2.3	6.4
MEL -0403	18-Aug-23	4352	Large chrysophyceae	7184	1.29025	7	7	179.6
MEL -0403	18-Aug-23	4355	Chrysochromulina parva Lackey	7184	0.46983	5	5	65.4
MEL -0403	18-Aug-23	4357	Chrysococcus sp.	229888	15.03468	5	5	65.4
MEL -0403	18-Aug-23	4362	Kephyrion sp.	7184	0.09196	2.9	2.9	12.8
MEL -0403	18-Aug-23	4363	Spiniferomonas serrata	7184	0.66093	5.6	5.6	92
MEL -0403	18-Aug-23	4390	Dinobryon sociale Ehrenberg	122128	27.62535	12	6	226.2
MEL -0403	18-Aug-23	4413	Chrysochromulina laurentiana Kling	86208	34.01768	9.1	9.1	394.6
MEL -0403	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	3800	9.0782	11.5	23	2389
MEL -0403	18-Aug-23	5509	Cyclotella ocellata Pant.	7184	0.74929	4.05	8.1	104.3
MEL -0403	18-Aug-23	5513	Tabellaria fenestrata (Lyngbye) Kutzing	800	0.56552	75	6	706.9
MEL -0403	18-Aug-23	5518	Synedra acus Kutzing	1000	0.1152	110	2	115.2
MEL -0403	18-Aug-23	5524	Asterionella formosa Hassall	4000	0.4188	100	2	104.7
MEL -0403	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	122128	2.33264	2.3	4.6	19.1
MEL -0403	18-Aug-23	5720	Cyclotella bodanica Eulenst.	200	1.6837	17.5	35	8418.5
MEL -0403	18-Aug-23	6554	Rhodomonas minuta Skuja	114944	17.33356	12	6	150.8
MEL -0403	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	2800	4.9042	25.6	14	1751.5
MEL -0403	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	1600	1.22864	22	10	767.9
MEL -0403	18-Aug-23	6565	Cryptomonas rostratiformis Skuja	200	0.45156	33	14	2257.8
MEL -0403	18-Aug-23	7632	Gymnodinium sp.	200	1.27412	23	23	6370.6
MEL -0403	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	1600	6.308	19.6	19.6	3942.5
MEL -0404	18-Aug-23	2121	Oocystis lacustris Chodat	50288	1.42315	6	3	28.3
MEL -0404	18-Aug-23	2137	Dictyosphaerium simplex Sukja	215520	0.90518	2	2	4.2
MEL -0404	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	35920	1.73853	7.7	4	48.4
MEL -0404	18-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	200	0.07748	13.6	12	387.4
MEL -0404	18-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	28736	1.08335	6	6	37.7
MEL -0404	18-Aug-23	2206	Botryococcus braunii Kutzing	200	0.18096	12	12	904.8
MEL -0404	18-Aug-23	4351	Small chrysophyceae	581904	3.72419	2.3	2.3	6.4
MEL -0404	18-Aug-23	4355	Chrysochromulina parva Lackey	114944	7.51734	5	5	65.4
MEL -0404	18-Aug-23	4357	Chrysococcus sp.	660928	43.22469	5	5	65.4
MEL -0404	18-Aug-23	4362	Kephyrion sp.	50288	0.64369	2.9	2.9	12.8
MEL -0404	18-Aug-23	4378	Dinobryon borgei Lemmermann	7184	0.3046	9	3	42.4
MEL -0404	18-Aug-23	4383	Dinobryon bavaricum Imhof	200	0.25	0	0	1250
MEL -0404	18-Aug-23	4390	Dinobryon sociale Ehrenberg	100576	22.75029	12	6	226.2
MEL -0404	18-Aug-23	4413	Chrysochromulina laurentiana Kling	86208	34.01768	9.1	9.1	394.6
MEL -0404	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	3800	9.0782	11.5	23	2389
MEL -0404	18-Aug-23	5509	Cyclotella ocellata Pant.	7184	0.74929	4.05	8.1	104.3
MEL -0404	18-Aug-23	5518	Synedra acus Kutzing	200	0.02408	115	2	120.4
MEL -0404	18-Aug-23	5524	Asterionella formosa Hassall	1600	0.16752	100	2	104.7
MEL -0404	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	86208	1.64657	2.3	4.6	19.1
MEL -0404	18-Aug-23	5720	Cyclotella bodanica Eulenst.	200	1.54346	17	34	7717.3
MEL -0404	18-Aug-23	6554	Rhodomonas minuta Skuja	251440	37.91715	12	6	150.8
MEL -0404	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	7400	12.9611	25.6	14	1751.5
MEL -0404	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	2400	1.84296	22	10	767.9
MEL -0404	18-Aug-23	6565	Cryptomonas rostratiformis Skuja	200	0.45156	33	14	2257.8
MEL -0404	18-Aug-23	7632	Gymnodinium sp.	1000	6.3706	23	23	6370.6
MEL -0404	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	2200	8.6735	19.6	19.6	3942.5
MEL -0405	18-Aug-23	1073	Snowella sp	400	0.2	0	0	500
MEL -0405	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	57472	0.81036	3	3	14.1
MEL -0405	18-Aug-23	2121	Oocystis lacustris Chodat	50288	1.42315	6	3	28.3
MEL -0405	18-Aug-23	2137	Dictyosphaerium simplex Sukja	172416	0.72415	2	2	4.2
MEL -0405	18-Aug-23	2178	Cosmarium sp.	400	0.55852	20	20	1396.3
MEL -0405	18-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	400	0.15496	13.6	12	387.4

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^3
MEL -0405	18-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	28736	1.08335	6	6	37.7
MEL -0405	18-Aug-23	2235	Ankistrodesmus spiralis Lemmermann	21552	1.21769	36	2	56.5
MEL -0405	18-Aug-23	4351	Small chrysophyceae	438224	2.80463	2.3	2.3	6.4
MEL -0405	18-Aug-23	4355	Chrysochromulina parva Lackey	86208	5.638	5	5	65.4
MEL -0405	18-Aug-23	4357	Chrysococcus sp.	431040	28.19002	5	5	65.4
MEL -0405	18-Aug-23	4361	Kephyrion boreale Skuja	7184	0.85346	6.1	6.1	118.8
MEL -0405	18-Aug-23	4362	Kephyrion sp.	50288	0.64369	2.9	2.9	12.8
MEL -0405	18-Aug-23	4368	Mallomonas crassisquama (Asmund) Fott	200	0.20526	19.6	10	1026.3
MEL -0405	18-Aug-23	4378	Dinobryon borgei Lemmermann	7184	0.3046	9	3	42.4
MEL -0405	18-Aug-23	4388	Dinobryon sertularia Ehrenberg	400	0.38	0	0	950
MEL -0405	18-Aug-23	4390	Dinobryon sociale Ehrenberg	71840	16.25021	12	6	226.2
MEL -0405	18-Aug-23	4390	Dinobryon sociale Ehrenberg	200	0.25	0	0	1250
MEL -0405	18-Aug-23	4413	Chrysochromulina laurentiana Kling	14368	5.66961	9.1	9.1	394.6
MEL -0405	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	2800	6.6892	11.5	23	2389
MEL -0405	18-Aug-23	5509	Cyclotella ocellata Pant.	7184	0.74929	4.05	8.1	104.3
MEL -0405	18-Aug-23	5518	Synedra acus Kutzing	2000	0.2304	110	2	115.2
MEL -0405	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	21552	0.41164	2.3	4.6	19.1
MEL -0405	18-Aug-23	6554	Rhodomonas minuta Skuja	359200	54.16736	12	6	150.8
MEL -0405	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	3600	6.3054	25.6	14	1751.5
MEL -0405	18-Aug-23	6559	Cryptomonas ovata Ehrenberg	200	1.11702	40	20	5585.1
MEL -0405	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	2200	1.53582	20	10	698.1
MEL -0405	18-Aug-23	6565	Cryptomonas rostratiformis Skuja	400	0.90312	33	14	2257.8
MEL -0405	18-Aug-23	7632	Gymnodinium sp.	600	3.82236	23	23	6370.6
MEL -0405	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	2800	11.039	19.6	19.6	3942.5
MEL -0501	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	488512	6.88802	3	3	14.1
MEL -0501	18-Aug-23	2121	Oocystis lacustris Chodat	337648	9.55544	6	3	28.3
MEL -0501	18-Aug-23	2137	Dictyosphaerium simplex Sukja	71840	0.30173	2	2	4.2
MEL -0501	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	57472	2.78164	7.7	4	48.4
MEL -0501	18-Aug-23	2145	Crucigenia quadrata Morr.	172416	0.24138	2	2	1.4
MEL -0501	18-Aug-23	2167	Elakatothrix gelatinosa Willen	79024	1.36712	11	2	17.3
MEL -0501	18-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	400	0.15496	13.6	12	387.4
MEL -0501	18-Aug-23	2191	Staurodesmus cuspidatus (Brebisson and Ralfs) Teiling	200	0.42772	23.6	22	2138.6
MEL -0501	18-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27084	6	6	37.7
MEL -0501	18-Aug-23	2215	Tetraedron caudatum (Corda) Hansgrig	21552	0.10129	3	3	4.7
MEL -0501	18-Aug-23	4351	Small chrysophyceae	294544	1.64945	2.2	2.2	5.6
MEL -0501	18-Aug-23	4352	Large chrysophyceae	7184	1.29025	7	7	179.6
MEL -0501	18-Aug-23	4355	Chrysochromulina parva Lackey	7184	0.46983	5	5	65.4
MEL -0501	18-Aug-23	4357	Chrysococcus sp.	316096	20.67268	5	5	65.4
MEL -0501	18-Aug-23	4362	Kephyrion sp.	21552	0.27587	2.9	2.9	12.8
MEL -0501	18-Aug-23	4388	Dinobryon sertularia Ehrenberg	7184	1.62502	12	6	226.2
MEL -0501	18-Aug-23	4390	Dinobryon sociale Ehrenberg	35920	8.1251	12	6	226.2
MEL -0501	18-Aug-23	4413	Chrysochromulina laurentiana Kling	14368	5.66961	9.1	9.1	394.6
MEL -0501	18-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	7184	0.20331	6	3	28.3
MEL -0501	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	2400	5.7336	11.5	23	2389
MEL -0501	18-Aug-23	5509	Cyclotella ocellata Pant.	50288	5.24504	4.05	8.1	104.3
MEL -0501	18-Aug-23	5513	Tabellaria fenestrata (Lyngbye) Kutzing	1600	1.13104	75	6	706.9
MEL -0501	18-Aug-23	5518	Synedra acus Kutzing	400	0.04608	110	2	115.2
MEL -0501	18-Aug-23	5524	Asterionella formosa Hassall	2000	0.2094	100	2	104.7
MEL -0501	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	71840	1.6595	2.45	4.9	23.1
MEL -0501	18-Aug-23	5720	Cyclotella bodanica Eulenst.	200	1.54346	17	34	7717.3
MEL -0501	18-Aug-23	6554	Rhodomonas minuta Skuja	272992	41.16719	12	6	150.8
MEL -0501	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	3200	5.8016	26.5	14	1813
MEL -0501	18-Aug-23	6559	Cryptomonas ovata Ehrenberg	200	1.11702	40	20	5585.1
MEL -0501	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	3000	2.199	21	10	733
MEL -0501	18-Aug-23	6568	Katablepharis ovalis Skuja	14368	0.57903	7.6	4	40.3
MEL -0501	18-Aug-23	7632	Gymnodinium sp.	800	5.09648	23	23	6370.6
MEL -0501	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	4800	18.924	19.6	19.6	3942.5
MEL -0502	18-Aug-23	1054	Planktolyngbya limnetica	400	0.09048	200	1.2	226.2
MEL -0502	18-Aug-23	1073	Snowella sp	200	0.1	0	0	500
MEL -0502	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	172416	2.43107	3	3	14.1
MEL -0502	18-Aug-23	2121	Oocystis lacustris Chodat	431040	12.19843	6	3	28.3
MEL -0502	18-Aug-23	2137	Dictyosphaerium simplex Sukja	21552	0.09052	2	2	4.2
MEL -0502	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	64656	3.12935	7.7	4	48.4
MEL -0502	18-Aug-23	2167	Elakatothrix gelatinosa Willen	35920	0.56394	10	2	15.7
MEL -0502	18-Aug-23	2169	Planctonema lauterbornii Schmidle	7184	1.12861	8	5	157.1
MEL -0502	18-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	400	0.15496	13.6	12	387.4
MEL -0502	18-Aug-23	2195	Staurodesmus bullardii G.M. Smith	200	0.71154	28	26	3557.7
MEL -0502	18-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	28736	1.08335	6	6	37.7
MEL -0502	18-Aug-23	2206	Botryococcus braunii Kutzing	14368	13.00017	12	12	904.8
MEL -0502	18-Aug-23	2247	Oocystis gigas Archer	400	0.96508	18	16	2412.7
MEL -0502	18-Aug-23	4351	Small chrysophyceae	114944	0.64369	2.2	2.2	5.6
MEL -0502	18-Aug-23	4352	Large chrysophyceae	7184	1.29025	7	7	179.6
MEL -0502	18-Aug-23	4357	Chrysococcus sp.	193968	12.68551	5	5	65.4
MEL -0502	18-Aug-23	4362	Kephyrion sp.	86208	1.10346	2.9	2.9	12.8
MEL -0502	18-Aug-23	4363	Spiniferomonas serrata	7184	0.85346	6.1	6.1	118.8
MEL -0502	18-Aug-23	4381	Dinobryon mucronatom Nygaard	7184	0.94039	10	5	130.9
MEL -0502	18-Aug-23	4390	Dinobryon sociale Ehrenberg	7184	1.62502	12	6	226.2
MEL -0502	18-Aug-23	4413	Chrysochromulina laurentiana Kling	7184	2.83481	9.1	9.1	394.6
MEL -0502	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	1200	2.8668	11.5	23	2389
MEL -0502	18-Aug-23	5509	Cyclotella ocellata Pant.	7184	0.74929	4.05	8.1	104.3
MEL -0502	18-Aug-23	5511	Rhizosolenia eriense H.L. Smith	21552	1.82761	12	3	84.8
MEL -0502	18-Aug-23	5513	Tabellaria fenestrata (Lyngbye) Kutzing	800	0.56552	75	6	706.9
MEL -0502	18-Aug-23	5518	Synedra acus Kutzing	800	0.09216	110	2	115.2

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^{3}
MEL -0502	18-Aug-23	5524	Asterionella formosa Hassall	400	0.04188	100	2	104.7
MEL -0502	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	71840	1.55893	2.4	4.8	21.7
MEL -0502	18-Aug-23	5720	Cyclotella bodanica Eulenst.	400	3.08692	17	34	7717.3
MEL -0502	18-Aug-23	6554	Rhodomonas minuta Skuja	222704	33.58376	12	6	150.8
MEL -0502	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	4400	7.9772	26.5	14	1813
MEL -0502	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	4800	3.5184	21	10	733
MEL -0502	18-Aug-23	6565	Cryptomonas rostratiformis Skuja	800	1.80624	33	14	2257.8
MEL -0502	18-Aug-23	7632	Gymnodinium sp.	1600	10.19296	23	23	6370.6
MEL -0502	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	3600	14.193	19.6	19.6	3942.5
MEL -0503	18-Aug-23	1014	Chroococcus limneticus Lemmermann	57472	5.28742	5.6	5.6	92
MEL -0503	18-Aug-23	1073	Snowella sp	200	0.1	0	0	500
MEL -0503	18-Aug-23	2105	Chlamydomonas spp.	7184	0.17601	5.2	3	24.5
MEL -0503	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	818976	11.54756	3	3	14.1
MEL -0503	18-Aug-23	2121	Oocystis lacustris Chodat	431040	12.19843	6	3	28.3
MEL -0503	18-Aug-23	2137	Dictyosphaerium simplex Sukja	21552	0.09052	2	2	4.2
MEL -0503	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.34771	7.7	4	48.4
MEL -0503	18-Aug-23	2167	Elakatothrix gelatinosa Willen	71840	1.12789	10	2	15.7
MEL -0503	18-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	200	0.07748	13.6	12	387.4
MEL -0503	18-Aug-23	2191	Staurodesmus cuspidatus (Brebisson and Ralfs) Teiling	200	0.36932	23	20	1846.6
MEL -0503	18-Aug-23	2193	Staurodesmus paradoxum Meyen	200	0.56632	26	24	2831.6
MEL -0503	18-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	28736	1.08335	6	6	37.7
MEL -0503	18-Aug-23	4351	Small chrysophyceae	143680	0.80461	2.2	2.2	5.6
MEL -0503	18-Aug-23	4357	Chrysococcus sp.	158048	10.33634	5	5	65.4
MEL -0503	18-Aug-23	4361	Kephyrion boreale Skuja	7184	0.85346	6.1	6.1	118.8
MEL -0503	18-Aug-23	4362	Kephyrion sp.	21552	0.27587	2.9	2.9	12.8
MEL -0503	18-Aug-23	4363	Spiniferomonas serrata	21552	1.98278	5.6	5.6	92
MEL -0503	18-Aug-23	4364	Mallomonas caudata Ivanov	200	1.07234	40	16	5361.7
MEL -0503	18-Aug-23	4381	Dinobryon mucronatom Nygaard	7184	0.94039	10	5	130.9
MEL -0503	18-Aug-23	4390	Dinobryon sociale Ehrenberg	7184	1.62502	12	6	226.2
MEL -0503	18-Aug-23	4413	Chrysochromulina laurentiana Kling	14368	5.66961	9.1	9.1	394.6
MEL -0503	18-Aug-23	4414	Stichogloea spp.	71840	3.61355	6	4	50.3
MEL -0503	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	6200	14.8118	11.5	23	2389
MEL -0503	18-Aug-23	5514	Tabellaria flocculosa (Roth) Kutzing	6400	8.53824	26	14	1334.1
MEL -0503	18-Aug-23	5518	Synedra acus Kutzing	600	0.06912	110	2	115.2
MEL -0503	18-Aug-23	5524	Asterionella formosa Hassall	3400	0.35598	100	2	104.7
MEL -0503	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	43104	0.93536	2.4	4.8	21.7
MEL -0503	18-Aug-23	5720	Cyclotella bodanica Eulenst.	400	2.82248	16.5	33	7056.2
MEL -0503	18-Aug-23	6554	Rhodomonas minuta Skuja	93392	14.08351	12	6	150.8
MEL -0503	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	5200	9.4276	26.5	14	1813
MEL -0503	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	2800	2.0524	21	10	733
MEL -0503	18-Aug-23	6565	Cryptomonas rostratiformis Skuja	600	1.35468	33	14	2257.8
MEL -0503	18-Aug-23	7631	Gymnodinium helveticum Penard	200	4.71238	50	30	23561.9
MEL -0503	18-Aug-23	7632	Gymnodinium sp.	1400	8.91884	23	23	6370.6
MEL -0503	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	4000	15.77	19.6	19.6	3942.5
MEL -0504	18-Aug-23	2105	Chlamydomonas spp.	7184	0.09411	4	2.5	13.1
MEL -0504	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	172416	2.43107	3	3	14.1
MEL -0504	18-Aug-23	2121	Oocystis lacustris Chodat	265808	7.52237	6	3	28.3
MEL -0504	18-Aug-23	2137	Dictyosphaerium simplex Sukja	79024	0.3319	2	2	4.2
MEL -0504	18-Aug-23	2178	Cosmarium sp.	400	0.55852	20	20	1396.3
MEL -0504	18-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	200	0.07748	13.6	12	387.4
MEL -0504	18-Aug-23	2193	Staurodesmus paradoxum Meyen	200	0.56632	26	24	2831.6
MEL -0504	18-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27084	6	6	37.7
MEL -0504	18-Aug-23	2247	Oocystis gigas Archer	200	0.48254	18	16	2412.7
MEL -0504	18-Aug-23	4351	Small chrysophyceae	359200	2.01152	2.2	2.2	5.6
MEL -0504	18-Aug-23	4352	Large chrysophyceae	35920	6.45123	7	7	179.6
MEL -0504	18-Aug-23	4355	Chrysochromulina parva Lackey	43104	2.819	5	5	65.4
MEL -0504	18-Aug-23	4357	Chrysococcus sp.	344832	22.55201	5	5	65.4
MEL -0504	18-Aug-23	4362	Kephyrion sp.	71840	0.91955	2.9	2.9	12.8
MEL -0504	18-Aug-23	4363	Spiniferomonas serrata	7184	0.77228	5.9	5.9	107.5
MEL -0504	18-Aug-23	4381	Dinobryon mucronatom Nygaard	7184	0.94039	10	5	130.9
MEL -0504	18-Aug-23	4390	Dinobryon sociale Ehrenberg	57472	13.00017	12	6	226.2
MEL -0504	18-Aug-23	4413	Chrysochromulina laurentiana Kling	7184	2.83481	9.1	9.1	394.6
MEL -0504	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	1800	4.3002	11.5	23	2389
MEL -0504	18-Aug-23	5508	Cyclotella pseudostelligera	7184	3.95407	7.05	14.1	550.4
MEL -0504	18-Aug-23	5509	Cyclotella ocellata Pant.	7184	0.74929	4.05	8.1	104.3
MEL -0504	18-Aug-23	5515	Fragilaria crotonensis Kitton	400	0.11728	70	4	293.2
MEL -0504	18-Aug-23	5518	Synedra acus Kutzing	1200	0.13824	110	2	115.2
MEL -0504	18-Aug-23	5524	Asterionella formosa Hassall	1200	0.12564	100	2	104.7
MEL -0504	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	79024	1.71482	2.4	4.8	21.7
MEL -0504	18-Aug-23	6554	Rhodomonas minuta Skuja	294544	44.41724	12	6	150.8
MEL -0504	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	3000	5.439	26.5	14	1813
MEL -0504	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	6000	4.398	21	10	733
MEL -0504	18-Aug-23	6565	Cryptomonas rostratiformis Skuja	600	1.35468	33	14	2257.8
MEL -0504	18-Aug-23	7632	Gymnodinium sp.	2000	12.7412	23	23	6370.6
MEL -0504	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	4000	15.77	19.6	19.6	3942.5
MEL -0505	18-Aug-23	1073	Snowella sp	200	0.1	0	0	500
MEL -0505	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	352016	4.96343	3	3	14.1
MEL -0505	18-Aug-23	2121	Oocystis lacustris Chodat	258624	7.31906	6	3	28.3
MEL -0505	18-Aug-23	2137	Dictyosphaerium simplex Sukja	57472	0.24138	2	2	4.2
MEL -0505	18-Aug-23	2141	Monoraphidium contortum (Thur.) Komarkova-Legnerova	7184	0.13362	21	1.5	18.6
MEL -0505	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.34771	7.7	4	48.4
MEL -0505	18-Aug-23	2178	Cosmarium sp.	200	0.27926	20	20	1396.3
MEL -0505	18-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	400	0.15496	13.6	12	387.4

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^3
MEL -0505	18-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	14368	0.54167	6	6	37.7
MEL -0505	18-Aug-23	2206	Botryococcus braunii Kutzing	400	0.36192	12	12	904.8
MEL -0505	18-Aug-23	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.03376	3	3	4.7
MEL -0505	18-Aug-23	4351	Small chrysophyceae	158048	0.88507	2.2	2.2	5.6
MEL -0505	18-Aug-23	4352	Large chrysophyceae	21552	3.87074	7	7	179.6
MEL -0505	18-Aug-23	4355	Chrysochromulina parva Lackey	7184	0.46983	5	5	65.4
MEL -0505	18-Aug-23	4357	Chrysococcus sp.	158048	10.33634	5	5	65.4
MEL -0505	18-Aug-23	4361	Kephyrion boreale Skuja	14368	1.70692	6.1	6.1	118.8
MEL -0505	18-Aug-23	4362	Kephyrion sp.	64656	0.8276	2.9	2.9	12.8
MEL -0505	18-Aug-23	4390	Dinobryon sociale Ehrenberg	50288	11.37515	12	6	226.2
MEL -0505	18-Aug-23	4413	Chrysochromulina laurentiana Kling	71840	28.34806	9.1	9.1	394.6
MEL -0505	18-Aug-23	4414	Stichogloea spp.	79024	3.97491	6	4	50.3
MEL -0505	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	3600	8.6004	11.5	23	2389
MEL -0505	18-Aug-23	5508	Cyclotella pseudostelligera	21552	11.86222	7.05	14.1	550.4
MEL -0505	18-Aug-23	5509	Cyclotella ocellata Pant.	43104	4.49575	4.05	8.1	104.3
MEL -0505	18-Aug-23	5514	Tabellaria flocculosa (Roth) Kutzing	200	0.26682	26	14	1334.1
MEL -0505	18-Aug-23	5518	Synedra acus Kutzing	800	0.09216	110	2	115.2
MEL -0505	18-Aug-23	5524	Asterionella formosa Hassall	400	0.04188	100	2	104.7
MEL -0505	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	28736	0.62357	2.4	4.8	21.7
MEL -0505	18-Aug-23	6554	Rhodomonas minuta Skuja	165232	24.91699	12	6	150.8
MEL -0505	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	4200	7.6146	26.5	14	1813
MEL -0505	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	5400	3.9582	21	10	733
MEL -0505	18-Aug-23	6565	Cryptomonas rostratiformis Skuja	400	0.90312	33	14	2257.8
MEL -0505	18-Aug-23	7632	Gymnodinium sp.	1600	10.19296	23	23	6370.6
MEL -0505	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	1800	7.0965	19.6	19.6	3942.5
MEL -DUP1	18-Aug-23	1073	Snowella sp	200	0.1	0	0	500
MEL -DUP1	18-Aug-23	2105	Chlamydomonas spp.	7184	0.20331	6	3	28.3
MEL -DUP1	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	100576	1.41812	3	3	14.1
MEL -DUP1	18-Aug-23	2121	Oocystis lacustris Chodat	208336	5.89591	6	3	28.3
MEL -DUP1	18-Aug-23	2137	Dictyosphaerium simplex Sukja	129312	0.54311	2	2	4.2
MEL -DUP1	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	7184	0.34771	7.7	4	48.4
MEL -DUP1	18-Aug-23	2169	Planctonema lauterbornii Schmidle	7184	2.53883	18	5	353.4
MEL -DUP1	18-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27084	6	6	37.7
MEL -DUP1	18-Aug-23	2247	Oocystis gigas Archer	200	0.48254	18	16	2412.7
MEL -DUP1	18-Aug-23	4351	Small chrysophyceae	258624	1.44829	2.2	2.2	5.6
MEL -DUP1	18-Aug-23	4355	Chrysochromulina parva Lackey	7184	0.46983	5	5	65.4
MEL -DUP1	18-Aug-23	4357	Chrysococcus sp.	438224	28.65985	5	5	65.4
MEL -DUP1	18-Aug-23	4362	Kephyrion sp.	114944	1.47128	2.9	2.9	12.8
MEL -DUP1	18-Aug-23	4369	Mallomonas pseudocoronata Prescott	200	0.34684	23	12	1734.2
MEL -DUP1	18-Aug-23	4388	Dinobryon sertularia Ehrenberg	200	0.25	0	0	1250
MEL -DUP1	18-Aug-23	4390	Dinobryon sociale Ehrenberg	86208	19.50025	12	6	226.2
MEL -DUP1	18-Aug-23	4396	Chrysolykos skuja (Nauwerck) Willen	7184	0.19612	5.8	3	27.3
MEL -DUP1	18-Aug-23	4413	Chrysochromulina laurentiana Kling	57472	22.67845	9.1	9.1	394.6
MEL -DUP1	18-Aug-23	4414	Stichogloea spp.	7184	0.36136	6	4	50.3
MEL -DUP1	18-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	7184	0.19972	5.9	3	27.8
MEL -DUP1	18-Aug-23	4448	Rhizochrysis scherffelii Pascher	200	0.61072	18	18	3053.6
MEL -DUP1	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	3000	7.7901	12.5	23	2596.7
MEL -DUP1	18-Aug-23	5509	Cyclotella ocellata Pant.	21552	2.24787	4.05	8.1	104.3
MEL -DUP1	18-Aug-23	5515	Fragilaria crotonensis Kitton	600	0.17592	70	4	293.2
MEL -DUP1	18-Aug-23	5518	Synedra acus Kutzing	200	0.02408	115	2	120.4
MEL -DUP1	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	43104	0.93536	2.4	4.8	21.7
MEL -DUP1	18-Aug-23	5720	Cyclotella bodanica Eulenst.	200	1.54346	17	34	7717.3
MEL -DUP1	18-Aug-23	6554	Rhodomonas minuta Skuja	165232	22.83506	11	6	138.2
MEL -DUP1	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	2400	4.41696	26.9	14	1840.4
MEL -DUP1	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	200	0.1466	21	10	733
MEL -DUP1	18-Aug-23	6568	Katablepharis ovalis Skuja	7184	0.32112	8	4	44.7
MEL -DUP1	18-Aug-23	7632	Gymnodinium sp.	600	3.82236	23	23	6370.6
MEL -DUP1	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	2200	8.6735	19.6	19.6	3942.5
MEL -DUP2	22-Aug-23	1073	Snowella sp	800	0.4	0	0	500
MEL -DUP2	22-Aug-23	2105	Chlamydomonas spp.	50288	1.23206	5.2	3	24.5
MEL -DUP2	22-Aug-23	2112	Sphaerocystis schroeteri Chodat	143680	2.02589	3	3	14.1
MEL -DUP2	22-Aug-23	2115	Pediastrum tetras (Ehrenberg) Ralfs	200	0.24	0	0	1200
MEL -DUP2	22-Aug-23	2121	Oocystis lacustris Chodat	50288	1.93609	6	3.5	38.5
MEL -DUP2	22-Aug-23	2137	Dictyosphaerium simplex Sukja	14368	0.06035	2	2	4.2
MEL -DUP2	22-Aug-23	2167	Elakatothrix gelatinosa Willen	7184	0.11279	10	2	15.7
MEL -DUP2	22-Aug-23	2195	Staurodesmus bullardii G.M. Smith	200	0.51914	26	22	2595.7
MEL -DUP2	22-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	14368	0.54167	6	6	37.7
MEL -DUP2	22-Aug-23	2206	Botryococcus braunii Kutzing	600	0.54288	12	12	904.8
MEL -DUP2	22-Aug-23	2235	Ankistrodesmus spiralis Lemmermann	7184	0.37213	33	2	51.8
MEL -DUP2	22-Aug-23	4351	Small chrysophyceae	919552	5.88513	2.3	2.3	6.4
MEL -DUP2	22-Aug-23	4352	Large chrysophyceae	50288	9.03172	7	7	179.6
MEL -DUP2	22-Aug-23	4355	Chrysochromulina parva Lackey	93392	6.10784	5	5	65.4
MEL -DUP2	22-Aug-23	4357	Chrysococcus sp.	538800	35.23752	5	5	65.4
MEL -DUP2	22-Aug-23	4358	Chrysostephanosphaera globulifera Scherffel	21552	7.68975	8.8	8.8	356.8
MEL -DUP2	22-Aug-23	4361	Kephyrion boreale Skuja	28736	3.41384	6.1	6.1	118.8
MEL -DUP2	22-Aug-23	4362	Kephyrion sp.	100576	1.28737	2.9	2.9	12.8
MEL -DUP2	22-Aug-23	4378	Dinobryon borgei Lemmermann	100576	4.26442	9	3	42.4
MEL -DUP2	22-Aug-23	4383	Dinobryon bavaricum Imhof	57472	13.00017	12	6	226.2
MEL -DUP2	22-Aug-23	4383	Dinobryon bavaricum Imhof	2800	3.5	0	0	1250
MEL -DUP2	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	28736	6.50008	12	6	226.2
MEL -DUP2	22-Aug-23	4388	Dinobryon sertularia Ehrenberg	5600	11.1496	0	0	1991
MEL -DUP2	22-Aug-23	4390	Dinobryon sociale Ehrenberg	172416	39.0005	12	6	226.2
MEL -DUP2	22-Aug-23	4390	Dinobryon sociale Ehrenberg	200	0.19	0	0	950

Station	Date	Species Code	Speceis name	density cells/L^{-1}	biomass mg/m^{-3}	length µ	width µ	cell volume µ^3
MEL -DUP2	22-Aug-23	4413	Chrysochromulina laurentiana Kling	64656	25.51326	9.1	9.1	394.6
MEL -DUP2	22-Aug-23	4418	Salpingoeca frequentissima (Zach.) Lemmermann	150864	7.58846	6	4	50.3
MEL -DUP2	22-Aug-23	4448	Rhizochrysis scherffelii Pascher	1600	4.88576	18	18	3053.6
MEL -DUP2	22-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	4600	11.13338	11.55	23.1	2420.3
MEL -DUP2	22-Aug-23	5508	Cyclotella pseudostelligera	7184	3.95407	7.05	14.1	550.4
MEL -DUP2	22-Aug-23	5509	Cyclotella ocellata Pant.	50288	5.44619	4.1	8.2	108.3
MEL -DUP2	22-Aug-23	5511	Rhizosolenia eriense H.L. Smith	21552	1.67675	11	3	77.8
MEL -DUP2	22-Aug-23	5513	Tabellaria fenestrata (Lyngbye) Kutzing	800	0.56552	75	6	706.9
MEL -DUP2	22-Aug-23	5514	Tabellaria flocculosa (Roth) Kutzing	200	0.26682	26	14	1334.1
MEL -DUP2	22-Aug-23	5518	Synedra acus Kutzing	3200	0.38528	115	2	120.4
MEL -DUP2	22-Aug-23	5524	Asterionella formosa Hassall	14400	1.50768	100	2	104.7
MEL -DUP2	22-Aug-23	5551	Cyclotella michiganiana Skvortzow	150864	3.27375	2.4	4.8	21.7
MEL -DUP2	22-Aug-23	6554	Rhodomonas minuta Skuja	136496	20.5836	12	6	150.8
MEL -DUP2	22-Aug-23	6558	Cryptomonas erosa Ehrenberg	7400	13.82172	27.3	14	1867.8
MEL -DUP2	22-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	400	0.2932	21	10	733
MEL -DUP2	22-Aug-23	6565	Cryptomonas rostratiformis Skuja	400	0.87572	32	14	2189.3
MEL -DUP2	22-Aug-23	7631	Gymnodinium helveticum Penard	1400	32.98666	50	30	23561.9
MEL -DUP2	22-Aug-23	7632	Gymnodinium sp.	3600	22.93416	23	23	6370.6
MEL -DUP2	22-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	7800	32.18514	19.9	19.9	4126.3
MEL -DUP3	18-Aug-23	1073	Snowella sp	200	0.1	0	0	500
MEL -DUP3	18-Aug-23	2112	Sphaerocystis schroeteri Chodat	172416	2.43107	3	3	14.1
MEL -DUP3	18-Aug-23	2121	Oocystis lacustris Chodat	373568	10.57197	6	3	28.3
MEL -DUP3	18-Aug-23	2137	Dictyosphaerium simplex Sukja	50288	0.21121	2	2	4.2
MEL -DUP3	18-Aug-23	2143	Monoraphidium minutum (Nag.) Komarkova-Legnerova	21552	1.04312	7.7	4	48.4
MEL -DUP3	18-Aug-23	2145	Crucigenia quadrata Morr.	28736	0.04023	2	2	1.4
MEL -DUP3	18-Aug-23	2167	Elakatothrix gelatinosa Willen	7184	0.11279	10	2	15.7
MEL -DUP3	18-Aug-23	2178	Cosmarium sp.	400	0.55852	20	20	1396.3
MEL -DUP3	18-Aug-23	2187	Staurodesmus extensus (Andersson) Teiling	200	0.07748	13.6	12	387.4
MEL -DUP3	18-Aug-23	2199	Spondylosium planum (Wolle) W. and G.S. West	7184	0.27084	6	6	37.7
MEL -DUP3	18-Aug-23	2215	Tetraedron caudatum (Corda) Hansgrig	7184	0.03376	3	3	4.7
MEL -DUP3	18-Aug-23	2247	Oocystis gigas Archer	200	0.48254	18	16	2412.7
MEL -DUP3	18-Aug-23	4351	Small chrysophyceae	524432	2.93682	2.2	2.2	5.6
MEL -DUP3	18-Aug-23	4352	Large chrysophyceae	7184	1.29025	7	7	179.6
MEL -DUP3	18-Aug-23	4355	Chrysochromulina parva Lackey	71840	4.69834	5	5	65.4
MEL -DUP3	18-Aug-23	4357	Chrysococcus sp.	474144	31.00902	5	5	65.4
MEL -DUP3	18-Aug-23	4362	Kephyrion sp.	50288	0.64369	2.9	2.9	12.8
MEL -DUP3	18-Aug-23	4368	Mallomonas crassisquama (Asmund) Fott	200	0.20944	20	10	1047.2
MEL -DUP3	18-Aug-23	4381	Dinobryon mucronatom Nygaard	7184	0.94039	10	5	130.9
MEL -DUP3	18-Aug-23	4390	Dinobryon sociale Ehrenberg	7184	1.62502	12	6	226.2
MEL -DUP3	18-Aug-23	4413	Chrysochromulina laurentiana Kling	43104	17.00884	9.1	9.1	394.6
MEL -DUP3	18-Aug-23	5507	Cyclotella stelligera Cleve and Grunow	2200	5.2558	11.5	23	2389
MEL -DUP3	18-Aug-23	5509	Cyclotella ocellata Pant.	43104	4.49575	4.05	8.1	104.3
MEL -DUP3	18-Aug-23	5514	Tabellaria flocculosa (Roth) Kutzing	6600	8.80506	26	14	1334.1
MEL -DUP3	18-Aug-23	5518	Synedra acus Kutzing	1000	0.1152	110	2	115.2
MEL -DUP3	18-Aug-23	5524	Asterionella formosa Hassall	8600	0.90042	100	2	104.7
MEL -DUP3	18-Aug-23	5551	Cyclotella michiganiana Skvortzow	21552	0.46768	2.4	4.8	21.7
MEL -DUP3	18-Aug-23	5720	Cyclotella bodanica Eulenst.	200	1.41124	16.5	33	7056.2
MEL -DUP3	18-Aug-23	6554	Rhodomonas minuta Skuja	308912	46.58393	12	6	150.8
MEL -DUP3	18-Aug-23	6558	Cryptomonas erosa Ehrenberg	3400	6.1642	26.5	14	1813
MEL -DUP3	18-Aug-23	6562	Cryptomonas reflexa (Marsson) Skuja	8400	6.1572	21	10	733
MEL -DUP3	18-Aug-23	6565	Cryptomonas rostratiformis Skuja	200	0.45156	33	14	2257.8
MEL -DUP3	18-Aug-23	6568	Katablepharis ovalis Skuja	7184	0.32112	8	4	44.7
MEL -DUP3	18-Aug-23	7632	Gymnodinium sp.	800	5.09648	23	23	6370.6
MEL -DUP3	18-Aug-23	7639	Peridinium pusillum (Penard) Lemmermann	2600	10.2505	19.6	19.6	3942.5