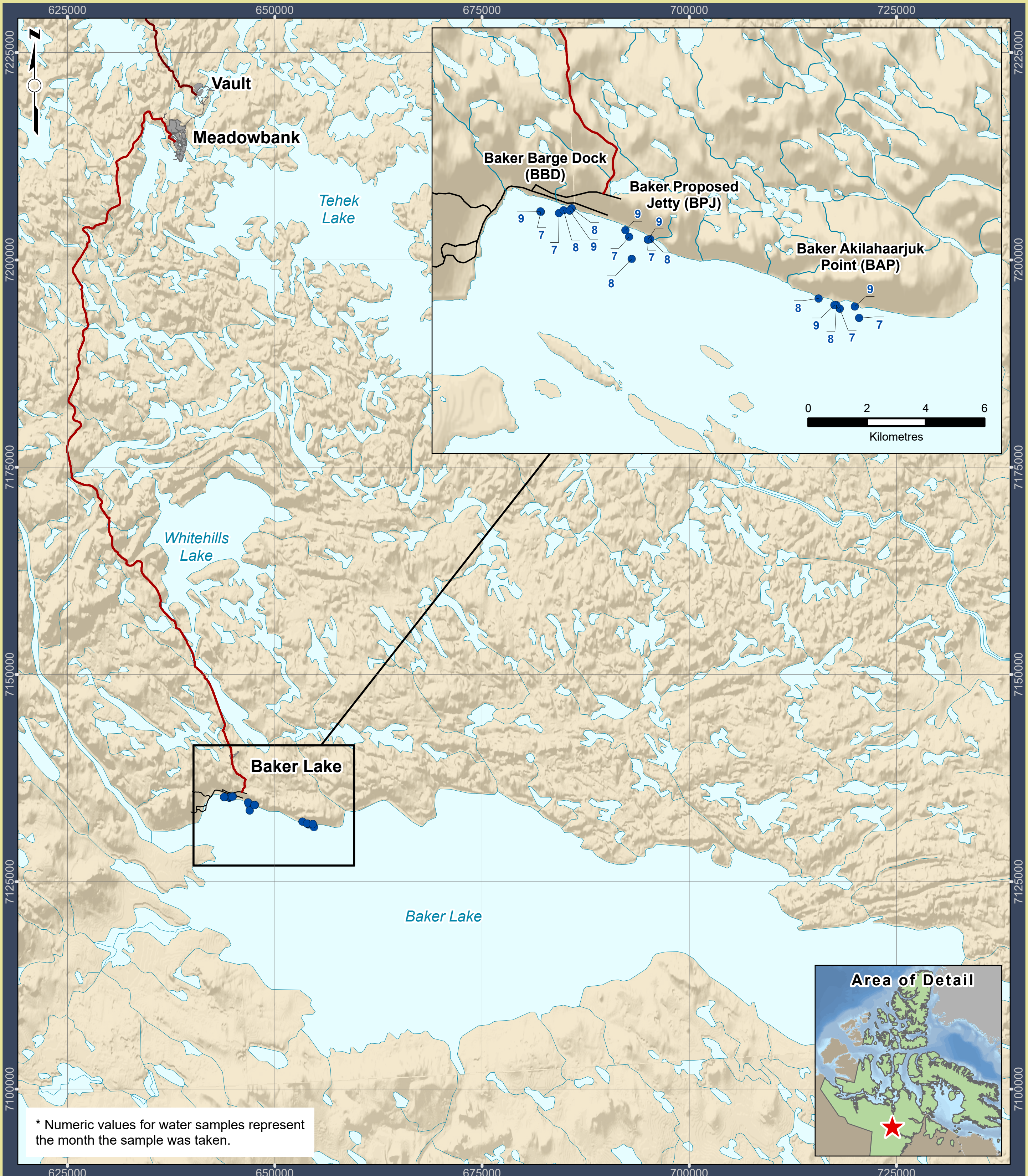


Water Sampling Station

- Water Quality Monitoring
- All-Weather Access Road
- Whale Tail Haul Road

0 5 10 15
Kilometres

Projection: UTM Zone 14 NAD83

Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.
Azimuth Consulting Group Inc.

Figure 6-1.
Baker Lake - 2022 Water Quality Sampling Stations

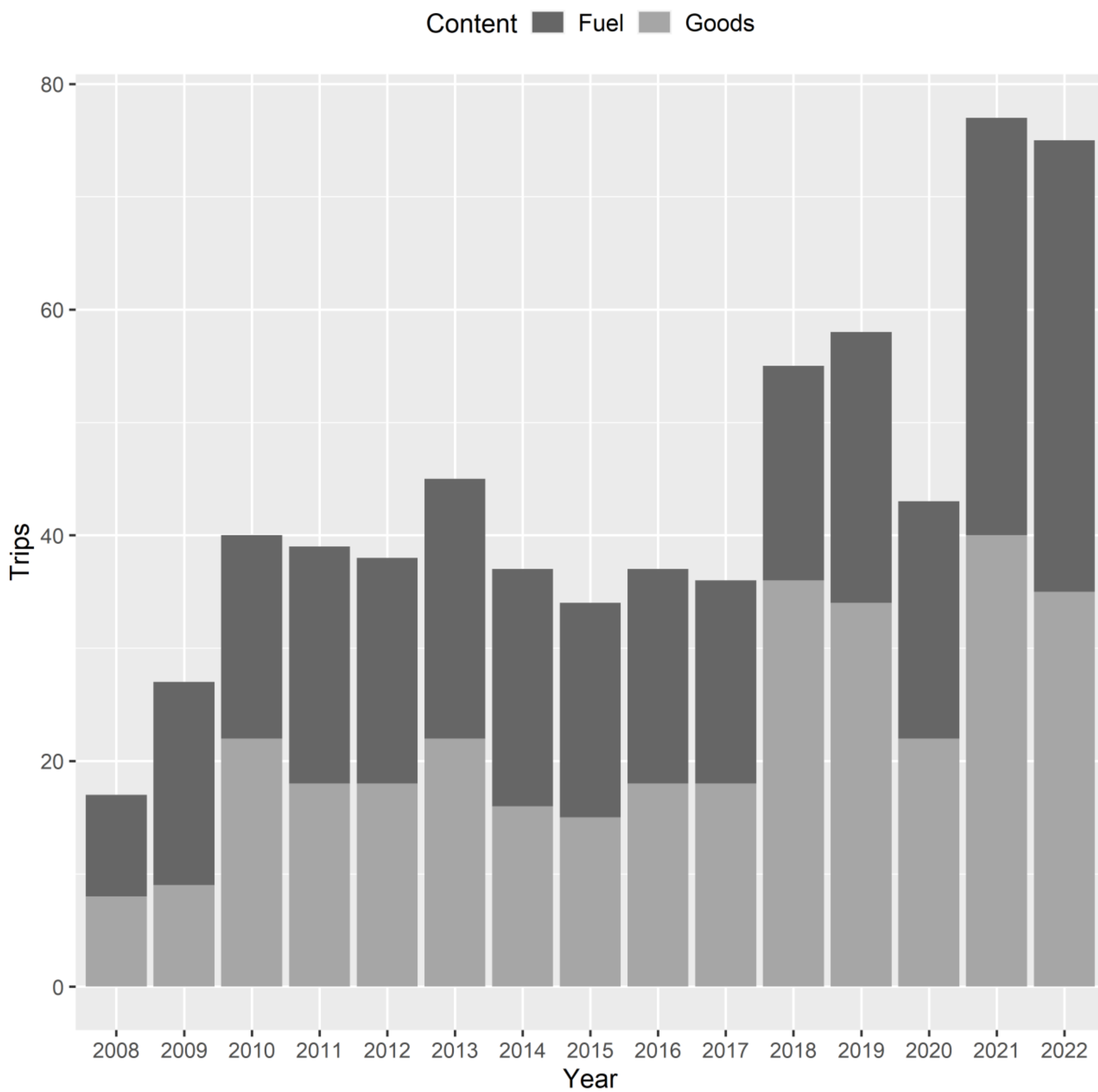
Meadowbank Gold Project

Prepared for: AGNICO EAGLE

By CASLYS CONSULTING

March 2023

Figure 6-2. Baker Lake barge traffic from Chesterfield Inlet since 2008.



Limnology Tables and Figures

Figure 6-3. Mean monthly field-measured temperature (°C) at 3 m depth since 2008, Baker Lake.

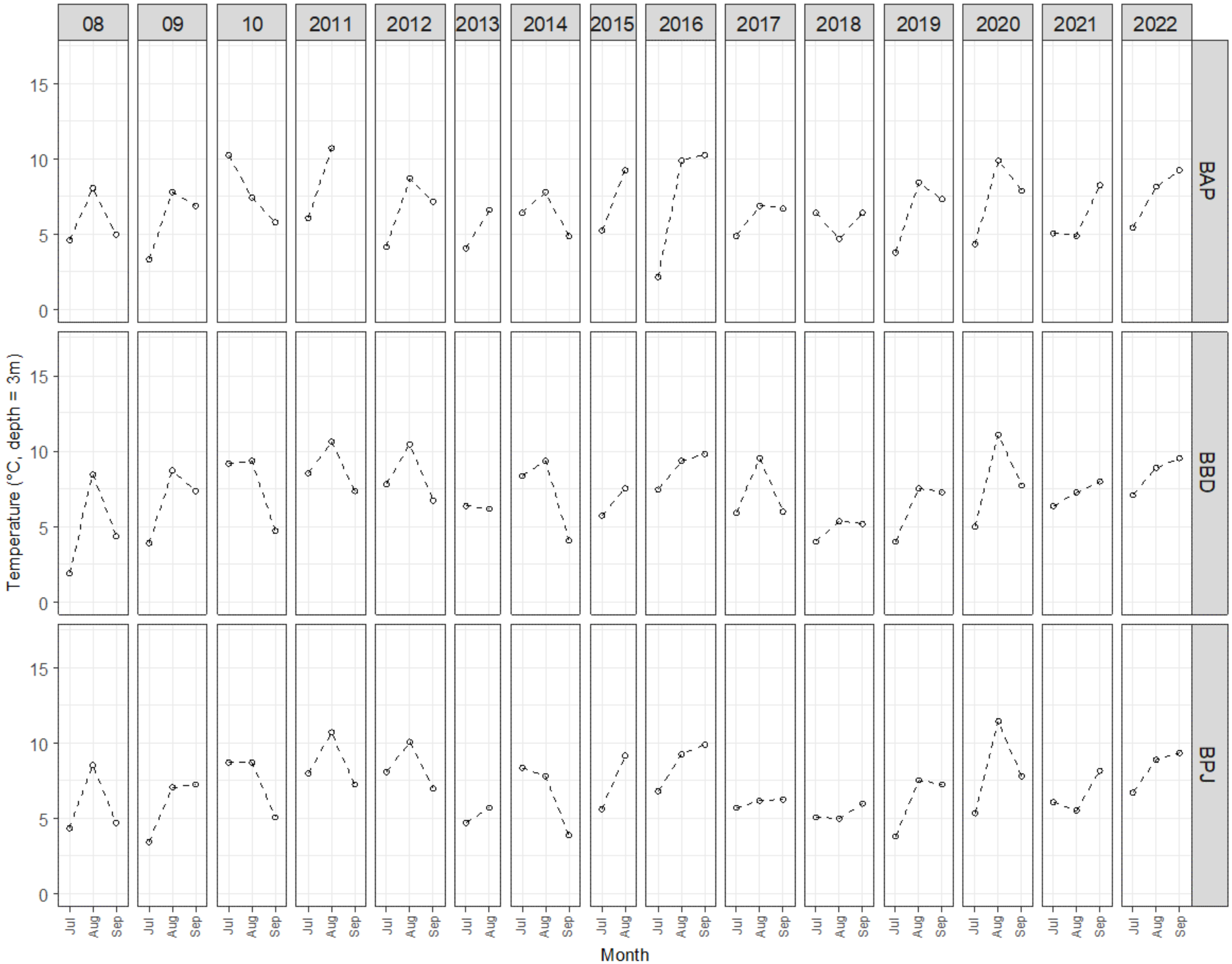
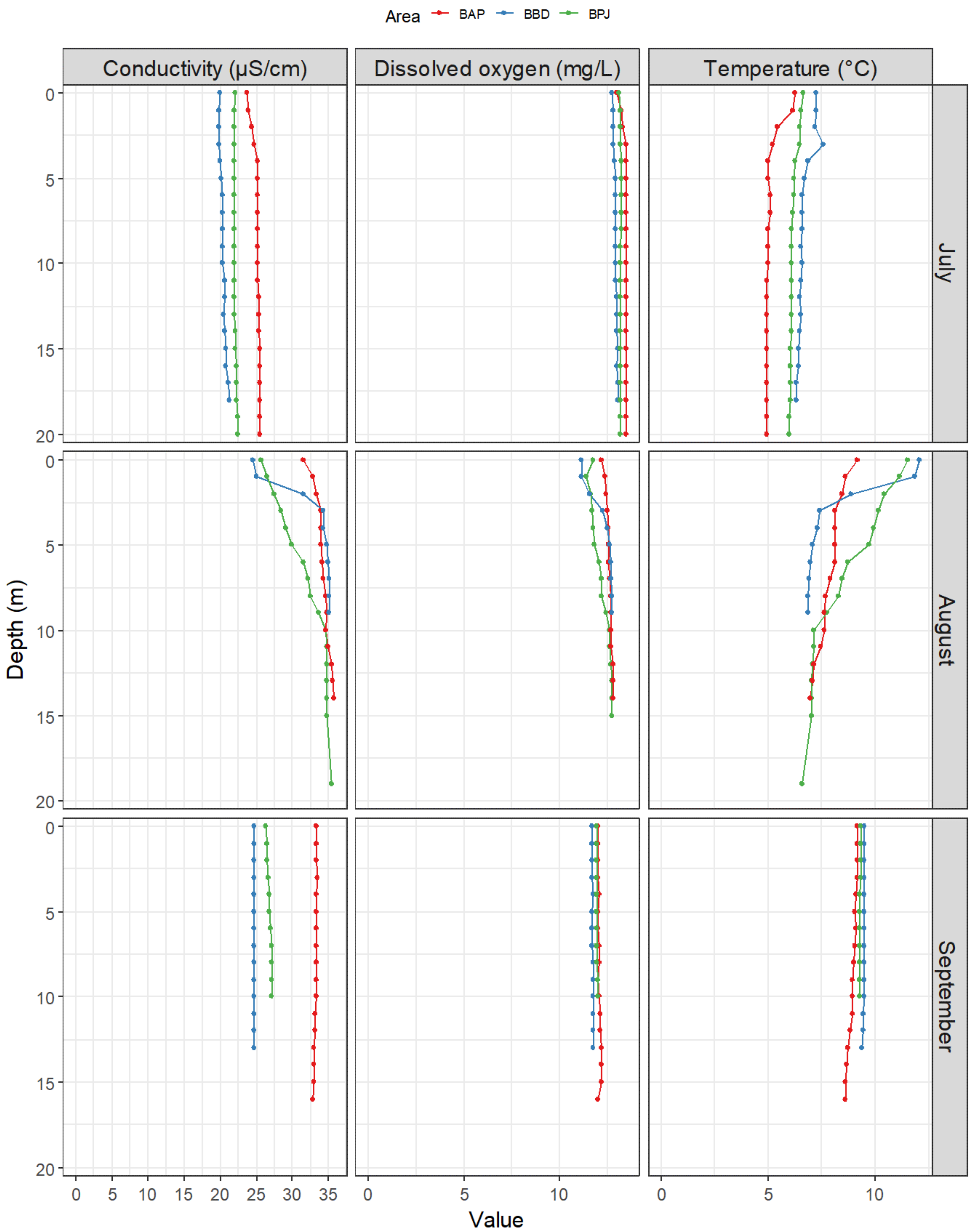


Figure 6-4. Baker Lake – Field-measured conductivity, dissolved oxygen, and temperature profiles, 2022.

Note: Only the field measured values up to 20 m depth shown in figure.



Water Chemistry Tables and Figures

Table 6-1. Screening process for water quality parameters, Baker Lake, 2022.

Parameters	Trigger Exceedance[2]	Screening Level and Rule[1] 1 >DL ≥ 10% Frequency	Screening Level and Rule[1] 2 C-I > 0.1 Frequency
CONVENTIONALS			
Conductivity	-	**Yes**	**Yes**
TSS	-	**Yes**	**Yes**
Hardness	-	**Yes**	**Yes**
T-Alkalinity	-	**Yes**	**Yes**
B-Alkalinity	-	**Yes**	**Yes**
C-Alkalinity	-	No	No
pH-Field	-	**Yes**	**Yes**
pH-Lab	-	**Yes**	**Yes**
MAJOR IONS			
TDS	-	**Yes**	**Yes**
Calcium	-	**Yes**	**Yes**
Chloride	-	**Yes**	**Yes**
Fluoride	-	**Yes**	**Yes**
Magnesium	-	**Yes**	**Yes**
Potassium	-	**Yes**	**Yes**
Sodium	-	**Yes**	**Yes**
Sulphate	-	**Yes**	**Yes**
NUTRIENTS & OTHERS			
Ammonia-N	-	**Yes**	**Yes**
Nitrate-N	-	**Yes**	**Yes**
Nitrite-N	-	No	No
TKN	-	**Yes**	**Yes**
T-Phosphorus	-	**Yes**	**Yes**
Ortho-phosphate	BPJ	**Yes**	**Yes**
DOC	BAP, BBD, and BPJ	**Yes**	**Yes**
TOC	BAP, BBD, and BPJ	**Yes**	**Yes**
Reactive Silica	-	**Yes**	**Yes**
T-Cyanide	*Not measured since 2019*		
Free Cyanide	*Not measured since 2019*		

Parameters	Trigger Exceedance[2]	Screening Level and Rule[1] 1 >DL ≥ 10% Frequency	Screening Level and Rule[1] 2 C-I > 0.1 Frequency
TOTAL METALS			
Aluminum	-	**Yes**	**Yes**
Antimony	-	No	No
Arsenic	-	**Yes**	**Yes**
Barium	-	**Yes**	**Yes**
Beryllium	-	No	No
Boron	-	**Yes**	**Yes**
Cadmium	-	No	No
Chromium	-	**Yes**	**Yes**
Copper	-	**Yes**	**Yes**
Iron	-	**Yes**	**Yes**
Lead	-	No	No
Lithium	-	**Yes**	**Yes**
Manganese	-	**Yes**	**Yes**
Mercury	-	No	No
Molybdenum	-	**Yes**	**Yes**
Nickel	-	No	No
Selenium	-	No	No
Silicon	-	**Yes**	**Yes**
Silver	-	No	No
Strontium	-	**Yes**	**Yes**
Thallium	-	No	No
Tin	-	No	No
Titanium	-	**Yes**	**Yes**
Uranium	-	**Yes**	**Yes**
Vanadium	-	No	No
Zinc	-	No	No

Parameters	Trigger Exceedance[2]	Screening Level and Rule[1] 1 >DL ≥ 10% Frequency	Screening Level and Rule[1] 2 C-I > 0.1 Frequency
DISSOLVED METALS			
Aluminum	-	**Yes**	**Yes**
Antimony	-	No	No
Arsenic	-	**Yes**	**Yes**
Barium	-	**Yes**	**Yes**
Beryllium	-	No	No
Boron	-	**Yes**	**Yes**
Cadmium	-	No	No
Chromium	-	No	No
Copper	-	**Yes**	**Yes**
Iron	-	**Yes**	**Yes**
Lead	-	No	No
Lithium	-	**Yes**	**Yes**
Manganese	-	**Yes**	**Yes**
Mercury	-	No	No
Molybdenum	-	**Yes**	**Yes**
Nickel	-	No	No
Selenium	-	No	No
Silicon	-	**Yes**	**Yes**
Silver	-	No	No
Strontium	-	**Yes**	**Yes**
Thallium	-	No	No
Tin	-	No	No
Titanium	-	No	No
Uranium	-	**Yes**	**Yes**
Vanadium	-	No	No
Zinc	-	No	No

Notes:

1. A three-step assessment process was used to identify parameters to include in the formal temporal and spatial trend assessment (**Section 2.3.1** and **Section 4.3.2**).
   Parameters were assigned a "Yes" if the following assessment was true:

(1) **>DL ≥ 10% Frequency**: parameters that exceeded MDLs in at least 10% of the samples.

(2) **C-I > 0.1 Frequency**: parameters that were detected more often in impact areas and the proportion of detected values increased by 0.1 or more.

(3) **Pattern = Activity**: additional step to avoid screening out potentially important parameters. Based on the trend plots, is there a trend for infrequently detected parameters and/or are there values > 5 x DL in at least one sampling event at NF areas?

2. Indicates that a trigger exceedance occurred at the listed Whale Tail study area lakes in one or more sampling event.

Shaded parameters are included in the temporal and spatial trend assessment.

Plots for all individual parameters are presented in **Appendix B3**.

Table 6-2. Water quality variables at the Bake Lake monitoring areas for which 2022 mean concentration exceeded the trigger.

Parameter	Trigger	2022 Mean		
		BAP	BBD	BPJ
		Ref	NF	NF
TOC	4.0	4.1	4.1	4.2
DOC	3.9	4.3	4.2	4.3

Notes:
"-" indicates mean annual concentration was < the trigger value.

Reported mean concentrations are all in units of mg/L.

Table 6-3. Results of BACI tests for selected water variables at Baker Lake monitoring areas in 2022.

Parameter	Test Area	n(B)	n(A)	Estimate	SE	F	DF	P-value[1]	Proportional change exp(Est)	LCI	UCI
TOC	BBD	39	3	-0.052	0.041	1.7	40	0.90	0.95	0.87	1.0
	BPJ	39	3	-0.015	0.029	0.26	40	0.69	0.99	0.93	1.0
DOC	BBD	39	3	-0.055	0.036	2.3	40	0.93	0.95	0.88	1.0
	BPJ	39	3	-0.020	0.031	0.43	40	0.74	0.98	0.92	1.0

Notes:
Bolded P-values are statistically significant < 0.05.
Test area = area compared to control (BAP).
n(B) = number of paired months in the "before" period.
n(A) = number of paired months in the "after" period (i.e., in 2022).
Estimate = BACI model estimate of the 2022 change in mean for log-transformed data.
SE = standard error of the estimate.
P-value = one-tailed test of the null hypothesis (no change or a decrease in mean [opposite for lower pH trigger]).
Exp(Est.) = estimated proportional change.
LCI = lower 95% confidence interval; UCI = upper 95% confidence interval.

Figure 6-5. Conventional parameters in water samples from Baker Lake since 2008.

Note: Laboratory-measured conductivity data from 2014 should be interpreted with caution, particularly at low concentrations (see Azimuth, 2015c for details).

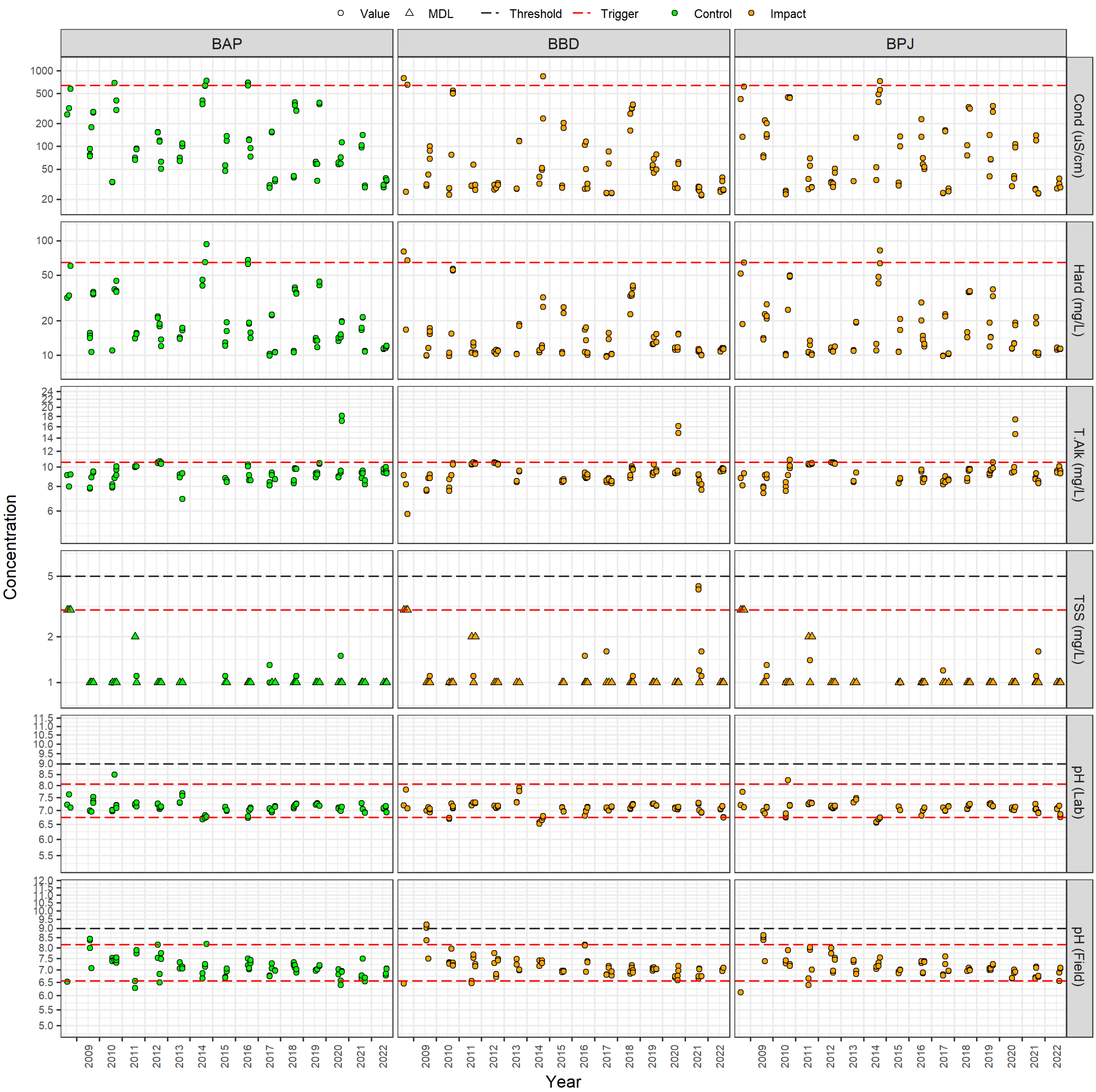


Figure 6-6. Major ions in water samples from Baker Lake since 2008.

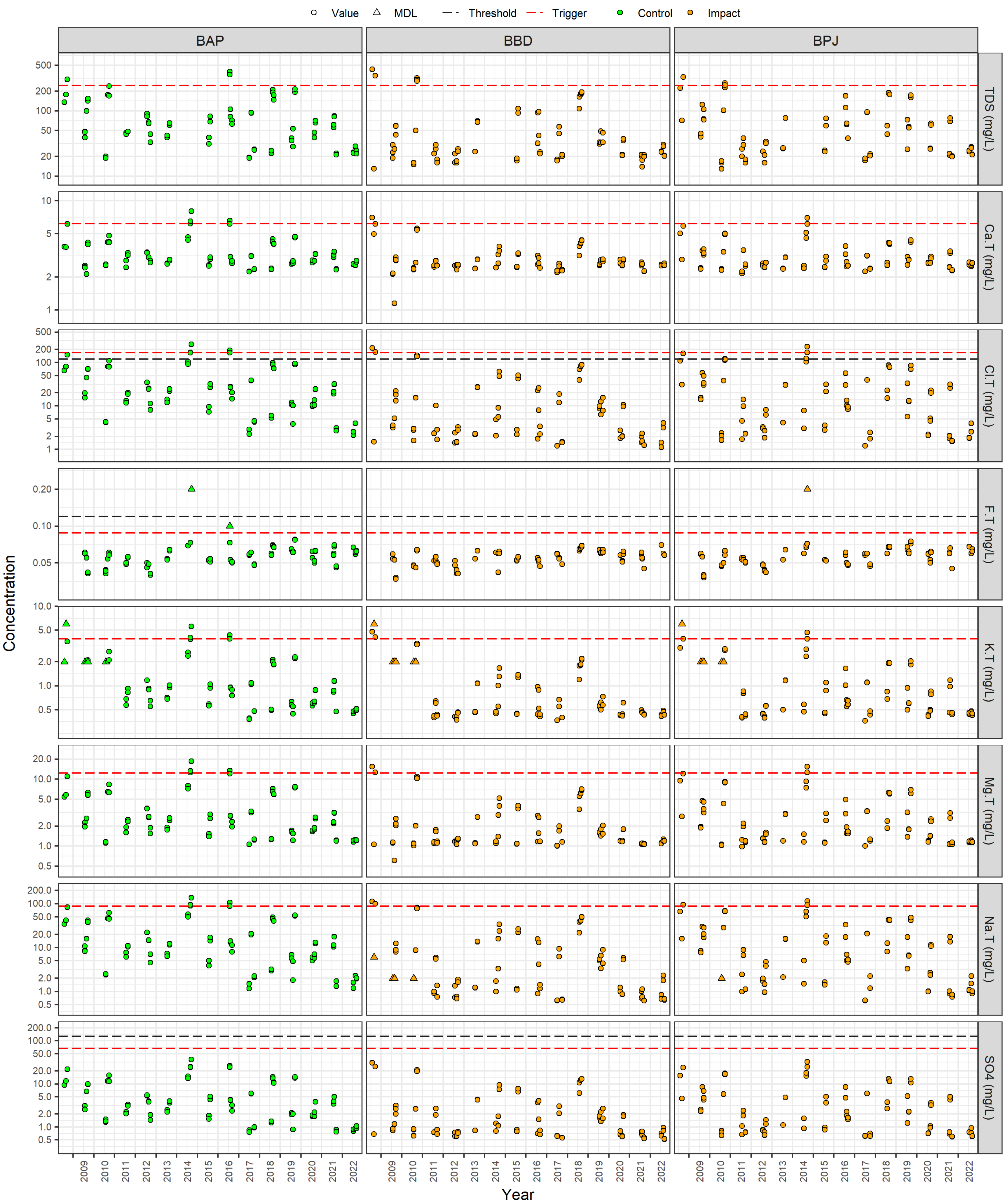


Figure 6-7. Nutrients in water samples from Baker Lake since 2008.

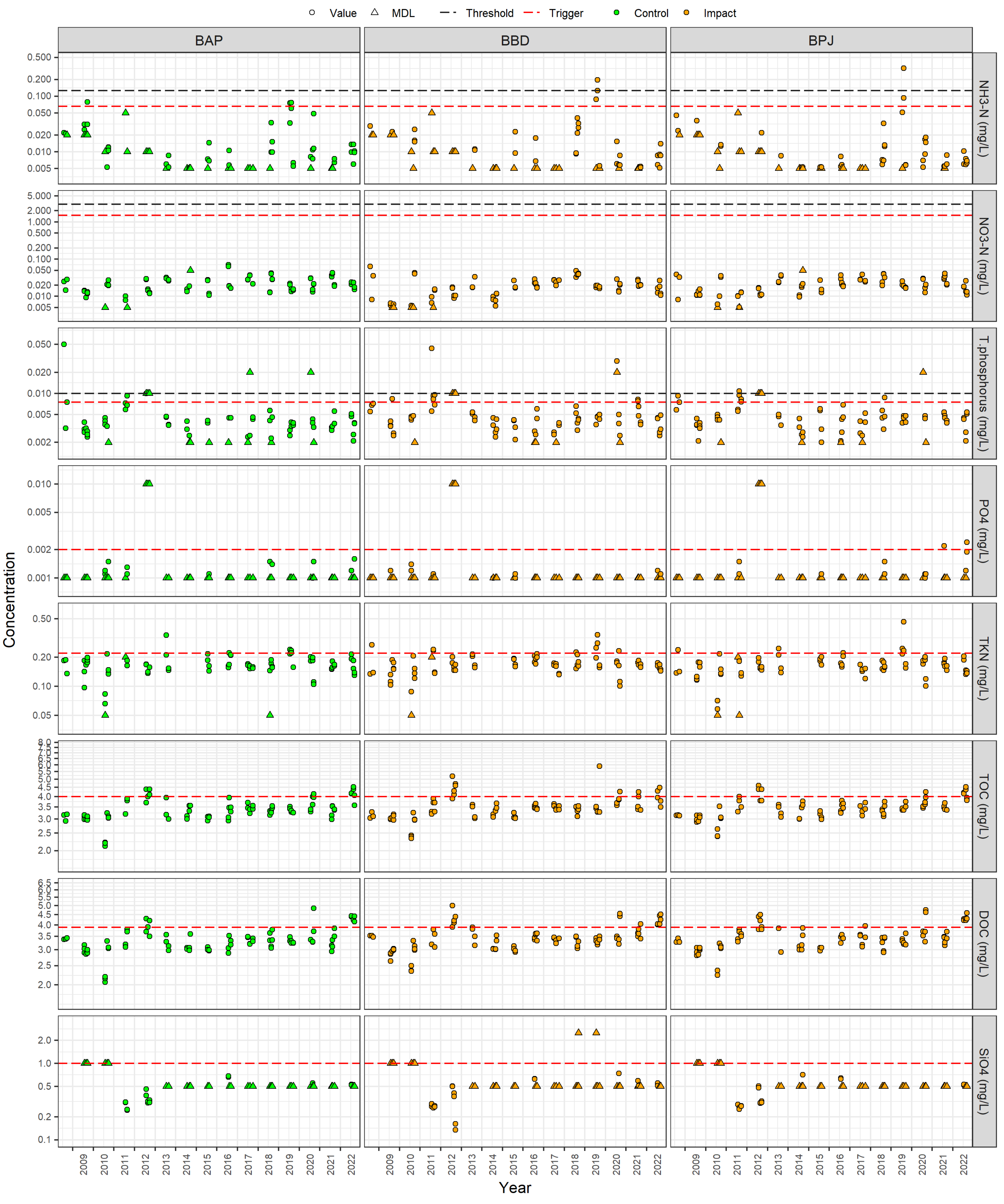


Figure 6-8. Metals in water samples from Baker Lake since 2008.

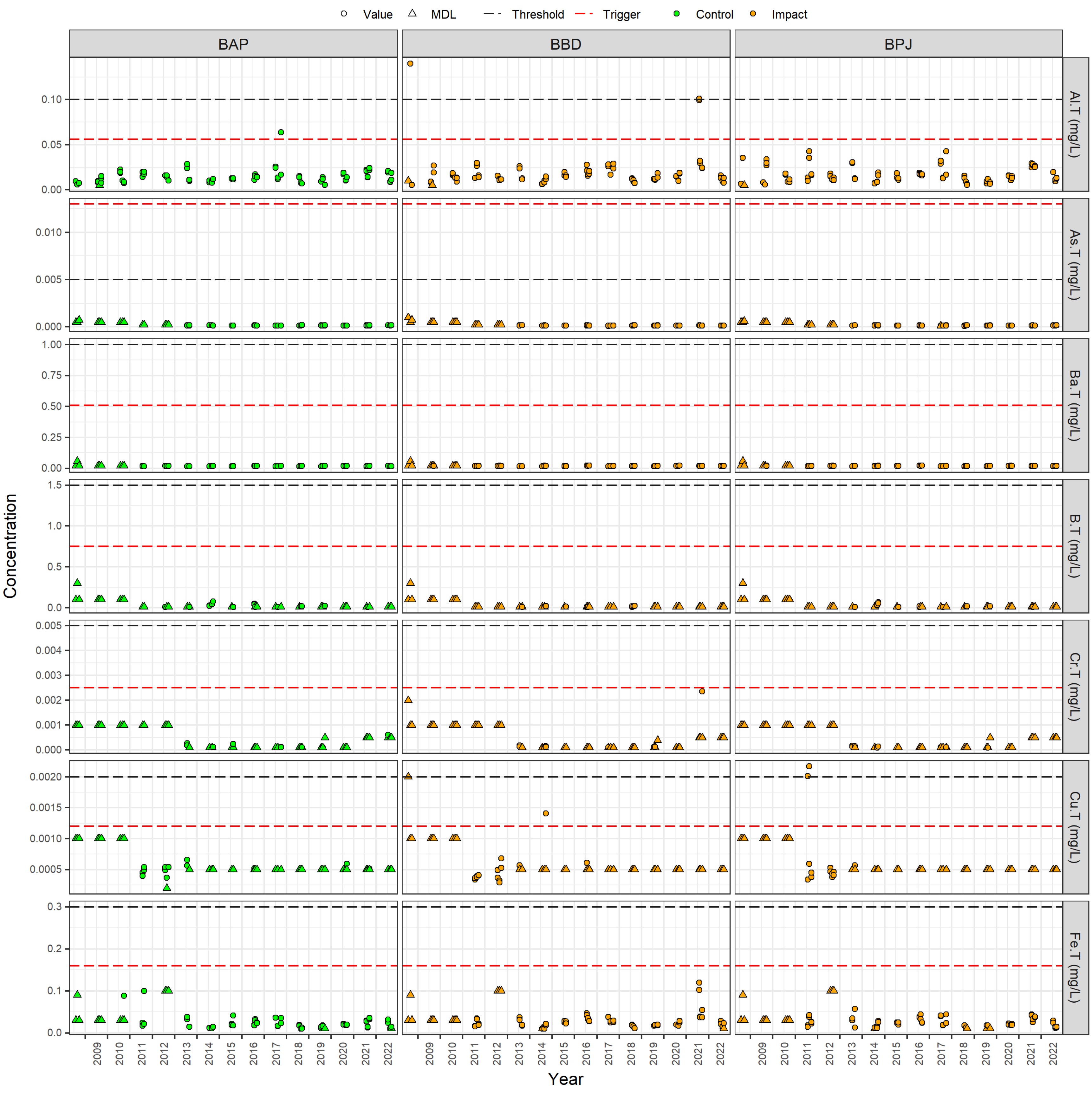
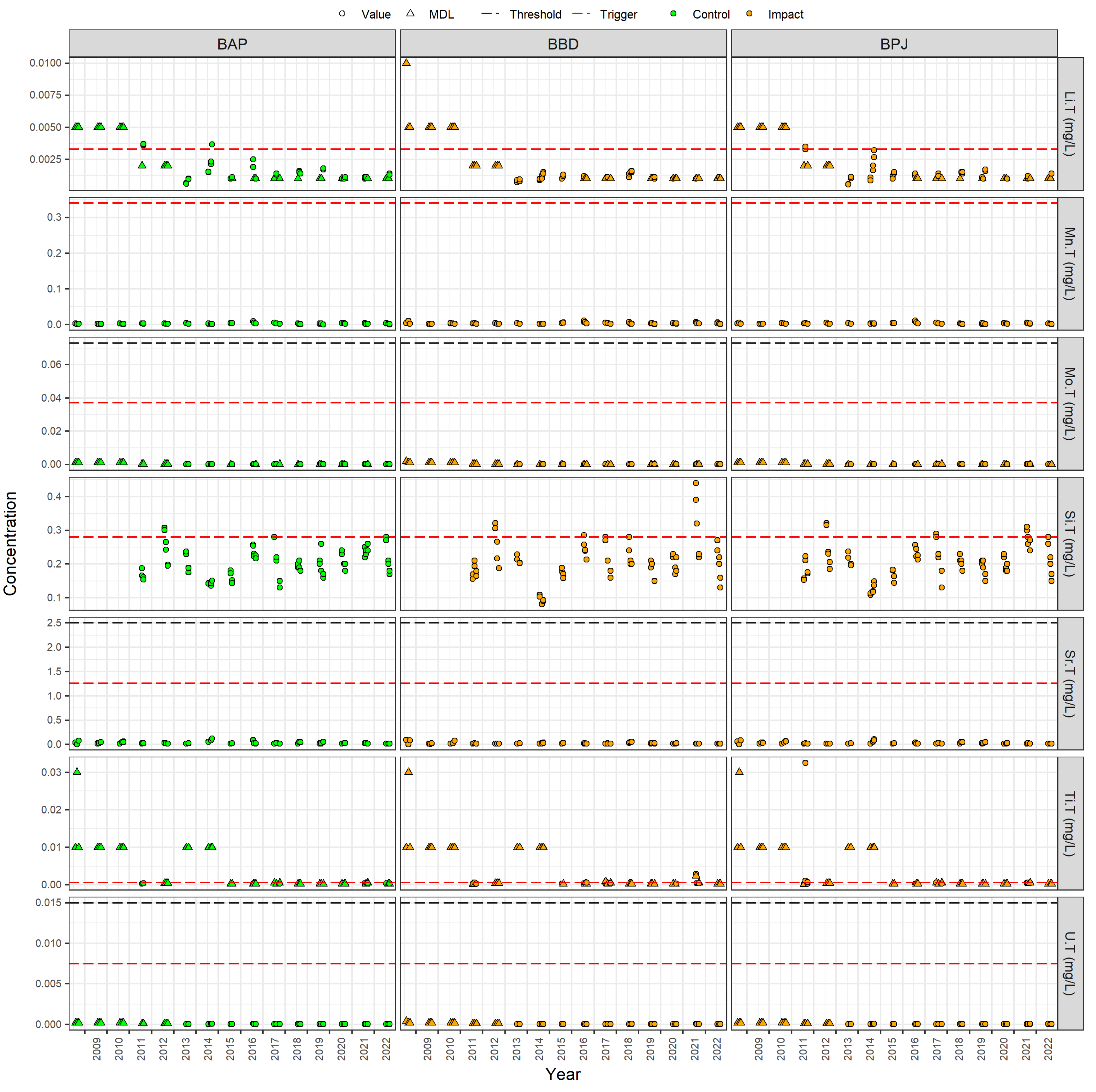


Figure 6-9. Metals in water samples from Baker Lake since 2008.



Phytoplankton Tables and Figures

Table 6-4. Results of the BACI tests for phytoplankton variables at Baker Lake areas, 2022.

Parameter Measured	Test Area	n(B)	n(A)	Estimate	SE	P-value*	Effect Size (%)		
							ES	LCI	UCI
Total Biomass	BBD	39	3	0.57	0.25	**0.027**	76	7	190
	BPJ	39	3	0.34	0.17	**0.052**	40	0	96
Species	BBD	39	3	-0.08	0.06	0.192	-8	-19	4
	BPJ	39	3	0.04	0.06	0.534	4	-8	17

Notes:

* **Bolded** values are P-values < 0.1.

Shaded cells indicate positive (increased) or negative (reduced) effect sizes of 20% or more.

Test area = area compared to control (BAP).

n(B) = number of months in the "before" period.

n(A) = number of months in the "after" period (i.e., in 2022).

Estimate = BACI model estimate of the 2022 change in mean for log-transformed data.

SE = standard error of the estimate.

P-value = two-tailed test of the null hypothesis of no change.

ES = estimated effect size (i.e., 100%*(exp[Estimate]-1)).

LCI = lower 95% confidence interval; UCI = upper 95% confidence interval.

Figure 6-10. Chlorophyll-a (µg/L) in water samples from Baker Lake since 2008.

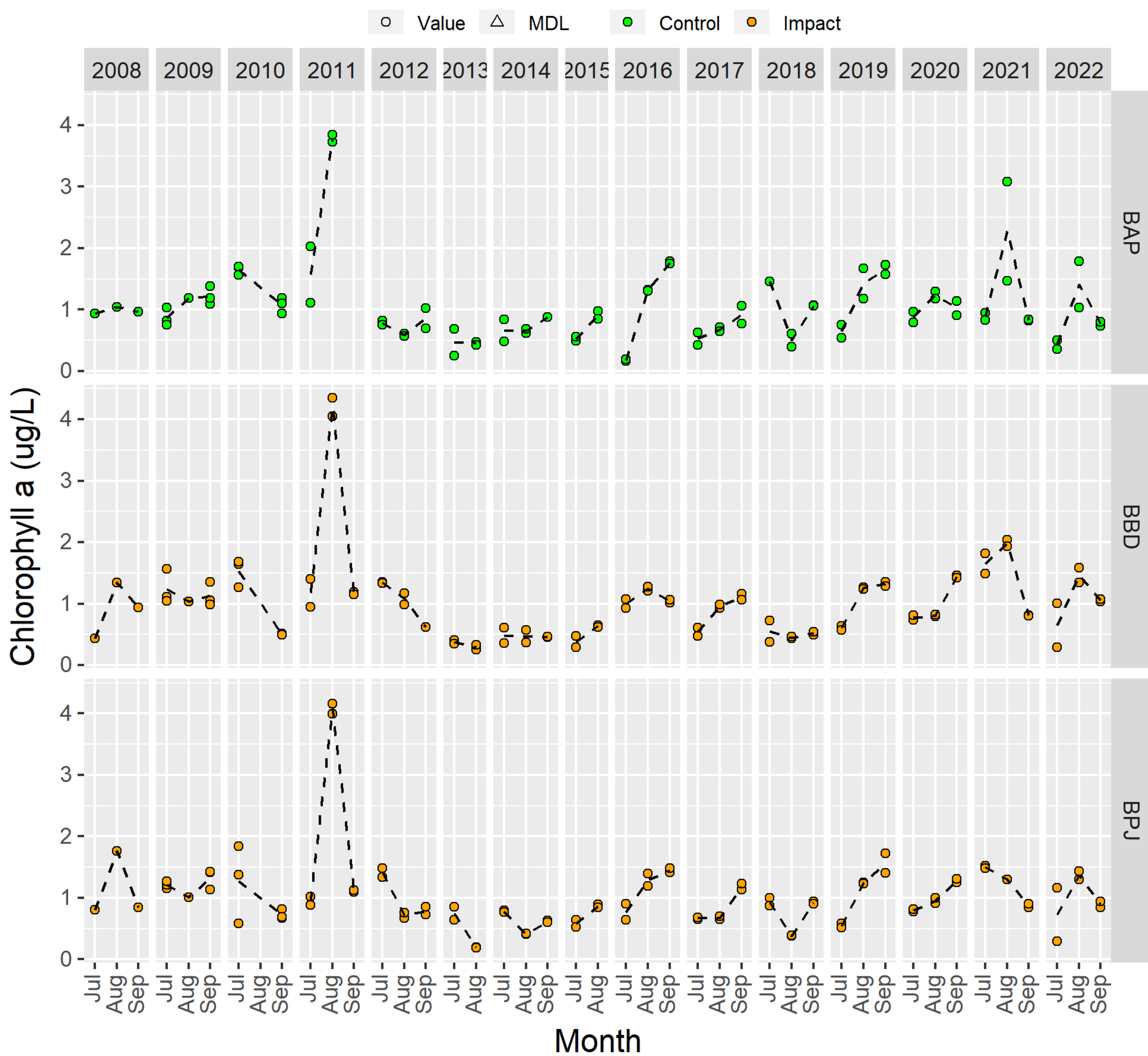


Figure 6-11. Total phytoplankton biomass (mg/m³) from Baker Lake since 2008.

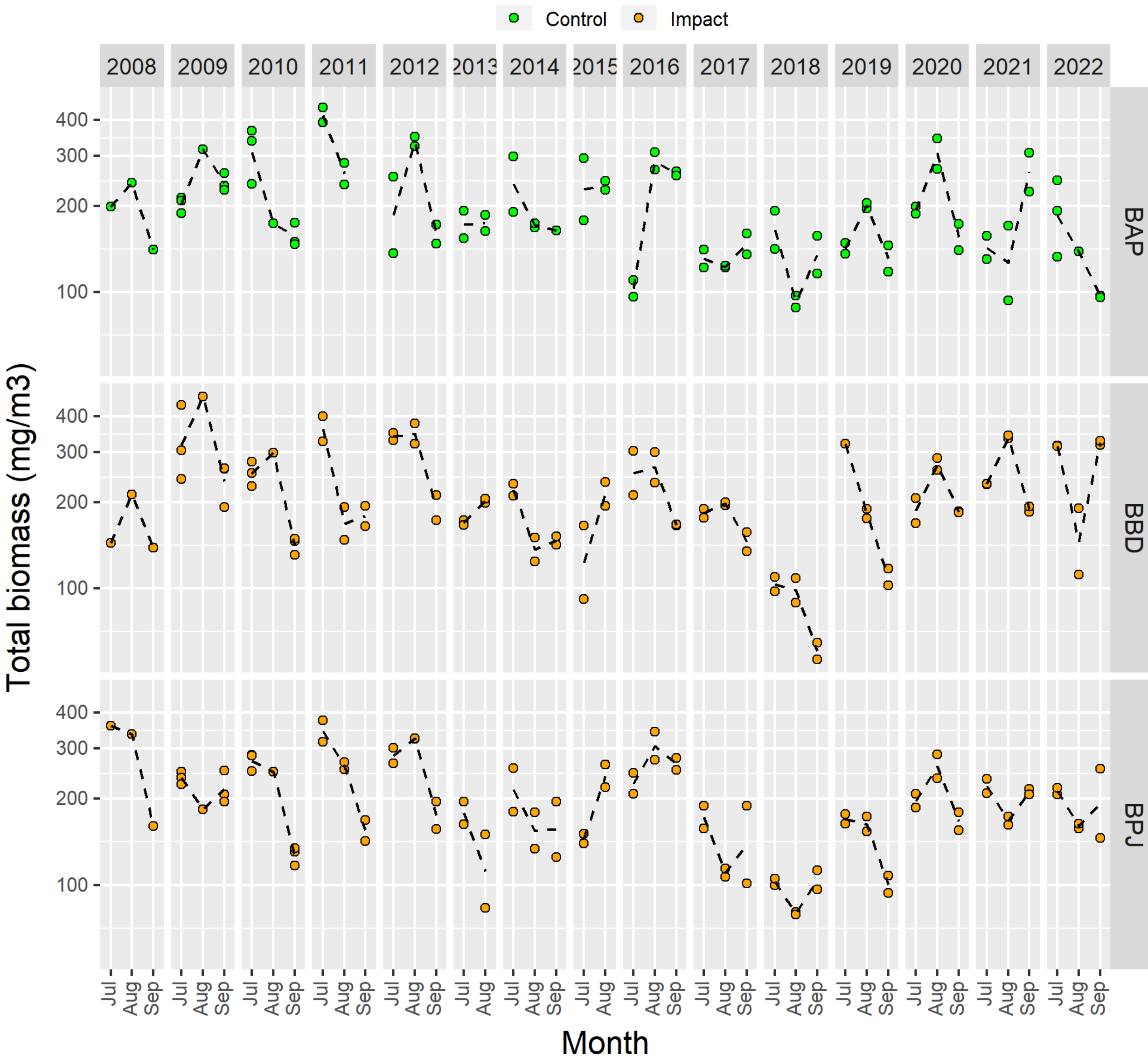


Figure 6-12. Phytoplankton biomass (mg/m^3) by major taxa from Baker Lake since 2008.

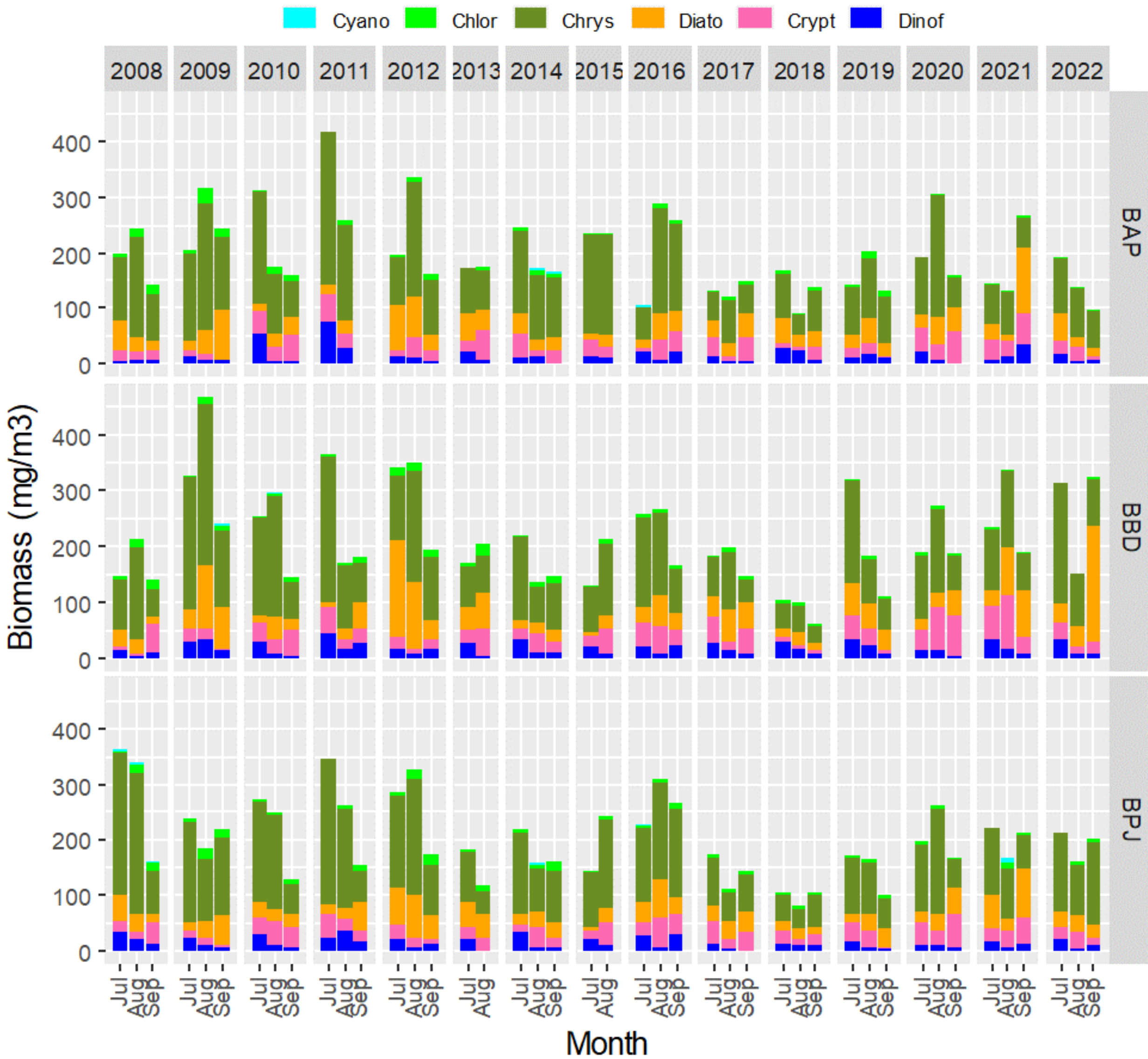


Figure 6-13. Relative phytoplankton biomass by major taxa from Baker Lake since 2008.

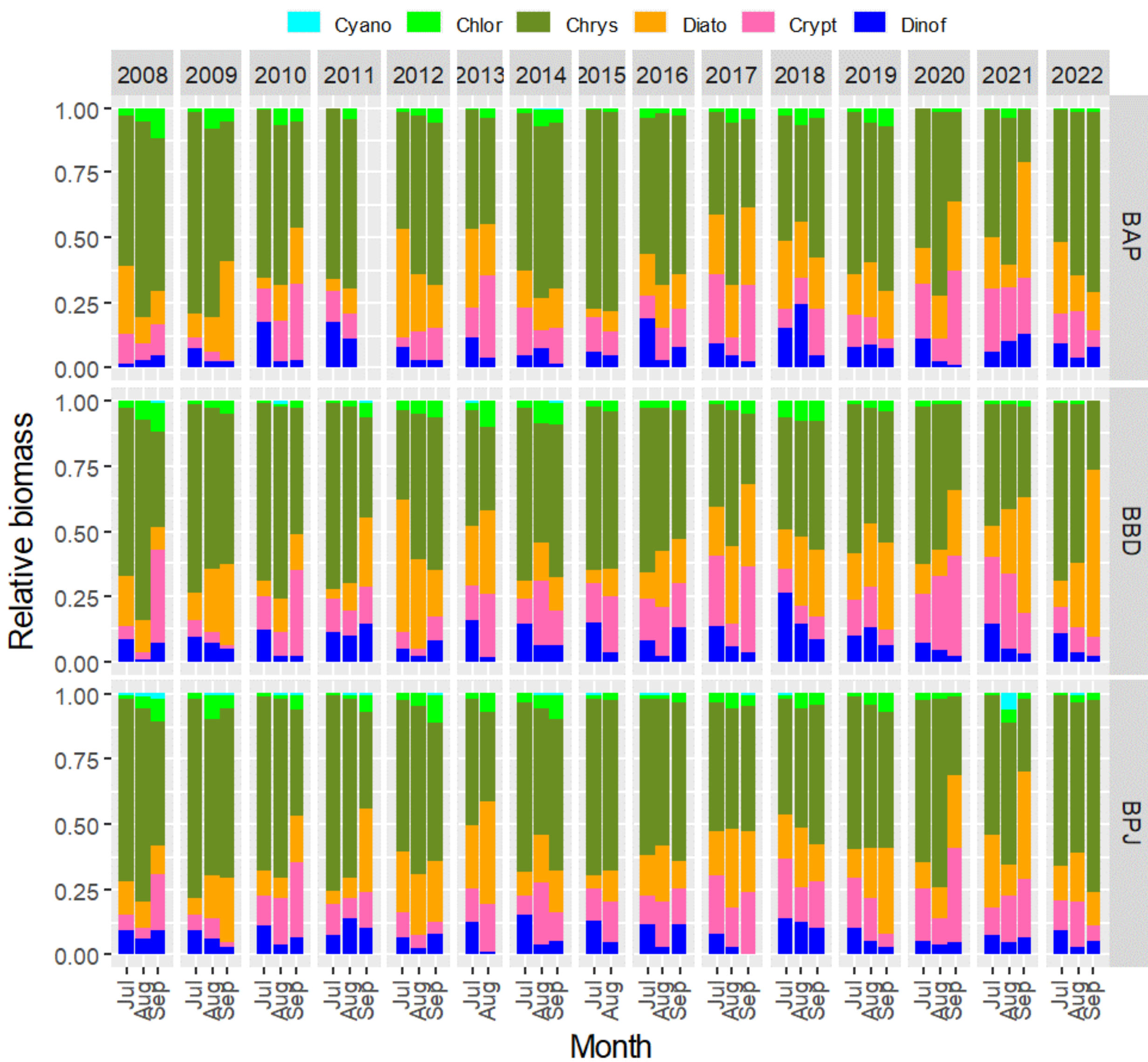
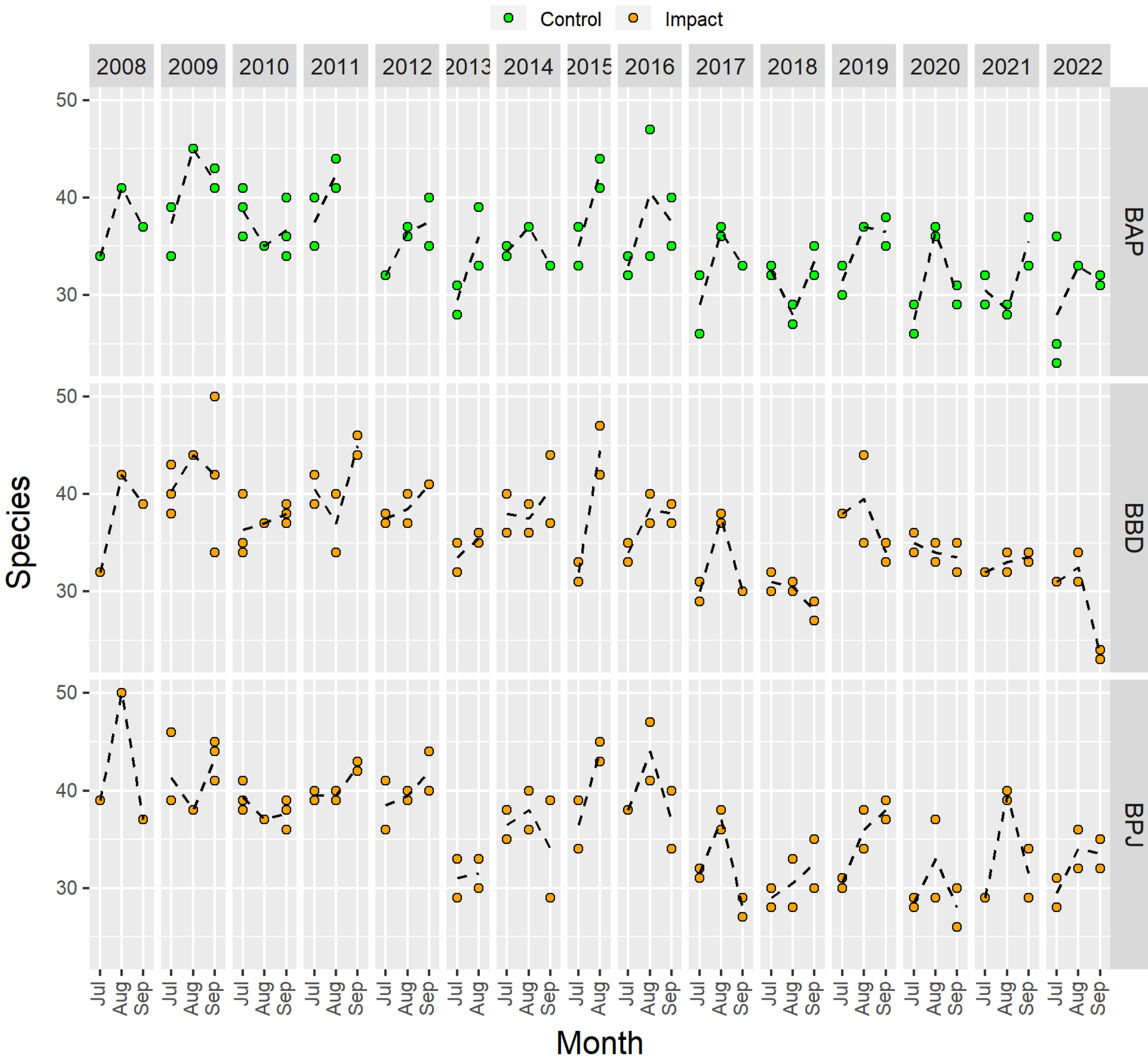


Figure 6-14. Phytoplankton species richness from Baker Lake since 2008.



7 SCOPE OF THE 2023 CREMP

The CREMP focuses on identifying changes in limnology, water, and sediment chemistry, and primary (phytoplankton) and secondary (benthic invertebrate community) aquatic producers that may be associated with mine development activities. This is accomplished by applying a temporal/spatial trend assessment that includes applying quantitative decision criteria (i.e., early warning *triggers* and action *thresholds*) to facilitate making immediate and objective decisions about appropriate management actions. CREMP results are integrated annually into the Aquatic Ecosystem Monitoring Program (AEMP) for holistic environmental management and decision making. Recommendations for the scope of the 2023 CREMP are provided for Meadowbank, Whale Tail, and Baker Lake based on the 2022 monitoring results discussed in **Sections 4**, **5**, and **6**, respectively.

7.1 Meadowbank

Based on the 2022 results and the annual decision framework for the sampling strategy (**Section 2.2.3**), the components and schedule for the 2023 CREMP for the Meadowbank study area is summarized in **Table 7-1**. The scope of work proposed for 2023 includes:

- Water quality – Water sampling for three open-water and two through-ice sampling events is recommended at the NF and reference areas. Through-ice limnology and water chemistry sampling at TPS, TE, and TEFF will be suspended unless monitoring data from NF areas suggest there are "moderate changes" in water quality[29]. In addition, contingency water samples may need to be collected during the limnology-only, through-ice sampling event(s) at the NF areas, if anomalous *in-situ* limnology results are observed.
- Phytoplankton – Routine sampling at the NF areas, at the same time as the three open-water and two through-ice sampling events. Winter phytoplankton samples will be archived and may be submitted for analysis depending on the results from the open-water sampling events. Sampling at MF and FF areas is not required.
- Sediment chemistry – Sediment chemistry samples will be collected by corer at all NF and reference areas. A full coring program will be completed at NF areas to coincide with EEM monitoring.
- Benthos – Benthos samples and supporting habitat data (TOC and grain size) will be collected by grab sampler at the NF and reference areas.

[29] "Moderate changes" in water quality are defined as statistically significant increases exceeding the early warning trigger for parameters with effects-based thresholds (i.e., CCME FWAL).

7.2 Whale Tail

Timing of the field sampling at the Whale Tail study area lakes matches the schedule for Meadowbank because of share-reference area sampling at INUG and PDL. The frequency of sampling and study components at each area are outlined in **Table 7-2**. The scope of work proposed for Whale Tail study area lakes in 2023 includes:

- Water quality – The full CREMP program (through-ice and open-water) is recommended at the NF, MF, FF, and reference areas. Through-ice limnology profiles are recommended at MAM, WTS, and NEM in the months when water sampling is not completed. In addition, contingency water samples may need to be collected during the limnology-only, through-ice sampling event(s), if anomalous *in-situ* limnology results are observed.
- Phytoplankton – Routine sampling with the full water quality sampling program.
- Sediment chemistry – Sediment chemistry samples will be collected by corer at all NF areas and reference. A full coring program will be completed at NF areas to coincide with EEM monitoring.
- Benthos – Benthos samples and supporting habitat data (TOC and grain size) will be collected by grab sampler at the NF, MF, FF, and reference areas on the same schedule as the Meadowbank study area lakes. Sampling at NF areas (WTS and MAM) to monitor for changes in the community due to construction and discharge. Sampling at NEM to monitor potential changes related to the temporary authorized discharge into the Nemo Lake watershed in 2019, and sampling at areas A20, A76, and DS1 to provide more information on the range of normal conditions to support future BACI-style analysis.

7.3 Baker Lake

The scope of the 2023 Baker Lake CREMP is presented in **Table 7-3**. Monthly water quality monitoring is planned for July, August, and September consistent with previous years. Sediment chemistry and benthos sampling are currently planned for completion in August 2023. Sediment chemistry and benthos monitoring frequency for this area will occur on a three-year cycle according to the 2022 *CREMP Plan Update* (Azimuth, 2022b).

Table 7-1. Monitoring components planned for 2023 Meadowbank CREMP.

Area ID	Through-Ice					Open-Water			Through-Ice	
	Jan	Feb	Mar	April	May	Jul	Aug	Sep	Nov	Dec
Reference Areas										
INUG			WQ		WQ	WQ	WQ	WQ		
			Phyto		Phyto	Phyto	Phyto	Phyto		
							Sed			
							Benthos			
PDL			WQ		WQ	WQ	WQ	WQ		
			Phyto		Phyto	Phyto	Phyto	Phyto		
							Sed			
							Benthos			
Near-Field Areas										
TPE	Limno	Limno	WQ	Limno	WQ	WQ	WQ	WQ	Limno	Limno
			Phyto		Phyto	Phyto	Phyto	Phyto		
							Sed			
							Benthos			
TPN	Limno	Limno	WQ	Limno	WQ	WQ	WQ	WQ	Limno	Limno
			Phyto		Phyto	Phyto	Phyto	Phyto		
							Sed			
							Benthos			
SP	Limno	Limno	WQ	Limno	WQ	WQ	WQ	WQ	Limno	Limno
			Phyto		Phyto	Phyto	Phyto	Phyto		
							Sed			
							Benthos			
WAL	Limno	Limno	WQ	Limno	WQ	WQ	WQ	WQ	Limno	Limno
			Phyto		Phyto	Phyto	Phyto	Phyto		
							Sed			
							Benthos			
Mid- and Far-Field Areas										
TPS, TE, and TEFF			Suspended[1]							

Notes:
1.Monitoring at MF and FF areas TPE, TE, and TEFF is only required if *moderate* changes are detected upstream at the NF locations consistent with the *2022 CREMP Plan Update* (Azimuth, 2022b).
No sampling in June and October due to unsafe ice conditions.
Limno: 1 limno depth profile should be collected at key near-field areas (TPN, TPE, SP, and WAL) during the winter months; water chemistry will also be collected if profiling shows unusual results.
WQ: water quality - 2 replicate samples from 3 m depth and limno profiles at each location.
Phyto: 2 replicate samples from 3 m depth; same locations as limno.
Sed: 1 composite of grabs for organics (LEPH, HEPH, PAH (low), Mineral Oil and Grease); 5 replicates for grab physical (TOC, grain size, moisture); 10 replicates for core chemistry (metals, TOC, moisture).
Benthos: 5 replicate samples (2 grab composite/sample); same locations as sediment.

Table 7-2. Monitoring components planned for 2023 Whale Tail CREMP.

Area ID	Through-Ice					Open-Water			Through-Ice	
	Jan	Feb	Mar	April	May	Jul	Aug	Sep	Nov	Dec
Near-Field Areas										
WTS	Limno	Limno	WQ	Limno	WQ	WQ	WQ	WQ	Limno	Limno
			Phyto		Phyto	Phyto	Phyto	Phyto		
							Sed			
							Benthos			
MAM	Limno	Limno	WQ	Limno	WQ	WQ	WQ	WQ	Limno	Limno
			Phyto		Phyto	Phyto	Phyto	Phyto		
							Sed			
							Benthos			
NEM	Limno	Limno	WQ	Limno	WQ	WQ	WQ	WQ	Limno	Limno
			Phyto		Phyto	Phyto	Phyto	Phyto		
							Sed			
							Benthos			
Mid- and Far-Field Areas										
A20			WQ		WQ	WQ	WQ	WQ		
			Phyto		Phyto	Phyto	Phyto	Phyto		
							Sed			
							Benthos			
A76			WQ		WQ	WQ	WQ	WQ		
			Phyto		Phyto	Phyto	Phyto	Phyto		
							Sed			
							Benthos			
DS1			WQ		WQ	WQ	WQ	WQ		
			Phyto		Phyto	Phyto	Phyto	Phyto		
							Sed			
							Benthos			

Notes:
No sampling in June and October due to unsafe ice conditions.
Limno: 1 limno depth profile should be collected at key near-field areas (MAM and WTS) to reduce uncertainty regarding the potential occurrence of changes over winter; water chemistry will also be collected if profiling shows unusual results.
WQ: water quality - 2 replicate samples from 3 m depth and limno profiles at each location.
Phyto: 2 replicate samples from 3 m depth; same locations as limno.
Sed: 1 composite of grabs for organics (LEPH, HEPH, PAH (low), Mineral Oil and Grease); 5 replicates for grab physical (TOC, grain size, moisture); 10 replicates for core chemistry (metals, TOC, moisture).
Coring: 10 replicate sediment core samples (+1 duplicate) for metals and TOC.
Benthos: 5 replicate samples (2 grab composite/sample); same locations as sediment.

Table 7-3. Monitoring components planned for 2023 Baker Lake CREMP.

Area ID	Open-Water		
	July	August	September
BBD	WQ	WQ	WQ
	Phyto	Phyto	Phyto
		Sed	
		Benthos	
BPJ	WQ	WQ	WQ
	Phyto	Phyto	Phyto
		Sed	
		Benthos	
BAP	WQ	WQ	WQ
	Phyto	Phyto	Phyto
		Sed	
		Benthos	
BES		Sed	
		Benthos	

Notes:
WQ: water quality 2 replicate samples from 3 m depth and limno profiles at each location.
Phyto: 2 replicate samples from 3 m depth; same locations as limno.
Sed: 1 composite of grabs for organics (LEPH, HEPH, PAH (low), Mineral Oil and Grease); 5 replicates for grab physical (TOC, Grain Size, Moisture); 10 replicates for core chemistry (metals, TOC, Moisture).
Coring: 10 replicate sediment core samples (+1 duplicate) for metals and TOC.
Benthos: 5 replicate samples (2 grab composite/sample); same locations as sediment.

8 REFERENCES

The references section is organized into three sections: Annual CREMP Reports, guidance documents related to the CREMP, and other literature cited in the report, including peer-reviewed studies and technical reports.

Annual CREMP Reports and Baseline Studies

Azimuth. 2022a. 2021 Core Receiving Environment Monitoring Program, Meadowbank Complex. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March 2022.

Azimuth. 2021. 2020 Core Receiving Environment Monitoring Program, Meadowbank Complex. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March 2021.

Azimuth. 2020a. 2019 Core Receiving Environment Monitoring Program, Meadowbank Mine and Whale Tail Project. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March 2020.

Azimuth. 2019a. 2018 Core Receiving Environment Monitoring Program, Meadowbank Mine and Whale Tail Project. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March 2019.

Azimuth. 2019b. Memorandum: Whale Tail Permitting Support – Stream Tributary Water Quality Data Summary (KivIA Aquatic-TC#3). Memo prepared for Agnico Eagle Mines Ltd. October 28, 2019.

Azimuth. 2018a. Whale Tail Pit Core Receiving Environment Monitoring Program (CREMP): 2014-2017 Baseline Studies. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. February, 2018.

Azimuth. 2018c. Core Receiving Environment Monitoring Program 2017. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March 2018.

Azimuth. 2017a. Core Receiving Environment Monitoring Program (CREMP) 2016, Meadowbank Mine. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March, 2017.

Azimuth. 2017b. Whale Tail Pit Core Receiving Environment Monitoring Program (CREMP): Rationale for Selection of Reference Areas. Technical Memorandum prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU, November 10, 2017.

Azimuth. 2016. Core Receiving Environment Monitoring Program (CREMP) 2015, Meadowbank Mine. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March, 2016.

Azimuth. 2015c. Core Receiving Environment Monitoring Program (CREMP) 2014, Meadowbank Mine. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March, 2015.

Azimuth. 2014. Core Receiving Environment Monitoring Program (CREMP) 2013, Meadowbank Mine. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March, 2014.

Azimuth. 2013. Core Receiving Environment Monitoring Program (CREMP) 2012, Meadowbank Mine. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March, 2013.

Azimuth. 2012a. Aquatic Effects Monitoring Program – Core Receiving Environment Monitoring Program 2011, Meadowbank Mine. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March, 2012.

Azimuth. 2012b. Aquatic Effects Monitoring Program – Targeted Study: Dike Construction TSS Effects Assessment Study 2011, Meadowbank Mine. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March, 2012.

Azimuth. 2011a. Aquatic Effects Monitoring Program – Targeted Study: Dike Construction TSS Effects Assessment Study 2010, Meadowbank Mine. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March, 2011.

Azimuth. 2011b. Aquatic Effects Monitoring Program – Core Receiving Environment Monitoring Program 2010, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March, 2011.

Azimuth. 2010a. Aquatic Effects Monitoring Program – Core Receiving Environment Monitoring Program 2009, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU.

Azimuth. 2010b. Aquatic Effects Monitoring Program – Targeted Study: Dike Construction Monitoring 2009, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU.

Azimuth. 2010c. Aquatic Effects Monitoring Program – Targeted Study: Dike Construction TSS Effects Assessment Study 2009, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU.

Azimuth. 2009a. Aquatic Effects Monitoring Program – Targeted Study: Dike Construction Monitoring 2008, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico Eagle Mines Ltd., Vancouver, BC. March 2009.

Azimuth. 2009b. Aquatic Effects Monitoring Program – Targeted Study: Second Portage Lake TSS Effects Assessment Study 2008, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico Eagle Mines Ltd., Vancouver, BC. March 2009.

Azimuth. 2009c. Aquatic Effects Monitoring Program – Receiving Environment Monitoring 2008, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico Eagle Mines Ltd., Vancouver, BC. March 2009.

Azimuth. 2008a. Aquatic Effects Management Program Monitoring – Meadowbank Gold Project, 2007. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico Eagle Mines Ltd., Vancouver, BC. March 2008.

Azimuth. 2008b. Aquatic Effects Management Program Monitoring – Meadowbank Gold Project, 2006. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico Eagle Mines Ltd., Vancouver, BC. March 2008.

Azimuth. 2005b. Baseline Aquatic Ecosystem Report (BAER) – Meadowbank Gold Project. A report prepared by Azimuth Consulting Group Inc., Vancouver for Cumberland Resources Ltd. October, 2005.

Azimuth. 2003. Baseline water and sediment quality data for the Meadowbank Gold Project, March 2003.

Guidance Documents

Azimuth. 2022b. Core Receiving Environment Monitoring Program (CREMP): 2022 Plan Update. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. April, 2022.

Agnico Eagle Mines Ltd. 2021. Whale Tail Pit Expansion Project – Adaptive Management Plan. Report prepared by Agnico Eagle Mines Limited – Meadowbank Division. July, 2021.

Agnico Eagle Mines Ltd. 2019. Whale Tail 2018 Mercury monitoring report. Report prepared by Agnico Eagle Mines Limited – Meadowbank Division. March 2019.

Azimuth. 2020b. Aquatic Effects Management Program (AEMP), Meadowbank Mine. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March, 2020.

Azimuth. 2018b. Core Receiving Environment Monitoring Program (CREMP): 2015 Plan Update – Whale Tail Pit Addendum. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. December, 2018.

Azimuth. 2015a. Aquatic Effects Management Program (AEMP), Meadowbank Mine. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. November, 2015.

Azimuth. 2015b. Core Receiving Environment Monitoring Program (CREMP): 2015 Plan Update. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. November, 2015.

Azimuth. 2012c. Aquatic Effects Management Program (AEMP), Meadowbank Mine. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. December, 2012.

Azimuth. 2012d. Core Receiving Environment Monitoring Program (CREMP): Design Document 2012, Meadowbank Mine. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. December, 2012.

Azimuth. 2010d. Core Receiving Environment Monitoring Program (CREMP): 2010 Plan Update, Meadowbank Gold Project. Report prepared by Azimuth Consulting Group Inc., Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. June 2010.

Azimuth. 2005a. Aquatic Effects Management Program (AEMP) – Meadowbank Gold Project. 2005. A report prepared by Azimuth Consulting Group, Vancouver for Cumberland Resources Ltd. October, 2005.

Other References

ADEC (Alaska Department of Environmental Conservation). 2012. Water Quality Standards. 18 AAC 70. Amended as of April 8, 2012. Juneau, AK, USA. Available at: Link. Accessed March 2014.

Agnico Eagle Mined Ltd. (Agnico Eagle). 2018. Technical Report on the Mineral Resources and Mineral Reserves at Meadowbank Gold Complex including the Amaruq Satellite Mine Development, Nunavut, Canada as at December 31, 2017.

Agnico Eagle. 2016. Whale Tail Pit Project - Meadowbank Mine Final Environmental Impact Statement and Type A Water Licence Amendments. Amendment/Reconsideration of the Project Certificate (No. 004/ File No. 03MN107) and Amendment to the Type A Water Licence (No. 2AM-MEA1525). Submitted to the Nunavut Impact Review Board. June 2016.

Agnico Eagle. 2011. Aquatic Effects Monitoring Program – Targeted Study: Dike Construction Monitoring 2010, Meadowbank Mine. Report prepared by Agnico Eagle Mines Ltd., Baker Lake, NU.

Alstad, N.E., Skardal, L. and Hessen, D.O. 1999. The effect of calcium concentration on the calcification of Daphnia magna. Limnology and Oceanography, 44(8), pp.2011-2017.

Arnott, S.E., Azan, S.S.E. and Ross, A.J. 2017. Calcium decline reduces population growth rates of zooplankton in field mesocosms. Canadian Journal of Zoology, 95(5), pp.323-333.

British Columbia Ministry of Environment (BC MOE). 2017. British Columbia Working Water Quality Guidelines: Aquatic Life, Wildlife & Agriculture.

British Columbia Ministry of Environment (BC MOE). 2016. Water and Air Baseline Monitoring Guidance Document for Mine Proponents and Operators.

British Columbia Ministry of Environment (BC MOE). 1998. Ambient Water Quality Criteria for Organic Carbon in British Columbia. Victoria BC.

Burnham, K.P. and Anderson, D.R., 2002. A practical information-theoretic approach. Model selection and multimodel inference, 2, pp.70-71.

Campbell, M. W., J. G. Shaw, and C.A. Blyth. 2012. Kivalliq Ecological Land Classification Map Atlas: a wildlife perspective. Government of Nunavut, Department of Environment. Technical Report Series #1-2012. 274 pp.

Calvert, S.E. and Pedersen, T.F. 1996. Sedimentary geochemistry of manganese; implications for the environment of formation of manganiferous black shales. Economic Geology, 91(1), pp.36-47.

CCME. 2019. Canadian Water Quality Guidelines for the Protection of Aquatic Life. In: Canadian environmental quality guidelines, 1999. Canadian Council of Ministers of the Environment, Winnipeg, MB.

CCME. 2018. Canadian water quality guidelines for the protection of aquatic life: zinc. In: Canadian environmental quality guidelines, 1999. Canadian Council of Ministers of the Environment, Winnipeg, MB.

CCME. 2010. Canadian Water Quality Guidelines for the Protection of Aquatic Life: Ammonia. In: Canadian environmental quality guidelines, 1999. Canadian Council of Ministers of the Environment, Winnipeg, MB.

CCME. 2004. Canadian Water Quality Guidelines for the Protection of Aquatic Life: Phosphorus: Canadian Guidance Framework for the Management of Freshwater Systems. Canadian Environmental Quality Guidelines, 2004. Winnipeg, MB, Canada.

CCME. 2002. Canadian Sediment Quality Guidelines for the Protection of Freshwater Aquatic Life, 1999, updated 2002.

CCME. 1999. Polycyclic Aromatic Hydrocarbons (PAHs). Canadian Sediment Quality Guidelines for the Protection of Freshwater Aquatic Life.

CCME. 1995. Protocol for the derivation of Canadian sediment quality guidelines for the protection of aquatic life. CCME EPC-98E. Prepared by Environment Canada, Guidelines Division, Technical Secretariat of the CCME Task Group on Water Quality Guidelines, Ottawa. [Reprinted in Canadian environmental quality guidelines, Chapter 6, Canadian Council of Ministers of the Environment, 1999, Winnipeg.]

Cumberland Resources Ltd. (Cumberland). 2005. Meadowbank Gold Project. Final Environmental Impact Statement. November 2005.

De Schamphelaire, L., Rabaey, K., Boon, N., Verstraete, W. and Boeckx, P. 2007. Minireview: The potential of enhanced manganese redox cycling for sediment oxidation. Geomicrobiology Journal, 24(7-8), pp.547-558.

Doig, L., and K. Liber. 2000. Dialysis minipeeper for measuring porewater metal concentrations in laboratory sediment toxicity and bioavailability tests. Environ. Toxicol. Chem. 19(12): 2882-2889.

Doyle, C.J., F. Pablo, R.P. Lim, and R.V. Hyne. 2003. Assessment of metal toxicity in sediment pore water from Lake Macquarie, Australia. Arch Environ Contam Toxicol, 44(3), pp.0343-0350.

Environment Canada. 2012. Metal Mining Environmental Effects Monitoring Technical Guidance Document. Can be viewed at Environment Canada's website: Link

Environment Canada. 1997. Biological test method: Test for survival and growth in sediment and water using the larvae of freshwater midges (*Chironomus tentans* and *Chironomus riparius*). EPS 1/RM/32, Second Edition, December 1997. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 131 pp.

Environment Canada. 2013. Biological test method: Test for survival and growth in sediment and water using the freshwater amphipod, *Hyalella azteca*. EPS 1/RM/33, Second Edition, January 2013. Environment Canada, Method Development and Application Section, Environmental Technology Centre, Ottawa, ON. 150 pp.

EVS Environment Consultants. 1999. Fisheries evaluation of candidate reference lakes, Meadowbank Gold Project Nunavut, 1998. A report prepared for Cumberland Resources Ltd., Vancouver BC by EVS Environment Consultants, North Vancouver, April 1999. 60 pp.

Golder. 2020. Predicted 1% Water Treatment Plant Effluent Dilution Location in Mammoth Lake. Technical Memorandum prepared by Golder Associates Ltd., Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. April 2020.

Golder Associates Ltd. 2019. Whale Tail Pit Expansion Project. Mine Site and Downstream Receiving Water Quality Predictions. Report Submitted to Agnico Eagle Mines Ltd, Meadowbank Division, May 2019.

Golder. 2018. Final Environmental Impact Statement (FEIS) Addendum. Whale Tail Pit – Expansion Project. Submitted to Nunavut Impact Review Board. November 2018.

Holmgren, S.K. 1984. Experimental lake fertilization in the Kuokkel area, northern Sweden: phytoplankton biomass and algal composition in natural and fertilized subarctic lakes. International Revue der Gesamten Hydrobiologie 69: 781–817.

Hutchinson, N.J., Hadley, K.R., Nesbitt, R.A., and Manzo, L. 2018. Establishing baseline limnological conditions in Baker Lake, Nunavut. Polar Knowledge: Aqhaliat 2018, Polar Knowledge Canada. Available online (Link).

Johnson, L. 1965. The salinity of Baker Lake, NWT, Canada. Journal of the Fisheries Board of Canada, 22(1), 239-241.

Kalff, J., H.J. Kling, S.H. Holmgren, and H.E. Welch. 1975. Phytoplankton, phytoplankton growth and biomass cycles in an unpolluted and in a polluted polar lake. Verh. int. Verein. Limnol. 19: 487–495.

Kasprzak, P., J. Padisák, R. Koschel, L. Krienitz, and F. Gervais. 2008. Chlorophyll a concentration across a trophic gradient of lakes: An estimator of phytoplankton biomass? Limnologica. 38: 327–338.

Lasier, P.J., Winger, P.V. and Bogenrieder, K.J. 2000. Toxicity of manganese to Ceriodaphnia dubia and Hyalella azteca. Archives of Environmental Contamination and Toxicology, 38(3), pp.298-304.

McKee P., R. Watters, and D.L. Lush. 1989. Aquatic Baseline Conditions – Kiggavik Project Area. Environmental Assessment – Supporting Document No. 4. Report prepared by Beak Consultants Limited for Urangesellschaft Canada Limited. December 1989.

MDEQ [Michigan Department of Environmental Quality]. 2008. Aquatic Life Fact Sheet for Lithium (Aquatic Life – acute concentration). https://www.epa.gov/glclearinghouse/aquatic-life-fact-sheet-lithium-aquatic-life-acute-concentration-michigan. Accessed 06\02\2023.

Natural Resources Canada (NRC). 2004. Lakes. The Atlas of Canada (2004). 1 November 2006.

Nguyen HT, Lee YM, Hong JK, et al. 2022. Climate warming-driven changes in the flux of dissolved organic matter and its effects on bacterial communities in the Arctic Ocean: A review. Front. Mar. Sci. 9:968583.

Nunami Jacques Whitford Limited (Nunami). 2007. Report of the Environmental Study and Evaluation of the Water and Sewage System, Qamani'tuaq, Nunavut. Prepared for the Department of Community and Government Services, Government of Nunavut, Rankin Inlet, NU. October 15, 2007.

Ogbego, F.E., M.S. Evans, M.J. Waiser, V.P. Tumber and J.J. Keating. 2009. Nutrient limitation of phytoplankton growth in Arctic lakes of the lower Mackenzie River Basin, northern Canada. Can J Fish Aquat Sci 66: 247-260.

Portt and Associates (C. Portt and Associates) and Kilgour & Associates Ltd. 2021. Environmental Effects Monitoring: Whale Tail Pit Cycle 1 Biological Study Interpretive Report. Report submitted to Agnico Eagle Mines Ltd.: Meadowbank Division, Val d'Or, Québec. July 2021.

Portt and Associates (C. Portt and Associates). 2015a. Amaruq Lakes 2014 Aquatic Field Investigations. Report submitted to Agnico Eagle Mines Ltd.: Meadowbank Division, Val d'Or, Québec. January 2015.

Pueyo, M., Rauret, G., Lück, D., Yli-Halla, M., Muntau, H., Quevauviller, P., & López-Sánchez, J. F. 2001. Certification of the extractable contents of Cd, Cr, Cu, Ni, Pb and Zn in a freshwater sediment following a collaboratively tested and optimised three-step sequential extraction procedure. Journal of Environmental Monitoring, 3(2), 243-250.

Science Advisory Board (SAB) for Contaminated Sites in British Columbia. 2008. Guidance for Detailed Ecological Risk Assessments (DERA) in British Columbia. British Columbia, Canada.

Shuttleworth, S.M., Davison, W. and Hamilton-Taylor, J. 1999. Two-dimensional and fine structure in the concentrations of iron and manganese in sediment pore-waters. Environmental science & technology, 33(23), pp.4169-4175.

Smith, R. 2013. Integrated Water Quality Report 2012. Monaghan and Louth. Published by the Environmental Protection Agency, Ireland. Edited by Ray Smith.

Stolpmann L, Coch C, Morgenstern A et al. 2021. First pan-Arctic assessment of dissolved organic carbon in permafrost-region lakes. Biogeosci 18:3917–3936.

Weber-Scannell, P.K and L.K. Duffy. 2007. Effects of Total Dissolved Solids on Aquatic Organisms: A Review of Literature and Recommendation for Salmonid Species. Amer. J. Environ. Sci. 3: 1-6.

Welch, H.E., J.A. Legault, and H.J. Kling. 1989. Phytoplankton, nutrients, and primary production in fertilized and natural lakes at Saqvaqjuac, N.W.T. Can. J. Fish. Aquat. Sci. 46: 90-107.

Wetzel, R.G. 1983. Limnology. W.B. Saunders Co. Toronto Ont. 743 pp.

WLWB. 2013. AEMP - Version 3.1 – Response Framework. Decision from Wek’èezhìi Land and Water Board Meeting of August 12, 2013. File W2009L2-0001 (Type “A”). Letter to Diavik Diamond Mine Inc., Yellowknife, NWT, Canada.

APPENDICES

APPENDIX A
QUALITY ASSURANCE / QUALITY CONTROL ASSESSMENT

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A.1 INTRODUCTION

A.1.1 Quality Assurance / Quality Control

The objective of quality assurance and quality control (QA/QC) was to assure that the chemical and biological data collected were representative of the material or populations being sampled, were of known quality, had sufficient laboratory precision to be highly repeatable, were properly documented, and were scientifically defensible. Data quality was assured throughout sample collection and analysis using specified standardized procedures, by employing laboratories that have been certified for all applicable methods, and by staffing the program with experienced technicians.

Quality assurance and quality control practices are briefly described here.

- *Quality Assurance* (QA) are the practices used to collect scientifically defensible samples meeting pre-defined data quality objectives (DQOs). For example, employing experienced field staff, standard operating procedures (SOPs), field data sheets, and certified laboratories.
- *Quality Control* (QC) are measures taken to verify that the specific DQOs are met.

The 2022 CREMP QA/QC program was completed at the Meadowbank, Baker Lake, and Whale Tail sampling areas. The QA/QC program is completed at each area to refine the sample procedures and QA/QC protocols and ensure consistency between Meadowbank and Whale Tail Environment teams. An overview of the QA/QC program for each component is provided below; refer to the *CREMP: 2022 Plan Update* (Azimuth, 2022) for a complete description.

The QA/QC results presented below for the 2022 CREMP program are summarized in **Section 3** of the main report.

Sample Integrity

The first step in the QC program involved documenting any issues with the sample submission. This step applies to all sampling components (e.g., water chemistry, sediment chemistry, phytoplankton, benthic invertebrates). The analytical laboratory used for water and sediment chemistry in 2022 was ALS Environmental who reported concerns surrounding sample submission as “Sample Integrity” issues in the Sample Receipt Confirmation (SRC) email after the samples were received. Plankton-R-Us Inc. (phytoplankton) and Zaranko Environmental Assessment Services (ZEAS; benthic invertebrates) also reported sample integrity concerns via email. For ALS reports, the results were 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 recommended hold time was exceeded prior to analysis. Sample integrity issues do not necessarily mean the data were unusable; rather, this information is meant to help the client make an informed decision on how to proceed with analysis and use the results.

Data Quality Objectives - Duplicates

Quality control results of the laboratory and field duplicates were assessed by measuring the relative percent difference (RPD) as a percentage between original and duplicate measurements. The RPD serves as a measure of precision by the laboratory and the magnitude of variability between original and field duplicate samples, respectively. The variability in field duplicates may be attributed to sampling procedures but may also be attributed to natural conditions (i.e., spatial heterogeneity in the sampling media). The equation used to calculate the RPD is:

$$RPD = \frac{(A - B)}{(\frac{A + B}{2})} x\ 100$$

where: A = analytical result; B = duplicate result.

Laboratory duplicate DQOs were parameter-specific and depended on the concentration in the sample. Field duplicate samples were collected for water and sediment chemistry, and phytoplankton. Laboratory duplicates were completed for water chemistry, sediment chemistry, phytoplankton, and benthic invertebrates. DQOs for the duplicate samples are discussed below.

The DQOs for field duplicates were 1.5X the laboratory RPDs unless no RPD was provided by the laboratory (e.g., for chlorophyll-a where the laboratory does not run duplicates) in which case the field duplicate DQO was set at 40% by default. The DQO approach for field duplicates was adopted for both water chemistry and sediment chemistry. Field DQOs were adjusted above laboratory RPD levels to reflect that field duplicates are inherently more variable compared to laboratory duplicates. This is partly because field duplicate samples are collected from a large sample volume (i.e., the lake or stream) as opposed to a small, well mixed sample volume (i.e., the single sample container in the laboratory). The Canadian Council of Ministers of the Environment (CCME) states that acceptance limits for field-based QC are broader than laboratory QC and are typically 1.5 to 2 times the laboratory QC limits (CCME, 2016).

As stated, RPD values may be positive or negative, and ideally should provide a mix of the two, clustered around zero. RPDs were not calculated when one of the samples (i.e., either A or B above) was below detection and the other was not. If an RPD value was outside the field duplicate DQO it was flagged for further review. When analyte concentrations were less than 10X the detection limit (DL) we expected a greater likelihood of not meeting the DQOs. Laboratory precision is reduced close to the DLs as smaller concentrations of analytes per volume tends to magnify variability between the original sample and the duplicate. These occurrences were still flagged, however, given the inherent analytical effects on precision, they were not weighted as heavily unless unusual RPD patterns were observed (e.g., relatively high percentage of RPD values not meeting DQOs or very high RPD values). Analyte concentrations that were greater than 10X DL and did not meet the DQOs were given more weight in the QA/QC assessment.

Phytoplankton DQOs did not change in 2022. The laboratory did not calculate RPD values though they did run duplicate samples. The DQOs for phytoplankton laboratory duplicates were less than ±25% RPD and for field duplicates were less than ±50% RPD.

There were no benthic invertebrate field duplicates and RPDs were not calculated for laboratory duplicates. For laboratory duplicates, ZEAS calculated the re-sort and re-count percent recovery (the difference between the original sorting and a second sorting from the same sample) with DQOs of 90% or better.

A.1.2 Overview

QA/QC procedures consisted of careful field collection and sample handling, collecting field duplicate samples and analyzing laboratory replicates and standard reference materials. A discussion of sample shipping and handling procedures is provided upfront, followed by a discussion of the results pertaining to the various components of the CREMP.

Sample Shipping and Handling

Sample shipping and handling concerns documented in previous CREMP reports have largely been rectified in recent years. The Meadowbank and Whale Tail Environment departments plan water sampling events to minimize the amount of time that samples are in transit between Site, Val d'Or, and ALS in Burnaby. The remote location of the mine will always present challenges with some analytes meeting recommended hold times but the effect of slightly exceeding hold times on the quality of the results is considered negligible. Correspondence with the laboratory regarding hold time exceedance has not led to establishing definitive benchmarks for data quality. ALS recommends using *professional judgement* when interpreting chemistry data for parameters that exceeded hold times for analysis.

The sample shipping and handling QA/QC for 2022 was comparable to 2021. There were a few discrepancies between samples submitted and the CoCs but most were rectified without impacting the analytical results. **Table A-1** summarizes the sample integrity observations (e.g., broken sample containers, mislabeled containers), the temperature in the shipping coolers upon arrival to the laboratory, and the parameters that exceeded their recommended hold times for analysis.

The target temperature for samples arriving at ALS is between 5°C and 10°C. The range of temperatures reported in 2022 was between 4°C in September to a high of 24°C in August. The range of temperatures was similar to past years and reflects the seasonal ambient temperatures. The effect on preserved samples is considered negligible, but for chlorophyll-a samples, the increase in temperature means samples may have arrived thawed. Keeping the chlorophyll-a samples frozen is a recurring challenge for this program given the logistics of shipping samples from Nunavut to Vancouver in a timely fashion.

There was only one broken container and one container that spilled due to the cap not being tightened properly in the water shipments from the 2022 sampling events. Given the large number of sample containers shipped during a CREMP cycle year, this represents a very small number of lost samples to breakage or spillage.

There were several incidents of chain of custody (CoC) discrepancies – mislabeled samples or samples either submitted and not included on the CoC or included on the CoC but not submitted. CoC discrepancies were identified and forwarded to CREMP project managers immediately after the laboratory received the samples. As such, these types of errors were often rectified shortly after ALS received the samples. The discrepancies are listed in **Table A-1**.

Recommended hold times were provided by the laboratory for analytes and water quality parameters. The times varied from a low of 0.25 days for pH to six months for metals. Hold times for water samples were routinely exceeded for alkalinity, turbidity, laboratory pH, nitrate, nitrite, total dissolved solids (TDS), total suspended solids (TSS), and dissolved orthophosphate (as P). Very occasionally hold times were exceeded for cyanides (free and total), total Kjeldahl nitrogen (TKN), ammonia, total mercury, and chlorophyll-a. Hold times for sediments were exceeded for pH, mercury, and methylmercury. Samples were generally shipped very soon after collection and though shipping from the Meadowbank Mine has improved in recent years, the distances and logistics make it impossible to meet short hold times. However, it is highly unlikely that results were affected for those parameters or analytes where hold times were not met in 2022.

A.2 SURFACE WATER

A.2.1 Field QA/QC Procedures

The standard QA procedures included thoroughly flushing the flexible tubing and pump to prevent cross-contamination between areas and thoroughly rinsing the sample containers with site water prior to sample collection. Field QC procedures included collecting and analyzing field duplicates, and three types of *blank* samples: travel blanks, de-ionized water (DI) blanks, and equipment blanks. Blank sample collection, particularly equipment blank samples, required careful planning, attention to detail, focus on the importance of cleanliness, and generally provided a good opportunity to assess QA procedures.

Blank samples were collected once per sample event, and were submitted *blind* to the laboratory to ensure they were treated the same as field collected samples during analysis. Results from both the equipment and travel blanks were examined for detectable concentrations of any of the parameters measured; no parameter in either blank should exceed laboratory method DLs. If an analyte was detected in a blank, the results for the batch of samples submitted with the blank were compared to the measured concentration in the blank. Results that were less than 5-times the detected analyte concentration in the equipment blank were flagged to examine the potential for cross-contamination to affect the results. Results carried forward in the QA/QC assessment received either a cautionary flag or an unreliable flag. Cautionary flags were applied to sample results if the analyte was detected in the blank but the effect of potential cross-contamination was considered minor (e.g., the concentration in the equipment blank was a small percentage of the concentration in the samples). Unreliable data flags were applied to water quality results that were unrepresentative of the water quality (e.g., elevated metals concentrations in a sample that were not observed in other replicate sample(s) collected during the same event). The water chemistry data with *cautionary* and *unreliable* data flags were provided in **Appendix B** for clarity on which results should be examined further and/or excluded from decision making.

A.2.2 Laboratory QC Procedures

There were four main components of the water chemistry laboratory QC program used to assess analytical precision, bias, and completeness:

- Laboratory Duplicate – duplicates provided insight into the precision of laboratory analyses. The laboratory randomly chose samples to re-run as duplicates. Duplicate aliquots were taken from the same sample and run through the entire laboratory analytical process. The difference between the concentrations in the two samples is a measure of the variability associated with duplicate analyses of the same sample in the laboratory.
- Method Blank (MB) – samples were analyzed to assess background interference or contamination that existed in the analytical system that could lead to elevated concentrations or false positive data. An analyte-free matrix, such as de-ionized water, was subjected to the entire analytical process to demonstrate that the analytical system itself did not introduce contamination.
- Matrix Spike (MS) / Matrix Duplicate (MD) – a known amount of a compound that is chemically similar to the target analyte, was 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) – this is a well-characterized sample of known analytes and concentrations. 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 was compared to established control limits and helped determine whether the methodology

was in control and whether the laboratory could make accurate and precise measurements at the required reporting limit.

Laboratory QC results are included in each laboratory report for CREMP water quality samples.

A.2.3 Water Chemistry

Field duplicates, laboratory duplicates, and blank samples were analyzed as part of the QA/QC program in each of the five sampling events in 2022. The blank results and field duplicate samples have been fully integrated for all CREMP study areas. Similar to last year, in order to better identify potential QA/QC weakness, each team (i.e., Meadowbank Environment and Whale Tail Environment) took turns collecting blank samples and the field duplicate samples were split evenly between the Meadowbank/Baker Lake study areas and the Whale Tail study area. This approach ensured both teams were familiar with the QA/QC process and better appreciated the nuances of sample collection and handling methods. Blank sample collection, particularly equipment blank samples, required careful planning, attention to detail, focus on the importance of cleanliness, and generally provided a good opportunity to assess QA procedures.

Results of the QA/QC analysis are discussed below, along with a discussion on the implications of the QA/QC assessment on the 2022 sample results.

Travel Blanks

Travel blanks should be included in sample container shipments, come directly from the analytical laboratory and be stored in a cool place (e.g., refrigerator). Travel blanks were submitted for all sampling events. Except for a detectable concentration of total ammonia as N in the July travel blank, there were no detectable concentrations of analytes.

Travel blank results are summarized in **Table A-2** and complete results are provided in **Table A-4**.

De-ionized Blanks

The goal of collecting de-ionized (DI) blanks was to test the quality of the DI water batch and variability in laboratory analytical methods. DI blanks with the full suite of analyses were submitted for all 2022 sample events; results are reported in **Table A-4**.

In the DI blanks, there were no detectable concentrations of any analytes in March, May, July, or August. In September, ammonia as N and dissolved molybdenum were detected above DLs in the DI blank but not in the equipment blank. None of the parameters were detected above 10X DL.

Equipment Blanks

Equipment blanks (EBs) represent a good opportunity to assess not only the water sampling equipment but also the QA procedures employed by the sampling teams. Collecting these samples require careful planning and close attention to detail in the sample collection methods which are updated yearly but underwent a notable review in 2015 (Azimuth, 2015).

Several analytes were detected for at least one of the EBs submitted in 2022; results are provided in **Table A-4**. In general, results were very good for most events and were comparable to past years:

- In March, conductivity, total and bicarbonate alkalinity, chloride, nitrate, and total lead were detected in the EB sample concentrations < 10X DL. No other parameters were detected in EB collected in the March sampling event.
- In May, total aluminum was detected in the EB sample at a concentration slightly above the DL.
- In July, total aluminum and total manganese were detected in the EB sample at concentrations slightly above the DL.
- In August, total and bicarbonate alkalinity, and total lead were detected in the EB sample at concentrations slightly above the DL.
- In September, total aluminum, magnesium, and manganese were detected in the EB sample at concentrations slightly above the DL.

The implications of possible cross-contamination on the interpretation of the water quality data from the same event was considered inconsequential for all sampling events. Of the analytes that were detected in EBs in 2022, all concentrations were <10X DL; therefore, no additional scrutiny is warranted.

Field Duplicates

Field duplicate analysis combined results for the Meadowbank, Baker Lake and Whale Tail study areas. The target frequency of collecting sample duplicates was approximately 10% of the total number of samples collected. In 2022, there was a combined total of 20 duplicates collected between the Meadowbank Lakes, Baker Lake, and the Whale Tail Lakes, corresponding to approximately 14% of the total number of water samples (n=144). Across all CREMP study areas, four field duplicates were collected in each sampling event. The field duplicate assessment is provided in **Table A-5**.

As mentioned in **Section A.1.1**, the DQOs for field duplicates were 1.5X the laboratory RPD for each analyte unless no RPD was available in which case a default 40% was used. The laboratory RPDs for water chemistry for most analytes is 20% therefore the DQOs for field duplicate were less than ±30%. In 2022, there were only 30 RPDs that did not meet DQOs out of the 2410 RPDs calculated[1], corresponding to approximately 1% of the RPDs. Of the 30 RPDs that did not meet DQOs, 19 of them were for concentrations >10X DL (see **Table A-5**).

Table A-6 is provided below to show RPDs by analyte that did not meet their DQOs for each month. A shaded cell indicates that concentrations were >10X DL, in addition to exceeding their DQOs. The RPDs that did not meet DQOs showed no pattern.

Overall, approximately 1% of field duplicate RPDs did not meet DQOs, suggesting that sample collection and sample handling in 2022 have maintained a high standard. Twenty RPDs did not meet the DQOs when an analyte concentration was > 10X DL. This was higher than previous years and were attributed mostly to one sample duplicate collected in September. The concentrations in the field duplicate for several total metals were as much as two magnitudes higher than what was reported in the sample. This is likely due to cross-contamination in the field duplicate since the two samples collected in the same lake during the September sampling event had very similar results.

Laboratory QC Samples

ALS provided a thorough account of their QA assessment in each certificate of analysis (COA) report that was issued[2]. These results are provided in **Table A-3**. The various components of the QA assessment are provided to help make informed decisions when interpreting the data. The QA program was comprised of four main elements:

- **Laboratory Duplicates** – the laboratory DQO for most parameters was an RPD of less than 20%. All laboratory duplicates met the DQOs for water chemistry in 2022, except one duplicate in

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[1] Reporting an analyte does not necessarily calculate an RPD. See **Section A.1.2** for a description on how RPD values are not calculated when either the parent sample or the duplicate are below detection limits.

[2] 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 CREMP samples. In general, this does not impact the assessment of laboratory QA; however, in some instances, particularly for sediment laboratory duplicates, data qualifiers in the COA related to sample heterogeneity may not relate to CREMP 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.

September. This corresponds to fewer laboratory duplicates that did not meet DQOs compared to the previous year.

- **Method blanks (MB)** – the MB was a blank matrix sample that was taken through the entire analytical procedure to test variability in the analytical method and report any bias in the analysis. MB results were equal to the limit of reporting (LOR or DL[3] as termed here). MB qualifiers were either:
  - "B" – MB exceeded ALS DQO. Associated sample results which were less than DL or greater than 5X blank levels were considered reliable.
  - "MB-LOR" – MB exceeded ALS DQO. DLs were adjusted for samples with positive hits below 5x blank levels.
- For most sample analyses there were no flags or very few flags (e.g., one or two analytes in one sample may have been flagged for B) in the method blank results. However, the limited number of cases with DQO flags for MB samples were nonetheless reviewed; the results did not affect the interpretation of the water quality data.
- **Matrix Spike (MS)** – MS recovery is periodically flagged in the QC assessment due to high concentrations of the analyte in the sample. These instances are generally rare, and typically associated with parameters such as major cations (e.g., magnesium) or certain metals with detected results above the DL (e.g., strontium in 2020).
- **Laboratory Control Samples (LCS) / Certified Reference Material (CRM) / Internal Reference Material (IRM)** – reference material analysis met the ALS DQOs for all samples analyzed as part of the 2022 program.

Part of the QA assessment involved comparing the paired sampling events collected at each station within a given event to confirm the data were representative of current conditions and to determine whether the data required additional review. First, the dissolved and total concentrations for a given parameter were compared for each location. Samples where the dissolved concentrations were greater than the total with an RPD of more than 30% were reviewed further. The second analysis compared the concentrations of parameters from the paired samples located within each water body (lake or basin). Parameters for which the difference between the paired intra-lake samples was greater than a factor of

[3] The DL is sometimes referred to as the MDL (method detection limit) in this appendix and the main report.

5 (or factor of 10 in cases where at least one of the samples was within a factor of 10 of the DL) were flagged for further review. The results that required additional assessment are reported in each of the QC screening events (see **Appendix A1**). The sample review resulted in a few results being flagged and removed from formal analysis. For transparency, the sample results that were removed from formal analysis are retained in the water chemistry tables provided in **Appendix B**.

Water Chemistry QA/QC Summary

The field and laboratory QA/QC results for the 2022 water chemistry were acceptable and comparable to the 2021 results:

Sample Integrity – a similar number of lost samples from breakage or mislabeling were reported in 2022 compared to 2021. Sample temperatures received at the laboratory were variable depending on the season and reflected the challenges with shipping from a remote mine site. Likewise, hold time exceedances for parameters and analytes with short hold times were unavoidable but were not considered likely to impact data analysis and interpretation. The detection limit for chromium was adjusted by the laboratory from 0.0001 to 0.0005 mg/L in May 2021 and for beryllium in 2018 from 0.00002 to 0.00001 mg/L due to method re-validation (Pers. Comm. Brent Mack, ALS November 28, 2022). For both parameters, the revised MDLs still meet the lowest available Canadian quality guidelines (0.1 µg/L for beryllium, 0.5 µg/L for chromium; Pers. Comm. Brent Mack, ALS November 28, 2022). Beryllium has consistently remained below MDL since baseline and is not a parameter of concern for the Site. Furthermore, the revised MDL is below the trigger and threshold values for the Meadowbank, Whale Tail, and Baker Lake study areas. As such, the revised MDL is sufficient to detect changes in concentrations of beryllium at the Site. There is no lower MDL analysis available for beryllium. For chromium, concentrations above MDL have been detected during operations and the revised MDL is higher than those detected concentrations. Therefore, in 2023, low-level chromium (MDL = 0.1 µg/L) will be analyzed in order to ensure any potential changes in chromium concentrations due to mining activities are detected. The 2022 results for chromium and beryllium were less than the revised MDLs.

Blanks – blank results in 2022 indicated reliable sample handling and that cross-contamination related to sampling equipment was unlikely. Very few analytes were detected in blank samples from each event.

The implication of possible cross-contamination on interpretation of the 2022 water quality data was evaluated by comparing the sample concentrations with the equipment blank results from the same event. Sample results in the complete datasets were given a cautionary flag using underlining (e.g., <u>0.001</u>) to indicate that the measured concentration was less than 5-times the concentration detected in the equipment blank sample. Several analytes were occasionally given cautionary flags, including aluminum, copper, and manganese. None of the results with cautionary flags exceeded the trigger.

Sample results, including results with cautionary flags, are reported in **Appendix B1** (Meadowbank), **Appendix B2** (Whale Tail), and **Appendix B3** (Baker Lake).

Despite the assigned cautionary flags, potential cross-contamination is considered unlikely to bias interpretation of the 2022 water quality analysis.

Field Duplicates – overall, the field duplicate results were very good with only 1% of all the calculated RPDs not meeting their DQOs in 2022. As previously mentioned, there was one field duplicate collected in September with metals concentrations much higher than concentrations in the sample (NEM-75) and compared to the paired sample collected in Nemo Lake (NEM-76). The results for this field duplicate sample were likely due to cross-contamination, however, the field samples collected during the same sampling event do not appear to be affected.

Laboratory QC Assessment – the laboratory QC assessment completed by ALS indicated the 2022 water quality data were typically within the established DQOs. In the few instances where a DQO was exceeded, the laboratory concluded the results were reliable and fit for use in the water quality assessment.

A.3 SEDIMENT

Field duplicates, and filter swipe samples were analyzed as part of the QA/QC program in the August sediment sampling event. Results of the QA/QC analysis are discussed below, along with a discussion on the implications of the QA/QC assessment on the sample results from 2022. In 2022, grab samples collected from INUG, PDL, and A76 had high moisture content which resulted in there not being enough sediment for grain size and TOC analysis. Grab samples are planned at these locations again in 2023 along with sediment coring, therefore, grain size and TOC analyses will be completed in 2023. Additional sediment will be collected at each location to avoid this from happening in the future.

A.3.1 Field QA/QC Procedures

Field QA consisted of taking care between sampling areas by rinsing and cleaning the sampling gear for sediment grabs (Petite Ponar grab, stainless steel bowls and spoons) using site water and phosphate-free cleaning detergent, to avoid the possibility of cross-contamination. Field QC measures included collecting and analyzing field duplicates and filter swipes.

A filter swipe sample consisted of an ashless filter (QA/QC Filter) that was wiped over the pre-cleaned stainless-steel bowl and spoon and Petite Ponar at two sampling areas to assess the cleaning procedures. The significance of any metal detected on this filter was evaluated by comparing the detected amount on the filter to the minimum amount measured in the sediment samples. Where comparisons were required, the concentration of metals originating from any sampling equipment was estimated by dividing the amount detected on the filter (weight) by the surface area of two Petite Ponar grab samplers (assuming a thickness of 3 cm was collected from each) multiplied by the density of sediment (assumed to be 2 g/cm^3).

A.3.2 Laboratory QC Procedures

Laboratory duplicates were analyzed for sediment chemistry parameters similar to water chemistry parameters. The full list of laboratory DQOs for each parameter are presented in the standard operating procedure (SOP) appended to the *CREMP 2022 Plan Update* (Azimuth, 2022).

A.3.3 Sediment Chemistry

Filter Swipes

Filter swipes were collected for various pieces of the sampling gear to quantify potential metals cross-contamination for grab samples. Ashless filters were wiped on the various sampling gear including the stainless-steel spoons and bowls, and the Petite Ponar, and analyzed for metals (µg/filter). The ashless filters themselves can sometimes pose a problem if they contain any trace metals. For example, in 2017 Whatman™ glass microfiber filters (47 mm) were used as swipe material. These filters were made entirely of borosilicate glass and were touted as “the industry standard for high purity filtration”; however, detectable amounts of copper, iron, magnesium, sodium, and zinc were found on the blank filters as well as the equipment swipes of the sampling equipment. A new filter swipe product was used in 2018, which was an improvement from the prior year, and has been used in each CREMP sampling event since 2018.

Several analytes were detected on the grab equipment filter swipes including: aluminum, calcium, chromium, manganese, nickel, titanium, and zinc. All detectable analytes were at concentrations <10X DL, except for chromium, and zinc which were > 10X DL (**Table A-7**). When comparing the amount of each metal on the filters to the concentration in the sediment grab samples, the potential percent contribution from the swipe around 0.02% for zinc and chromium. For all the other detected analytes, the concentrations corresponded to well below 0.01% of the concentrations present in the sediment grabs. The QA results from 2022 show the potential for cross-contamination to affect the sediment chemistry results is negligible.

Field Duplicates

Seven grab sample field duplicates were collected in 2022 for general chemistry (moisture, pH, particle size, TOC, and metals). Additionally, two composite field duplicates were collected for moisture content, hydrocarbon and PAH chemistry. The field duplicates for grab samples are provided in **Table A-8** (particle size, TOC, and metals) and **Table A-9** (hydrocarbons and PAHs). The DQOs for sediment samples are outlined in **Section A.1.1**. Generally, the RPD limits were 1.5 times the laboratory RPDs unless no RPD was provided in which case a default ±40% was applied. For grab samples, RPDs are also calculated on particle size and moisture content where default DQOs of 40% and 30% were applied.

In 2022, all DQOs for sediment grabs were met except for particle size (clay < 0.004mm) at WAL and methylmercury at MAM. For the composite sample duplicates, all RPDs met the DQOs for hydrocarbon/PAHs in sediment. Overall, field duplicate results indicate good field collection methods and a high degree of replicability in sampling.

Laboratory QC Samples

Laboratory QC for sediment samples included laboratory duplicates, method blanks, matrix spikes, and reference material. The summary for the laboratory QC is provided in **Table A-3**.

No qualifiers were identified for the laboratory QC results indicating a high degree of precision for the laboratory analysis and that laboratory processing and analytical methods were consistent between sub-samples. Detection limits were adjusted for PAHs due to high moisture content in the composite samples.

A.4 PHYTOPLANKTON

The phytoplankton QA/QC assessment for 2022 was combined for the Meadowbank, Baker Lake and the Whale Tail study areas. Four field duplicate samples were collected for each sampling event, however, samples from the May event were archived as per the 2022 CREMP Plan Update (Azimuth, 2022). The field duplicates and laboratory QC duplicates were analyzed for RPDs for total density and total biomass between the original sample and the duplicate. 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. Thus, we evaluate the quality of these data based on total density and total biomass both for field and laboratory duplicates.

Results of the RPD analysis for all these parameters are presented in **Table A-10** (field) and **Table A-11** (laboratory) and are discussed below.

Field Duplicates

Field duplicates were collected for phytoplankton during each sampling event (i.e., monthly) alongside water sample duplicate collection and were taken in order to assess sampling variability and sample homogeneity. A RPD of 50% for total density and biomass concentrations was considered acceptable.

The DQOs for phytoplankton field duplicates were ±50% RPD. None of the RPDs for total biomass or total density exceeded the DQOs indicating very good replicability in sample collection.

Laboratory Duplicates

As a measure of laboratory QA/QC on the enumeration method, replicate counts were performed on 10% of the samples. Replicate samples were chosen at random and processed at different times from the original analysis to reduce biases. The laboratory replicate was a new aliquot (10 mL) from the sample jar and was counted from the start in the same manner as the original aliquot (10 mL) taken from the jar. A RPD of 25% for total density and biomass was considered acceptable for laboratory replicates.

The DQOs for laboratory duplicates for phytoplankton are ±25% RPD. In 2022, all laboratory RPDs for total density and total biomass met the DQOs.

Phytoplankton QA/QC for both field and laboratory components in 2022 was good and overall results of the QA/QC analysis were similar to 2021. This indicates very good replicability and sample handling in the field and in the laboratory.

A.5 BENTHIC INVERTEBRATES

Standard procedures were used to collect phytoplankton and benthic invertebrate samples (Azimuth, 2022). Sampling gear was thoroughly rinsed between sampling areas to ensure that there was no inadvertent introduction (i.e., cross-contamination) of biota from one area to another.

A.5.1.1 Field QA/QC

Field replicates (5 per area) were collected for benthic invertebrates to determine natural variability and heterogeneity. Replicates were collected at least 20 m apart from one another within the defined sampling areas.

A.5.1.2 Laboratory QC

ZEAS re-sorted and re-counted approximately 10% of the samples, targeting greater than 90% recovery between the original and re-sorted sample.

No field duplicate samples were collected for benthic invertebrates. Laboratory replicate counts were performed on approximately 10% of all samples. Replicate samples were chosen at random and processed at different times from the original analysis to reduce bias. Percent recovery was above 95% in all re-sorted samples, with an average percent recovery of 95.7% (**Table A-12**, **Table A-13**). These results suggest that the majority of individual organisms are recovered by the taxonomist during enumeration. As in previous years, the reference collection of benthic taxa for this project has been maintained.

There were no QA/QC concerns for benthic invertebrates in 2022.

A.6 REFERENCES

Azimuth. 2022. Core Receiving Environment Monitoring Program (CREMP): 2022 Plan Update. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. April, 2022.

Azimuth. 2015. Core Receiving Environment Monitoring Program (CREMP): 2015 Plan Update. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. November, 2015.

Canadian Council of Ministers of the Environment (CCME). 2016. Guidance Manual for Environmental Site Characterization in Support of Environmental and Human Health Risk Assessment. PN 1557.

TABLES

Table A-1. Sample submission and integrity QA/QC summary for the water and phytoplankton for all CREMP study areas, 2022.

Event	Lab ID(s)	Parameters Measured	Sample Integrity Observations	Temperature (°C)	Hold-time Exceedances
March	VA22A4994 VA22A6100 VA22A6101 VA22A6102 VA22A5201 VA22A5756	All parameters	Arsenic analysis box empty on CoC, assigned analysis based on containers received. Sample "March EB": One of the unpreserved water bottles was received empty due to the cap not being screwed on properly. Bottle deleted from sample. Unclear if LK and PDL samples are to be reported together or separately. Received March-TB sample, analysis will be added as per bottles received.	9, 10, 13	pH, TSS, TDS, TKN, alkalinity, turbidity, D. O-PO_4, ammonia, Nitrate, Nitrite, free cyanide, and chl-a. See lab reports.
May	VA22B0586 VA22B0431 VA22B0666 VA22B1268	All parameters	D-Hg for sample DS1-59 broken in transit. Analysis conducted from plastic dissolved metal bottle provided and data qualified. Chl-a filter not received for TB sample, analysis will not be reported. For all the samples chl-a, containers are not received at laboratory, but requested on CoC / analytical request form. Analysis deleted. For samples May DUP-1 and May DUP-2 received bottles for cyanide at laboratory but analysis were not requested for them on CoC. Containers are on hold. Sample INUG-140 not received at Lab but listed on CoC. Analysis to be deleted.	17, 18, 19	pH, turbidity, TSS, TDS, alkalinity, D. O-PO_4, Nitrate, Nitrite, total and free cyanide. See lab reports.
July	VA22B5784 VA22B7054 VA22B5785 VA22B6388	All parameters	Sample 7 "July DI-1", two nutrients bottles sent to lab, but not marked as either total or dissolved. Subsample will be taken for nutrients. Filtration status not marked on mercury vials. Analyses will run from metals bottles. Sample 7 "July-DI-1" arsenic bottle was received, but not listed on CoC. Analysis will run. Turn-Around-Time updated to "Regular" as per Project Manager.	18, 19, 21	pH, turbidity, TSS, TDS, D. O-PO_4, Nitrate, Nitrite. See lab reports.
August	VA22B9756 VA22B9759 VA22C0136 VA22C0250	All parameters	Sample 9: INUG-144; Water sample for total mercury analysis was not submitted in glass or PTFE container with HCl preservative since glass bottle broke in transit. Results may be biased low.	17, 19, 20, 22, 23, 24	pH, Turbidity, TSS, TDS, Nitrite, Nitrate, D. O-OP_4, T.Hg. See lab reports.
	VA22B9801 VA22C0074 VA22C0090	Sediment - All parameters	For all 'PDL', 'INUG', 'A76' samples (excluding the Comp samples) and Dup-3, received insufficient sample for testing requested. Samples all contain large amounts of water and very little sediment. Samples will be placed on hold. Limited sample was available for PSA (100g minimum is standard). Measurement Uncertainty for PSA results may be higher than usual.	18, 19, 20, 22	pH, T.Hg, MeHg
September	VA22C1353 VA22C1407 VA22C1655 VA22C1653 VA22C2788 VA22C2789	All parameters	Samples will be reported as per routine TAT, TAT error on CoC will be ignored as per historical. Sample A76-67, A76-68- D metals bottles. On CoC indicates that all D metal bottles are F/P but these 2 samples are marked as dissolved only and they are not preserved. Please contact account manager for filtration information. Bottles placed on hold. Sample September EB for CN and arsenic spec bottle listed on submitted CoC but not received. Analysis deleted for both bottles. Sample INUG-146 for CN bottle, login on hold: Sample received but not listed on submitted CoC.	4, 13.5, 16	pH, Turbidity, Nitrite, Nitrate, D. O-OP_4, TSS, TDS, T.Hg. See lab reports.

Acronyms

CoC = Chain of custody
CN = Cyanide
DI = De-ionized water blank
D. O-PO4 = Orthophosphate
EB = Equipment blank
PTFE = Polytetrafluoroethylene
TB = Travel blank
TDS = Total dissolved solids
TKN = Total Kjeldahl nitrogen
T.Hg = Total mercury
TOC = Total organic carbon
TSS = Total suspended solids

Table A-2. Field QA/QC summary for the water and phytoplankton at CREMP study areas, 2022.

Event	Field QC summary [1]			
	Travel Blank	DI Blank	Equipment Blank	Duplicates
March	None	None	6 results failed to meet DQOs	8 duplicate results failed to meet DQOs
May	None	None	1 result failed to meet DQO	1 duplicate result failed to meet DQO
July	1 result failed to meet DQO	None	2 results failed to meet DQOs	3 duplicate results failed to meet DQOs
August	None	None	3 results failed to meet DQOs	4 duplicate results failed to meet DQOs
September	None	2 results failed to meet DQOs	3 results failed to meet DQOs	15 duplicate results failed to meet DQOs[2]

Notes

1 - For more details on parameters that failed to meet DQOs, see lab reports and **Appendix A1**.
2. Likely one field duplicate sample was cross-contaminated resulting in a higher number of failed DQOs than usual. See **Table A-5** for more details.
N/A = No field QC sample collected during this sampling event.
DQO = Data quality objective.

Table A-3. Laboratory QC summary for the water, phytoplankton, and sediment for all CREMP study areas, 2022.

Event	Laboratory QC Summary [1]				
	Detection Limits	Duplicates	Method Blanks	Matrix Spike	LCS / CRM
March	None	None	None	1 result failed to meet DQO; see lab reports and **Appendix A1**.	None
May	None	None	3 results failed to meet DQOs; see lab reports and **Appendix A1**.	None	None
July	None	None	None	None	None
August	None	None	1 result failed to meet DQOs; see lab reports and **Appendix A1**.	None	None
August (Sediment)	None	None	None	None	None
September	None	1 result failed to meet DQOs; see lab reports and **Appendix A1**.	None	None	None

Notes

[1] Data qualifiers referring to laboratory QC methods (e.g., Method Blanks, Matrix Spikes, and LCS/CRM) are flagged here.

DLHM = Detection limit adjusted: Sample has high moisture content.

DQO = Data quality objectives.

LCS / CRM = laboratory control sample / certified reference material.

PAH = Polycyclic aromatic hydrocarbons.

Table A-4. Laboratory detection limits and blanks (travel, de-ionized, and equipment) for all CREMP study areas, 2022.

Month	March					May				July				August				September			
Blank (Travel, DI, or EB)	Detection Limits	Travel Blank	DI Blank	Equip. Blank	Equip. Blank	Detection Limits	Travel Blank	DI Blank	Equip. Blank	Detection Limits	Travel Blank	DI Blank	Equip. Blank	Detection Limits	Travel Blank	DI Blank	Equip. Blank	Detection Limits	Travel Blank	DI Blank	Equip. Blank
Date		12-Mar-2022	08-Mar-2022	20-Mar-2022	08-Mar-2022		06-May-2022	10-May-2022	10-May-2022		19-Jul-2022	19-Jul-2022	19-Jul-2022		21-Aug-2022	19-Aug-2022	21-Aug-2022		16-Sep-2022	16-Sep-2022	17-Sep-2022
ALS Sample ID		VA22A5756-005	VA22A5201-020	VA22A6100-005	VA22A5201-019		VA22B0431-009	VA22B0586-016	VA22B0586-015		VA22B7054-009	VA22B7054-007	VA22B7054-008		VA22C0136-042	VA22C0250-013	VA22C0136-041		VA22C2789-005	VA22C2789-006	VA22C2789-007
Physical Tests																					
Conductivity (µS/cm)	2.0	<2.0	<2.0	**2.1**	<2.0	2.0	<2.0	<2.0	<2.0	2.0	<2.0	<2.0	<2.0	2.0	<2.0	<2.0	<2.0	2.0	<2.0	<2.0	<2.0
Alkalinity, Total	1.0	<1.0	<1.0	**1.1**	<1.0	1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	**1**	1.0	<1.0	<1.0	**1.9**	1.0	<1.0	<1.0	<1.0
Alkalinity, Bicarbonate	1.0	<1.0	<1.0	**1.1**	<1.0	1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	**1**	1.0	<1.0	<1.0	**1.9**	1.0	<1.0	<1.0	<1.0
Alkalinity, Carbonate	1.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0
Alkalinity, Hydroxide	1.0	<1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0
Hardness (mg/L), Dissolved	0.60	<0.60	<0.60	<0.60	<0.60	0.60	-	<0.60	<0.60	0.60	-	<0.60	<0.60	0.60	<0.60	<0.60	<0.60	0.60	<0.60	<0.60	<0.60
Hardness (as $CaCO_3$), from total Ca/Mg	0.60	<0.60	<0.60	<0.60	<0.60	0.60	<0.60	<0.60	<0.60	0.60	-	<0.60	<0.60	0.60	<0.60	<0.60	<0.60	0.60	<0.60	<0.60	<0.60
pH (Laboratory)	0.10	5.7	5.5	5.9	5.5	0.10	5.3	5.3	5.1	0.10	5.6	5.6	5.7	0.10	5.5	5.6	5.6	0.10	5.5	5.5	5.5
Total Dissolved Solids (mg/L)	3.0	<3.0	<3.0	<3.0	<3.0	3.0	-	<3.0	<3.0	3.0	<3.0	<3.0	<3.0	3.0	<3.0	<3.0	<3.0	3.0	<3.0	<3.0	<3.0
Total Suspended Solids (mg/L)	1.0	<1.0	<1.0	<1.0	<1.0	1.0	-	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0	1.0	<1.0	<1.0	<1.0
Turbidity (NTU)	0.10	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.10
Anions and Nutrients (mg/L)																					
Total Kjeldahl Nitrogen	0.050	<0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050
Ammonia, Total (as N)	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0050	<0.0050	<0.0050	0.0050	**0.0085**	<0.0050	<0.0050	0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0050	**0.0086**	<0.0050
Bromide (Br)	0.050	<0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050
Chloride (Cl)	0.10	<0.10	<0.10	**0.2**	<0.10	0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	0.10	<0.10 <0.50	<0.10	<0.10 <0.50	0.10	<0.10	<0.10	<0.10
Fluoride (F)	0.020	<0.020	<0.020	<0.020	<0.020	0.020	<0.020	<0.020	<0.020	0.020	<0.020	<0.020	<0.020	0.020	<0.020	<0.020	<0.020	0.020	<0.020	<0.020	<0.020
Nitrate (as N)	0.0050	<0.0050	<0.0050	**0.0107**	<0.0050	0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010
Orthophosphate-Dissolved (as P)	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P)-Total	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P)-Total Dissolved	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	-	<0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020	0.0020	<0.0020	<0.0020	<0.0020
Reactive Silica (as SiO_2)	0.50	<0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50
Sulfate (SO_4)	0.30	<0.30	<0.30	<0.30	<0.30	0.30	<0.30	<0.30	<0.30	0.30	<0.30	<0.30	<0.30	0.30	<0.30	<0.30	<0.30	0.30	<0.30	<0.30	<0.30
Cyanides (mg/L)																					
Free Cyanide	0.0010	<0.0010	-	-	-	0.0010	-	-	-	0.0010	<0.0010	<0.0010	-	0.0010	<0.0010	<0.0010		-	<0.0010	<0.0010	
Total Cyanide	0.0010	<0.0010	-	-	-	0.0010	-	-	-	0.0010	<0.0010	<0.0010	-	0.0010	<0.0010	<0.0010		-	<0.0010	<0.0010	
Organic / Inorganic Carbon (mg/L)																					
Dissolved Organic Carbon	0.50	<0.50	<0.50	<0.50	<0.50	0.50	-	<0.50	<0.50	0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50
Total Organic Carbon	0.50	<0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50
Total Metals (mg/L)																					
Aluminum	0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0030	<0.0030	<0.0030	**0.004**	0.0030	<0.0030	<0.0030	**0.0039**	0.0030	<0.0030	<0.0030	<0.0030	0.0030	<0.0030	<0.0030	**0.0052**
Antimony	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
Barium	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
Beryllium	0.00010	<0.000100	<0.000100	<0.000100	<0.000100	0.00010	<0.000100	<0.000100	<0.000100	0.00010	<0.000020	<0.000100	<0.000100	0.00010	<0.000100	<0.000100	<0.000100	0.00010	<0.000100	<0.000100	<0.000100
Bismuth	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050
Boron	0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010
Cadmium	0.000005	<0.0000050	<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	0.000005	<0.0000050	<0.0000050	<0.0000050
Calcium	0.050	<0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050
Cesium	0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010
Chromium	0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050
Cobalt	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
Copper	0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050
Iron	0.010	<0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010
Lead	0.000050	<0.000050	<0.000050	**0.00049**	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	**0.000055**	0.000050	<0.000050	<0.000050	<0.000050
Lithium	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010
Magnesium	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0050	<0.0050	**0.0057**
Manganese	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	**0.00014**	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	**0.00013**
Mercury	0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.000005	<0.0000050	<0.0000050	<0.0000050	0.000005		<0.0000050	<0.0000050	0.000005	<0.0000050	<0.0000050	<0.0000050	0.000005	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050
Nickel	0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050
Phosphorus	0.050	<0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050
Potassium	0.050	<0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050
Rubidium	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020
Selenium	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050
Silicon	0.10	<0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.10	0.10	<0.10	<0.10	<0.10
Silver	0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010
Sodium	0.050	<0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050
Strontium	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020
Sulfur	0.50	<0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50
Tellurium	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020
Thallium	0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010
Thorium	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
Tin	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
Titanium	0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00030	<0.00030	<0.00030	<0.00030	0.00030	<0.00030	<0.00030	<0.00030	0.00030	<0.00030	<0.00030	<0.00030	0.00030	<0.00030	<0.00030	<0.00030
Tungsten	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
Uranium	0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010
Vanadium	0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050
Zinc	0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0030	<0.0030	<0.0030	<0.0030	0.0030	<0.0030	<0.0030	<0.0030	0.0030	<0.0030	<0.0030	<0.0030	0.0030	<0.0030	<0.0030	<0.0030
Zirconium	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020
Dissolved Metals (mg/L)																					
Aluminum	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	-	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010
Antimony	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	-	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	-	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
Barium	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	-	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
Beryllium	0.00010	<0.000100	<0.000100	<0.000100	<0.000100	0.00010	-	<0.000100	<0.000100	0.00010	<0.000020	<0.000100	<0.000100	0.00010	<0.000100	<0.000100	<0.000100	0.00010	<0.000100	<0.000100	<0.000100
Bismuth	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	-	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050
Boron	0.010	<0.010	<0.010	<0.010	<0.010	0.010	-	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010
Cadmium	0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.000005	-	<0.0000050	<0.0000050	0.000005	<0.0000050	<0.0000050	<0.0000050	0.000005	<0.0000050	<0.0000050	<0.0000050	0.000005	<0.0000050	<0.0000050	<0.0000050
Calcium	0.050	<0.050	<0.050	<0.050	<0.050	0.050	-	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050
Cesium	0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	-	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010
Chromium	0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	-	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00010	<0.00050	<0.00050	<0.00050
Cobalt	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	-	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
Copper	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	-	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020
Iron	0.010	<0.010	<0.010	<0.010	<0.010	0.010	-	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	<0.010
Lead	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	-	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050
Lithium	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	-	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010
Magnesium	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	-	<0.0050	<0.0050	0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.0050	<0.0050	<0.0050
Manganese	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	-	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
Mercury	0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.000005	-	<0.0000050	<0.0000050	0.000005	-	<0.0000050	<0.0000050	0.000005	<0.0000050	<0.0000050	<0.0000050	0.000005	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	-	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	**0.000079**	<0.000050
Nickel	0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	-	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050
Phosphorus	0.050	<0.050	<0.050	<0.050	<0.050	0.050	-	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050
Potassium	0.050	<0.050	<0.050	<0.050	<0.050	0.050	-	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050
Rubidium	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	-	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020
Selenium	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	-	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050	0.000050	<0.000050	<0.000050	<0.000050
Silicon	0.050	<0.050	<0.050	<0.050	<0.050	0.050	-	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050
Silver	0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	-	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010
Sodium	0.050	<0.050	<0.050	<0.050	<0.050	0.050	-	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	<0.050
Strontium	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	-	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020
Sulfur	0.50	<0.50	<0.50	<0.50	<0.50	0.50	-	<0.50	<0.50	0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50	0.50	<0.50	<0.50	<0.50
Tellurium	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	-	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020
Thallium	0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	-	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010
Thorium	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	-	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
Tin	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	-	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
Titanium	0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00030	-	<0.00030	<0.00030	0.00030	<0.00030	<0.00030	<0.00030	0.00030	<0.00030	<0.00030	<0.00030	0.00030	<0.00030	<0.00030	<0.00030
Tungsten	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	-	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010
Uranium	0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	-	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010
Vanadium	0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	-	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050	0.00050	<0.00050	<0.00050	<0.00050
Zinc	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	-	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010
Zirconium	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	-	<0.00020	<0.00020	0.00020	<0.00030	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	<0.00020	<0.00020	<0.00020
Speciated Metals (µg/L)																					
Arsenate (As V)														0.020	<0.020	<0.020	<0.020	0.020	<0.020	<0.020	
Arsenite (As III)														0.020	<0.020	<0.020	<0.020	0.020	<0.020	<0.020	
Arsenobetaine (AsB)														0.050	<0.050	<0.050	<0.050	0.050	<0.050	<0.050	
Dimethylarsinic Acid (DMA)														0.020	<0.020	<0.020	<0.020	0.020	<0.020	<0.020	
Monomethylarsonic Acid (MMA)														0.020	<0.020	<0.020	<0.020	0.020	<0.020	<0.020	

Notes:

Bolded Travel, DI, or Equipment Blank concentration exceeds laboratory DLs but < 10x DL.

Shaded Travel, DI, or Equipment Blank concentration is > 10x DL.

Italicized numbers are below detection limits.

"-" analyte not measured

Table A-5. Field QA/QC summary for water quality for all CREMP study areas, 2022.

Month				March											
	Lab RPD Values (%)	Field RPD Values (%)	March MDLs	Tehek Lake - Mid Field			Inuggugayualik Lake			Mammoth Lake			Lake D5		
Analyte				TE-103	MAR-DUP-1	**RPD (%)**	INUG-138	MAR-DUP-2	**RPD (%)**	MAM-67	MAR-DUP-3	**RPD (%)**	LK5-36	MAR-DUP-4	**RPD (%)**
Date Sampled				04-Mar-2022	04-Mar-2022		07-Mar-2022	07-Mar-2022		05-Mar-2022	05-Mar-2022		05-Mar-2022	05-Mar-2022	
ALS Sample ID				VA22A5201-011	VA22A5201-017		VA22A5201-015	VA22A5201-018		VA22A4994-003	VA22A4994-011		VA22A4994-010	VA22A4994-012	
Physical Tests															
Conductivity (µS/cm)	10	15	2.0	39	40	-2	18	18	0.57	207	206	0.48	42	41	2.7
Alkalinity, Total	20	30	1.0	11	11	-3	9.4	5.9	**46**	24	24	0	14	14	3.6
Alkalinity, Bicarbonate	20	30	1.0	11	11	-3	9.4	5.9	**46**	24	24	0	14	14	3.6
Alkalinity, Carbonate	20	30	1.0	<1.0	<1.0		<1.0	<1.0		<1.0	<1.0		<1.0	<1.0	
Alkalinity, Hydroxide	20	30	1.0	<1.0	<1.0		<1.0	<1.0		<1.0	<1.0		<1.0	<1.0	
Hardness (mg/L), dissolved		40	0.60	16	16	0.63	7.1	7.1	0.42	77	77	-0.5	19	17	12
Hardness (as $CaCO_3$), from total Ca/Mg		40	0.60	16	16	-3	7.0	7.1	-1	75	73	2.0	16	16	0.62
pH (Laboratory)		40	0.10	7.2	7.2	-0.7	6.9	6.9	0.29	7.2	7.2	-0.6	7.2	7.2	0.14
Total Dissolved Solids (mg/L)		40	3.0	23	21	8.2	11	12	-9	131	137	-4	25	22	14
Total Suspended Solids (mg/L)		40	1.0	<1.0	<1.0		<1.0	<1.0		1.2	1.1	8.7	<1.0	<1.0	
Turbidity (NTU)	15	23	0.10	0.11	0.11	0	0.11	0.12	-9	0.25	0.24	4.1	0.10	0.13	**-26**
Anions and Nutrients (mg/L)															
Total Kjeldahl Nitrogen	20	30	0.050	0.19	0.14	30	0.16	0.13	24	0.43	0.37	14	0.13	0.14	-3
Ammonia, Total (as N)	20	30	0.0050	0.012	0.0081	**36**	0.016	0.016	0.63	0.063	0.059	5.9	0.0069	0.0062	11
Bromide (Br)	20	30	0.050	<0.050	<0.050		<0.050	<0.050		0.24	0.24	-1	<0.050	<0.050	
Chloride (Cl)	20	30	0.10	0.94	1.1	-12	0.82	0.82	0	26	26	-0.4	1.5	1.5	0.69
Fluoride (F)	20	30	0.020	0.085	0.094	-10	0.063	0.068	-8	0.074	0.071	4.1	0.043	0.043	0
Nitrate (as N)	20	30	0.0050	<0.0050	<0.0050		0.0057	<0.0050		0.96	0.98	-2	<0.0050	<0.0050	
Nitrite (as N)	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		0.0051	0.0051	0	<0.0010	<0.0010	
Orthophosphate-Dissolved (as P)	20	30	0.0010	<0.0010	<0.0010		<0.0010	0.0010		0.0012	<0.0010		<0.0010	0.0012	
Phosphorus (P)-Total	20	30	0.0020	<0.0020	<0.0020		<0.0020	<0.0020		0.011	0.0051	**76**	0.0044	0.0041	7.1
Phosphorus (P)-Total Dissolved	25	38	0.0020	<0.0020	<0.0020		<0.0020	<0.0020		0.0037	0.0036	2.7	0.0026	0.0032	-21
Reactive Silica (as SiO_2)	20	30	0.50	0.61	0.61	0	<0.50	<0.50		0.93	0.95	-2	1.3	1.3	0.79
Sulfate (SO_4)	20	30	0.30	3.9	5.3	-31.3	1.1	1.2	-6	28	28	0	3.6	3.6	-0.6
Cyanides (mg/L)															
Free Cyanide	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		-	-		-	-	
Total Cyanide	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		-	-		-	-	
Organic / Inorganic Carbon (mg/L)															
Dissolved Organic Carbon	20	30	0.50	2.8	2.7	5.8	2.5	2.9	-15	4.4	4.0	11	2.1	2.1	1.4
Total Organic Carbon	20	30	0.50	2.4	2.3	5.5	3.4	2.5	30	4.3	4.3	0.70	2.5	2.5	0
Total Metals (mg/L)															
Aluminum	20	30	0.0030	0.0057	0.0065	-13	0.0082	0.0089	-8	0.0032	0.0040	-22	0.0032	0.0034	-6
Antimony	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		0.0019	0.0018	3.8	<0.00010	<0.00010	
Arsenic	20	30	0.00010	0.00031	0.00027	14	0.00013	0.00011	17	0.0015	0.0015	-1	0.00027	0.00026	3.8
Barium	20	30	0.00010	0.0040	0.0037	7.3	0.0022	0.0022	0.92	0.034	0.034	2.4	0.0046	0.0048	-4
Beryllium	20	30	0.00010	<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100	
Bismuth	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Boron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		<0.010	<0.010		<0.010	<0.010	
Cadmium	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Calcium	20	30	0.050	3.8	4.0	-4	1.4	1.4	1.4	21	21	2.4	3.9	3.8	0.52
Cesium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		0.000024	0.000022	8.7	<0.000010	<0.000010	
Chromium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Cobalt	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		0.00011	<0.00010		<0.00010	<0.00010	
Copper	20	30	0.00050	0.00066	0.00074	-11	<0.00050	<0.00050		0.00082	0.00095	-15	<0.00050	<0.00050	
Iron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		<0.010	0.011		<0.010	<0.010	
Lead	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Lithium	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		0.0032	0.0032	0	<0.0010	<0.0010	
Magnesium	20	30	0.0050	1.5	1.5	-1	0.87	0.90	-4	5.3	5.2	0.95	1.6	1.6	0.63
Manganese	20	30	0.00010	0.00059	0.00049	19	0.00087	0.00095	-9	0.0021	0.0029	-35.0	0.00054	0.00076	**-34**
Mercury	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Molybdenum	20	30	0.000050	0.00013	0.00012	4.1	<0.000050	<0.000050		0.00060	0.00056	5.9	<0.000050	<0.000050	
Nickel	20	30	0.00050	<0.00050	<0.00050		0.00073	0.00055	28	0.0028	0.0029	-2	<0.00050	<0.00050	
Phosphorus	20	30	0.050	<0.050	<0.050		<0.050	<0.050		<0.050	<0.050		<0.050	<0.050	
Potassium	20	30	0.050	0.73	0.71	2.2	0.44	0.45	-3	5.0	4.9	1.2	0.56	0.56	0
Rubidium	20	30	0.00020	0.0014	0.0012	11	0.00063	0.00069	-9	0.0061	0.0060	2.5	0.00068	0.00075	-10
Selenium	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		0.00010	0.00012	-19	<0.000050	<0.000050	
Silicon	20	30	0.10	0.35	0.36	-3	0.24	0.25	-4	0.50	0.50	0	0.67	0.66	1.5
Silver	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Sodium	20	30	0.050	1.1	1.2	-3	0.66	0.69	-4	3.7	3.7	-0.5	0.82	0.82	0.24
Strontium	20	30	0.00020	0.020	0.019	1.5	0.0076	0.0076	-0.1	0.15	0.15	3.4	0.015	0.015	1.3
Sulfur	20	30	0.50	1.7	1.7	1.8	<0.50	<0.50		9.7	9.8	-1	1.4	1.4	6.5
Tellurium	20	30	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Thallium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Thorium	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Tin	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Titanium	20	30	0.00030	<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030	
Tungsten	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Uranium	20	30	0.000010	0.000087	0.000075	15	0.000064	0.000066	-3	0.00015	0.00015	0	0.000022	0.000024	-9
Vanadium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Zinc	20	30	0.0030	<0.0030	<0.0030		<0.0030	<0.0030		<0.0030	<0.0030		<0.0030	<0.0030	
Zirconium	20	30	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Dissolved Metals (mg/L)															
Aluminum	20	30	0.0010	0.0053	0.0052	1.9	0.0073	0.0073	0	<0.0010	0.0011		0.0016	0.0017	-6
Antimony	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		0.0020	0.0021	-0.5	<0.00010	<0.00010	
Arsenic	20	30	0.00010	0.00025	0.00023	8.3	0.00010	<0.00010		0.0016	0.0015	2.6	0.00025	0.00030	-18
Barium	20	30	0.00010	0.0037	0.0036	2.5	0.0020	0.0020	0	0.037	0.035	6.1	0.0047	0.0064	-31.5
Beryllium	20	30	0.00010	<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100	
Bismuth	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Boron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		<0.010	<0.010		<0.010	<0.010	
Cadmium	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Calcium	20	30	0.050	4.0	4.0	0	1.4	1.4	0	21	22	-3	4.1	4.1	0.98
Cesium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		0.000021	0.000024	-13	<0.000010	<0.000010	
Chromium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Cobalt	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		0.00010	0.00010	0	<0.00010	<0.00010	
Copper	20	30	0.00020	0.00068	0.00072	-6	0.00042	0.00041	2.4	0.00077	0.00079	-3	0.00028	0.00028	0
Iron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		<0.010	<0.010		<0.010	<0.010	
Lead	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Lithium	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		0.0033	0.0032	3.1	<0.0010	<0.0010	
Magnesium	20	30	0.0050	1.5	1.5	2.0	0.87	0.87	0.69	5.6	5.4	4.7	2.1	1.6	27
Manganese	20	30	0.00010	0.00035	0.00032	9.0	0.00017	0.00019	-11	<0.00010	<0.00010		<0.00010	<0.00010	
Mercury	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Molybdenum	20	30	0.000050	0.00013	0.00012	6.5	<0.000050	<0.000050		0.00061	0.00061	0.16	<0.000050	<0.000050	
Nickel	20	30	0.00050	<0.00050	<0.00050		0.00053	<0.00050		0.0029	0.0029	0.68	<0.00050	<0.00050	
Phosphorus	20	30	0.050	<0.050	<0.050		<0.050	<0.050		<0.050	<0.050		<0.050	<0.050	
Potassium	20	30	0.050	0.72	0.72	-0.3	0.46	0.45	1.5	5.4	5.4	1.5	0.74	0.74	-0.1
Rubidium	20	30	0.00020	0.0012	0.0012	-4	0.00060	0.00061	-2	0.0062	0.0055	11	0.00092	0.00093	-1
Selenium	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		0.00012	0.00014	-15	<0.000050	<0.000050	
Silicon	20	30	0.050	0.33	0.34	-1	0.23	0.22	2.2	0.51	0.52	-2	0.62	0.64	-2
Silver	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Sodium	20	30	0.050	1.2	1.2	0.87	0.69	0.67	2.6	3.8	3.7	2.7	1.1	1.1	-0.9
Strontium	20	30	0.00020	0.020	0.020	-1.0	0.0081	0.0079	2.3	0.15	0.16	-6	0.016	0.015	2.6
Sulfur	20	30	0.50	2.0	1.8	8.4	<0.50	<0.50		9.5	9.0	5.1	1.0	0.97	3.0
Tellurium	20	30	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Thallium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Thorium	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Tin	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Titanium	20	30	0.00030	<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030	
Tungsten	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Uranium	20	30	0.000010	0.000090	0.000099	-10	0.000072	0.000073	-1	0.00011	0.00011	3.6	0.000017	0.000015	13
Vanadium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Zinc	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	0.0013	
Zirconium		40	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Speciated Metals (µg/L)															
Arsenate (As V)	20	30	0.020	-	-		<0.020	<0.020		0.21	0.18	15	<0.020	<0.020	
Arsenite (As III)	20	30	0.020	-	-		0.026	0.027	-4	0.56	0.59	-5	0.088	0.087	1.1
Arsenobetaine (AsB)	20	30	0.050	-	-		<0.050	<0.050		<0.050	<0.050		<0.050	<0.050	
Dimethylarsinic Acid (DMA)	20	30	0.020	-	-		<0.020	<0.020		0.28	0.28	2.1	<0.020	<0.020	
Monomethylarsonic Acid (MMA)	20	30	0.020	-	-		<0.020	<0.020		0.033	0.031	6.3	<0.020	<0.020	
Plant Pigments (µg/L)															
chlorophyll-a		40	0.010	0.44	0.66	-40	0.26	0.29	-8	<0.010	<0.010		<0.010	<0.010	

Notes:

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

RPDs are only calculated when both samples are above detection.

The data quality objective (DQO) for field duplicates is an RPD of 1.5 x the laboratory RPD or 40% in the absence of a lab RPD.

Bolded RPDs	**RPD values exceeded but < 10 x MDL.**
Shaded RPDs	RPD values exceeded and > 10 x MDL.

Italicized numbers are below detection limits.

"-" = No measurement

Table A-5. Field QA/QC summary for water quality for all CREMP study areas, 2022.

Month				May											
	Lab RPD Values (%)	Field RPD Values (%)	May MDLs	Inuggugayualik Lake			Pipe Dream Lake			Lake DS1			Nemo Lake		
Analyte				INUG-141	MAY-DUP-1	**RPD (%)**	PDL-106	MAY-DUP-2	**RPD (%)**	DS1-59	MAY-DUP-3	**RPD (%)**	NEM-70	MAY-DUP-4	**RPD (%)**
Date Sampled				06-May-2022	06-May-2022		06-May-2022	06-May-2022		10-May-2022	10-May-2022		06-May-2022	06-May-2022	
ALS Sample ID				VA22B0666-010	VA22B0666-013		VA22B0666-012	VA22B0666-014		VA22B0586-009	VA22B0586-014		VA22B0431-008	VA22B0431-010	
Physical Tests															
Conductivity (µS/cm)	10	15	2.0	19	19	-1.6	29	29	1.4	34	33	4.5	13	13	2.4
Alkalinity, Total	20	30	1.0	5.9	5.9	0	9.7	9.5	2.1	7.4	6.8	8.5	107	106	0.94
Alkalinity, Bicarbonate	20	30	1.0	5.9	5.9	0	9.7	9.5	2.1	7.4	6.8	8.5	13	13	2.4
Alkalinity, Carbonate	20	30	1.0	<1.0	<1.0		<1.0	<1.0		<1.0	<1.0		<1.0	<1.0	
Alkalinity, Hydroxide	20	30	1.0	<1.0	<1.0		<1.0	<1.0		<1.0	<1.0		<1.0	<1.0	
Hardness (mg/L), dissolved		40	0.60	7.2	7.1	1.4	11	11	1.8	12	13	-4.0	41	42	-0.97
Hardness (as $CaCO_3$), from total Ca/Mg		40	0.60	7.2	7.1	0.56	12	12	-0.86	12	12	0.83	42	42	0.72
pH (Laboratory)		40	0.10	6.9	6.9	0	7.1	7.1	0	6.9	6.9	-0.29	7.3	7.3	0.41
Total Dissolved Solids (mg/L)		40	3.0	12	12	-5.0	17	16	11	31	25	21	80	80	0.50
Total Suspended Solids (mg/L)		40	1.0	1.2	<1.0		1.4	<1.0		<1.0	<1.0		<1.0	<1.0	
Turbidity (NTU)	15	23	0.10	<0.10	<0.10		<0.10	<0.10		0.15	0.16	-6.5	0.20	0.18	11
Anions and Nutrients (mg/L)															
Total Kjeldahl Nitrogen	20	30	0.050	0.13	0.27	**-68**	0.13	0.12	7.3	0.10	0.11	-4.8	0.16	0.17	-4.9
Ammonia, Total (as N)	20	30	0.0050	0.016	0.018	-16	0.0073	0.0091	-22	0.0073	0.0095	-26	0.0064	<0.0050	
Bromide (Br)	20	30	0.050	<0.050	<0.050		<0.050	<0.050		<0.050	<0.050		0.15	0.15	-1.4
Chloride (Cl)	20	30	0.10	0.84	0.85	-1.2	0.82	0.82	0	2.9	2.8	1.8	19	19	1.6
Fluoride (F)	20	30	0.020	0.064	0.064	0	0.044	0.043	2.3	0.053	0.051	3.8	0.033	0.032	3.1
Nitrate (as N)	20	30	0.0050	0.014	0.015	-1.4	<0.0050	<0.0050		0.035	0.036	-2.3	0.021	0.018	13
Nitrite (as N)	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010		0.0021	<0.0010	
Orthophosphate-Dissolved (as P)	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010	
Phosphorus (P)-Total	20	30	0.0020	0.0021	<0.0020		<0.0020	<0.0020		<0.0020	<0.0020		0.0048	0.0037	26
Phosphorus (P)-Total Dissolved	25	38	0.0020	<0.0020	<0.0020		<0.0020	<0.0020		<0.0020	<0.0020		<0.0020	<0.0020	
Reactive Silica (as SiO_2)	20	30	0.50	<0.50	<0.50		<0.50	<0.50		1.2	1.2	2.6	<0.50	<0.50	
Sulfate (SO_4)	20	30	0.30	1.1	1.1	-0.88	2.2	2.2	0.91	2.3	2.3	0	5.6	5.5	1.6
Cyanides (mg/L)															
Free Cyanide	20	30	0.0010	-	-		-	-		-	-		-	-	
Total Cyanide	20	30	0.0010	-	-		-	-		-	-		-	-	
Organic / Inorganic Carbon (mg/L)															
Dissolved Organic Carbon	20	30	0.50	2.6	2.4	6.9	2.0	1.9	2.1	2.7	2.4	12	2.3	2.3	3.0
Total Organic Carbon	20	30	0.50	2.6	2.4	6.0	2.1	2.1	-0.48	2.8	2.8	-0.35	2.5	2.3	12
Total Metals (mg/L)															
Aluminum	20	30	0.0030	0.0076	0.0085	-11	0.0035	0.0038	-8.2	0.012	0.011	7.6	<0.0030	0.0034	
Antimony	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Arsenic	20	30	0.00010	0.00015	0.00015	0	0.00022	0.00021	4.7	0.00014	0.00014	0	0.00077	0.00078	-1.3
Barium	20	30	0.00010	0.0022	0.0022	0.45	0.0025	0.0025	-0.40	0.0064	0.0064	0.16	0.021	0.021	0.48
Beryllium	20	30	0.00010	<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100	
Bismuth	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Boron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		<0.010	<0.010		<0.010	<0.010	
Cadmium	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Calcium	20	30	0.050	1.4	1.4	2.1	3.0	3.0	-2.0	3.2	3.1	2.2	13	13	0.80
Cesium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		0.000014	0.000014	0
Chromium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Cobalt	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Copper	20	30	0.00050	0.00057	<0.00050		0.00065	0.00068	-4.5	0.00051	<0.00050		<0.00050	<0.00050	
Iron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		0.020	0.018	11	<0.010	<0.010	
Lead	20	30	0.000050	0.000051	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Lithium	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010		0.0018	0.0018	0
Magnesium	20	30	0.0050	0.87	0.88	-1.0	1.0	1.0	0	1.0	1.0	-1.9	2.5	2.5	0
Manganese	20	30	0.00010	0.00096	0.0010	-6.1	0.00045	0.00048	-6.5	0.0019	0.0020	-1.0	0.0029	0.0029	1.4
Mercury	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Molybdenum	20	30	0.000050	<0.000050	<0.000050		0.000055	0.000054	1.8	0.000055	0.000052	5.6	0.000093	0.000093	0
Nickel	20	30	0.00050	<0.00050	0.00053		0.00052	0.00059	-13	<0.00050	<0.00050		0.0017	0.0017	-0.58
Phosphorus	20	30	0.050	<0.050	<0.050		<0.050	<0.050		<0.050	<0.050		<0.050	<0.050	
Potassium	20	30	0.050	0.48	0.45	6.0	0.47	0.45	2.8	0.61	0.62	-1.1	1.9	1.9	0
Rubidium	20	30	0.00020	0.00060	0.00056	6.9	0.00051	0.00058	-13	0.00070	0.00075	-6.9	0.0028	0.0028	0.72
Selenium	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Silicon	20	30	0.10	0.26	0.28	-7.4	0.20	0.19	5.1	0.61	0.60	1.7	0.13	0.13	0
Silver	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Sodium	20	30	0.050	0.67	0.64	4.0	0.62	0.62	0.16	1.1	1.1	0	1.2	1.1	1.8
Strontium	20	30	0.00020	0.0078	0.0077	1.7	0.012	0.012	0	0.017	0.017	0	0.076	0.076	0.92
Sulfur	20	30	0.50	0.55	0.60	-8.7	0.90	0.88	2.2	0.84	0.93	-10	1.8	1.9	-1.6
Tellurium	20	30	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Thallium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Thorium	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Tin	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Titanium	20	30	0.00030	<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030	
Tungsten	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Uranium	20	30	0.000010	0.000076	0.000083	-8.8	0.000032	0.000029	9.8	0.000057	0.000057	0	0.000018	0.000017	5.7
Vanadium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Zinc	20	30	0.0030	<0.0030	<0.0030		<0.0030	<0.0030		<0.0030	<0.0030		<0.0030	<0.0030	
Zirconium	20	30	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Dissolved Metals (mg/L)															
Aluminum	20	30	0.0010	0.0055	0.012	-74.3	0.0021	0.0021	0	0.0091	0.011	-17	0.0015	0.0012	22
Antimony	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Arsenic	20	30	0.00010	0.00013	<0.00010		0.00018	0.00016	12	0.00010	0.00014	**-33**	0.00067	0.00064	4.6
Barium	20	30	0.00010	0.0022	0.0021	5.1	0.0024	0.0023	3.0	0.0059	0.0061	-3.8	0.021	0.021	0
Beryllium	20	30	0.00010	<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100	
Bismuth	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Boron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		<0.010	<0.010		<0.010	<0.010	
Cadmium	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Calcium	20	30	0.050	1.5	1.4	8.2	2.9	2.9	2.1	3.3	3.5	-5.1	12	12	-0.82
Cesium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		0.000014	0.000014	0
Chromium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Cobalt	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Copper	20	30	0.00020	0.00050	0.00060	-18	0.00051	0.00049	4.0	0.00041	0.00042	-2.4	0.00035	0.00036	-2.8
Iron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		0.012	0.012	0	<0.010	<0.010	
Lead	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Lithium	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010		0.0019	0.0019	0
Magnesium	20	30	0.0050	0.83	0.88	-5.5	1.0	0.99	0.70	0.95	0.98	-3.2	2.6	2.6	-1.5
Manganese	20	30	0.00010	0.00032	0.00038	-17	0.00011	0.00012	-8.7	0.00088	0.0011	-19	0.00040	0.00036	11
Mercury	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Molybdenum	20	30	0.000050	<0.000050	<0.000050		0.000058	<0.000050		0.000073	0.000063	15	0.000085	0.000084	1.2
Nickel	20	30	0.00050	<0.00050	<0.00050		0.00070	0.00067	4.4	<0.00050	<0.00050		0.0017	0.0017	-2.4
Phosphorus	20	30	0.050	<0.050	<0.050		<0.050	<0.050		<0.050	<0.050		<0.050	<0.050	
Potassium	20	30	0.050	0.46	0.45	2.6	0.44	0.44	1.1	0.58	0.59	-1.2	2.0	2.0	0
Rubidium	20	30	0.00020	0.00054	0.00058	-7.1	0.00053	0.00051	3.8	0.00063	0.00076	-19	0.0026	0.0027	-3.0
Selenium	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Silicon	20	30	0.050	0.24	0.26	-8.5	0.17	0.15	10	0.55	0.60	-8.3	0.099	0.11	-6.8
Silver	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Sodium	20	30	0.050	0.66	0.64	3.4	0.61	0.60	1.7	1.0	1.1	-3.9	1.2	1.2	-0.86
Strontium	20	30	0.00020	0.0079	0.0076	4.6	0.012	0.011	6.8	0.018	0.017	3.4	0.083	0.083	0
Sulfur	20	30	0.50	0.54	0.70	-26	0.86	0.70	21	0.95	0.86	9.9	1.8	1.7	5.2
Tellurium	20	30	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Thallium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Thorium	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Tin	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Titanium	20	30	0.00030	<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030	
Tungsten	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Uranium	20	30	0.000010	0.000082	0.000076	7.6	0.000035	0.000031	12	0.000057	0.000056	1.8	0.000016	0.000015	6.5
Vanadium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Zinc	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010	
Zirconium		40	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Speciated Metals (µg/L)															
Arsenate (As V)	20	30	0.020	<0.020	<0.020		<0.020	<0.020		<0.020	<0.020		0.049	0.050	-2.0
Arsenite (As III)	20	30	0.020	0.022	<0.020		0.062	0.058		0.040	0.036		0.30	0.29	2.0
Arsenobetaine (AsB)	20	30	0.050	<0.050	<0.050		<0.050	<0.050		<0.050	<0.050		<0.050	<0.050	
Dimethylarsinic Acid (DMA)	20	30	0.020	<0.020	<0.020		<0.020	<0.020		<0.020	<0.020		0.060	0.047	24
Monomethylarsonic Acid (MMA)	20	30	0.020	<0.020	<0.020		<0.020	<0.020		<0.020	<0.020		0.020	0.022	-9.5
Plant Pigments (µg/L)															
chlorophyll-a		40	0.010	0.70	0.70	0.57	1.1	1.4	-26	1.2	1.2	5.0	2.2	2.2	-1.8

Notes:
RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.
RPDs are only calculated when both samples are above detection.
The data quality objective (DQO) for field duplicates is an RPD of 1.5 x the laboratory RPD or 40% in the absence of a lab RPD.

Bolded RPDs	RPD values exceeded but < 10 x MDL.
Shaded RPD	RPD values exceeded and > 10 x MDL.

Italicized numbers are below detection limits.
"-" = No measurement

Table A-5. Field QA/QC summary for water quality for all CREMP study areas, 2022.

Month				July											
	Lab RPD Values (%)	Field RPD Values (%)	July MDLs	Inuggugayualik Lake			Wally Lake			Lake A20			Lake DS1		
Analyte				INUG-143	JUL-DUP-1	RPD (%)	WAL-124	JUL-DUP-2	RPD (%)	A20-66	JUL-DUP-3	RPD (%)	DS1-62	JUL-DUP-4	RPD (%)
Date Sampled				09-Jul-2022	09-Jul-2022		05-Jul-2022	05-Jul-2022		01-Jul-2022	01-Jul-2022		05-Jul-2022	05-Jul-2022	
ALS Sample ID				VA22B6388-002	VA22B6388-003		VA22B5785-006	VA22B5785-007		VA22B5784-002	VA22B5784-007		VA22B5784-006	VA22B5784-008	
Physical Tests															
Conductivity (µS/cm)	10	15	2.0	16	16	0	36	36	-1.4	54	54	0.56	27	28	-1.5
Alkalinity, Total	20	30	1.0	5.1	4.6	10	12	12	-0.83	10	10	2.0	5.8	5.9	-1.7
Alkalinity, Bicarbonate	20	30	1.0	5.1	4.6	10	12	12	-0.83	10	10	2.0	5.8	5.9	-1.7
Alkalinity, Carbonate	20	30	1.0	<1.0	<1.0		<1.0	<1.0		<1.0	<1.0		<1.0	<1.0	
Alkalinity, Hydroxide	20	30	1.0	<1.0	<1.0		<1.0	<1.0		<1.0	<1.0		<1.0	<1.0	
Hardness (mg/L), dissolved		40	0.60	5.7	5.7	0.18	16	15	1.9	19	18	4.3	9.3	9.2	1.7
Hardness (as $CaCO_3$), from total Ca/Mg		40	0.60	5.7	5.6	3.4	16	16	0	19	19	-1.1	9.5	9.4	0.53
pH (Laboratory)		40	0.10	6.8	6.8	0.15	7.3	7.3	0	7.2	7.2	-0.28	6.9	7.0	-0.29
Total Dissolved Solids (mg/L)		40	3.0	14	12	12	25	24	0.41	38	36	5.4	18	20	-7.4
Total Suspended Solids (mg/L)		40	1.0	<1.0	<1.0		<1.0	<1.0		<1.0	<1.0		<1.0	<1.0	
Turbidity (NTU)	15	23	0.10	0.21	0.20	4.9	0.32	0.19	**51**	0.45	0.53	-16	0.48	0.30	**46**
Anions and Nutrients (mg/L)															
Total Kjeldahl Nitrogen	20	30	0.050	0.11	0.12	-9.0	0.10	0.11	-9.2	0.21	0.20	4.3	0.12	0.12	4.1
Ammonia, Total (as N)	20	30	0.0050	<0.0050	0.0062		<0.0050	<0.0050		0.0081	0.0079	2.5	<0.0050	<0.0050	
Bromide (Br)	20	30	0.050	<0.050	<0.050		<0.050	<0.050		0.057	0.060	-5.1	<0.050	<0.050	
Chloride (Cl)	20	30	0.10	0.70	0.79	-12	0.52	0.51	1.9	6.2	6.2	-0.16	2.6	2.6	0
Fluoride (F)	20	30	0.020	0.053	0.054	-1.9	0.043	0.041	4.8	0.036	0.037	-2.7	0.033	0.034	-3.0
Nitrate (as N)	20	30	0.0050	<0.0050	0.0068		<0.0050	<0.0050		0.043	0.045	-3.2	<0.0050	<0.0050	
Nitrite (as N)	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010	
Orthophosphate-Dissolved (as P)	20	30	0.0010	<0.0010	<0.0010		0.0010	0.0019	**-62**	0.0014	0.0011	24	<0.0010	0.0011	
Phosphorus (P)-Total	20	30	0.0020	0.0035	0.0068	**-64**	0.0022	0.0027	-20	0.0050	0.0053	-5.8	0.0052	0.0028	**60**
Phosphorus (P)-Total Dissolved	25	38	0.0020	<0.0020	<0.0020		<0.0020	<0.0020		0.0029	0.0029	0	0.0028	0.0026	7.4
Reactive Silica (as SiO_2)	20	30	0.50	<0.50	<0.50		0.79	0.77	2.6	<0.50	<0.50		0.56	0.61	-8.5
Sulfate (SO_4)	20	30	0.30	0.88	2.3	**-90**	5.0	4.5	12	3.6	3.7	-1.1	2.1	2.1	0.97
Cyanides (mg/L)															
Free Cyanide	20	30	0.0010	-	<0.0010		-	<0.0010		-	-		-	-	
Total Cyanide	20	30	0.0010	-	<0.0010		-	<0.0010		-	-		-	-	
Organic / Inorganic Carbon (mg/L)															
Dissolved Organic Carbon	20	30	0.50	2.0	2.0	1.00	2.6	2.5	2.4	2.9	2.9	1.7	2.1	2.2	-6.5
Total Organic Carbon	20	30	0.50	2.2	2.4	-10	2.6	2.3	14	2.8	3.0	-8.3	2.2	2.0	12
Total Metals (mg/L)															
Aluminum	20	30	0.0030	0.0090	0.011	-17	0.0059	0.0063	-6.6	0.0080	0.0072	11	0.011	0.012	-9.0
Antimony	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		0.00012	0.00011	8.7	<0.00010	<0.00010	
Arsenic	20	30	0.00010	0.00013	0.00013	0	0.00032	0.00032	0	0.00043	0.00041	4.8	0.00016	0.00015	6.5
Barium	20	30	0.00010	0.0019	0.0019	2.6	0.0021	0.0021	-0.95	0.0095	0.0098	-3.0	0.0047	0.0046	2.2
Beryllium	20	30	0.00010	<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100	
Bismuth	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Boron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		<0.010	<0.010		<0.010	<0.010	
Cadmium	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Calcium	20	30	0.050	1.2	1.1	5.4	4.3	4.3	0.23	5.2	5.2	0.58	2.6	2.6	0.78
Cesium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Chromium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Cobalt	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Copper	20	30	0.00050	<0.00050	<0.00050		0.0010	0.0011	-2.9	<0.00050	<0.00050		<0.00050	<0.00050	
Iron	20	30	0.010	0.011	0.012	-8.7	0.013	0.013	0	0.088	0.090	-2.2	0.045	0.045	0
Lead	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Lithium	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		0.0011	<0.0010		<0.0010	<0.0010	
Magnesium	20	30	0.0050	0.70	0.69	1.6	1.2	1.2	-0.82	1.4	1.5	-4.1	0.73	0.73	0.14
Manganese	20	30	0.00010	0.0024	0.0025	-5.3	0.0011	0.0012	-8.9	0.028	0.029	-1.1	0.0015	0.0015	4.7
Mercury	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Molybdenum	20	30	0.000050	<0.000050	<0.000050		0.00011	0.00012	-8.9	0.000075	0.000076	-1.3	<0.000050	0.000060	
Nickel	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		0.00071	0.00080	-12	<0.00050	<0.00050	
Phosphorus	20	30	0.050	<0.050	<0.050		<0.050	<0.050		<0.050	<0.050		<0.050	<0.050	
Potassium	20	30	0.050	0.38	0.37	1.9	0.40	0.41	-3.2	1.3	1.3	0.77	0.57	0.56	1.4
Rubidium	20	30	0.00020	0.00050	0.00049	2.0	0.00051	0.00051	0	0.0019	0.0019	-0.52	0.00071	0.00069	2.9
Selenium	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Silicon	20	30	0.10	0.20	0.21	-4.9	0.44	0.46	-4.4	0.17	0.14	19	0.29	0.30	-3.4
Silver	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Sodium	20	30	0.050	0.54	0.54	0	0.50	0.51	-1.4	1.1	1.1	-0.93	0.84	0.83	1.4
Strontium	20	30	0.00020	0.0065	0.0063	2.8	0.020	0.020	0	0.038	0.036	5.9	0.013	0.013	-2.3
Sulfur	20	30	0.50	<0.50	<0.50		1.3	1.3	6.2	0.94	1.2	-24	0.60	0.68	-13
Tellurium	20	30	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Thallium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Thorium	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Tin	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Titanium	20	30	0.00030	<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030	
Tungsten	20	30	0.00010	0.00014	0.00013	7.4	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Uranium	20	30	0.000010	0.000074	0.000082	-10	0.000064	0.000062	3.2	0.000050	0.000050	0	0.000037	0.000037	0
Vanadium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Zinc	20	30	0.0030	<0.0030	<0.0030		<0.0030	<0.0030		<0.0030	<0.0030		<0.0030	<0.0030	
Zirconium	20	30	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Dissolved Metals (mg/L)															
Aluminum	20	30	0.0010	0.0074	0.0071	4.1	0.0038	0.0044	-15	0.0033	0.0044	-29	0.0064	0.0067	-4.6
Antimony	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	0.00010		<0.00010	<0.00010	
Arsenic	20	30	0.00010	<0.00010	0.00011		0.00026	0.00026	0	0.00033	0.00032	3.1	0.00011	0.00011	0
Barium	20	30	0.00010	0.0019	0.0018	2.7	0.0021	0.0021	-2.4	0.0097	0.0095	2.1	0.0046	0.0046	-0.87
Beryllium	20	30	0.00010	<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100	
Bismuth	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Boron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		<0.010	<0.010		<0.010	<0.010	
Cadmium	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Calcium	20	30	0.050	1.1	1.1	0	4.2	4.1	3.4	5.2	4.9	5.3	2.5	2.5	1.6
Cesium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Chromium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Cobalt	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Copper	20	30	0.00020	0.00042	0.00042	0	0.0011	0.0012	-12	0.00042	0.00044	-4.7	0.00034	0.00037	-8.5
Iron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		0.044	0.046	-4.4	0.024	0.026	-8.0
Lead	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Lithium	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010	
Magnesium	20	30	0.0050	0.70	0.69	0.43	1.2	1.2	0	1.5	1.5	2.0	0.72	0.71	2.0
Manganese	20	30	0.00010	0.0020	0.0019	2.6	0.00066	0.00070	-5.9	0.023	0.023	-0.88	0.0011	0.0011	-3.7
Mercury	20	30	0.000005	<0.0000050	<0.0000050		0.000005	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Molybdenum	20	30	0.000050	<0.000050	<0.000050		0.00012	0.00012	-2.5	0.000077	0.000087	-12	0.000058	0.000080	**-32**
Nickel	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		0.00077	0.00078	-1.3	<0.00050	<0.00050	
Phosphorus	20	30	0.050	<0.050	<0.050		<0.050	<0.050		<0.050	<0.050		<0.050	<0.050	
Potassium	20	30	0.050	0.38	0.38	0	0.42	0.42	-0.24	1.4	1.3	0.74	0.57	0.58	-2.6
Rubidium	20	30	0.00020	0.00048	0.00053	-9.9	0.00049	0.00045	8.5	0.0020	0.0020	-2.5	0.00064	0.00066	-3.1
Selenium	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Silicon	20	30	0.050	0.18	0.17	3.4	0.39	0.40	-1.8	0.098	0.096	2.1	0.24	0.26	-4.8
Silver	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Sodium	20	30	0.050	0.54	0.54	0.56	0.52	0.52	-0.57	1.2	1.1	3.5	0.86	0.87	-1.0
Strontium	20	30	0.00020	0.0064	0.0065	-1.5	0.021	0.022	-1.4	0.039	0.037	6.1	0.014	0.013	2.2
Sulfur	20	30	0.50	<0.50	<0.50		1.2	1.4	-15	1.2	1.1	8.6	0.72	0.70	2.8
Tellurium	20	30	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Thallium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Thorium	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Tin	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Titanium	20	30	0.00030	<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030	
Tungsten	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Uranium	20	30	0.000010	0.000075	0.000073	2.7	0.000059	0.000060	-1.7	0.000043	0.000044	-2.3	0.000031	0.000033	-6.3
Vanadium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Zinc	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010	
Zirconium		40	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Speciated Metals (µg/L)															
Arsenate (As V)	20	30	0.020	<0.020	<0.020		-	-		0.043	0.042	2.4	<0.020	<0.020	
Arsenite (As III)	20	30	0.020	<0.020	0.023		-	-		0.079	0.076	3.9	<0.020	0.023	
Arsenobetaine (AsB)	20	30	0.050	<0.050	<0.050		-	-		<0.050	<0.050		<0.050	<0.050	
Dimethylarsinic Acid (DMA)	20	30	0.020	<0.020	<0.020		-	-		0.037	0.042	-13	<0.020	<0.020	
Monomethylarsonic Acid (MMA)	20	30	0.020	<0.020	<0.020		-	-		<0.020	<0.020		<0.020	<0.020	
Plant Pigments (µg/L)															
chlorophyll-a		40	0.010	0.17	0.18	-2.9	0.65	0.55	17	0.094	0.90	-162.3	0.35	0.33	7.1

Notes:

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

RPDs are only calculated when both samples are above detection.

The data quality objective (DQO) for field duplicates is an RPD of 1.5 x the laboratory RPD or 40% in the absence of a lab RPD.

Bolded RPDs RPD values exceeded but < 10 x MDL.

Shaded RPD RPD values exceeded and > 10 x MDL.

Italicized numbers are below detection limits.

"-" = No measurement

Table A-5. Field QA/QC summary for water quality for all CREMP study areas, 2022.

Month				August											
	Lab RPD Values (%)	Field RPD Values (%)	August MDLs	Third Portage Lake - East Basin			Wally Lake			Whale Tail Lake - South Basin			Lake DS1		
Analyte				TPE-156	AUG-DUP-1	RPD (%)	WAL-125	AUG-DUP-2	RPD (%)	WTS-74	AUG-DUP-3	RPD (%)	DS1-64	AUG-DUP-4	RPD (%)
Date Sampled				18-Aug-2022	18-Aug-2022		19-Aug-2022	19-Aug-2022		17-Aug-2022	17-Aug-2022		16-Aug-2022	16-Aug-2022	
ALS Sample ID				VA22B9756-003	VA22C0136-035		VA22C0136-033	VA22C0136-036		VA22B9756-008	VA22B9756-011		VA22B9756-006	VA22B9756-012	
Physical Tests															
Conductivity (µS/cm)	10	15	2.0	29	30	-3.4	39	37	3.4	100	102	-2.0	24	24	1.2
Alkalinity, Total	20	30	1.0	7.8	7.6	2.6	12	12	2.4	17	17	-2.9	6.4	6.6	-3.1
Alkalinity, Bicarbonate	20	30	1.0	7.8	7.6	2.6	12	12	2.4	17	17	-2.9	6.4	6.6	-3.1
Alkalinity, Carbonate	20	30	1.0	<1.0	<1.0		<1.0	<1.0		<1.0	<1.0		<1.0	<1.0	
Alkalinity, Hydroxide	20	30	1.0	<1.0	<1.0		<1.0	<1.0		<1.0	<1.0		<1.0	<1.0	
Hardness (mg/L), dissolved		40	0.60	9.7	9.9	-1.9	15	16	-1.3	35	37	-4.2	8.2	8.6	-4.8
Hardness (as $CaCO_3$), from total Ca/Mg		40	0.60	10	9.9	2.6	15	16	-6.5	35	34	1.2	8.3	8.3	-1.1
pH (Laboratory)		40	0.10	7.1	7.1	-0.14	7.3	7.3	-0.14	7.4	7.4	-0.14	7.0	7.0	0.29
Total Dissolved Solids (mg/L)		40	3.0	19	28	-40	28	28	-0.71	61	62	-0.98	15	16	-5.2
Total Suspended Solids (mg/L)		40	1.0	<1.0	<1.0		<1.0	<1.0		1.4	1.6	-13	<1.0	<1.0	
Turbidity (NTU)	15	23	0.10	0.15	0.13	14	0.16	0.16	0	1.0	0.89	15	0.34	0.28	19
Anions and Nutrients (mg/L)															
Total Kjeldahl Nitrogen	20	30	0.050	0.090	0.063	**35**	0.13	0.12	4.8	0.23	0.23	-0.88	0.12	0.12	1.7
Ammonia, Total (as N)	20	30	0.0050	<0.0050	0.0081		<0.0050	<0.0050		0.015	0.0088	**54**	<0.0050	<0.0050	
Bromide (Br)	20	30	0.050	<0.050	<0.050		<0.050	<0.050		0.13	0.14	-2.9	<0.050	<0.050	
Chloride (Cl)	20	30	0.10	0.71	0.72	-1.4	0.52	0.54	-3.8	11	11	0	1.8	1.8	-0.54
Fluoride (F)	20	30	0.020	0.066	0.073	-10	0.049	0.050	-2.0	0.052	0.053	-1.9	0.047	0.047	0
Nitrate (as N)	20	30	0.0050	<0.0050	<0.0050		<0.0050	<0.0050		0.20	0.20	0	<0.0050	<0.0050	
Nitrite (as N)	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		0.0015	0.0012	22	<0.0010	<0.0010	
Orthophosphate-Dissolved (as P)	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010	
Phosphorus (P)-Total	20	30	0.0020	<0.0020	0.028		<0.0020	0.0022		0.0065	0.0063	3.1	0.0033	0.0037	-11
Phosphorus (P)-Total Dissolved	25	38	0.0020	<0.0020	<0.0020		<0.0020	<0.0020		0.0034	0.0035	-2.9	<0.0020	0.0026	
Reactive Silica (as SiO_2)	20	30	0.50	<0.50	<0.50		1.2	1.2	-0.82	<0.50	<0.50		0.53	0.54	-1.9
Sulfate (SO_4)	20	30	0.30	4.4	4.2	2.8	3.9	3.9	0	11	11	-0.94	1.6	1.6	0.62
Cyanides (mg/L)															
Free Cyanide	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		-	-		-	-	
Total Cyanide	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		-	-		-	-	
Organic / Inorganic Carbon (mg/L)															
Dissolved Organic Carbon	20	30	0.50	1.4	1.7	-23	2.7	2.7	0.75	3.7	3.6	3.3	2.6	2.8	-5.9
Total Organic Carbon	20	30	0.50	1.5	2.0	-28	3.1	2.9	5.4	3.6	3.5	2.9	2.4	2.6	-8.5
Total Metals (mg/L)															
Aluminum	20	30	0.0030	0.0072	0.0056	25	0.0042	0.0046	-9.1	0.017	0.018	-6.9	0.0095	0.0079	18
Antimony	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		0.00078	0.00078	0	<0.00010	<0.00010	
Arsenic	20	30	0.00010	0.00054	0.00050	7.7	0.00035	0.00035	0	0.0011	0.0011	0.90	0.00015	0.00015	0
Barium	20	30	0.00010	0.0027	0.0026	6.5	0.0019	0.0019	-0.53	0.017	0.017	-1.8	0.0043	0.0043	0
Beryllium	20	30	0.00010	<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100	
Bismuth	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Boron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		<0.010	<0.010		<0.010	<0.010	
Cadmium	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Calcium	20	30	0.050	2.5	2.5	1.2	4.1	4.3	-6.2	9.3	9.1	1.7	2.1	2.1	-1.4
Cesium	20	30	0.000010	0.000014	0.000013	7.4	<0.000010	<0.000010		0.000024	0.000024	0	<0.000010	<0.000010	
Chromium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Cobalt	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Copper	20	30	0.00050	<0.00050	<0.00050		0.0011	0.0011	0.94	0.00050	0.00051	-2.0	<0.00050	<0.00050	
Iron	20	30	0.010	0.012	<0.010		0.015	0.015	0	0.066	0.067	-1.5	0.030	0.031	-3.3
Lead	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Lithium	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		0.0017	0.0017	0	<0.0010	<0.0010	
Magnesium	20	30	0.0050	0.98	0.92	5.7	1.2	1.3	-4.9	2.8	2.8	-0.36	0.74	0.74	-0.27
Manganese	20	30	0.00010	0.0011	0.00098	9.7	0.0014	0.0014	-0.71	0.0091	0.0094	-3.7	0.0016	0.0018	-11
Mercury	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Molybdenum	20	30	0.000050	0.00012	0.00011	5.1	0.00016	0.00016	-0.61	0.00045	0.00045	2.0	0.000054	0.000051	5.7
Nickel	20	30	0.00050	0.00056	<0.00050		<0.00050	<0.00050		0.0022	0.0022	0	<0.00050	<0.00050	
Phosphorus	20	30	0.050	<0.050	<0.050		<0.050	<0.050		<0.050	<0.050		<0.050	<0.050	
Potassium	20	30	0.050	0.53	0.54	-0.94	0.45	0.46	-2.6	2.7	2.7	0.37	0.50	0.50	-0.20
Rubidium	20	30	0.00020	0.00088	0.00083	5.8	0.00063	0.00064	-1.6	0.0042	0.0043	-0.71	0.00068	0.00074	-8.5
Selenium	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Silicon	20	30	0.10	0.12	0.12	0	0.57	0.55	3.6	0.15	0.15	0	0.26	0.28	-7.4
Silver	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Sodium	20	30	0.050	1.0	1.0	-0.99	0.55	0.57	-3.1	2.3	2.3	1.3	0.78	0.79	-0.76
Strontium	20	30	0.00020	0.011	0.012	-8.5	0.023	0.023	-2.6	0.080	0.077	3.3	0.011	0.012	-3.4
Sulfur	20	30	0.50	1.7	1.4	20	1.2	1.2	0.83	3.5	3.6	-2.6	0.54	<0.50	
Tellurium	20	30	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Thallium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Thorium	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Tin	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Titanium	20	30	0.00030	<0.00030	<0.00030		<0.00030	<0.00030		0.00067	0.00079	-16	<0.00030	<0.00030	
Tungsten	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Uranium	20	30	0.000010	0.000041	0.000040	2.5	0.000054	0.000054	0	0.000078	0.000076	2.6	0.000038	0.000038	0
Vanadium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Zinc	20	30	0.0030	<0.0030	<0.0030		<0.0030	<0.0030		<0.0030	<0.0030		<0.0030	<0.0030	
Zirconium	20	30	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Dissolved Metals (mg/L)															
Aluminum	20	30	0.0010	0.0027	0.0026	3.8	0.0022	0.0023	-4.4	0.0047	0.0042	11	0.0048	0.0048	0
Antimony	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		0.00076	0.00077	-1.3	<0.00010	<0.00010	
Arsenic	20	30	0.00010	0.00051	0.00047	8.2	0.00034	0.00034	0	0.0011	0.0011	0	0.00014	0.00014	0
Barium	20	30	0.00010	0.0027	0.0027	0	0.0019	0.0019	3.7	0.017	0.017	-1.2	0.0043	0.0044	-2.6
Beryllium	20	30	0.00010	<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100	
Bismuth	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Boron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		<0.010	<0.010		<0.010	<0.010	
Cadmium	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Calcium	20	30	0.050	2.4	2.4	-1.3	4.1	4.2	-1.9	9.6	9.8	-2.1	2.1	2.2	-4.7
Cesium	20	30	0.000010	0.000012	0.000012	0	<0.000010	<0.000010		0.000021	0.000017	21	<0.000010	<0.000010	
Chromium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Cobalt	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Copper	20	30	0.00020	0.00043	0.00044	-2.3	0.0010	0.0010	2.0	0.00047	0.00053	-12	0.00032	0.00032	0
Iron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		0.024	0.027	-12	0.013	0.015	-14
Lead	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Lithium	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		0.0017	0.0017	0	<0.0010	<0.0010	
Magnesium	20	30	0.0050	0.93	0.96	-3.0	1.3	1.3	0.79	2.7	3.0	-8.4	0.73	0.77	-4.9
Manganese	20	30	0.00010	0.00067	0.00066	1.5	0.00033	0.00032	3.1	0.00085	0.0011	-21	0.00038	0.00052	**-31**
Mercury	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Molybdenum	20	30	0.000050	0.00012	0.00011	16	0.00014	0.00015	-9.1	0.00045	0.0051	-168	0.000057	0.0028	-192
Nickel	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		0.0021	0.0021	-2.4	<0.00050	<0.00050	
Phosphorus	20	30	0.050	<0.050	<0.050		<0.050	<0.050		<0.050	<0.050		<0.050	<0.050	
Potassium	20	30	0.050	0.54	0.54	1.7	0.47	0.47	1.1	2.8	2.8	0.72	0.49	0.48	1.6
Rubidium	20	30	0.00020	0.00089	0.00082	8.2	0.00058	0.00065	-11	0.0042	0.0044	-6.1	0.00070	0.00066	5.9
Selenium	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Silicon	20	30	0.050	0.089	0.085	4.6	0.54	0.55	-2.8	0.091	0.092	-1.1	0.23	0.23	-2.2
Silver	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Sodium	20	30	0.050	0.98	1.0	-1.7	0.59	0.59	-0.51	2.4	2.4	-1.2	0.78	0.79	-0.89
Strontium	20	30	0.00020	0.012	0.011	5.2	0.021	0.021	1.4	0.079	0.078	1.4	0.011	0.012	-0.87
Sulfur	20	30	0.50	1.4	1.5	-6.1	1.4	1.4	0.70	3.5	3.2	10	<0.50	<0.50	
Tellurium	20	30	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Thallium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Thorium	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Tin	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Titanium	20	30	0.00030	<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030	
Tungsten	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Uranium	20	30	0.000010	0.000039	0.000036	8.0	0.000051	0.000050	2.0	0.000067	0.000066	1.5	0.000037	0.000035	5.6
Vanadium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Zinc	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010		0.0012	<0.0010	
Zirconium		40	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Speciated Metals (µg/L)															
Arsenate (As V)	20	30	0.020	-	-		-	-		0.059	0.045	27	<0.020	<0.020	
Arsenite (As III)	20	30	0.020	-	-		-	-		0.44	0.44	0.23	0.038	0.041	-7.6
Arsenobetaine (AsB)	20	30	0.050	-	-		-	-		<0.050	<0.050		<0.050	<0.050	
Dimethylarsinic Acid (DMA)	20	30	0.020	-	-		-	-		0.21	0.21	2.9	<0.020	<0.020	
Monomethylarsonic Acid (MMA)	20	30	0.020	-	-		-	-		<0.020	<0.020		<0.020	<0.020	
Plant Pigments (µg/L)															
chlorophyll-a		40	0.010	0.25	0.28	-11	0.57	0.59	-4.8	2.7	2.9	-7.2	0.64	0.66	-3.1

Notes:

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

RPDs are only calculated when both samples are above detection.

The data quality objective (DQO) for field duplicates is an RPD of 1.5 x the laboratory RPD or 40% in the absence of a lab RPD.

Bolded RPDs RPD values exceeded but < 10 x MDL.

Shaded RPD RPD values exceeded and > 10 x MDL.

Italicized numbers are below detection limits.

"-" = No measurement

Table A-5. Field QA/QC summary for water quality for all CREMP study areas, 2022.

Month				September											
				Pipedream Lake			Inuggugayualik Lake			Nemo Lake			Lake DS1		
Analyte	Lab RPD Values (%)	Field RPD Values (%)	Sep. MDLs	PDL-112	SEP-DUP-1	**RPD (%)**	INUG-147	SEP-DUP-2	**RPD (%)**	NEM-75	SEP-DUP-3	**RPD (%)**	DS1-65	SEP-DUP-4	**RPD (%)**
Date Sampled				14-Sep-2022	14-Sep-2022		11-Sep-2022	14-Sep-2022		03-Sep-2022	03-Sep-2022		05-Sep-2022	05-Sep-2022	
ALS Sample ID				VA22C2783-004	VA22C2783-005		VA22C2783-002	VA22C2783-006		VA22C1407-003	VA22C1407-009		VA22C1655-001	VA22C1655-005	
Physical Tests															
Conductivity (µS/cm)	10	15	2.0	24	24	0.42	17	16	1.8	90	89	1.3	40	40	-0.50
Alkalinity, Total	20	30	1.0	8.3	8.4	-1.2	5.6	5.3	5.5	11	11	0.90	8.5	8.4	1.2
Alkalinity, Bicarbonate	20	30	1.0	8.3	8.4	-1.2	5.6	5.3	5.5	11	11	0.90	8.5	8.4	1.2
Alkalinity, Carbonate	20	30	1.0	<1.0	<1.0		<1.0	<1.0		<1.0	<1.0		<1.0	<1.0	
Alkalinity, Hydroxide	20	30	1.0	<1.0	<1.0		<1.0	<1.0		<1.0	<1.0		<1.0	<1.0	
Hardness (mg/L), dissolved		40	0.60	9.7	9.6	0.72	6.0	6.1	-1.5	33	33	0.61	14	14	1.4
Hardness (as $CaCO_3$), from total Ca/Mg		40	0.60	9.7	9.8	-1.5	6.0	6.1	-2.0	33	56	-51.4	14	14	0
pH (Laboratory)		40	0.10	7.0	7.0	0	6.8	6.8	-0.29	7.3	7.3	-0.14	6.7	6.7	-0.30
Total Dissolved Solids (mg/L)		40	10	19	18	1.1	14	15	-11	65	65	-0.62	32	25	24
Total Suspended Solids (mg/L)		40	1.0	<1.0	<1.0		<1.0	<1.0		<1.0	<1.0		<1.0	<1.0	
Turbidity (NTU)	15	23	0.10	0.18	0.16	12	0.26	0.27	-3.8	0.18	0.18	0	0.25	0.24	4.1
Anions and Nutrients (mg/L)															
Total Kjeldahl Nitrogen	20	30	0.050	0.11	0.10	5.8	0.13	0.13	2.4	0.11	0.11	-1.8	0.11	0.090	24
Ammonia, Total (as N)	20	30	0.0050	<0.0050	<0.0050		<0.0050	<0.0050		<0.0050	<0.0050		<0.0050	<0.0050	
Bromide (Br)	20	30	0.050	<0.050	<0.050		<0.050	<0.050		0.098	0.099	-1.0	<0.050	<0.050	
Chloride (Cl)	20	30	0.10	0.72	0.71	1.4	0.76	0.76	0	15	15	0.68	4.10 4.10	4.03 4.03	
Fluoride (F)	20	30	0.020	0.041	0.040	2.5	0.064	0.063	1.6	0.030	0.027	11	0.048	0.045	6.5
Nitrate (as N)	20	30	0.0050	<0.0050	<0.0050		<0.0050	<0.0050		<0.0050	<0.0050		<0.0050	<0.0050	
Nitrite (as N)	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010	
Orthophosphate-Dissolved (as P)	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010		0.0012	0.0011	8.7
Phosphorus (P)-Total	20	30	0.0020	0.0023	0.0026	-12	0.0034	0.0035	-2.9	0.0022	<0.0020		0.0028	0.0030	-6.9
Phosphorus (P)-Total Dissolved	25	38	0.020	0.0020	<0.0020		0.0022	0.0024	-8.7	<0.0020	<0.0020		0.0022	0.0050	**-78**
Reactive Silica (as SiO_2)	20	30	0.50	<0.50	<0.50		<0.50	<0.50		<0.50	<0.50		0.78	0.79	-1.3
Sulfate (SO_4)	20	30	0.30	1.9	1.9	0.52	0.93	0.97	-4.2	4.6	4.5	2.2	3.0	3.0	2.3
Cyanides (mg/L)															
Free Cyanide	20	30	0.0010												
Total Cyanide	20	30	0.0010												
Organic / Inorganic Carbon (mg/L)															
Dissolved Organic Carbon	20	30	0.50	1.7	1.7	1.8	2.2	2.1	0.47	2.3	2.5	-12	2.9	2.7	8.7
Total Organic Carbon	20	30	0.50	1.7	1.7	1.2	2.1	2.1	0	2.1	2.5	-20	2.7	2.1	29
Total Metals (mg/L)															
Aluminum	20	30	0.0030	0.0053	0.0052	1.9	0.0091	0.0096	-5.3	0.0043	0.0043	0	0.0074	0.0064	14
Antimony	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	0.0015		<0.00010	<0.00010	
Arsenic	20	30	0.00010	0.00019	0.00017	11	0.00012	0.00011	8.7	0.00090	0.0014	-41.4	0.00017	0.00016	6.1
Barium	20	30	0.00010	0.0019	0.0020	-5.5	0.0018	0.0018	1.1	0.016	0.021	-28	0.0055	0.0055	0.36
Beryllium	20	30	0.00010	<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100	
Bismuth	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Boron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		<0.010	<0.010		<0.010	<0.010	
Cadmium	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Calcium	20	30	0.050	2.5	2.5	-0.81	1.2	1.2	-1.7	9.8	16	-46.8	3.9	3.9	1.0
Cesium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		0.000019	0.000022	-15	<0.000010	<0.000010	
Chromium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Cobalt	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	0.00013		<0.00010	<0.00010	
Copper	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	0.00060		<0.00050	<0.00050	
Iron	20	30	0.010	<0.010	<0.010		0.017	0.026	**-42**	0.015	0.029	**-64**	0.089	0.056	**46**
Lead	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Lithium	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		0.0017	0.0027	**-45**	<0.0010	<0.0010	
Magnesium	20	30	0.0050	0.86	0.88	-2.9	0.74	0.76	-2.1	2.1	4.0	-62.5	1.0	1.1	-2.8
Manganese	20	30	0.00010	0.00092	0.00096	-4.3	0.0016	0.0017	-4.3	0.0045	0.013	-93.8	0.0026	0.0025	4.0
Mercury	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Molybdenum	20	30	0.000050	0.000058	0.000056	3.5	<0.000050	<0.000050		0.000092	0.0013	-172.8	0.000059	0.000056	5.2
Nickel	20	30	0.00050	0.00059	0.00061	-3.3	<0.00050	<0.00050		0.0012	0.0024	**-66**	<0.00050	<0.00050	
Phosphorus	20	30	0.050	<0.050	<0.050		<0.050	<0.050		<0.050	<0.050		<0.050	<0.050	
Potassium	20	30	0.050	0.36	0.38	-4.0	0.38	0.38	0	1.6	4.1	-88.0	0.78	0.80	-3.2
Rubidium	20	30	0.00020	0.00044	0.00042	4.7	0.00057	0.00054	5.4	0.0026	0.0051	-63.2	0.0010	0.0010	1.9
Selenium	20	30	0.000050	<0.000050	<0.000050		0.000051	<0.000050		<0.000050	0.000090		<0.000050	<0.000050	
Silicon	20	30	0.10	0.17	0.17	0	0.17	0.17	0	0.12	0.38	**-104**	0.36	0.37	-2.7
Silver	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Sodium	20	30	0.050	0.51	0.53	-2.1	0.57	0.58	-1.9	0.92	3.7	-120.8	1.1	1.1	-3.7
Strontium	20	30	0.00020	0.011	0.011	0	0.0072	0.0071	0.84	0.061	0.12	-64.3	0.020	0.020	0
Sulfur	20	30	0.50	0.58	0.71	-20	<0.50	<0.50		1.6	7.4	-130.0	1.3	1.4	-1.5
Tellurium	20	30	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Thallium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Thorium	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Tin	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Titanium	20	30	0.00060	<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030	
Tungsten	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Uranium	20	30	0.000010	0.000030	0.000029	3.4	0.000058	0.000057	1.7	0.000017	0.00023	-172.9	0.000026	0.000025	3.9
Vanadium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Zinc	20	30	0.0030	<0.0030	<0.0030		<0.0030	<0.0030		<0.0030	<0.0030		<0.0030	<0.0030	
Zirconium	20	30	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Dissolved Metals (mg/L)															
Aluminum	20	30	0.0010	0.0015	0.0015	0	0.0029	0.0031	-6.7	0.0019	0.0016	17	0.0024	0.0019	23
Antimony	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Arsenic	20	30	0.00010	0.00018	0.00019	-5.4	<0.00010	<0.00010		0.00089	0.00085	4.6	0.00011	0.00012	-8.7
Barium	20	30	0.00010	0.0020	0.0019	2.6	0.0017	0.0017	3.5	0.015	0.015	3.3	0.0056	0.0057	-1.6
Beryllium	20	30	0.00010	<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100		<0.000100	<0.000100	
Bismuth	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Boron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		<0.010	<0.010		<0.010	<0.010	
Cadmium	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Calcium	20	30	0.050	2.4	2.4	0	1.2	1.2	-1.7	9.6	9.6	0.52	3.8	3.7	2.4
Cesium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		0.000017	0.000015	13	<0.000010	<0.000010	
Chromium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Cobalt	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Copper	20	30	0.00020	0.00043	0.00045	-4.5	0.00043	0.00050	-15	0.00042	0.00046	-9.1	0.00048	0.00040	18
Iron	20	30	0.010	<0.010	<0.010		<0.010	<0.010		<0.010	<0.010		0.015	0.014	6.9
Lead	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Lithium	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		0.0015	0.0014	6.9	<0.0010	<0.0010	
Magnesium	20	30	0.0050	0.88	0.86	2.0	0.74	0.75	-1.1	2.2	2.1	1.4	1.1	1.1	-0.92
Manganese	20	30	0.00010	0.00021	0.00022	-4.7	0.00060	0.00058	3.4	0.0018	0.0018	0.55	0.00089	0.0013	-35.9
Mercury	20	30	0.000005	<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050		<0.0000050	<0.0000050	
Molybdenum	20	30	0.000050	0.000051	0.000058	-13	<0.000050	<0.000050		0.000094	0.000093	1.1	0.000058	0.000060	-3.4
Nickel	20	30	0.00050	0.00054	0.00057	-5.4	<0.00050	<0.00050		0.0012	0.0012	0.83	<0.00050	<0.00050	
Phosphorus	20	30	0.050	<0.050	<0.050		<0.050	<0.050		<0.050	<0.050		<0.050	<0.050	
Potassium	20	30	0.050	0.40	0.39	2.0	0.42	0.42	0.48	1.7	1.6	0.61	0.80	0.80	-0.38
Rubidium	20	30	0.00020	0.00045	0.00048	-6.5	0.00058	0.00060	-3.4	0.0025	0.0023	6.2	0.00094	0.0011	-16
Selenium	20	30	0.000050	<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050		<0.000050	<0.000050	
Silicon	20	30	0.050	0.13	0.14	-1.5	0.14	0.14	-4.3	0.082	0.081	1.2	0.34	0.34	0.89
Silver	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Sodium	20	30	0.050	0.53	0.52	0.95	0.59	0.59	-0.17	0.93	0.92	1.8	1.1	1.1	-0.91
Strontium	20	30	0.00020	0.011	0.011	0.95	0.0068	0.0070	-3.1	0.060	0.059	1.7	0.020	0.020	1.0
Sulfur	20	30	0.50	0.50	<0.50		<0.50	<0.50		1.4	1.6	-12	1.0	0.90	12
Tellurium	20	30	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Thallium	20	30	0.000010	<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010		<0.000010	<0.000010	
Thorium	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Tin	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		0.00026	<0.00010		<0.00010	<0.00010	
Titanium	20	30	0.00030	<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030		<0.00030	<0.00030	
Tungsten	20	30	0.00010	<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010		<0.00010	<0.00010	
Uranium	20	30	0.000010	0.000027	0.000026	3.8	0.000052	0.000051	1.9	0.000013	0.000013	0	0.000023	0.000022	4.4
Vanadium	20	30	0.00050	<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050		<0.00050	<0.00050	
Zinc	20	30	0.0010	<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010		<0.0010	<0.0010	
Zirconium		40	0.00020	<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020		<0.00020	<0.00020	
Speciated Metals (µg/L)															
Arsenate (As V)	20	30	0.020	<0.020	-		<0.020	-		-	-		<0.020	0.021	
Arsenite (As III)	20	30	0.020	0.030	-		<0.020	-		-	-		<0.020	<0.020	
Arsenobetaine (AsB)	20	30	0.050	<0.050	-		<0.050	-		-	-		<0.050	<0.050	
Dimethylarsinic Acid (DMA)	20	30	0.020	<0.020	-		<0.020	-		-	-		0.022	<0.020	
Monomethylarsonic Acid (MMA)	20	30	0.020	<0.020	-		<0.020	-		-	-		<0.020	<0.020	
Plant Pigments (µg/L)															
chlorophyll-a		40	0.020	0.98	1.1	-6.5	0.59	0.66	-11	0.60	0.61	-0.33	0.94	1.2	-26

Notes:

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

RPDs are only calculated when both samples are above detection.

The data quality objective (DQO) for field duplicates is an RPD of 1.5 x the laboratory RPD or 40% in the absence of a lab RPD.

Bolded RPDs RPD values exceeded but < 10 x MDL.

Shaded RPD RPD values exceeded and > 10 x MDL.

Italicized numbers are below detection limits.

"-" = No measurement

Table A-6. Water chemistry field duplicate RPDs greater than QA/QC DQOs in 2022.

Parameter	March	May	July	August	September
Total Hardness					I
Turbidity	I		II		
Total Kjeldahl Nitrogen		I		I	
Ammonia, Total (as N)				I	
Orthophosphate-Dissolved (as P)			I		
Phosphorus (P)-Total			II		
Phosphorus (P)-Total Dissolved					I
Sulphate	II		I		
Total Metals					
Arsenic					II
Calcium					I
Iron					III
Lithium					I
Magnesium					I
Manganese	III				I
Molybdenum					II
Nickel					I
Potassium					I
Rubidium					I
Silicon					I
Sodium					I
Strontium					I
Sulfur					II
Uranium					II
Dissolved Metals					
Aluminum		II			
Arsenic		I			
Barium	I				
Manganese					II
Molybdenum			I	II	
Plant Pigments					
Chlorophyll-a			II		

Notes

I — Tally indicates number of DQO exceedances

(shaded) — Shading indicates that the DQO was exceeded and the concentrations were >10X DL.

Table A-7. Swipe chemistry data for sediment grab analyses, 2022.

		Equipment Swipes [1]	
		SWIPE-1	SWIPE-2
	Swipe DLs (µg)	FILTER	FILTER
		13-Aug-2022	22-Aug-2022
Analyte	**ALS Sample ID**	VA22B9801-053	VA22C0074-046
Total Metals (µg)			
Aluminum	20	**101**	*<20*
Antimony	20	*<20*	*<20*
Arsenic	20	*<20*	*<20*
Barium	1	*<1.0*	*<1.0*
Beryllium	0.5	*<0.50*	*<0.50*
Bismuth	20	*<20*	*<20*
Cadmium	1	*<1.0*	*<1.0*
Calcium	200	*<200*	**220**
Chromium	2	28.3	**7.7**
Cobalt	1	*<1.0*	*<1.0*
Copper	1	*<1.0*	*<1.0*
Lead	0.4	*<0.40*	*<0.40*
Lithium	1	*<1.0*	*<1.0*
Manganese	0.5	**2.27**	**1.43**
Mercury	0.01	*<0.010*	*<0.010*
Molybdenum	3	*<3.0*	*<3.0*
Nickel	5	**9.6**	*<5.0*
Potassium	200	*<200*	*<200*
Selenium	20	*<20*	*<20*
Silver	1	*<1.0*	*<1.0*
Strontium	0.5	*<0.50*	*<0.50*
Thallium	20	*<20*	*<20*
Tin	3	*<3.0*	*<3.0*
Titanium	1	**2.9**	*<1.0*
Vanadium	3	*<3.0*	*<3.0*
Zinc	0.5	27.9	44.7

Notes:

Bold Filter Swipes	**concentration exceeds laboratory DLs, but < 10x DL.**
Shaded Filter Swipes	concentration is > 10x DL.

Table A-8. Field duplicate results for the sediment grabs collected in 2022.

Analyte	August MDLs	Lab RPD Values (%)	Field RPD Values (%)[1]	Wally Lake			Third Portage Lake - East Basin			Inuggugayualik Lake			Third Portage Lake - North Basin			Mammoth Lake			Nemo Lake			Lake A20		
				WAL-5	AUG-DUP-1	RPD (%)	TPE-5	AUG-DUP-2	RPD (%)	INUG-2	AUG-DUP-3	RPD (%)	TPN-4	AUG-DUP-4	RPD (%)	MAM-5	AUG-DUP-5	RPD (%)	NEM-5	AUG-DUP-6	RPD (%)	A20-5	AUG-DUP-7	RPD (%)
Date Sampled				13-Aug-2022	13-Aug-2022		13-Aug-2022	13-Aug-2022		14-Aug-2022	13-Aug-2022		13-Aug-2022	13-Aug-2022		15-Aug-2022	15-Aug-2022		15-Aug-2022	15-Aug-2022		17-Aug-2022	17-Aug-2022	
ALS Sample ID				VA22B9801-017	VA22B9801-049		VA22B9801-023	VA22B9801-050		VA22B9801-038	VA22B9801-051		VA22B9801-028	VA22B9801-052		VA22C0074-017	VA22C0074-042		VA22C0074-005	VA22C0074-043		VA22C0074-023	VA22C0074-044	
Physical Tests																								
Moisture (%)	*0.25*	20	30	91	91	0.11	78	76	2.5	-	-		77	77	0.00	89	90	-1.01	87	90	-2.60	87	88	-1.72
pH	*0.10*	5	8	6.4	6.4	-1.25	6.4	6.1	4.0	5.4	5.4	0.37	5.8	6.1	-3.70	5.9	5.9	1.2	6.4	6.4	0.00	5.6	5.6	-0.89
Particle Size (%)																								
Clay (<0.004mm)	*1.00*	-	40	12	18	**-42**	33	37	-10.34	-	-		16	21	-26.27	34	28	22	9.5	10	-7.11	35	38	-7.45
Silt (0.063mm - 0.004mm)	*1.00*	-	40	85	78	8.4	59	53	9.8	-	-		58	59	-2.05	65	71	-9.72	64	62	3.0	65	62	5.2
Sand (2.0mm - 0.063mm)	*1.00*	-	40	3.1	3.8	-20.29	8.2	10	-20.77	-	-		26	20	27	1.0	1.2	-18.18	27	28	-4.38	*<1.0*	*<1.0*	
Gravel (>2mm)	*1.00*	-	40	*<1.0*	*<1.0*		*<1.0*	*<1.0*		-	-		*<1.0*	*<1.0*		*<1.0*	*<1.0*		*<1.0*	*<1.0*		*<1.0*	*<1.0*	
Organic Carbon (% dw)																								
Total Organic Carbon	*0.10*	20	30	11	11	2.8	2.5	2.6	-1.96	-	-		3.3	3.0	10	8.7	8.2	5.3	7.9	8.5	-7.94	5.2	5.3	-1.71
Total Metals (mg/kg dw)																								
Aluminum	*50*	40	60	-	-		-	-		19500	20400	-4.51	-	-		23800	22800	4.3	9870	9040	8.8	22000	21400	2.8
Antimony	*0.10*	30	45	-	-		-	-		0.18	0.18	0.00	-	-		0.93	0.99	-6.25	0.36	0.31	15	0.18	0.19	-5.41
Arsenic	*0.100*	30	45	-	-		-	-		118	129	-8.91	-	-		119	124	-4.12	53	47	13	55	57	-4.28
Barium	*0.50*	40	60	-	-		-	-		109	124	-12.88	-	-		158	154	2.6	87	77	12	142	146	-2.78
Beryllium	*0.10*	30	45	-	-		-	-		1.3	1.3	-3.08	-	-		1.7	1.6	5.9	0.59	0.54	8.8	1.8	2.0	-8.56
Bismuth	*0.20*	30	45	-	-		-	-		1.1	1.2	-5.22	-	-		0.58	0.59	-1.71	0.21	*<0.20*		0.95	1.0	-7.11
Boron	*5.0*	30	45	-	-		-	-		8.2	8.7	-5.92	-	-		14	13	6.8	12	11	11	8.1	6.9	16
Cadmium	*0.020*	30	45	-	-		-	-		0.23	0.24	-3.01	-	-		0.51	0.49	4.2	0.19	0.16	14	0.13	0.13	-2.30
Calcium	*50*	30	45	-	-		-	-		1800	1990	-10.03	-	-		3720	3700	0.54	3560	3110	13	2320	2400	-3.39
Chromium	*0.50*	30	45	-	-		-	-		96	105	-8.96	-	-		202	200	1.00	128	128	0.00	58	59	-2.06
Cobalt	*0.10*	30	45	-	-		-	-		12	12	-6.72	-	-		23	24	-1.27	9.2	8.7	5.9	14	15	-3.41
Copper	*0.50*	30	45	-	-		-	-		42	45	-6.88	-	-		82	83	-0.85	35	32	7.8	43	43	0.70
Iron	*50*	30	45	-	-		-	-		79200	87600	-10.07	-	-		45400	45500	-0.22	25400	22400	13	83300	86200	-3.42
Lead	*0.50*	40	60	-	-		-	-		13	14	-10.53	-	-		20	20	0.49	8.5	7.3	15	18	19	-6.42
Lithium	*2.0*	30	45	-	-		-	-		23	23	-3.48	-	-		23	22	3.2	11	11	1.9	20	20	-1.50
Magnesium	*20*	30	45	-	-		-	-		8390	9150	-8.67	-	-		11100	11200	-0.90	6700	6140	8.7	7040	7630	-8.04
Manganese	*1.0*	30	45	-	-		-	-		1100	1160	-5.31	-	-		611	650	-6.19	603	556	8.1	1620	1720	-5.99
Mercury	*0.0050*	40	60	-	-		-	-		0.03	0.03	2.2	-	-		0.08	0.08	0.90	0.02	0.02	17	0.05	0.05	-0.21
Molybdenum	*0.10*	40	60	-	-		-	-		6.9	7.2	-3.69	-	-		6.7	6.9	-3.40	3.4	4.5	-27.27	5.7	5.9	-2.41
Nickel	*0.50*	30	45	-	-		-	-		72	76	-5.81	-	-		157	154	1.9	91	90	1.4	37	37	-0.54
Phosphorus	*50*	30	45	-	-		-	-		2220	2560	-14.23	-	-		853	826	3.2	646	515	23	892	904	-1.34
Potassium	*100*	40	60	-	-		-	-		3200	3440	-7.23	-	-		3210	3210	0.00	1220	1080	12	3200	3160	1.3
Selenium	*0.20*	30	45	-	-		-	-		0.60	0.65	-8.00	-	-		0.99	1.0	-3.96	0.47	0.38	21	0.78	0.75	3.9
Silver	*0.10*	40	60	-	-		-	-		0.19	0.19	0.00	-	-		0.60	0.62	-3.28	0.14	0.12	15	0.20	0.20	0.00
Sodium	*50*	40	60	-	-		-	-		166	166	0.00	-	-		229	204	12	121	90	29	269	241	11
Strontium	*0.50*	40	60	-	-		-	-		26	27	-4.93	-	-		29	30	-2.39	26	24	8.8	22	22	2.3
Sulfur	*1000*	30	45	-	-		-	-		*<1000*	*<1000*		-	-		2800	2700	3.6	2500	1800	33	1900	1900	0.00
Thallium	*0.050*	30	45	-	-		-	-		0.20	0.22	-11.03	-	-		0.41	0.40	0.25	0.09	0.07	16	0.25	0.26	-4.72
Tin	*2.0*	40	60	-	-		-	-		*<2.0*	*<2.0*		-	-		*<2.0*	*<2.0*		*<2.0*	*<2.0*		*<2.0*	*<2.0*	
Titanium	*1.0*	40	60	-	-		-	-		464	528	-12.90	-	-		549	563	-2.52	179	180	-0.56	430	399	7.5
Tungsten	*0.50*	30	45	-	-		-	-		*<0.50*	0.60		-	-		0.77	0.83	-7.50	*<0.50*	*<0.50*		*<0.50*	*<0.50*	
Uranium	*0.050*	30	45	-	-		-	-		15	16	-5.86	-	-		16	15	1.3	3.7	3.1	19	12	13	-6.56
Vanadium	*0.20*	30	45	-	-		-	-		33	35	-7.67	-	-		45	45	-0.89	22	20	7.1	30	31	-1.97
Zinc	*2.0*	30	45	-	-		-	-		85	90	-5.50	-	-		180	173	4.0	52	49	6.9	92	90	1.5
Zirconium	*1.0*	30	45	-	-		-	-		2.5	2.2	13	-	-		5.6	5.1	9.3	*<1.0*	*<1.0*		2.9	2.7	7.1
Speciated Metals (mg/kg dw)																								
Methylmercury (as MeHg)	*0.1*	30	45	-	-		-	-		0.08	0.12	-42.05	-	-		3.2	0.23	**173**	-	-		3.9	4.0	-1.27

Notes:

[1] The DQO for field duplicates is an RPD 1.5x the laboratory RPD or 40% in the absence of a lab RPD.

[2] Field Dup grab samples are homogenization duplicates - the original and duplicate samples were split from the same homogenized bowl of sediment.

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

RPDs are only calculated when both samples are above detection.

Bold RPDs **RPD values exceeded but < 10 x MDL.**

Shaded RPDs RPD values exceeded and > 10 x MDL.

Italicized numbers are below detection limits.

Table A-9. QA/QC results for sediment grab sample hydrocarbon and PAH analyses, 2022.

Analyte	Detection Limits	Lab DQO Values	Field DQO Values[1]	COMP-DUP-1 WAL-COMP	COMP-DUP-1 Dup[2]	COMP-DUP-1 RPD (%)	COMP-DUP-2 WTS-COMP	COMP-DUP-2 Dup	COMP-DUP-2 RPD (%)
Date Sampled				13-Aug-2022	13-Aug-2022		14-Aug-2022	14-Aug-2022	
ALS Sample ID				VA22B9801-018	VA22B9801-054		VA22C0074-012	VA22C0074-045	
Physical Parameters									
Moisture (%)	*0.25*	20	30	90.5	90.5	0	85	84	0.7
Aggregate Organics (mg/kg)									
Mineral Oil and Grease	*500*	<1000	1500	670	610	9.4	*<500*	*<500*	-
Hydrocarbons (mg/kg)									
EPH10-19	*200*	<400	600	*<580*	*<580*	-	*<280*	*<280*	-
EPH19-32	*200*	<400	600	*<580*	*<580*	-	*<280*	*<280*	-
LEPH	*200*	<400	600	*<580*	*<580*	-	*<280*	*<280*	-
HEPH	*200*	<400	600	*<580*	*<580*	-	*<280*	*<280*	-
Hydrocarbons Surrogates (%)									
2-Bromobenzotrifluoride	*5.8*	60-140	17.4	78	92.8	-17.3	93	100	-7.3
Polycyclic Aromatic Hydrocarbons (mg/kg)									
acenaphthene	*0.005*	<0.01	0.015	*<0.0289*	*<0.0291*	-	*<0.0142*	*<0.0141*	-
acenaphthylene	*0.005*	<0.01	0.015	*<0.0289*	*<0.0291*	-	*<0.0142*	*<0.0141*	-
acridine	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	*<0.014*	*<0.014*	-
anthracene	*0.004*	<0.008	0.012	*<0.0289*	*<0.0291*	-	*<0.0142*	*<0.0141*	-
benz(a)anthracene	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	*<0.014*	*<0.014*	-
benzo(a)pyrene	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	*<0.014*	*<0.014*	-
benzo(b+j)fluoranthene	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	*<0.014*	*<0.014*	-
benzo(b+j+k)fluoranthene	*0.015*	<0.03	0.045	*<0.041*	*<0.041*	-	*<0.020*	*<0.020*	-
benzo(g,h,i)perylene	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	*<0.014*	*<0.014*	-
benzo(k)fluoranthene	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	*<0.014*	*<0.014*	-
chrysene	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	*<0.014*	*<0.014*	-
dibenz(a,h)anthracene	*0.005*	<0.01	0.015	*<0.0289*	*<0.0291*	-	*<0.0142*	*<0.0141*	-
fluoranthene	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	*<0.014*	*<0.014*	-
fluorene	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	*<0.014*	*<0.014*	-
indeno(1,2,3-c,d)pyrene	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	*<0.014*	*<0.014*	-
methylnaphthalene, 1-	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	*<0.014*	*<0.014*	-
methylnaphthalene, 2-	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	*<0.014*	*<0.014*	-
naphthalene	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	0.018	0.018	0
phenanthrene	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	*<0.014*	*<0.014*	-
pyrene	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	*<0.014*	*<0.014*	-
quinoline	*0.01*	<0.02	0.03	*<0.029*	*<0.029*	-	*<0.014*	*<0.014*	-
B(a)P total potency equivalents [B(a)P TPE]	*0.02*	<0.04	0.06	0.035	0.035	0	*<0.020*	*<0.020*	-
PAH Surrogates (%)									
acridine-d9	*0.1*	35	52.5	126	97.2	25.8	127	101	22.8
chrysene-d12	*0.1*	35	52.5	107	112	-4.6	108	117	-8.0
naphthalene-d8	*0.1*	40	60	108	116	-7.1	117	126	-7.4
phenanthrene-d10	*0.1*	35	52.5	94.2	98.9	-4.9	95	103	-7.9

Notes:

[1] The DQO for field duplicates is an RPD 1.5x the laboratory DQO or 1.5x twice the DL when lab DQOs are "<" values.

[2] Field Dup grab samples are homogenized duplicates - the original and duplicate samples were split from the same homogenized bowl of sediment.

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

RPDs are only calculated when both samples are above detection.

Bold RPDs — **RPD values exceeded but < 10 x MDL.**

Shaded RPDs — RPD values exceeded and > 10 x MDL.

Italicized numbers are below detection limits.

Table A-10. Field QA/QC data for phytoplankton for all CREMP study areas.

Area-Replicate	Date	Phytoplankton Biomass (mg/m^3)							Taxa Richness
		Cyanophyte	Chlorophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate	TOTAL	
TE-103	4-Mar-22	0.17	0.62	28	3.5	32	10	75	18
DUP - 1	1-Mar-22	0.31	0.85	30	7.2	12	11	60	17
RPD (%)		**-60**	-32	-5.4	**-69**	**94**	-6.9	21	5.7
INUG-138	7-Mar-22	0.29	1.1	4.4	4.1	2.4	0.92	13	16
DUP - 2	7-Mar-22	0.30	0.70	4.9	2.8	2.8	8.0	19	16
RPD (%)		-1.3	42	-9.9	38	-14	**-159**	-38	0
MAM-67	5-Mar-22	0	3.3	117	166	56	0	342	22
DUP - 3	1-Mar-22	0	2.2	86	243	46	3.3	381	20
RPD (%)			39	30	-38	19	**NA**	-11	9.5
LK5-36	6-Mar-22	0	0.11	137	5.4	64	1.6	208	21
DUP - 4	1-Mar-22	0	0.52	190	9.5	83	7.1	289	21
RPD (%)			**-131**	-32	**-56**	-26	**-125**	-33	0
INUG-143	9-Jul-22	0.43	0.10	120	17	11	5.8	154	25
DUP - 1	1-Jul-22	0.33	2.1	98	20	14	9.9	145	28
RPD (%)		25	**-181**	20	-20	-25	**-52**	6.2	-11
WAL-124	5-Jul-22	0	5.6	179	36	7.7	32	260	31
DUP - 2	1-Jul-22	0	4.2	126	35	7.7	9.2	182	31
RPD (%)			28	34	3.6	0	**110**	35	0
A20-66	1-Jul-22	0	2.2	345	139	111	18	615	31
DUP - 3	1-Jul-22	0	4.6	383	131	119	17	654	32
RPD (%)			**-70**	-10	6.2	-6.5	6.9	-6.0	-3.2
DS1-62	5-Jul-22	0	4.2	96	3.8	10	16	131	30
DUP - 4	1-Jul-22	0	6.0	75	3.6	12	16	111	28
RPD (%)			-35	25	6.4	-11	2.6	16	6.9
TPE-156	18-Aug-22	1.8	2.8	85	14	5.5	14	123	27
DUP - 1	18-Aug-22	2.3	3.4	64	10	11	24	116	30
RPD (%)		-28	-18	27	27	**-66**	**-52**	5.9	-11
WAL-125	19-Aug-22	1.9	16	117	8.0	11	23	178	38
DUP - 2	1-Aug-22	0.93	9.1	81	11	9.4	21	133	35
RPD (%)		**70**	**54**	36	-36	19	11	29	8.2
WTS-74	17-Aug-22	0.062	6.6	224	60	96	11	397	31
DUP - 3	1-Aug-22	0.092	10.0	220	50	95	8.4	384	35
RPD (%)		-40	-40	1.6	18	0.53	27	3.4	-12
DS1-64	16-Aug-22	0	3.3	106	4.6	14	20	148	24
DUP - 4	1-Aug-22	0	5.1	104	4.4	18	14	146	31
RPD (%)			-42	1.8	6.2	-26	36	1.7	-25
PDL-112	13-Sep-22	12	1.4	142	21	16	11	203	28
DUP - 1	1-Sep-22	9.9	5.1	144	23	7.7	8.5	198	30
RPD (%)		16	**-112**	-0.85	-9.7	**68**	26	2.6	-6.9
INUG-147	11-Sep-22	8.6	10	181	8.2	7.8	14	230	38
DUP - 2	1-Sep-22	7.9	8.6	265	8.1	2.7	20	312	38
RPD (%)		7.7	19	-38	0.36	**96**	-31	-30	0
NEM-75	3-Sep-22	0.50	2.4	61	13	6.4	8.7	92	23
DUP - 3	1-Sep-22	0.19	6.0	53	13	7.4	4.4	84	20
RPD (%)		**89**	**-86**	15	-2.2	-13	**67**	9.3	14
DS1-65	5-Sep-22	0	0.44	116	3.3	22	20	162	24
DUP - 4	1-Sep-22	0	0.45	103	7.4	29	42	183	27
RPD (%)			-1.6	12	**-76**	-28	**-70**	-12	-12

Notes:

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

Bolded RPD values exceed 50%.

RPDs have not been calculated for cases where one or both of the samples is "0".

Table A-10. Field QA/QC data for phytoplankton for all CREMP study areas.

Area-Replicate	Phytoplankton Density (cells/L)						
	Cyanophyte	Chlorophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate	**TOTAL**
TE-103	1,000	138,398	493,608	83,960	207,028	1,400	925,394
DUP - 1	1,800	81,860	507,592	164,721	59,138	1,500	816,611
RPD (%)	**-57**	**51**	-2.8	**-65**	**111**	-6.9	12
INUG-138	1,600	220,158	188,043	187,597	5,346	100	602,845
DUP - 2	1,800	166,667	266,058	183,051	9,092	600	627,268
RPD (%)	-12	28	-34	2.5	**-52**	**-143**	-4.0
MAM-67	0	57,472	2,012,520	479,992	419,472	0	2,969,456
DUP - 3	0	35,920	1,574,096	514,560	305,528	600	2,430,704
RPD (%)		46	24	-7.0	31	**NA**	20
LK5-36	0	7,184	1,503,656	64,672	305,144	200	1,880,856
DUP - 4	0	7,384	1,834,920	107,992	304,376	600	2,255,272
RPD (%)		-2.7	-20	**-50**	0.25	**-100**	-18
INUG-143	1,800	21,552	1,268,784	388,968	40,120	1,000	1,722,224
DUP - 1	1,400	79,424	1,157,640	434,256	27,952	1,200	1,701,872
RPD (%)	25	**-115**	9.2	-11	36	-18	1.2
WAL-124	0	129,912	1,373,392	452,224	52,088	600	2,008,216
DUP - 2	0	166,032	926,784	345,880	52,088	1,400	1,492,184
RPD (%)		-24	39	27	0	**-80**	29
A20-66	0	129,712	3,053,664	417,048	190,696	2,800	3,793,920
DUP - 3	0	187,984	3,179,792	342,608	252,568	2,200	3,965,152
RPD (%)		-37	-4.0	20	-28	24	-4.4
DS1-62	0	37,320	1,638,152	12,184	25,952	3,200	1,716,808
DUP - 4	0	45,504	1,380,328	18,768	13,184	3,000	1,460,784
RPD (%)		-20	17	-43	**65**	6.5	16
TPE-156	10,184	137,296	560,352	341,248	23,752	1,600	1,074,432
DUP - 1	12,784	223,304	884,232	183,600	95,392	2,600	1,401,912
RPD (%)	-23	-48	-45	**60**	**-120**	-48	-26
WAL-125	37,120	325,280	1,336,424	98,792	123,528	3,400	1,924,544
DUP - 2	8,984	267,408	1,092,368	129,528	94,792	3,000	1,596,080
RPD (%)	**122**	20	20	-27	26	13	19
WTS-74	400	589,288	2,445,360	2,061,272	491,176	2,400	5,589,896
DUP - 3	600	446,008	2,308,864	1,475,384	656,192	2,000	4,889,048
RPD (%)	-40	28	5.7	33	-29	18	13
DS1-64	0	143,680	1,282,752	23,000	21,568	3,800	1,474,800
DUP - 4	0	323,480	1,611,016	22,600	51,304	3,200	2,011,600
RPD (%)		**-77**	-23	1.8	**-82**	17	-31
PDL-112	257,520	108,160	1,732,544	206,552	88,208	2,400	2,395,384
DUP - 1	167,512	274,592	1,761,480	285,776	50,688	1,800	2,541,848
RPD (%)	42	**-87**	-1.7	-32	**54**	29	-5.9
INUG-147	37,800	395,920	2,013,336	227,904	31,536	3,400	2,709,896
DUP - 2	35,000	332,264	2,033,888	135,312	15,368	10,984	2,562,816
RPD (%)	7.7	17	-1.0	**51**	**69**	**-105**	5.6
NEM-75	28,936	122,128	1,185,560	213,536	51,288	1,400	1,602,848
DUP - 3	800	143,680	1,120,704	420,672	72,240	800	1,758,896
RPD (%)	**189**	-16	5.6	**-65**	-34	**55**	-9.3
DS1-65	0	64,656	1,870,040	65,688	87,424	3,400	2,091,208
DUP - 4	0	50,288	1,232,264	123,760	119,560	7,400	1,533,272
RPD (%)		25	41	**-61**	-31	**-74**	31

Notes:

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

Bolded RPD values exceed 50%.

RPDs have not been calculated for cases where one or both of the samples is "0".

Table A-11. Laboratory QA/QC data for phytoplankton for all CREMP study areas, 2022.

Area-Replicate	Date	Phytoplankton Biomass (mg/m^3)								Phytoplankton Density (cells/L)							
		Cyanophyte	Chlorophyte	Euglenophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate	**TOTAL**	Cyanophyte	Chlorophyte	Euglenophyte	Chrysophyte	Diatom	Cryptophyte	Dinoflagellate	**TOTAL**
LK5 - 36	6-Mar-22	0	0.11	0	137	5.4	64	1.6	208	0	7,184	0	1,503,656	64,672	305,144	200	1,880,856
LK5 - 36R	7-Mar-22	0	8.7	0	114	24	37	20	204	0	244,456	0	2,143,032	321,528	186,200	2,800	2,898,016
RPD (%)			**-195**		18	**-127**	**53**	**-170**	2.0		**-189**		-35	**-133**	48	**-173**	-43
NEM - 68	5-Mar-22	0	0	0	23	53	24	13	113	0	0	0	525,432	271,240	113,160	2,000	911,832
NEM - 68R	5-Mar-22	0	0	0	22	56	21	9.9	109	0	0	0	482,928	317,144	78,240	1,600	879,912
RPD (%)					5.7	-4.0	13	23	4.1				8.4	-16	36	22	3.6
TPE - 151S	2-Mar-22	0.20	1.0	0	15	7.5	23	2.8	49	1,200	131,606	0	298,072	145,744	157,828	500	734,951
TPE - 151SR	2-Mar-22	0.13	1.5	0	13	8.5	26	1.7	51	900	110,329	0	259,165	101,045	182,351	300	654,090
RPD (%)		42	-38		13	-12	-12	50	-2.8	29	18		14	36	-14	50	12
WAL - 120S	6-Mar-22	0	1.5	0	23	7.2	19	0.36	51	0	67,376	0	344,172	99,645	129,860	100	641,152
WAL - 120SR	6-Mar-22	0	1.2	0	16	6.2	23	2.6	49	0	46,299	0	322,695	107,437	168,267	200	644,898
RPD (%)			25		33	16	-18	**-151**	3.9		37		6.4	-7.5	-26	**-67**	-0.58
BAP - 79S	18-Jul-22	0	0.20	0	111	74	29	31	246	0	7,184	0	1,514,240	170,664	108,776	4,600	1,805,464
BAP - 79SR	18-Jul-22	0	0.68	0	118	49	26	11	206	0	28,736	0	1,461,968	243,688	93,808	2,000	1,830,200
RPD (%)			**-108**		-6.3	40	10	**94**	18		**-120**		3.5	-35	15	**79**	-1.4
SP - 155S	4-Jul-22	0.65	1.3	0	190	44	12	14	261	2,600	36,720	0	1,444,216	502,728	61,872	2,000	2,050,136
SP - 155SR	4-Jul-22	1.0	1.7	0	191	40	10	37	281	4,000	50,688	0	1,409,096	482,976	47,104	1,600	1,995,464
RPD (%)		-42	-21		-0.52	9.0	13	**-93**	-7.4	-42	-32		2.5	4.0	27	22	2.7
WTS - 72	1-Jul-22	0	4.5	0	210	46	89	21	371	0	466,960	0	2,359,568	176,064	177,296	4,000	3,183,888
WTS - 72R	1-Jul-22	0	4.2	0	217	52	95	19	388	0	409,888	0	2,598,040	149,128	179,496	3,400	3,339,952
RPD (%)			4.9		-3.4	-12	-6.0	9.4	-4.4		13		-9.6	17	-1.2	16	-4.8
BAP - 82S	20-Aug-22	0.036	2.9	0	86	19	25	4.7	138	200	216,720	0	1,101,552	22,184	164,648	600	1,505,904
BAP - 82SR	20-Aug-22	0	1.8	0	84	17	31	7.4	140	0	244,856	0	1,101,152	14,800	194,984	600	1,556,392
RPD (%)		**NA**	45		3.2	14	-20	-44	-1.4	**NA**	-12		0.036	40	-17	0	-3.3
BBD - 81S	20-Aug-22	0	1.1	0	47	47	9.0	7.5	112	0	72,240	0	576,320	107,008	46,304	1,400	803,272
BBD - 81SR	20-Aug-22	0.090	2.1	0	41	52	23	10	128	400	158,448	0	568,136	115,392	40,336	2,000	884,712
RPD (%)		**NA**	**-60**		14	-9.5	**-88**	-32	-14	**NA**	**-75**		1.4	-7.5	14	-35	-9.6
PDL - 109S	15-Aug-22	1.9	5.3	0	126	6.4	0.71	19	159	8,200	280,576	0	1,099,352	4,000	400	3,800	1,396,328
PDL - 109SR	15-Aug-22	2.9	3.5	0	129	8.1	0.96	18	162	12,600	172,816	0	1,107,136	3,400	600	3,600	1,300,152
RPD (%)		-42	42		-2.7	-23	-30	3.9	-2.3	-42	48		-0.71	16	-40	5.4	7.1
TPN - 157S	18-Aug-22	0.070	2.3	0	52	12	8.6	3.6	79	400	115,544	0	640,576	203,752	73,640	400	1,034,312
TPN - 157SR	18-Aug-22	0.10	3.0	0	57	18	5.8	7.1	91	600	122,328	0	668,912	225,104	51,488	800	1,069,232
RPD (%)		-40	-25		-9.9	-35	38	**-67**	-14	-40	-5.7		-4.3	-10.0	35	**-67**	-3.3
BPJ - 84S	6-Sep-22	0	3.7	0	91	26	11	13	146	0	173,016	0	1,244,232	76,904	88,208	1,800	1,584,160
BPJ - 84SR	6-Sep-22	0	6.4	0	103	24	12	15	161	0	188,184	0	1,631,768	150,544	68,056	2,000	2,040,552
RPD (%)			-53		-12	10	-5.9	-15	-9.7		-8.4		-27	-65	26	-11	-25
DS1 - 65	5-Sep-22	0	0.44	0	116	3.3	22	20	162	0	64,656	0	1,870,040	65,688	87,424	3,400	2,091,208
DS1 - 65R	5-Sep-22	0	1.1	0	118	5.3	27	28	180	0	129,312	0	1,712,392	151,496	96,808	4,000	2,094,008
RPD (%)			**-82**		-1.6	-47	-20	-33	-10		**-67**		8.8	**-79**	-10	-16	-0.13
LK8 - 19	15-Sep-22	0	2.1	2.0	64	3.2	17	21	109	0	101,376	200	841,928	73,240	89,408	10,584	1,116,736
LK8 - 19R	15-Sep-22	0	1.1	0	72	5.2	16	23	118	0	136,896	0	942,104	116,544	62,272	3,600	1,261,416
RPD (%)			**64**	**NA**	-11	-49	5.0	-10	-7.4		-30	**NA**	-11	-46	36	**98**	-12
WAL - 128S	3-Sep-22	0.58	4.3	0	140	7.0	3.6	7.5	163	8,184	224,104	0	1,517,224	148,080	8,584	8,184	1,914,360
WAL - 128SR	3-Sep-22	0.39	3.8	0	142	10	12	4.5	173	2,200	209,336	0	1,460,152	138,928	73,040	7,584	1,891,240
RPD (%)		40	12		-1.4	-38	**-110**	50	-6.1	**115**	6.8		3.8	6.4	**-158**	7.6	1.2

Notes:

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

Bolded RPD values exceed 25%.

RPDs have not been calculated for cases where one or both of the samples is "0".

Table A-12. Percent recovery of benthic invertebrate samples for all CREMP study areas, 2022.

Area-Replicate	Number of Organisms Recovered	Number of Organisms in Re-sort	Percent Recovery
A76-4	336	344	97.7%
BO3-4	57	61	93.4%
DS1-3	115	118	97.5%
INUG-1	36	37	97.3%
MAM-2	255	274	93.1%
NEM-5	225	243	92.6%
SP-1	77	82	93.9%
WAL-1	119	119	100.0%
		Average % Recovery	95.7%

Notes

All samples were sorted in their entirety.
Pupae were not counted toward total number of taxa unless they were the sole representative of their taxa group.
Immatures were not counted toward total number of taxa unless they were the sole representative of their taxa group.
The exceptions to this rule are immature tubificidae with and without hairs. Immature oligochaetes are counted as taxa as the probability of the immature being a unique taxa is high.
Indeterminates are unique taxa that could not be identified further for various reasons (e.g., small, damaged).

Table A-13. Subsampling error calculation for benthic macroinvertebrate samples for all CREMP study areas, 2022.

Station	Whole Organisms	Number of Organisms in Fraction 1	Number of Organisms in Fraction 2	Number of Organisms in Fraction 3	Number of Organisms in Fraction 4	Actual Density*	Precision	Accuracy	
							% Range	Min	Max
A76-3	-	196	207	-	-	403	5	3	-
D1-2	-	202	220	-	-	422	8	4	-

Notes:

Whole large organisms excluded in calculations.

Density expressed per sample area.

Min = minimum absolute % error

Max = maximum absolute % error

Sample fractions sorted from CREMP study areas.

Station	Fraction Sorted (500 µm)
A76-1	1/2
A76-4	1/2
A76-5	1/2
MAM-1	1/2
MAM-2	1/2
MAM-3	1/2
MAM-4	1/2
MAM-5	1/2
TPE-1	1/2
D1-3	1/2

SUB-APPENDICES

Appendix A1
Water Quality Monitoring Preliminary QC Screening

Meadowbank Mine - Water Quality Monitoring 2022

Preliminary Screening of March, 2022 Water Quality Monitoring

Azimuth Consulting Group Inc.
on behalf of Agnico Eagle Mines Ltd.

Report Date: 2022-04-19

Table of Contents

1. Introduction & Sampling Overview

This document was prepared by Azimuth Consulting Group Inc (Azimuth) to provide the Meadowbank Environment Department with a brief overview of the water chemistry results collected in March, 2022 as part of the Core Receiving Environment Monitoring Program (CREMP). CREMP water quality monitoring occurs in all summer months (July - September) as well as two through-ice sampling events in March and May. CREMP monitoring occurs at near-field, mid-field, and far-field stations in three distinct areas - the Meadowbank Mine Project, The Whale Tail Pit Project, and Baker Lake, however sampling does not occur at all stations or all areas in each sampling event. The purpose of this preliminary document is to:

1. Screen the water chemistry results from ALS against the trigger values to keep the Environment Department informed about potential changes in water quality, including the early identification of potentially anomalous data (Section 2).

2. Review the data for laboratory QC issues (blanks, duplicates, matrix spikes, etc.) and potential field quality assurance (QA) concerns, ensuring that questionable results are verified by reanalysis (Section 3).

Samples included in this report are shown in Table 1, while field blanks are shown in Table 2.

Table 1: Summary of March, 2022 samples.

Area	Sample ID	ID	ID_Name	Duplicate	Date_Sampled
Meadowbank					
	INUG-138	INUG	Inuggugayualik	MARCH DUP-2	2022-03-07
	INUG-139	INUG	Inuggugayualik	-	2022-03-07
	PDL-103	PDL	Pipedream	-	2022-03-12
	PDL-104	PDL	Pipedream	-	2022-03-12
	SP-150	SP	Second Portage	-	2022-03-02
	SP-151	SP	Second Portage	-	2022-03-02
	TE-102	TE	Tehek - Mid Field	-	2022-03-04
	TE-103	TE	Tehek - Mid Field	MARCH DUP-1	2022-03-04
	TEFF-54	TEFF	Tehek - Far Field	-	2022-03-04
	TEFF-55	TEFF	Tehek - Far Field	-	2022-03-04
	TPE-150	TPE	Third Portage - East Basin	-	2022-03-02
	TPE-151	TPE	Third Portage - East Basin	-	2022-03-02
	TPN-150	TPN	Third Portage - North Basin	-	2022-03-01
	TPN-151	TPN	Third Portage - North Basin	-	2022-03-01
	TPS-67	TPS	Third Portage - South Basin	-	2022-03-01
	TPS-68	TPS	Third Portage - South Basin	-	2022-03-01
	WAL-119	WAL	Wally	-	2022-03-06
	WAL-120	WAL	Wally	-	2022-03-06
Whale Tail Pit					
	A20-61	A20	Lake A20	-	2022-03-05
	A20-62	A20	Lake A20	-	2022-03-05
	A76-59	A76	Lake A76	-	2022-03-19
	A76-60	A76	Lake A76	-	2022-03-19
	DS1-57	DS1	Lake DS1	-	2022-03-19

Area	Sample ID	ID	ID_Name	Duplicate	Date_Sampled
	DS1-58	DS1	Lake DS1	-	2022-03-19
	MAM-67	MAM	Mammoth	MARCH DUP-3	2022-03-05
	MAM-68	MAM	Mammoth	-	2022-03-05
	NEM-67	NEM	Nemo	-	2022-03-05
	NEM-68	NEM	Nemo	-	2022-03-05
	WTS-67	WTS	Whale Tail South	-	2022-03-05
	WTS-68	WTS	Whale Tail South	-	2022-03-05

Table 2: Summary of field blanks collected in March, 2022.

Client_Sample_ID	ID_Name
MARCH DI	DI Blank
MARCH-EB	Equipment Blank
MARCH EB	Equipment Blank
MARCH-TB	Travel Blank

2. Trigger Screening

Sampling results were screened relative to relevant triggers and thresholds. A summary of trigger and threshold exceedances is provided in Table 3. Subsequent tables provide all sample results above trigger and threshold values for Meadowbank (Table 4), Whale Tail Pit (Table 5), and Baker Lake (Baker Lake not sampled in this sampling event). Samples exceeding triggers or thresholds but failing reliability checks (see Section 2.1) are labeled as uncertain.

Table 3: Summary of trigger and threshold exceedances in March, 2022.

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
Meadowbank				
	Bicarbonate alkalinity	9	0	INUG-138, PDL-103, PDL-104, SP-150, SP-151, TE-102, TE-103, TPE-151, TPS-68
	Calcium (T)	15	0	PDL-103, PDL-104, SP-150, SP-151, TE-102, TE-103, TEFF-55, TPE-150, TPE-151, TPN-150, TPN-151, TPS-67, TPS-68, WAL-119, WAL-120
	Chromium (D)	18	0	INUG-138, INUG-139, PDL-103, PDL-104, SP-150, SP-151, TE-102, TE-103, TEFF-54, TEFF-55, TPE-150, TPE-151, TPN-150, TPN-151, TPS-67, TPS-68, WAL-119, WAL-120
	Conductivity	15	0	PDL-103, PDL-104, SP-150, SP-151, TE-102, TE-103, TEFF-55, TPE-150, TPE-151, TPN-150, TPN-151, TPS-67, TPS-68, WAL-119, WAL-120
	Copper (D)	1	0	WAL-119

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
	Copper (T)	1	0	WAL-119
	Fluoride	6	0	SP-150, TE-102, TPE-150, TPE-151, TPS-68, WAL-119
	Hardness	16	0	PDL-103, PDL-104, SP-150, SP-151, TE-102, TE-103, TEFF-54, TEFF-55, TPE-150, TPE-151, TPN-150, TPN-151, TPS-67, TPS-68, WAL-119, WAL-120
	Magnesium (T)	16	0	PDL-103, PDL-104, SP-150, SP-151, TE-102, TE-103, TEFF-54, TEFF-55, TPE-150, TPE-151, TPN-150, TPN-151, TPS-67, TPS-68, WAL-119, WAL-120
	Potassium (T)	11	0	SP-150, SP-151, TE-102, TE-103, TEFF-55, TPE-150, TPE-151, TPN-150, TPN-151, TPS-67, TPS-68
	Reactive silica	2	0	WAL-119, WAL-120
	Silicon (D)	11	0	INUG-138, INUG-139, PDL-104, SP-150, SP-151, TE-102, TE-103, TEFF-54, TEFF-55, WAL-119, WAL-120
	Silicon (T)	11	0	INUG-138, INUG-139, PDL-104, SP-150, SP-151, TE-102, TE-103, TEFF-54, TEFF-55, WAL-119, WAL-120
	Sodium (T)	8	0	TPE-150, TPE-151, TPN-150, TPN-151, TPS-67, TPS-68, WAL-119, WAL-120
	TDS	8	0	PDL-104, SP-150, SP-151, TE-102, TE-103, TPE-151, TPS-68, WAL-120
	TKN	2	0	TE-103, WAL-119
	Total Alkalinity	9	0	INUG-138, PDL-103, PDL-104, SP-150, SP-151, TE-102, TE-103, TPE-151, TPS-68

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
	Total phosphorous	1	1	SP-150
Whale Tail Pit				
	Ammonia-N	1	0	NEM-68
	Bicarbonate alkalinity	10	0	A20-61, A20-62, A76-59, A76-60, MAM-67, MAM-68, NEM-67, NEM-68, WTS-67, WTS-68
	Calcium (T)	10	0	A20-61, A20-62, A76-59, A76-60, MAM-67, MAM-68, NEM-67, NEM-68, WTS-67, WTS-68
	Conductivity	10	0	A20-61, A20-62, A76-59, A76-60, MAM-67, MAM-68, NEM-67, NEM-68, WTS-67, WTS-68
	Hardness	10	0	A20-61, A20-62, A76-59, A76-60, MAM-67, MAM-68, NEM-67, NEM-68, WTS-67, WTS-68
	Lithium (D)	4	0	MAM-67, MAM-68, WTS-67, WTS-68
	Lithium (T)	4	0	MAM-67, MAM-68, WTS-67, WTS-68
	Magnesium (T)	10	0	A20-61, A20-62, A76-59, A76-60, MAM-67, MAM-68, NEM-67, NEM-68, WTS-67, WTS-68
	Potassium (T)	10	0	A20-61, A20-62, A76-59, A76-60, MAM-67, MAM-68, NEM-67, NEM-68, WTS-67, WTS-68

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
	Reactive silica	1	0	NEM-68*
	Silicon (D)	1	0	WTS-67
	Silicon (T)	2	0	DS1-57, WTS-67
	Sodium (T)	11	0	A20-61, A20-62, A76-59, A76-60, DS1-57, MAM-67, MAM-68, NEM-67, NEM-68, WTS-67, WTS-68
	TDS	10	0	A20-61, A20-62, A76-59, A76-60, MAM-67, MAM-68, NEM-67, NEM-68, WTS-67, WTS-68
	TKN	7	0	A20-61, A20-62, MAM-67, MAM-68, NEM-68, WTS-67, WTS-68
	Total Alkalinity	10	0	A20-61, A20-62, A76-59, A76-60, MAM-67, MAM-68, NEM-67, NEM-68, WTS-67, WTS-68
	Total phosphorous	6	7	A20-61, A20-62, MAM-67, MAM-68, NEM-67, WTS-67, WTS-68

* Indicates samples which failed reliability checks and are consequently uncertain.

Table 4: Trigger and threshold exceedances at Meadowbank sampling stations.

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
INUG-138	Inuggugayualik	Bicarbonate alkalinity	9.40000	1.0000	mg/L	-	-	8.70000	-
INUG-138	Inuggugayualik	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
INUG-138	Inuggugayualik	Silicon (D)	0.22900	0.0500	mg/L	-	-	0.18000	-
INUG-138	Inuggugayualik	Silicon (T)	0.24000	0.1000	mg/L	-	-	0.20000	-
INUG-138	Inuggugayualik	Total Alkalinity	9.40000	1.0000	mg/L	-	-	8.70000	-
INUG-139	Inuggugayualik	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
INUG-139	Inuggugayualik	Silicon (D)	0.24800	0.0500	mg/L	-	-	0.18000	-
INUG-139	Inuggugayualik	Silicon (T)	0.26000	0.1000	mg/L	-	-	0.20000	-
PDL-103	Pipedream	Bicarbonate alkalinity	10.30000	1.0000	mg/L	-	-	8.70000	-
PDL-103	Pipedream	Calcium (T)	2.77000	0.0500	mg/L	-	-	2.39000	-
PDL-103	Pipedream	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
PDL-103	Pipedream	Conductivity	27.70000	2.0000	µS/cm	-	-	27.40000	-
PDL-103	Pipedream	Hardness	10.80000	0.6000	mg/L	-	-	9.50000	-
PDL-103	Pipedream	Magnesium (T)	0.94200	0.0050	mg/L	-	-	0.93000	-
PDL-103	Pipedream	Total Alkalinity	10.30000	1.0000	mg/L	-	-	8.70000	-
PDL-104	Pipedream	Bicarbonate alkalinity	11.80000	1.0000	mg/L	-	-	8.70000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
PDL-104	Pipedream	Calcium (T)	3.03000	0.0500	mg/L	-	-	2.39000	-
PDL-104	Pipedream	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
PDL-104	Pipedream	Conductivity	32.40000	2.0000	µS/cm	-	-	27.40000	-
PDL-104	Pipedream	Hardness	12.10000	0.6000	mg/L	-	-	9.50000	-
PDL-104	Pipedream	Magnesium (T)	1.10000	0.0050	mg/L	-	-	0.93000	-
PDL-104	Pipedream	Silicon (D)	0.18100	0.0500	mg/L	-	-	0.18000	-
PDL-104	Pipedream	Silicon (T)	0.23000	0.1000	mg/L	-	-	0.20000	-
PDL-104	Pipedream	TDS	19.80000	3.0000	mg/L	-	-	19.00000	-
PDL-104	Pipedream	Total Alkalinity	11.80000	1.0000	mg/L	-	-	8.70000	-
SP-150	Second Portage	Bicarbonate alkalinity	12.30000	1.0000	mg/L	-	-	8.70000	-
SP-150	Second Portage	Calcium (T)	4.62000	0.0500	mg/L	-	-	2.39000	-
SP-150	Second Portage	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
SP-150	Second Portage	Conductivity	43.40000	2.0000	µS/cm	-	-	27.40000	-
SP-150	Second Portage	Fluoride	0.08900	0.0200	mg/L	-	0.12	0.08800	-
SP-150	Second Portage	Hardness	18.30000	0.6000	mg/L	-	-	9.50000	-
SP-150	Second Portage	Magnesium (T)	1.64000	0.0050	mg/L	-	-	0.93000	-
SP-150	Second Portage	Potassium (T)	0.67100	0.0500	mg/L	-	-	0.58000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
SP-150	Second Portage	Silicon (D)	0.36100	0.0500	mg/L	-	-	0.18000	-
SP-150	Second Portage	Silicon (T)	0.35000	0.1000	mg/L	-	-	0.20000	-
SP-150	Second Portage	TDS	23.60000	3.0000	mg/L	-	-	19.00000	-
SP-150	Second Portage	Total Alkalinity	12.30000	1.0000	mg/L	-	-	8.70000	-
SP-150	Second Portage	Total phosphorous	***0.01170***	0.0020	mg/L	-	0.004	0.00510	-
SP-151	Second Portage	Bicarbonate alkalinity	11.90000	1.0000	mg/L	-	-	8.70000	-
SP-151	Second Portage	Calcium (T)	4.51000	0.0500	mg/L	-	-	2.39000	-
SP-151	Second Portage	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
SP-151	Second Portage	Conductivity	42.40000	2.0000	µS/cm	-	-	27.40000	-
SP-151	Second Portage	Hardness	17.70000	0.6000	mg/L	-	-	9.50000	-
SP-151	Second Portage	Magnesium (T)	1.56000	0.0050	mg/L	-	-	0.93000	-
SP-151	Second Portage	Potassium (T)	0.63100	0.0500	mg/L	-	-	0.58000	-
SP-151	Second Portage	Silicon (D)	0.29500	0.0500	mg/L	-	-	0.18000	-
SP-151	Second Portage	Silicon (T)	0.34000	0.1000	mg/L	-	-	0.20000	-
SP-151	Second Portage	TDS	23.30000	3.0000	mg/L	-	-	19.00000	-
SP-151	Second Portage	Total Alkalinity	11.90000	1.0000	mg/L	-	-	8.70000	-
TE-102	Tehek - Mid Field	Bicarbonate alkalinity	12.30000	1.0000	mg/L	-	-	8.70000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
TE-102	Tehek - Mid Field	Calcium (T)	4.30000	0.0500	mg/L	-	-	2.39000	-
TE-102	Tehek - Mid Field	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TE-102	Tehek - Mid Field	Conductivity	41.50000	2.0000	µS/cm	-	-	27.40000	-
TE-102	Tehek - Mid Field	Fluoride	0.09400	0.0200	mg/L	-	0.12	0.08800	-
TE-102	Tehek - Mid Field	Hardness	17.00000	0.6000	mg/L	-	-	9.50000	-
TE-102	Tehek - Mid Field	Magnesium (T)	1.53000	0.0050	mg/L	-	-	0.93000	-
TE-102	Tehek - Mid Field	Potassium (T)	0.67200	0.0500	mg/L	-	-	0.58000	-
TE-102	Tehek - Mid Field	Silicon (D)	0.36200	0.0500	mg/L	-	-	0.18000	-
TE-102	Tehek - Mid Field	Silicon (T)	0.37000	0.1000	mg/L	-	-	0.20000	-
TE-102	Tehek - Mid Field	TDS	21.80000	3.0000	mg/L	-	-	19.00000	-
TE-102	Tehek - Mid Field	Total Alkalinity	12.30000	1.0000	mg/L	-	-	8.70000	-
TE-103	Tehek - Mid Field	Bicarbonate alkalinity	10.70000	1.0000	mg/L	-	-	8.70000	-
TE-103	Tehek - Mid Field	Calcium (T)	3.82000	0.0500	mg/L	-	-	2.39000	-
TE-103	Tehek - Mid Field	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TE-103	Tehek - Mid Field	Conductivity	38.90000	2.0000	µS/cm	-	-	27.40000	-
TE-103	Tehek - Mid Field	Hardness	15.60000	0.6000	mg/L	-	-	9.50000	-
TE-103	Tehek - Mid Field	Magnesium (T)	1.46000	0.0050	mg/L	-	-	0.93000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
TE-103	Tehek - Mid Field	Potassium (T)	0.72600	0.0500	mg/L	-	-	0.58000	-
TE-103	Tehek - Mid Field	Silicon (D)	0.33100	0.0500	mg/L	-	-	0.18000	-
TE-103	Tehek - Mid Field	Silicon (T)	0.35000	0.1000	mg/L	-	-	0.20000	-
TE-103	Tehek - Mid Field	TDS	22.80000	3.0000	mg/L	-	-	19.00000	-
TE-103	Tehek - Mid Field	TKN	0.18500	0.0500	mg/L	-	-	0.17000	-
TE-103	Tehek - Mid Field	Total Alkalinity	10.70000	1.0000	mg/L	-	-	8.70000	-
TEFF-54	Tehek - Far Field	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TEFF-54	Tehek - Far Field	Hardness	9.69000	0.6000	mg/L	-	-	9.50000	-
TEFF-54	Tehek - Far Field	Magnesium (T)	0.93500	0.0050	mg/L	-	-	0.93000	-
TEFF-54	Tehek - Far Field	Silicon (D)	0.20700	0.0500	mg/L	-	-	0.18000	-
TEFF-54	Tehek - Far Field	Silicon (T)	0.23000	0.1000	mg/L	-	-	0.20000	-
TEFF-55	Tehek - Far Field	Calcium (T)	2.54000	0.0500	mg/L	-	-	2.39000	-
TEFF-55	Tehek - Far Field	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TEFF-55	Tehek - Far Field	Conductivity	29.00000	2.0000	µS/cm	-	-	27.40000	-
TEFF-55	Tehek - Far Field	Hardness	10.70000	0.6000	mg/L	-	-	9.50000	-
TEFF-55	Tehek - Far Field	Magnesium (T)	1.07000	0.0050	mg/L	-	-	0.93000	-
TEFF-55	Tehek - Far Field	Potassium (T)	0.64200	0.0500	mg/L	-	-	0.58000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
TEFF-55	Tehek - Far Field	Silicon (D)	0.20500	0.0500	mg/L	-	-	0.18000	-
TEFF-55	Tehek - Far Field	Silicon (T)	0.24000	0.1000	mg/L	-	-	0.20000	-
TPE-150	Third Portage - East Basin	Calcium (T)	3.11000	0.0500	mg/L	-	-	2.39000	-
TPE-150	Third Portage - East Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPE-150	Third Portage - East Basin	Conductivity	34.20000	2.0000	µS/cm	-	-	27.40000	-
TPE-150	Third Portage - East Basin	Fluoride	0.08900	0.0200	mg/L	-	0.12	0.08800	-
TPE-150	Third Portage - East Basin	Hardness	12.90000	0.6000	mg/L	-	-	9.50000	-
TPE-150	Third Portage - East Basin	Magnesium (T)	1.25000	0.0050	mg/L	-	-	0.93000	-
TPE-150	Third Portage - East Basin	Potassium (T)	0.63700	0.0500	mg/L	-	-	0.58000	-
TPE-150	Third Portage - East Basin	Sodium (T)	1.25000	0.0500	mg/L	-	-	1.16000	-
TPE-151	Third Portage - East Basin	Bicarbonate alkalinity	9.30000	1.0000	mg/L	-	-	8.70000	-
TPE-151	Third Portage - East Basin	Calcium (T)	3.43000	0.0500	mg/L	-	-	2.39000	-
TPE-151	Third Portage - East Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPE-151	Third Portage - East Basin	Conductivity	37.10000	2.0000	µS/cm	-	-	27.40000	-
TPE-151	Third Portage - East Basin	Fluoride	0.09400	0.0200	mg/L	-	0.12	0.08800	-
TPE-151	Third Portage - East Basin	Hardness	15.20000	0.6000	mg/L	-	-	9.50000	-
TPE-151	Third Portage - East Basin	Magnesium (T)	1.62000	0.0050	mg/L	-	-	0.93000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
TPE-151	Third Portage - East Basin	Potassium (T)	0.85800	0.0500	mg/L	-	-	0.58000	-
TPE-151	Third Portage - East Basin	Sodium (T)	1.70000	0.0500	mg/L	-	-	1.16000	-
TPE-151	Third Portage - East Basin	TDS	21.40000	3.0000	mg/L	-	-	19.00000	-
TPE-151	Third Portage - East Basin	Total Alkalinity	9.30000	1.0000	mg/L	-	-	8.70000	-
TPN-150	Third Portage - North Basin	Calcium (T)	2.99000	0.0500	mg/L	-	-	2.39000	-
TPN-150	Third Portage - North Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPN-150	Third Portage - North Basin	Conductivity	33.90000	2.0000	µS/cm	-	-	27.40000	-
TPN-150	Third Portage - North Basin	Hardness	12.60000	0.6000	mg/L	-	-	9.50000	-
TPN-150	Third Portage - North Basin	Magnesium (T)	1.26000	0.0050	mg/L	-	-	0.93000	-
TPN-150	Third Portage - North Basin	Potassium (T)	0.67500	0.0500	mg/L	-	-	0.58000	-
TPN-150	Third Portage - North Basin	Sodium (T)	1.39000	0.0500	mg/L	-	-	1.16000	-
TPN-151	Third Portage - North Basin	Calcium (T)	2.79000	0.0500	mg/L	-	-	2.39000	-
TPN-151	Third Portage - North Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPN-151	Third Portage - North Basin	Conductivity	31.90000	2.0000	µS/cm	-	-	27.40000	-
TPN-151	Third Portage - North Basin	Hardness	11.70000	0.6000	mg/L	-	-	9.50000	-
TPN-151	Third Portage - North Basin	Magnesium (T)	1.15000	0.0050	mg/L	-	-	0.93000	-
TPN-151	Third Portage - North Basin	Potassium (T)	0.61600	0.0500	mg/L	-	-	0.58000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
TPN-151	Third Portage - North Basin	Sodium (T)	1.28000	0.0500	mg/L	-	-	1.16000	-
TPS-67	Third Portage - South Basin	Calcium (T)	2.71000	0.0500	mg/L	-	-	2.39000	-
TPS-67	Third Portage - South Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPS-67	Third Portage - South Basin	Conductivity	31.30000	2.0000	µS/cm	-	-	27.40000	-
TPS-67	Third Portage - South Basin	Hardness	11.40000	0.6000	mg/L	-	-	9.50000	-
TPS-67	Third Portage - South Basin	Magnesium (T)	1.13000	0.0050	mg/L	-	-	0.93000	-
TPS-67	Third Portage - South Basin	Potassium (T)	0.61200	0.0500	mg/L	-	-	0.58000	-
TPS-67	Third Portage - South Basin	Sodium (T)	1.25000	0.0500	mg/L	-	-	1.16000	-
TPS-68	Third Portage - South Basin	Bicarbonate alkalinity	9.80000	1.0000	mg/L	-	-	8.70000	-
TPS-68	Third Portage - South Basin	Calcium (T)	3.41000	0.0500	mg/L	-	-	2.39000	-
TPS-68	Third Portage - South Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPS-68	Third Portage - South Basin	Conductivity	39.80000	2.0000	µS/cm	-	-	27.40000	-
TPS-68	Third Portage - South Basin	Fluoride	0.09300	0.0200	mg/L	-	0.12	0.08800	-
TPS-68	Third Portage - South Basin	Hardness	14.30000	0.6000	mg/L	-	-	9.50000	-
TPS-68	Third Portage - South Basin	Magnesium (T)	1.41000	0.0050	mg/L	-	-	0.93000	-
TPS-68	Third Portage - South Basin	Potassium (T)	0.76000	0.0500	mg/L	-	-	0.58000	-
TPS-68	Third Portage - South Basin	Sodium (T)	1.55000	0.0500	mg/L	-	-	1.16000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
TPS-68	Third Portage - South Basin	TDS	21.50000	3.0000	mg/L	-	-	19.00000	-
TPS-68	Third Portage - South Basin	Total Alkalinity	9.80000	1.0000	mg/L	-	-	8.70000	-
WAL-119	Wally	Calcium (T)	5.76000	0.0500	mg/L	-	-	4.88000	-
WAL-119	Wally	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
WAL-119	Wally	Conductivity	49.50000	2.0000	µS/cm	-	-	36.60000	-
WAL-119	Wally	Copper (D)	0.00162	0.0002	mg/L	-	0.002	0.00150	-
WAL-119	Wally	Copper (T)	0.00183	0.0005	mg/L	-	0.002	0.00150	-
WAL-119	Wally	Fluoride	0.09000	0.0200	mg/L	-	0.12	0.08000	-
WAL-119	Wally	Hardness	21.80000	0.6000	mg/L	-	-	16.70000	-
WAL-119	Wally	Magnesium (T)	1.80000	0.0050	mg/L	-	-	1.36000	-
WAL-119	Wally	Reactive silica	1.35000	0.5000	mg/L	-	-	1.08000	-
WAL-119	Wally	Silicon (D)	0.70000	0.0500	mg/L	-	-	0.67000	-
WAL-119	Wally	Silicon (T)	0.72000	0.1000	mg/L	-	-	0.65000	-
WAL-119	Wally	Sodium (T)	0.78600	0.0500	mg/L	-	-	0.72000	-
WAL-119	Wally	TKN	0.16100	0.0500	mg/L	-	-	0.16000	-
WAL-120	Wally	Calcium (T)	5.59000	0.0500	mg/L	-	-	4.88000	-
WAL-120	Wally	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
WAL-120	Wally	Conductivity	46.90000	2.0000	µS/cm	-	-	36.60000	-
WAL-120	Wally	Hardness	21.20000	0.6000	mg/L	-	-	16.70000	-
WAL-120	Wally	Magnesium (T)	1.75000	0.0050	mg/L	-	-	1.36000	-
WAL-120	Wally	Reactive silica	1.29000	0.5000	mg/L	-	-	1.08000	-
WAL-120	Wally	Silicon (D)	0.67700	0.0500	mg/L	-	-	0.67000	-
WAL-120	Wally	Silicon (T)	0.69000	0.1000	mg/L	-	-	0.65000	-
WAL-120	Wally	Sodium (T)	0.75000	0.0500	mg/L	-	-	0.72000	-
WAL-120	Wally	TDS	26.50000	3.0000	mg/L	-	-	25.30000	-

[1]Bold values are above the threshold as well as above the trigger value.

[2]Results failing to meet reliability checks are indicated as uncertain.

Table 5: Trigger and threshold exceedances at Whale Tail Pit sampling stations

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
A20-61	Lake A20	Bicarbonate alkalinity	12.4000	1.000	mg/L	-	-	9.6000	-
A20-61	Lake A20	Calcium (T)	6.5500	0.050	mg/L	-	-	4.6000	-
A20-61	Lake A20	Conductivity	67.5000	2.000	µS/cm	-	-	48.6000	-
A20-61	Lake A20	Hardness	24.6000	0.600	mg/L	-	-	17.4000	-
A20-61	Lake A20	Magnesium (T)	2.0000	0.005	mg/L	-	-	1.4100	-
A20-61	Lake A20	Potassium (T)	1.6600	0.050	mg/L	-	-	0.8400	-
A20-61	Lake A20	Sodium (T)	1.9800	0.050	mg/L	-	-	0.9700	-
A20-61	Lake A20	TDS	46.3000	10.000	mg/L	-	-	38.5000	-
A20-61	Lake A20	TKN	0.2490	0.050	mg/L	-	-	0.1700	-
A20-61	Lake A20	Total Alkalinity	12.4000	1.000	mg/L	-	-	9.6000	-
A20-61	Lake A20	Total phosphorous	***0.0062***	0.002	mg/L	-	0.004	0.0045	-
A20-62	Lake A20	Bicarbonate alkalinity	19.0000	1.000	mg/L	-	-	9.6000	-
A20-62	Lake A20	Calcium (T)	10.3000	0.050	mg/L	-	-	4.6000	-
A20-62	Lake A20	Conductivity	105.0000	2.000	µS/cm	-	-	48.6000	-
A20-62	Lake A20	Hardness	38.5000	0.600	mg/L	-	-	17.4000	-
A20-62	Lake A20	Magnesium (T)	3.1000	0.005	mg/L	-	-	1.4100	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
A20-62	Lake A20	Potassium (T)	2.5300	0.050	mg/L	-	-	0.8400	-
A20-62	Lake A20	Sodium (T)	2.1800	0.050	mg/L	-	-	0.9700	-
A20-62	Lake A20	TDS	69.0000	10.000	mg/L	-	-	38.5000	-
A20-62	Lake A20	TKN	0.3450	0.050	mg/L	-	-	0.1700	-
A20-62	Lake A20	Total Alkalinity	19.0000	1.000	mg/L	-	-	9.6000	-
A20-62	Lake A20	Total phosphorous	***0.0064***	0.002	mg/L	-	0.004	0.0045	-
A76-59	Lake A76	Bicarbonate alkalinity	14.9000	1.000	mg/L	-	-	9.6000	-
A76-59	Lake A76	Calcium (T)	13.3000	0.050	mg/L	-	-	4.6000	-
A76-59	Lake A76	Conductivity	120.0000	2.000	µS/cm	-	-	48.6000	-
A76-59	Lake A76	Hardness	47.9000	0.600	mg/L	-	-	17.4000	-
A76-59	Lake A76	Magnesium (T)	3.5700	0.005	mg/L	-	-	1.4100	-
A76-59	Lake A76	Potassium (T)	2.9200	0.050	mg/L	-	-	0.8400	-
A76-59	Lake A76	Sodium (T)	2.1900	0.050	mg/L	-	-	0.9700	-
A76-59	Lake A76	TDS	72.5000	10.000	mg/L	-	-	38.5000	-
A76-59	Lake A76	Total Alkalinity	14.9000	1.000	mg/L	-	-	9.6000	-
A76-60	Lake A76	Bicarbonate alkalinity	15.3000	1.000	mg/L	-	-	9.6000	-
A76-60	Lake A76	Calcium (T)	12.9000	0.050	mg/L	-	-	4.6000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
A76-60	Lake A76	Conductivity	119.0000	2.000	µS/cm	-	-	48.6000	-
A76-60	Lake A76	Hardness	46.4000	0.600	mg/L	-	-	17.4000	-
A76-60	Lake A76	Magnesium (T)	3.4500	0.005	mg/L	-	-	1.4100	-
A76-60	Lake A76	Potassium (T)	2.8800	0.050	mg/L	-	-	0.8400	-
A76-60	Lake A76	Sodium (T)	2.1400	0.050	mg/L	-	-	0.9700	-
A76-60	Lake A76	TDS	73.8000	10.000	mg/L	-	-	38.5000	-
A76-60	Lake A76	Total Alkalinity	15.3000	1.000	mg/L	-	-	9.6000	-
DS1-57	Lake DS1	Silicon (T)	0.6300	0.100	mg/L	-	-	0.6100	-
DS1-57	Lake DS1	Sodium (T)	1.0200	0.050	mg/L	-	-	0.9700	-
MAM-67	Mammoth	Bicarbonate alkalinity	23.6000	1.000	mg/L	-	-	9.6000	-
MAM-67	Mammoth	Calcium (T)	21.2000	0.050	mg/L	-	-	4.6000	-
MAM-67	Mammoth	Conductivity	207.0000	2.000	µS/cm	-	-	48.6000	-
MAM-67	Mammoth	Hardness	74.7000	0.600	mg/L	-	-	17.4000	-
MAM-67	Mammoth	Lithium (D)	0.0033	0.001	mg/L	-	-	0.0020	-
MAM-67	Mammoth	Lithium (T)	0.0032	0.001	mg/L	-	-	0.0020	-
MAM-67	Mammoth	Magnesium (T)	5.2800	0.005	mg/L	-	-	1.4100	-
MAM-67	Mammoth	Potassium (T)	5.0000	0.050	mg/L	-	-	0.8400	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
MAM-67	Mammoth	Sodium (T)	3.7000	0.050	mg/L	-	-	0.9700	-
MAM-67	Mammoth	TDS	131.0000	10.000	mg/L	-	-	38.5000	-
MAM-67	Mammoth	TKN	0.4250	0.050	mg/L	-	-	0.1700	-
MAM-67	Mammoth	Total Alkalinity	23.6000	1.000	mg/L	-	-	9.6000	-
MAM-67	Mammoth	Total phosphorous	***0.0114***	0.002	mg/L	-	0.004	0.0045	-
MAM-68	Mammoth	Bicarbonate alkalinity	18.9000	1.000	mg/L	-	-	9.6000	-
MAM-68	Mammoth	Calcium (T)	16.4000	0.050	mg/L	-	-	4.6000	-
MAM-68	Mammoth	Conductivity	163.0000	2.000	µS/cm	-	-	48.6000	-
MAM-68	Mammoth	Hardness	57.7000	0.600	mg/L	-	-	17.4000	-
MAM-68	Mammoth	Lithium (D)	0.0025	0.001	mg/L	-	-	0.0020	-
MAM-68	Mammoth	Lithium (T)	0.0024	0.001	mg/L	-	-	0.0020	-
MAM-68	Mammoth	Magnesium (T)	4.0700	0.005	mg/L	-	-	1.4100	-
MAM-68	Mammoth	Potassium (T)	3.7000	0.050	mg/L	-	-	0.8400	-
MAM-68	Mammoth	Sodium (T)	2.8100	0.050	mg/L	-	-	0.9700	-
MAM-68	Mammoth	TDS	104.0000	10.000	mg/L	-	-	38.5000	-
MAM-68	Mammoth	TKN	0.3250	0.050	mg/L	-	-	0.1700	-
MAM-68	Mammoth	Total Alkalinity	18.9000	1.000	mg/L	-	-	9.6000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
MAM-68	Mammoth	Total phosphorous	***0.0052***	0.002	mg/L	-	0.004	0.0045	-
NEM-67	Nemo	Bicarbonate alkalinity	12.5000	1.000	mg/L	-	-	9.6000	-
NEM-67	Nemo	Calcium (T)	11.9000	0.050	mg/L	-	-	4.6000	-
NEM-67	Nemo	Conductivity	105.0000	2.000	µS/cm	-	-	48.6000	-
NEM-67	Nemo	Hardness	40.0000	0.600	mg/L	-	-	17.4000	-
NEM-67	Nemo	Magnesium (T)	2.5000	0.005	mg/L	-	-	1.4100	-
NEM-67	Nemo	Potassium (T)	1.7500	0.050	mg/L	-	-	0.8400	-
NEM-67	Nemo	Sodium (T)	1.1300	0.050	mg/L	-	-	0.9700	-
NEM-67	Nemo	TDS	73.3000	10.000	mg/L	-	-	38.5000	-
NEM-67	Nemo	Total Alkalinity	12.5000	1.000	mg/L	-	-	9.6000	-
NEM-67	Nemo	Total phosphorous	***0.0042***	0.002	mg/L	-	0.004	0.0045	-
NEM-68	Nemo	Ammonia-N	0.0767	0.005	mg/L	-	0.126	0.0650	-
NEM-68	Nemo	Bicarbonate alkalinity	13.0000	1.000	mg/L	-	-	9.6000	-
NEM-68	Nemo	Calcium (T)	11.3000	0.050	mg/L	-	-	4.6000	-
NEM-68	Nemo	Conductivity	109.0000	2.000	µS/cm	-	-	48.6000	-
NEM-68	Nemo	Hardness	38.8000	0.600	mg/L	-	-	17.4000	-
NEM-68	Nemo	Magnesium (T)	2.5600	0.005	mg/L	-	-	1.4100	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
NEM-68	Nemo	Potassium (T)	1.8000	0.050	mg/L	-	-	0.8400	-
NEM-68	Nemo	Reactive silica	5.8900	0.500	mg/L	-	-	1.3300	Uncertain
NEM-68	Nemo	Sodium (T)	1.2000	0.050	mg/L	-	-	0.9700	-
NEM-68	Nemo	TDS	78.3000	10.000	mg/L	-	-	38.5000	-
NEM-68	Nemo	TKN	0.2110	0.050	mg/L	-	-	0.1700	-
NEM-68	Nemo	Total Alkalinity	13.0000	1.000	mg/L	-	-	9.6000	-
WTS-67	Whale Tail South	Bicarbonate alkalinity	18.0000	1.000	mg/L	-	-	9.6000	-
WTS-67	Whale Tail South	Calcium (T)	12.6000	0.050	mg/L	-	-	4.6000	-
WTS-67	Whale Tail South	Conductivity	128.0000	2.000	µS/cm	-	-	48.6000	-
WTS-67	Whale Tail South	Hardness	46.0000	0.600	mg/L	-	-	17.4000	-
WTS-67	Whale Tail South	Lithium (D)	0.0021	0.001	mg/L	-	-	0.0020	-
WTS-67	Whale Tail South	Lithium (T)	0.0022	0.001	mg/L	-	-	0.0020	-
WTS-67	Whale Tail South	Magnesium (T)	3.5300	0.005	mg/L	-	-	1.4100	-
WTS-67	Whale Tail South	Potassium (T)	3.0800	0.050	mg/L	-	-	0.8400	-
WTS-67	Whale Tail South	Silicon (D)	0.6240	0.050	mg/L	-	-	0.5700	-
WTS-67	Whale Tail South	Silicon (T)	0.7000	0.100	mg/L	-	-	0.6100	-
WTS-67	Whale Tail South	Sodium (T)	2.6000	0.050	mg/L	-	-	0.9700	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
WTS-67	Whale Tail South	TDS	84.3000	10.000	mg/L	-	-	38.5000	-
WTS-67	Whale Tail South	TKN	0.2640	0.050	mg/L	-	-	0.1700	-
WTS-67	Whale Tail South	Total Alkalinity	18.0000	1.000	mg/L	-	-	9.6000	-
WTS-67	Whale Tail South	Total phosphorous	***0.0058***	0.002	mg/L	-	0.004	0.0045	-
WTS-68	Whale Tail South	Bicarbonate alkalinity	17.1000	1.000	mg/L	-	-	9.6000	-
WTS-68	Whale Tail South	Calcium (T)	11.8000	0.050	mg/L	-	-	4.6000	-
WTS-68	Whale Tail South	Conductivity	120.0000	2.000	µS/cm	-	-	48.6000	-
WTS-68	Whale Tail South	Hardness	43.5000	0.600	mg/L	-	-	17.4000	-
WTS-68	Whale Tail South	Lithium (D)	0.0021	0.001	mg/L	-	-	0.0020	-
WTS-68	Whale Tail South	Lithium (T)	0.0021	0.001	mg/L	-	-	0.0020	-
WTS-68	Whale Tail South	Magnesium (T)	3.4000	0.005	mg/L	-	-	1.4100	-
WTS-68	Whale Tail South	Potassium (T)	2.9500	0.050	mg/L	-	-	0.8400	-
WTS-68	Whale Tail South	Sodium (T)	2.4500	0.050	mg/L	-	-	0.9700	-
WTS-68	Whale Tail South	TDS	82.7000	10.000	mg/L	-	-	38.5000	-
WTS-68	Whale Tail South	TKN	0.2630	0.050	mg/L	-	-	0.1700	-
WTS-68	Whale Tail South	Total Alkalinity	17.1000	1.000	mg/L	-	-	9.6000	-
WTS-68	Whale Tail South	Total phosphorous	***0.0093***	0.002	mg/L	-	0.004	0.0045	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]

[1]Bold values are above the threshold as well as above the trigger value.

[2]Results failing to meet reliability checks are indicated as uncertain.

2.1 Result Reliability Checks

Two preliminary analyses were conducted to assess the reliability of sample results. Samples failing either one of these tests have been flagged as uncertain, and warrant further evaluation.

The first analysis compares dissolved and total concentrations for a given parameters at each location. Samples where dissolved concentrations are greater than total with a relative percent difference (RPD) of more than 30% are considered potentially unreliable. All samples in this sampling event met this reliability check.

The second analysis compares parameter concentrations from the two sampling stations located within each water body (either lake or basin). Parameters for which the difference between these two intra-lake samples was greater than a factor of 5 (or a factor of 10 if at least one of the samples was within a factor of 10 of the MDL) are considered potentially unreliable. All samples failing to meet this reliability check are summarized in Table 6.

Table 6: Samples with uncertain reliability due to differences between results from the same sampling area.

Area	ID	ID_Name	Parameter	Difference	Threshold[1]
Whale Tail Pit	A20	Lake A20	Manganese (D)	50.60000	10
Whale Tail Pit	NEM	Nemo	Reactive silica	11.78000	10
Whale Tail Pit	A20	Lake A20	Manganese (T)	11.35458	5

[1]Threshold is set at a factor of 5, unless one or more sample is within a factor of 10 of the MDL in which case the threshold is set at a factor of 10.

3. Laboratory & Field Quality Control Results

ALS' laboratory QC samples for water are:

- *Laboratory duplicates* (LD) - these samples provide insights into the precision of laboratory analyses. Duplicate aliquots are taken from the samples and run through part (aliquots taken post digestion) or all (aliquots taken from the sample bottle) the laboratory analytical process.
- *Laboratory control samples* (LCS) - these samples provide insights into whether the laboratory systems are working as intended. They are comprised of a mixture of analyte-free water to which known amounts of the method analytes are added. They are essentially an internal version of a certified reference material.
- *Matrix spikes* (MS) - these samples involve the analysis of actual samples, to which a known amount of method analytes are added in amounts high enough that the spikes are clearly discernible relative to existing concentrations. These samples provide insights into the degree that the sample matrix could interfere with analyses.
- *Matrix blanks* (MB) - these samples are analyzed to assess background interference or contamination that exists in the analytical system that could lead to elevated concentrations or false positive data. These samples are comprised of analyte-free water.

The following field QC samples were collected and submitted blind to ALS:

- *Field duplicates* (FD) - these samples provide insights into (a) variability in field conditions and (b) the precision of laboratory analyses. Duplicate samples are collected from the same location and treated independently through the sampling and analysis process.
- *Deionized blanks* (DB) - these samples 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.
- *Equipment blanks* (EB) - these samples 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.
- *Travel blanks* (TB) - these samples 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.

3.1 Overall QC Results

Overall laboratory and field QC results are summarized in Table 7.

Table 7: Summary of laboratory and field QC results by sample type.

	QC_Element	Pass	Fail	ND
Laboratory	Lab Duplicate	602	0	0
	Lab Control Sample	599	0	0
	Matrix Spike	521	1	46
	Matrix Blank	605	0	0
Field	Field Duplicate	433	8	0
	Deionized Water Blank	103	0	0
	Equipment Blank	200	6	0
	Travel Blank	110	0	0

3.2 Laboratory Duplicates

All laboratory duplicate results met laboratory QC objectives.

3.3 Laboratory Control Samples

All laboratory control sample results met laboratory QC objectives.

3.4 Matrix Spike

All matrix spike sample results met laboratory QC objectives. The sample in which matrix spike results did not meet QC objectives was a sample from another ALS client.

Some parameters had spike levels too low to confidently quantify them relative to existing concentrations in the sample. Consequently, QC results for these results could not be calculated (see Table 8).

Table 8: Details for matrix spike results not meeting QC objectives.

QC_Lot	Analyte	Percent	Limit	MS.QC
434270	phosphorus, dissolved	131	70-130	Fail

Table 9: Analytes not determined for matrix spikes.

QC_Lot	Analyte	ALS_QC_ID[1]
451758	calcium, total	DS1-58
451758	magnesium, total	DS1-58
451758	strontium, total	DS1-58

[1]ALS_QC_ID listing of 'Anonymous' indicates QC sample from another client used.

3.5 Matrix Blank

All matrix blank results met laboratory QC objectives.

3.6 Field Duplicates

In this sampling event, 8 field duplicate samples failed to meet the QC objectives. Field duplicate sample results not meeting QC objectives are summarized in Table 10.

Table 10: Details for field duplicate results not meeting QC objectives.

QC_Lot.x	Analyte	RPD	DIFFx	FD.QC
441654	phosphorus, total	76.4	3.1	Fail
433135	manganese, total	35.0	8.7	Fail
441392	barium, dissolved	31.5	17.5	Fail
432364	sulfate (as SO4)	31.3	4.8	Fail
	chlorophyll a	39.7	22.0	Fail
444884	chlorophyll a	39.7	55.0	Fail
432362	alkalinity, bicarbonate (as CaCO3)	45.8	3.5	Fail
432362	alkalinity, total (as CaCO3)	45.8	3.5	Fail

3.7 DI Blank

All deionized water blank results met laboratory QC objectives.

3.8 Equipment Blank

In this sampling event, 6 equipment blank samples failed to meet the QC objectives. Equipment blank results not meeting QC objectives are summarized in Table 11.

Table 11: Details for equipment blank results not meeting QC objectives.

QC_Lot	ID	Analyte	Results	DL	FB.QC
444423	EB	conductivity	2.10000	2.00000	Fail
444422	EB	alkalinity, bicarbonate (as CaCO3)	1.10000	1.00000	Fail
444422	EB	alkalinity, total (as CaCO3)	1.10000	1.00000	Fail
444425	EB	chloride	0.20000	0.10000	Fail
444427	EB	nitrate (as N)	0.01070	0.00500	Fail
451758	EB	lead, total	0.00049	0.00005	Fail

3.9 Travel Blank

All travel blank results met laboratory QC objectives.

3.10 Holding Time Exceedances

In addition to those ALS laboratory QC samples described above, during QC screening samples were also assessed agianst recommended hold times. Parameters and associated sample numbers exceeding recommended hold times in this sampling event are shown in Table 12. Note that pH is included in the suite of field measurements and has a very short recommended hold time, so exceeding the hold time for laboratory analysis is expected and of little importance.

Table 12: Analytes and associated number of samples exceeding holding times.

ALS_Method	n
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level)	42
Nitrate in Water by IC (Low Level)	42
Nitrite in Water by IC (Low Level)	42
pH by Meter	42
Turbidity by Nephelometry	42
TDS by Gravimetry (Low Level)	20
TSS by Gravimetry (Low Level)	20
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	10
Alkalinity Species by Titration	5
Free Cyanide (Low Level)	4
Total Cyanide (Low Level)	4

ALS_Method	n
Ammonia by Fluorescence	2
Total Dissolved Phosphorus by Colourimetry (Trace Level)	2

Meadowbank Mine - Water Quality Monitoring 2022

Preliminary Screening of May, 2022 Water Quality Monitoring

Azimuth Consulting Group Inc.
on behalf of Agnico Eagle Mines Ltd.

Report Date: 2022-08-02

Table of Contents

1. Introduction & Sampling Overview

This document was prepared by Azimuth Consulting Group Inc (Azimuth) to provide the Meadowbank Environment Department with a brief overview of the water chemistry results collected in May, 2022 as part of the Core Receiving Environment Monitoring Program (CREMP). CREMP water quality monitoring occurs in all summer months (July - September) as well as two through-ice sampling events in March and May. CREMP monitoring occurs at near-field, mid-field, and far-field stations in three distinct areas - the Meadowbank Mine Project, The Whale Tail Pit Project, and Baker Lake, however sampling does not occur at all stations or all areas in each sampling event. The purpose of this preliminary document is to:

1. Screen the water chemistry results from ALS against the trigger values to keep the Environment Department informed about potential changes in water quality, including the early identification of potentially anomalous data (Section 2).

2. Review the data for laboratory QC issues (blanks, duplicates, matrix spikes, etc.) and potential field quality assurance (QA) concerns, ensuring that questionable results are verified by reanalysis (Section 3).

Samples included in this report are shown in Table 1, while field blanks are shown in Table 2.

Table 1: Summary of May, 2022 samples.

Area	Sample ID	ID	ID_Name	Duplicate	Date_Sampled
Meadowbank					
	INUG-140	INUG	Inuggugayualik	-	2022-05-06
	INUG-141	INUG	Inuggugayualik	MAY DUP-1	2022-05-06
	PDL-105	PDL	Pipedream	-	2022-05-06
	PDL-106	PDL	Pipedream	MAY DUP-2	2022-05-06
	SP-152	SP	Second Portage	-	2022-05-07
	SP-153	SP	Second Portage	-	2022-05-07
	TPE-152	TPE	Third Portage - East Basin	-	2022-05-11
	TPE-153	TPE	Third Portage - East Basin	-	2022-05-11
	TPN-152	TPN	Third Portage - North Basin	-	2022-05-11
	TPN-153	TPN	Third Portage - North Basin	-	2022-05-11
	WAL-121	WAL	Wally	-	2022-05-07
	WAL-122	WAL	Wally	-	2022-05-07
Whale Tail Pit					
	A20-63	A20	Lake A20	-	2022-05-06
	A20-64	A20	Lake A20	-	2022-05-06
	A76-61	A76	Lake A76	-	2022-05-10
	A76-62	A76	Lake A76	-	2022-05-10
	DS1-59	DS1	Lake DS1	MAY DUP-3	2022-05-10
	DS1-60	DS1	Lake DS1	-	2022-05-10
	MAM-69	MAM	Mammoth	-	2022-05-05
	MAM-70	MAM	Mammoth	-	2022-05-05
	NEM-69	NEM	Nemo	-	2022-05-06
	NEM-70	NEM	Nemo	MAY DUP-4	2022-05-06
	WTS-69	WTS	Whale Tail South	-	2022-05-06

Area	Sample ID	ID	ID_Name	Duplicate	Date_Sampled
	WTS-70	WTS	Whale Tail South	-	2022-05-06

Table 2: Summary of field blanks collected in May, 2022.

Client_Sample_ID	ID_Name
MAY DI	DI Blank
MAY EB	Equipment Blank
MAY TB	Travel Blank

2. Trigger Screening

Sampling results were screened relative to relevant triggers and thresholds. A summary of trigger and threshold exceedances is provided in Table 3. Subsequent tables provide all sample results above trigger and threshold values for Meadowbank (Table 4), Whale Tail Pit (Table 5), and Baker Lake (Baker Lake not sampled in this sampling event). Samples exceeding triggers or thresholds but failing reliability checks (see Section 2.1) are labeled as uncertain.

Table 3: Summary of trigger and threshold exceedances in May, 2022.

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
Meadowbank				
	Bicarbonate alkalinity	7	0	PDL-105, PDL-106, SP-152, SP-153, TPE-152, WAL-121, WAL-122
	Calcium (T)	10	0	PDL-105, PDL-106, SP-152, SP-153, TPE-152, TPE-153, TPN-152, TPN-153, WAL-121, WAL-122
	Chromium (D)	12	0	INUG-140, INUG-141, PDL-105, PDL-106, SP-152, SP-153, TPE-152, TPE-153, TPN-152, TPN-153, WAL-121, WAL-122
	Conductivity	10	0	PDL-105, PDL-106, SP-152, SP-153, TPE-152, TPE-153, TPN-152, TPN-153, WAL-121, WAL-122
	Copper (D)	1	0	WAL-121

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
	Copper (T)	2	0	WAL-121, WAL-122
	Fluoride	1	0	TPE-152
	Hardness	10	0	PDL-105, PDL-106, SP-152, SP-153, TPE-152, TPE-153, TPN-152, TPN-153, WAL-121, WAL-122
	Magnesium (T)	11	0	INUG-140, PDL-105, PDL-106, SP-152, SP-153, TPE-152, TPE-153, TPN-152, TPN-153, WAL-121, WAL-122
	Potassium (T)	7	0	SP-152, SP-153, TPE-152, TPE-153, TPN-152, WAL-121, WAL-122
	Reactive silica	2	0	WAL-121, WAL-122
	Silicon (D)	7	0	INUG-140, INUG-141, PDL-105, SP-152, SP-153, WAL-121, WAL-122
	Silicon (T)	7	0	INUG-140, INUG-141, PDL-105, SP-152, SP-153, WAL-121, WAL-122
	Sodium (T)	5	0	TPE-152, TPE-153, TPN-152, WAL-121, WAL-122
	TDS	7	0	SP-152, SP-153, TPE-152, TPE-153, TPN-152, WAL-121, WAL-122
	TKN	2	0	WAL-121, WAL-122
	Total Alkalinity	7	0	PDL-105, PDL-106, SP-152, SP-153, TPE-152, WAL-121, WAL-122
	Total phosphorous	1	1	WAL-121

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
	TSS	1	1	WAL-121
Whale Tail Pit				
	Bicarbonate alkalinity	11	0	A20-63, A20-64, A76-61, A76-62, DS1-60, MAM-69, MAM-70, NEM-69, NEM-70, WTS-69, WTS-70
	Calcium (T)	11	0	A20-63, A20-64, A76-61, A76-62, DS1-60, MAM-69, MAM-70, NEM-69, NEM-70, WTS-69, WTS-70
	Conductivity	11	0	A20-63, A20-64, A76-61, A76-62, DS1-60, MAM-69, MAM-70, NEM-69, NEM-70, WTS-69, WTS-70
	Hardness	11	0	A20-63, A20-64, A76-61, A76-62, DS1-60, MAM-69, MAM-70, NEM-69, NEM-70, WTS-69, WTS-70
	Lithium (D)	4	0	MAM-69, MAM-70, WTS-69, WTS-70
	Lithium (T)	4	0	MAM-69, MAM-70, WTS-69, WTS-70
	Magnesium (T)	11	0	A20-63, A20-64, A76-61, A76-62, DS1-60, MAM-69, MAM-70, NEM-69, NEM-70, WTS-69, WTS-70
	Potassium (T)	11	0	A20-63, A20-64, A76-61, A76-62, DS1-60, MAM-69, MAM-70, NEM-69, NEM-70, WTS-69, WTS-70
	Reactive silica	3	0	DS1-60, WTS-69, WTS-70

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
	Silicon (D)	3	0	DS1-60, WTS-69, WTS-70
	Silicon (T)	3	0	DS1-60, WTS-69, WTS-70
	Sodium (T)	12	0	A20-63, A20-64, A76-61, A76-62, DS1-59, DS1-60, MAM-69, MAM-70, NEM-69, NEM-70, WTS-69, WTS-70
	TDS	10	0	A20-63, A20-64, A76-61, A76-62, MAM-69, MAM-70, NEM-69, NEM-70, WTS-69, WTS-70
	TKN	6	0	A20-63, A20-64, MAM-69, MAM-70, WTS-69, WTS-70
	Total Alkalinity	11	0	A20-63, A20-64, A76-61, A76-62, DS1-60, MAM-69, MAM-70, NEM-69, NEM-70, WTS-69, WTS-70
	Total phosphorous	5	7	A20-63, A20-64, MAM-69, MAM-70, NEM-70, WTS-69, WTS-70

* Indicates samples which failed reliability checks and are consequently uncertain.

Table 4: Trigger and threshold exceedances at Meadowbank sampling stations.

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
INUG-140	Inuggugayualik	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
INUG-140	Inuggugayualik	Magnesium (T)	0.98200	0.0050	mg/L	-	-	0.93000	-
INUG-140	Inuggugayualik	Silicon (D)	0.25600	0.0500	mg/L	-	-	0.18000	-
INUG-140	Inuggugayualik	Silicon (T)	0.29000	0.1000	mg/L	-	-	0.20000	-
INUG-141	Inuggugayualik	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
INUG-141	Inuggugayualik	Silicon (D)	0.23800	0.0500	mg/L	-	-	0.18000	-
INUG-141	Inuggugayualik	Silicon (T)	0.26000	0.1000	mg/L	-	-	0.20000	-
PDL-105	Pipedream	Bicarbonate alkalinity	9.90000	1.0000	mg/L	-	-	8.70000	-
PDL-105	Pipedream	Calcium (T)	3.00000	0.0500	mg/L	-	-	2.39000	-
PDL-105	Pipedream	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
PDL-105	Pipedream	Conductivity	28.80000	2.0000	µS/cm	-	-	27.40000	-
PDL-105	Pipedream	Hardness	11.70000	0.6000	mg/L	-	-	9.50000	-
PDL-105	Pipedream	Magnesium (T)	1.02000	0.0050	mg/L	-	-	0.93000	-
PDL-105	Pipedream	Silicon (D)	0.18200	0.0500	mg/L	-	-	0.18000	-
PDL-105	Pipedream	Silicon (T)	0.21000	0.1000	mg/L	-	-	0.20000	-
PDL-105	Pipedream	Total Alkalinity	9.90000	1.0000	mg/L	-	-	8.70000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
PDL-106	Pipedream	Bicarbonate alkalinity	9.70000	1.0000	mg/L	-	-	8.70000	-
PDL-106	Pipedream	Calcium (T)	2.95000	0.0500	mg/L	-	-	2.39000	-
PDL-106	Pipedream	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
PDL-106	Pipedream	Conductivity	28.90000	2.0000	µS/cm	-	-	27.40000	-
PDL-106	Pipedream	Hardness	11.60000	0.6000	mg/L	-	-	9.50000	-
PDL-106	Pipedream	Magnesium (T)	1.02000	0.0050	mg/L	-	-	0.93000	-
PDL-106	Pipedream	Total Alkalinity	9.70000	1.0000	mg/L	-	-	8.70000	-
SP-152	Second Portage	Bicarbonate alkalinity	12.40000	1.0000	mg/L	-	-	8.70000	-
SP-152	Second Portage	Calcium (T)	4.73000	0.0500	mg/L	-	-	2.39000	-
SP-152	Second Portage	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
SP-152	Second Portage	Conductivity	45.20000	2.0000	µS/cm	-	-	27.40000	-
SP-152	Second Portage	Hardness	18.20000	0.6000	mg/L	-	-	9.50000	-
SP-152	Second Portage	Magnesium (T)	1.56000	0.0050	mg/L	-	-	0.93000	-
SP-152	Second Portage	Potassium (T)	0.67200	0.0500	mg/L	-	-	0.58000	-
SP-152	Second Portage	Silicon (D)	0.36100	0.0500	mg/L	-	-	0.18000	-
SP-152	Second Portage	Silicon (T)	0.41000	0.1000	mg/L	-	-	0.20000	-
SP-152	Second Portage	TDS	25.20000	3.0000	mg/L	-	-	19.00000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
SP-152	Second Portage	Total Alkalinity	12.40000	1.0000	mg/L	-	-	8.70000	-
SP-153	Second Portage	Bicarbonate alkalinity	12.30000	1.0000	mg/L	-	-	8.70000	-
SP-153	Second Portage	Calcium (T)	4.54000	0.0500	mg/L	-	-	2.39000	-
SP-153	Second Portage	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
SP-153	Second Portage	Conductivity	45.30000	2.0000	µS/cm	-	-	27.40000	-
SP-153	Second Portage	Hardness	17.30000	0.6000	mg/L	-	-	9.50000	-
SP-153	Second Portage	Magnesium (T)	1.45000	0.0050	mg/L	-	-	0.93000	-
SP-153	Second Portage	Potassium (T)	0.61700	0.0500	mg/L	-	-	0.58000	-
SP-153	Second Portage	Silicon (D)	0.36500	0.0500	mg/L	-	-	0.18000	-
SP-153	Second Portage	Silicon (T)	0.38000	0.1000	mg/L	-	-	0.20000	-
SP-153	Second Portage	TDS	27.20000	3.0000	mg/L	-	-	19.00000	-
SP-153	Second Portage	Total Alkalinity	12.30000	1.0000	mg/L	-	-	8.70000	-
TPE-152	Third Portage - East Basin	Bicarbonate alkalinity	9.30000	1.0000	mg/L	-	-	8.70000	-
TPE-152	Third Portage - East Basin	Calcium (T)	3.44000	0.0500	mg/L	-	-	2.39000	-
TPE-152	Third Portage - East Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPE-152	Third Portage - East Basin	Conductivity	38.60000	2.0000	µS/cm	-	-	27.40000	-
TPE-152	Third Portage - East Basin	Fluoride	0.09100	0.0200	mg/L	-	0.12	0.08800	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
TPE-152	Third Portage - East Basin	Hardness	13.90000	0.6000	mg/L	-	-	9.50000	-
TPE-152	Third Portage - East Basin	Magnesium (T)	1.30000	0.0050	mg/L	-	-	0.93000	-
TPE-152	Third Portage - East Basin	Potassium (T)	0.70700	0.0500	mg/L	-	-	0.58000	-
TPE-152	Third Portage - East Basin	Sodium (T)	1.33000	0.0500	mg/L	-	-	1.16000	-
TPE-152	Third Portage - East Basin	TDS	20.60000	3.0000	mg/L	-	-	19.00000	-
TPE-152	Third Portage - East Basin	Total Alkalinity	9.30000	1.0000	mg/L	-	-	8.70000	-
TPE-153	Third Portage - East Basin	Calcium (T)	3.07000	0.0500	mg/L	-	-	2.39000	-
TPE-153	Third Portage - East Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPE-153	Third Portage - East Basin	Conductivity	35.90000	2.0000	µS/cm	-	-	27.40000	-
TPE-153	Third Portage - East Basin	Hardness	12.30000	0.6000	mg/L	-	-	9.50000	-
TPE-153	Third Portage - East Basin	Magnesium (T)	1.12000	0.0050	mg/L	-	-	0.93000	-
TPE-153	Third Portage - East Basin	Potassium (T)	0.61000	0.0500	mg/L	-	-	0.58000	-
TPE-153	Third Portage - East Basin	Sodium (T)	1.17000	0.0500	mg/L	-	-	1.16000	-
TPE-153	Third Portage - East Basin	TDS	19.40000	3.0000	mg/L	-	-	19.00000	-
TPN-152	Third Portage - North Basin	Calcium (T)	3.18000	0.0500	mg/L	-	-	2.39000	-
TPN-152	Third Portage - North Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPN-152	Third Portage - North Basin	Conductivity	36.80000	2.0000	µS/cm	-	-	27.40000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
TPN-152	Third Portage - North Basin	Hardness	13.20000	0.6000	mg/L	-	-	9.50000	-
TPN-152	Third Portage - North Basin	Magnesium (T)	1.28000	0.0050	mg/L	-	-	0.93000	-
TPN-152	Third Portage - North Basin	Potassium (T)	0.73900	0.0500	mg/L	-	-	0.58000	-
TPN-152	Third Portage - North Basin	Sodium (T)	1.44000	0.0500	mg/L	-	-	1.16000	-
TPN-152	Third Portage - North Basin	TDS	22.80000	3.0000	mg/L	-	-	19.00000	-
TPN-153	Third Portage - North Basin	Calcium (T)	2.58000	0.0500	mg/L	-	-	2.39000	-
TPN-153	Third Portage - North Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPN-153	Third Portage - North Basin	Conductivity	30.20000	2.0000	µS/cm	-	-	27.40000	-
TPN-153	Third Portage - North Basin	Hardness	10.50000	0.6000	mg/L	-	-	9.50000	-
TPN-153	Third Portage - North Basin	Magnesium (T)	0.98000	0.0050	mg/L	-	-	0.93000	-
WAL-121	Wally	Bicarbonate alkalinity	20.00000	1.0000	mg/L	-	-	17.80000	-
WAL-121	Wally	Calcium (T)	7.26000	0.0500	mg/L	-	-	4.88000	-
WAL-121	Wally	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
WAL-121	Wally	Conductivity	61.50000	2.0000	µS/cm	-	-	36.60000	-
WAL-121	Wally	Copper (D)	0.00157	0.0002	mg/L	-	0.002	0.00150	-
WAL-121	Wally	Copper (T)	0.00189	0.0005	mg/L	-	0.002	0.00150	-
WAL-121	Wally	Hardness	26.90000	0.6000	mg/L	-	-	16.70000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
WAL-121	Wally	Magnesium (T)	2.14000	0.0050	mg/L	-	-	1.36000	-
WAL-121	Wally	Potassium (T)	0.70200	0.0500	mg/L	-	-	0.59000	-
WAL-121	Wally	Reactive silica	1.77000	0.5000	mg/L	-	-	1.08000	-
WAL-121	Wally	Silicon (D)	0.83600	0.0500	mg/L	-	-	0.67000	-
WAL-121	Wally	Silicon (T)	0.89000	0.1000	mg/L	-	-	0.65000	-
WAL-121	Wally	Sodium (T)	0.92400	0.0500	mg/L	-	-	0.72000	-
WAL-121	Wally	TDS	42.20000	10.0000	mg/L	-	-	25.30000	-
WAL-121	Wally	TKN	0.16600	0.0500	mg/L	-	-	0.16000	-
WAL-121	Wally	Total Alkalinity	20.00000	1.0000	mg/L	-	-	17.80000	-
WAL-121	Wally	Total phosphorous	***0.00680***	0.0020	mg/L	-	0.004	0.00670	-
WAL-121	Wally	TSS	***11.10000***	1.0000	mg/L	-	5	3.00000	-
WAL-122	Wally	Bicarbonate alkalinity	18.20000	1.0000	mg/L	-	-	17.80000	-
WAL-122	Wally	Calcium (T)	6.53000	0.0500	mg/L	-	-	4.88000	-
WAL-122	Wally	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
WAL-122	Wally	Conductivity	56.20000	2.0000	µS/cm	-	-	36.60000	-
WAL-122	Wally	Copper (T)	0.00177	0.0005	mg/L	-	0.002	0.00150	-
WAL-122	Wally	Hardness	23.90000	0.6000	mg/L	-	-	16.70000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
WAL-122	Wally	Magnesium (T)	1.84000	0.0050	mg/L	-	-	1.36000	-
WAL-122	Wally	Potassium (T)	0.61100	0.0500	mg/L	-	-	0.59000	-
WAL-122	Wally	Reactive silica	1.52000	0.5000	mg/L	-	-	1.08000	-
WAL-122	Wally	Silicon (D)	0.75400	0.0500	mg/L	-	-	0.67000	-
WAL-122	Wally	Silicon (T)	0.77000	0.1000	mg/L	-	-	0.65000	-
WAL-122	Wally	Sodium (T)	0.81000	0.0500	mg/L	-	-	0.72000	-
WAL-122	Wally	TDS	38.20000	10.0000	mg/L	-	-	25.30000	-
WAL-122	Wally	TKN	0.19100	0.0500	mg/L	-	-	0.16000	-
WAL-122	Wally	Total Alkalinity	18.20000	1.0000	mg/L	-	-	17.80000	-

[1]Bold values are above the threshold as well as above the trigger value.

[2]Results failing to meet reliability checks are indicated as uncertain.

Table 5: Trigger and threshold exceedances at Whale Tail Pit sampling stations

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
A20-63	Lake A20	Bicarbonate alkalinity	13.0000	1.000	mg/L	-	-	9.6000	-
A20-63	Lake A20	Calcium (T)	6.8900	0.050	mg/L	-	-	4.6000	-
A20-63	Lake A20	Conductivity	68.4000	2.000	µS/cm	-	-	48.6000	-
A20-63	Lake A20	Hardness	25.5000	0.600	mg/L	-	-	17.4000	-
A20-63	Lake A20	Magnesium (T)	2.0200	0.005	mg/L	-	-	1.4100	-
A20-63	Lake A20	Potassium (T)	1.8400	0.050	mg/L	-	-	0.8400	-
A20-63	Lake A20	Sodium (T)	1.5400	0.050	mg/L	-	-	0.9700	-
A20-63	Lake A20	TDS	49.2000	10.000	mg/L	-	-	38.5000	-
A20-63	Lake A20	TKN	0.2320	0.050	mg/L	-	-	0.1700	-
A20-63	Lake A20	Total Alkalinity	13.0000	1.000	mg/L	-	-	9.6000	-
A20-63	Lake A20	Total phosphorous	***0.0049***	0.002	mg/L	-	0.004	0.0045	-
A20-64	Lake A20	Bicarbonate alkalinity	13.6000	1.000	mg/L	-	-	9.6000	-
A20-64	Lake A20	Calcium (T)	11.7000	0.050	mg/L	-	-	4.6000	-
A20-64	Lake A20	Conductivity	111.0000	2.000	µS/cm	-	-	48.6000	-
A20-64	Lake A20	Hardness	43.2000	0.600	mg/L	-	-	17.4000	-
A20-64	Lake A20	Magnesium (T)	3.3900	0.005	mg/L	-	-	1.4100	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
A20-64	Lake A20	Potassium (T)	3.0100	0.050	mg/L	-	-	0.8400	-
A20-64	Lake A20	Sodium (T)	2.5400	0.050	mg/L	-	-	0.9700	-
A20-64	Lake A20	TDS	78.2000	10.000	mg/L	-	-	38.5000	-
A20-64	Lake A20	TKN	0.3170	0.050	mg/L	-	-	0.1700	-
A20-64	Lake A20	Total Alkalinity	13.6000	1.000	mg/L	-	-	9.6000	-
A20-64	Lake A20	Total phosphorous	***0.0045***	0.002	mg/L	-	0.004	0.0045	-
A76-61	Lake A76	Bicarbonate alkalinity	14.8000	1.000	mg/L	-	-	9.6000	-
A76-61	Lake A76	Calcium (T)	13.3000	0.050	mg/L	-	-	4.6000	-
A76-61	Lake A76	Conductivity	126.0000	2.000	µS/cm	-	-	48.6000	-
A76-61	Lake A76	Hardness	47.0000	0.600	mg/L	-	-	17.4000	-
A76-61	Lake A76	Magnesium (T)	3.3400	0.005	mg/L	-	-	1.4100	-
A76-61	Lake A76	Potassium (T)	2.8000	0.050	mg/L	-	-	0.8400	-
A76-61	Lake A76	Sodium (T)	2.0200	0.050	mg/L	-	-	0.9700	-
A76-61	Lake A76	TDS	72.8000	10.000	mg/L	-	-	38.5000	-
A76-61	Lake A76	Total Alkalinity	14.8000	1.000	mg/L	-	-	9.6000	-
A76-62	Lake A76	Bicarbonate alkalinity	14.9000	1.000	mg/L	-	-	9.6000	-
A76-62	Lake A76	Calcium (T)	13.3000	0.050	mg/L	-	-	4.6000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
A76-62	Lake A76	Conductivity	126.0000	2.000	µS/cm	-	-	48.6000	-
A76-62	Lake A76	Hardness	47.3000	0.600	mg/L	-	-	17.4000	-
A76-62	Lake A76	Magnesium (T)	3.4300	0.005	mg/L	-	-	1.4100	-
A76-62	Lake A76	Potassium (T)	2.8100	0.050	mg/L	-	-	0.8400	-
A76-62	Lake A76	Sodium (T)	2.0800	0.050	mg/L	-	-	0.9700	-
A76-62	Lake A76	TDS	77.8000	10.000	mg/L	-	-	38.5000	-
A76-62	Lake A76	Total Alkalinity	14.9000	1.000	mg/L	-	-	9.6000	-
DS1-59	Lake DS1	Sodium (T)	1.0500	0.050	mg/L	-	-	0.9700	-
DS1-60	Lake DS1	Bicarbonate alkalinity	10.6000	1.000	mg/L	-	-	9.6000	-
DS1-60	Lake DS1	Calcium (T)	5.7600	0.050	mg/L	-	-	4.6000	-
DS1-60	Lake DS1	Conductivity	59.7000	2.000	µS/cm	-	-	48.6000	-
DS1-60	Lake DS1	Hardness	21.0000	0.600	mg/L	-	-	17.4000	-
DS1-60	Lake DS1	Magnesium (T)	1.6000	0.005	mg/L	-	-	1.4100	-
DS1-60	Lake DS1	Potassium (T)	1.1200	0.050	mg/L	-	-	0.8400	-
DS1-60	Lake DS1	Reactive silica	2.2000	0.500	mg/L	-	-	1.3300	-
DS1-60	Lake DS1	Silicon (D)	1.0400	0.050	mg/L	-	-	0.5700	-
DS1-60	Lake DS1	Silicon (T)	1.0900	0.100	mg/L	-	-	0.6100	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
DS1-60	Lake DS1	Sodium (T)	1.6500	0.050	mg/L	-	-	0.9700	-
DS1-60	Lake DS1	Total Alkalinity	10.6000	1.000	mg/L	-	-	9.6000	-
MAM-69	Mammoth	Bicarbonate alkalinity	23.5000	1.000	mg/L	-	-	9.6000	-
MAM-69	Mammoth	Calcium (T)	18.7000	0.050	mg/L	-	-	4.6000	-
MAM-69	Mammoth	Conductivity	176.0000	2.000	µS/cm	-	-	48.6000	-
MAM-69	Mammoth	Hardness	66.6000	0.600	mg/L	-	-	17.4000	-
MAM-69	Mammoth	Lithium (D)	0.0028	0.001	mg/L	-	-	0.0020	-
MAM-69	Mammoth	Lithium (T)	0.0028	0.001	mg/L	-	-	0.0020	-
MAM-69	Mammoth	Magnesium (T)	4.8300	0.005	mg/L	-	-	1.4100	-
MAM-69	Mammoth	Potassium (T)	4.4600	0.050	mg/L	-	-	0.8400	-
MAM-69	Mammoth	Sodium (T)	3.3000	0.050	mg/L	-	-	0.9700	-
MAM-69	Mammoth	TDS	121.0000	10.000	mg/L	-	-	38.5000	-
MAM-69	Mammoth	TKN	0.2830	0.050	mg/L	-	-	0.1700	-
MAM-69	Mammoth	Total Alkalinity	23.5000	1.000	mg/L	-	-	9.6000	-
MAM-69	Mammoth	Total phosphorous	***0.0057***	0.002	mg/L	-	0.004	0.0045	-
MAM-70	Mammoth	Bicarbonate alkalinity	28.0000	1.000	mg/L	-	-	9.6000	-
MAM-70	Mammoth	Calcium (T)	22.9000	0.050	mg/L	-	-	4.6000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
MAM-70	Mammoth	Conductivity	214.0000	2.000	µS/cm	-	-	48.6000	-
MAM-70	Mammoth	Hardness	80.7000	0.600	mg/L	-	-	17.4000	-
MAM-70	Mammoth	Lithium (D)	0.0035	0.001	mg/L	-	-	0.0020	-
MAM-70	Mammoth	Lithium (T)	0.0034	0.001	mg/L	-	-	0.0020	-
MAM-70	Mammoth	Magnesium (T)	5.7200	0.005	mg/L	-	-	1.4100	-
MAM-70	Mammoth	Potassium (T)	5.5100	0.050	mg/L	-	-	0.8400	-
MAM-70	Mammoth	Sodium (T)	3.9600	0.050	mg/L	-	-	0.9700	-
MAM-70	Mammoth	TDS	145.0000	15.000	mg/L	-	-	38.5000	-
MAM-70	Mammoth	TKN	0.3010	0.050	mg/L	-	-	0.1700	-
MAM-70	Mammoth	Total Alkalinity	28.0000	1.000	mg/L	-	-	9.6000	-
MAM-70	Mammoth	Total phosphorous	***0.0044***	0.002	mg/L	-	0.004	0.0045	-
NEM-69	Nemo	Bicarbonate alkalinity	13.6000	1.000	mg/L	-	-	9.6000	-
NEM-69	Nemo	Calcium (T)	13.2000	0.050	mg/L	-	-	4.6000	-
NEM-69	Nemo	Conductivity	112.0000	2.000	µS/cm	-	-	48.6000	-
NEM-69	Nemo	Hardness	43.9000	0.600	mg/L	-	-	17.4000	-
NEM-69	Nemo	Magnesium (T)	2.6500	0.005	mg/L	-	-	1.4100	-
NEM-69	Nemo	Potassium (T)	1.9900	0.050	mg/L	-	-	0.8400	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
NEM-69	Nemo	Sodium (T)	1.2300	0.050	mg/L	-	-	0.9700	-
NEM-69	Nemo	TDS	85.2000	10.000	mg/L	-	-	38.5000	-
NEM-69	Nemo	Total Alkalinity	13.6000	1.000	mg/L	-	-	9.6000	-
NEM-70	Nemo	Bicarbonate alkalinity	12.8000	1.000	mg/L	-	-	9.6000	-
NEM-70	Nemo	Calcium (T)	12.6000	0.050	mg/L	-	-	4.6000	-
NEM-70	Nemo	Conductivity	107.0000	2.000	µS/cm	-	-	48.6000	-
NEM-70	Nemo	Hardness	41.8000	0.600	mg/L	-	-	17.4000	-
NEM-70	Nemo	Magnesium (T)	2.5000	0.005	mg/L	-	-	1.4100	-
NEM-70	Nemo	Potassium (T)	1.9000	0.050	mg/L	-	-	0.8400	-
NEM-70	Nemo	Sodium (T)	1.1500	0.050	mg/L	-	-	0.9700	-
NEM-70	Nemo	TDS	80.2000	10.000	mg/L	-	-	38.5000	-
NEM-70	Nemo	Total Alkalinity	12.8000	1.000	mg/L	-	-	9.6000	-
NEM-70	Nemo	Total phosphorous	***0.0048***	0.002	mg/L	-	0.004	0.0045	-
WTS-69	Whale Tail South	Bicarbonate alkalinity	20.0000	1.000	mg/L	-	-	9.6000	-
WTS-69	Whale Tail South	Calcium (T)	14.0000	0.050	mg/L	-	-	4.6000	-
WTS-69	Whale Tail South	Conductivity	134.0000	2.000	µS/cm	-	-	48.6000	-
WTS-69	Whale Tail South	Hardness	50.8000	0.600	mg/L	-	-	17.4000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
WTS-69	Whale Tail South	Lithium (D)	0.0024	0.001	mg/L	-	-	0.0020	-
WTS-69	Whale Tail South	Lithium (T)	0.0024	0.001	mg/L	-	-	0.0020	-
WTS-69	Whale Tail South	Magnesium (T)	3.8600	0.005	mg/L	-	-	1.4100	-
WTS-69	Whale Tail South	Potassium (T)	3.5500	0.050	mg/L	-	-	0.8400	-
WTS-69	Whale Tail South	Reactive silica	1.6500	0.500	mg/L	-	-	1.3300	-
WTS-69	Whale Tail South	Silicon (D)	0.7580	0.050	mg/L	-	-	0.5700	-
WTS-69	Whale Tail South	Silicon (T)	0.8100	0.100	mg/L	-	-	0.6100	-
WTS-69	Whale Tail South	Sodium (T)	2.8000	0.050	mg/L	-	-	0.9700	-
WTS-69	Whale Tail South	TDS	95.5000	10.000	mg/L	-	-	38.5000	-
WTS-69	Whale Tail South	TKN	0.3160	0.050	mg/L	-	-	0.1700	-
WTS-69	Whale Tail South	Total Alkalinity	20.0000	1.000	mg/L	-	-	9.6000	-
WTS-69	Whale Tail South	Total phosphorous	***0.0052***	0.002	mg/L	-	0.004	0.0045	-
WTS-70	Whale Tail South	Bicarbonate alkalinity	19.7000	1.000	mg/L	-	-	9.6000	-
WTS-70	Whale Tail South	Calcium (T)	13.9000	0.050	mg/L	-	-	4.6000	-
WTS-70	Whale Tail South	Conductivity	133.0000	2.000	µS/cm	-	-	48.6000	-
WTS-70	Whale Tail South	Hardness	50.2000	0.600	mg/L	-	-	17.4000	-
WTS-70	Whale Tail South	Lithium (D)	0.0024	0.001	mg/L	-	-	0.0020	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
WTS-70	Whale Tail South	Lithium (T)	0.0023	0.001	mg/L	-	-	0.0020	-
WTS-70	Whale Tail South	Magnesium (T)	3.7700	0.005	mg/L	-	-	1.4100	-
WTS-70	Whale Tail South	Potassium (T)	3.4900	0.050	mg/L	-	-	0.8400	-
WTS-70	Whale Tail South	Reactive silica	1.6400	0.500	mg/L	-	-	1.3300	-
WTS-70	Whale Tail South	Silicon (D)	0.7850	0.050	mg/L	-	-	0.5700	-
WTS-70	Whale Tail South	Silicon (T)	0.8000	0.100	mg/L	-	-	0.6100	-
WTS-70	Whale Tail South	Sodium (T)	2.8100	0.050	mg/L	-	-	0.9700	-
WTS-70	Whale Tail South	TDS	92.2000	10.000	mg/L	-	-	38.5000	-
WTS-70	Whale Tail South	TKN	0.2580	0.050	mg/L	-	-	0.1700	-
WTS-70	Whale Tail South	Total Alkalinity	19.7000	1.000	mg/L	-	-	9.6000	-
WTS-70	Whale Tail South	Total phosphorous	***0.0049***	0.002	mg/L	-	0.004	0.0045	-

[1]Bold values are above the threshold as well as above the trigger value.

[2]Results failing to meet reliability checks are indicated as uncertain.

2.1 Result Reliability Checks

Two preliminary analyses were conducted to assess the reliability of sample results. Samples failing either one of these tests have been flagged as uncertain, and warrant further evaluation.

The first analysis compares dissolved and total concentrations for a given parameters at each location. Samples where dissolved concentrations are greater than total with a relative percent difference (RPD) of more than 30% are considered potentially unreliable. All samples failing to meet this reliability check are summarized in Table 6.

The second analysis compares parameter concentrations from the two sampling stations located within each water body (either lake or basin). Parameters for which the difference between these two intra-lake samples was greater than a factor of 5 (or a factor of 10 if at least one of the samples was within a factor of 10 of the MDL) are considered potentially unreliable. All samples in this sampling event met this reliability check.

Table 6: Samples with uncertain reliability due to differences in dissolved and total parameter results.

Area	Sample ID	ID_Name	Parameter	Result (T)	Result (D)	MDL (T)	MDL (D)	RPD
Whale Tail Pit	A20-64	Lake A20	Titanium	0.0003	0.00042	MDL	-	33.3

3. Laboratory & Field Quality Control Results

ALS' laboratory QC samples for water are:

- *Laboratory duplicates* (LD) - these samples provide insights into the precision of laboratory analyses. Duplicate aliquots are taken from the samples and run through part (aliquots taken post digestion) or all (aliquots taken from the sample bottle) the laboratory analytical process.
- *Laboratory control samples* (LCS) - these samples provide insights into whether the laboratory systems are working as intended. They are comprised of a mixture of analyte-free water to which known amounts of the method analytes are added. They are essentially an internal version of a certified reference material.
- *Matrix spikes* (MS) - these samples involve the analysis of actual samples, to which a known amount of method analytes are added in amounts high enough that the spikes are clearly discernible relative to existing concentrations. These samples provide insights into the degree that the sample matrix could interfere with analyses.
- *Matrix blanks* (MB) - these samples are analyzed to assess background interference or contamination that exists in the analytical system that could lead to elevated concentrations or false positive data. These samples are comprised of analyte-free water.

The following field QC samples were collected and submitted blind to ALS:

- *Field duplicates* (FD) - these samples provide insights into (a) variability in field conditions and (b) the precision of laboratory analyses. Duplicate samples are collected from the same location and treated independently through the sampling and analysis process.
- *Deionized blanks* (DB) - these samples 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.
- *Equipment blanks* (EB) - these samples 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.
- *Travel blanks* (TB) - these samples 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.

3.1 Overall QC Results

Overall laboratory and field QC results are summarized in Table 7.

Table 7: Summary of laboratory and field QC results by sample type.

	QC_Element	Pass	Fail	ND
Laboratory	Lab Duplicate	536	0	0
	Lab Control Sample	445	0	0
	Matrix Spike	383	0	37
	Matrix Blank	448	3	0
Field	Field Duplicate	441	1	0
	Deionized Water Blank	103	0	0
	Equipment Blank	102	1	0
	Travel Blank	58	0	0

3.2 Laboratory Duplicates

All laboratory duplicate results met laboratory QC objectives.

3.3 Laboratory Control Samples

All laboratory control sample results met laboratory QC objectives.

3.4 Matrix Spike

All matrix spike results met laboratory QC objectives.

In addition, some parameters had spike levels too low to confidently quantify them relative to existing concentrations in the sample. Consequently, QC results for these results could not be calculated (see Table 8).

Table 8: Analytes not determined for matrix spikes.

QC_Lot	Analyte	ALS_QC_ID[1]
500617	nitrate (as N)	Anonymous
500862	barium, total	WTS-70
500862	calcium, total	WTS-70

QC_Lot	Analyte	ALS_QC_ID[1]
500862	magnesium, total	WTS-70
500862	sodium, total	WTS-70
500862	strontium, total	WTS-70
501410	barium, dissolved	WTS-70
501410	calcium, dissolved	WTS-70
501410	magnesium, dissolved	WTS-70
501410	sodium, dissolved	WTS-70
501410	strontium, dissolved	WTS-70
490978	arsenite [As III]	WTS-69
502343	silicate (as SiO2)	Anonymous
505398	carbon, dissolved organic [DOC]	Anonymous
505399	carbon, total organic [TOC]	Anonymous
502307	calcium, total	DS1-60
502307	magnesium, total	DS1-60
502307	strontium, total	DS1-60
502770	barium, dissolved	Anonymous
502770	calcium, dissolved	Anonymous
502770	magnesium, dissolved	Anonymous
502770	manganese, dissolved	Anonymous
502770	potassium, dissolved	Anonymous
502770	selenium, dissolved	Anonymous
502770	sodium, dissolved	Anonymous
502770	strontium, dissolved	Anonymous
502770	sulfur, dissolved	Anonymous
502770	uranium, dissolved	Anonymous
502771	barium, dissolved	A76-62
502771	calcium, dissolved	A76-62
502771	magnesium, dissolved	A76-62

QC_Lot	Analyte	ALS_QC_ID[1]
502771	sodium, dissolved	A76-62
502771	strontium, dissolved	A76-62
490978	arsenite [As III]	Anonymous
506886	carbon, dissolved organic [DOC]	Anonymous
506887	carbon, total organic [TOC]	Anonymous
503764	magnesium, dissolved	PDL-106

[1]ALS_QC_ID listing of 'Anonymous' indicates QC sample from another client used.

3.5 Matrix Blank

In this sampling event, 3 matrix blanks results failed to meet the QC objectives. Matrix blank results not meeting QC objectives are summarized in Table 9.

Table 9: Details for matrix blank results not meeting QC objectives.

QC_Lot	Analyte	Result	Limit	MDL	MB.QC
502375	carbon, dissolved organic [DOC]	0.74000	0.5000	-	Fail
499585	cyanide, strong acid dissociable (total)	0.00190	0.0010	-	Fail
504142	tin, total	0.00039	0.0001	-	Fail

3.6 Field Duplicates

In this sampling event, 1 field duplicate sample failed to meet the QC objectives. Field duplicate sample results not meeting QC objectives are summarized in Table 10.

Table 10: Details for field duplicate results not meeting QC objectives.

QC_Lot.x	Analyte	RPD	DIFFx	FD.QC
503547	aluminum, dissolved	74.3	6.5	Fail

3.7 DI Blank

All deionized water blank results met laboratory QC objectives.

3.8 Equipment Blank

In this sampling event, 1 equipment blank sample failed to meet the QC objectives. Equipment blank results not meeting QC objectives are summarized in Table 11.

Table 11: Details for equipment blank results not meeting QC objectives.

QC_Lot	ID	Analyte	Results	DL	FB.QC
502307	EB	aluminum, total	0.004	0.003	Fail

3.9 Travel Blank

All travel blank results met laboratory QC objectives.

3.10 Holding Time Exceedances

In addition to those ALS laboratory QC samples described above, during QC screening samples were also assessed agianst recommended hold times. Parameters and associated sample numbers exceeding recommended hold times in this sampling event are shown in Table 12. Note that pH is included in the suite of field measurements and has a very short recommended hold time, so exceeding the hold time for laboratory analysis is expected and of little importance.

Table 12: Analytes and associated number of samples exceeding holding times.

ALS_Method	n
Alkalinity Species by Titration	31
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	31
Nitrate in Water by IC (Low Level)	31
Nitrite in Water by IC (Low Level)	31
pH by Meter	31
Turbidity by Nephelometry	31
TDS by Gravimetry (Low Level)	19
TSS by Gravimetry (Low Level)	19
Free Cyanide (Low Level)	1
Total Cyanide (Low Level)	1

Meadowbank Mine - Water Quality Monitoring 2022

Preliminary Screening of July, 2022 Water Quality Monitoring

Azimuth Consulting Group Inc.
on behalf of Agnico Eagle Mines Ltd.

Report Date: 2022-09-09

Table of Contents

1. Introduction & Sampling Overview

This document was prepared by Azimuth Consulting Group Inc (Azimuth) to provide the Meadowbank Environment Department with a brief overview of the water chemistry results collected in July, 2022 as part of the Core Receiving Environment Monitoring Program (CREMP). CREMP water quality monitoring occurs in all summer months (July - September) as well as two through-ice sampling events in March and May. CREMP monitoring occurs at near-field, mid-field, and far-field stations in three distinct areas - the Meadowbank Mine Project, The Whale Tail Pit Project, and Baker Lake, however sampling does not occur at all stations or all areas in each sampling event. The purpose of this preliminary document is to:

1. Screen the water chemistry results from ALS against the trigger values to keep the Environment Department informed about potential changes in water quality, including the early identification of potentially anomalous data (Section 2).

2. Review the data for laboratory QC issues (blanks, duplicates, matrix spikes, etc.) and potential field quality assurance (QA) concerns, ensuring that questionable results are verified by reanalysis (Section 3).

Samples included in this report are shown in Table 1, while field blanks are shown in Table 2.

Table 1: Summary of July, 2022 samples.

Area	Sample ID	ID	ID_Name	Duplicate	Date_Sampled
Baker Lake					
	BAP-79	BAP	Baker - Akilahaarjuk Point	-	2022-07-18
	BAP-80	BAP	Baker - Akilahaarjuk Point	-	2022-07-18
	BBD-79	BBD	Baker - Barge Dock	-	2022-07-18
	BBD-80	BBD	Baker - Barge Dock	-	2022-07-18
	BPJ-79	BPJ	Baker - Proposed Jetty	-	2022-07-18
	BPJ-80	BPJ	Baker - Proposed Jetty	-	2022-07-18
Meadowbank					
	INUG-142	INUG	Inuggugayualik	-	2022-07-09
	INUG-143	INUG	Inuggugayualik	JULY DUP-1	2022-07-09
	PDL-107	PDL	Pipedream	-	2022-07-19
	PDL-108	PDL	Pipedream	-	2022-07-19
	SP-154	SP	Second Portage	-	2022-07-04
	SP-155	SP	Second Portage	-	2022-07-04
	TPE-154	TPE	Third Portage - East Basin	-	2022-07-05
	TPE-155	TPE	Third Portage - East Basin	-	2022-07-05
	TPN-154	TPN	Third Portage - North Basin	-	2022-07-10
	TPN-155	TPN	Third Portage - North Basin	-	2022-07-10
	WAL-123	WAL	Wally	-	2022-07-05
	WAL-124	WAL	Wally	JULY DUP-2	2022-07-05
Whale Tail Pit					
	A20-65	A20	Lake A20	-	2022-07-01
	A20-66	A20	Lake A20	JULY DUP-3	2022-07-01
	A76-63	A76	Lake A76	-	2022-07-11
	A76-64	A76	Lake A76	-	2022-07-11

Area	Sample ID	ID	ID_Name	Duplicate	Date_Sampled
	DS1-61	DS1	Lake DS1	-	2022-07-05
	DS1-62	DS1	Lake DS1	JULY DUP-4	2022-07-05
	MAM-71	MAM	Mammoth	-	2022-07-08
	MAM-72	MAM	Mammoth	-	2022-07-08
	NEM-71	NEM	Nemo	-	2022-07-07
	NEM-72	NEM	Nemo	-	2022-07-07
	WTS-71	WTS	Whale Tail South	-	2022-07-01
	WTS-72	WTS	Whale Tail South	-	2022-07-01

Table 2: Summary of field blanks collected in July, 2022.

Client_Sample_ID	ID_Name
JULY DI-1	DI Blank
JULY EB	Equipment Blank
JULY TB	Travel Blank

2. Trigger Screening

Sampling results were screened relative to relevant triggers and thresholds. A summary of trigger and threshold exceedances is provided in Table 3. Subsequent tables provide all sample results above trigger and threshold values for Meadowbank (Table 4), Whale Tail Pit (Table 5), and Baker Lake (Table 6). Samples exceeding triggers or thresholds but failing reliability checks (see Section 2.1) are labeled as uncertain.

Table 3: Summary of trigger and threshold exceedances in July, 2022.

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
Baker Lake				
	Chromium (D)	6	0	BAP-79, BAP-80, BBD-79, BBD-80, BPJ-79, BPJ-80
	Total phosphorous	0	6	BAP-79, BAP-80, BBD-79, BBD-80, BPJ-79, BPJ-80
Meadowbank				
	Bicarbonate alkalinity	2	0	SP-154, SP-155
	Calcium (T)	3	0	SP-154, SP-155, TPE-154
	Chromium (D)	12	0	INUG-142, INUG-143, PDL-107, PDL-108, SP-154, SP-155, TPE-154, TPE-155, TPN-154, TPN-155, WAL-123, WAL-124

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
	Conductivity	4	0	SP-154, SP-155, TPE-154, TPE-155
	Copper (D)	1	0	SP-155
	Hardness	4	0	SP-154, SP-155, TPE-154, TPE-155
	Magnesium (T)	4	0	SP-154, SP-155, TPE-154, TPE-155
	Silicon (D)	2	0	SP-154, SP-155*
	Silicon (T)	3	0	SP-154, SP-155, TPN-154
	TDS	2	0	SP-154, SP-155
	Total Alkalinity	2	0	SP-154, SP-155
Whale Tail Pit				
	Bicarbonate alkalinity	10	0	A20-65, A20-66, A76-63, A76-64, MAM-71, MAM-72, NEM-71, NEM-72, WTS-71, WTS-72
	Calcium (T)	10	0	A20-65, A20-66, A76-63, A76-64, MAM-71, MAM-72, NEM-71, NEM-72, WTS-71, WTS-72
	Conductivity	10	0	A20-65, A20-66, A76-63, A76-64, MAM-71, MAM-72, NEM-71, NEM-72, WTS-71, WTS-72

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
	Hardness	10	0	A20-65, A20-66, A76-63, A76-64, MAM-71, MAM-72, NEM-71, NEM-72, WTS-71, WTS-72
	Magnesium (T)	9	0	A20-66, A76-63, A76-64, MAM-71, MAM-72, NEM-71, NEM-72, WTS-71, WTS-72
	Potassium (T)	10	0	A20-65, A20-66, A76-63, A76-64, MAM-71, MAM-72, NEM-71, NEM-72, WTS-71, WTS-72
	Sodium (T)	8	0	A20-65, A20-66, A76-63, A76-64, MAM-71, MAM-72, WTS-71, WTS-72
	TDS	9	0	A20-65, A76-63, A76-64, MAM-71, MAM-72, NEM-71, NEM-72, WTS-71, WTS-72
	Tin (T)	1	0	MAM-72
	Titanium (T)	2	0	WTS-71, WTS-72
	TKN	7	0	A20-65, A20-66, A76-63, MAM-71, MAM-72, WTS-71, WTS-72
	Total Alkalinity	10	0	A20-65, A20-66, A76-63, A76-64, MAM-71, MAM-72, NEM-71, NEM-72, WTS-71, WTS-72
	Total phosphorous	5	5	A20-65, A20-66, DS1-62, WTS-71, WTS-72

* Indicates samples which failed reliability checks and are consequently uncertain.

Table 6: Trigger and threshold exceedances at Baker Lake sampling stations

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
BAP-79	Baker - Akilahaarjuk Point	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BAP-79	Baker - Akilahaarjuk Point	Total phosphorous	***0.0047***	0.0020	mg/L	-	0.004	0.00750	-
BAP-80	Baker - Akilahaarjuk Point	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BAP-80	Baker - Akilahaarjuk Point	Total phosphorous	***0.0051***	0.0020	mg/L	-	0.004	0.00750	-
BBD-79	Baker - Barge Dock	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BBD-79	Baker - Barge Dock	Total phosphorous	***0.0045***	0.0020	mg/L	-	0.004	0.00750	-
BBD-80	Baker - Barge Dock	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BBD-80	Baker - Barge Dock	Total phosphorous	***0.0044***	0.0020	mg/L	-	0.004	0.00750	-
BPJ-79	Baker - Proposed Jetty	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BPJ-79	Baker - Proposed Jetty	Total phosphorous	***0.0045***	0.0020	mg/L	-	0.004	0.00750	-
BPJ-80	Baker - Proposed Jetty	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BPJ-80	Baker - Proposed Jetty	Total phosphorous	***0.0043***	0.0020	mg/L	-	0.004	0.00750	-

[1]Bold values are above the threshold as well as above the trigger value.

[2]Results failing to meet reliability checks are indicated as uncertain.

Table 4: Trigger and threshold exceedances at Meadowbank sampling stations.

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
INUG-142	Inuggugayualik	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
INUG-143	Inuggugayualik	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
PDL-107	Pipedream	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
PDL-108	Pipedream	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
SP-154	Second Portage	Bicarbonate alkalinity	10.70000	1.0000	mg/L	-	-	8.70000	-
SP-154	Second Portage	Calcium (T)	3.64000	0.0500	mg/L	-	-	2.39000	-
SP-154	Second Portage	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
SP-154	Second Portage	Conductivity	35.50000	2.0000	µS/cm	-	-	27.40000	-
SP-154	Second Portage	Hardness	14.10000	0.6000	mg/L	-	-	9.50000	-
SP-154	Second Portage	Magnesium (T)	1.22000	0.0050	mg/L	-	-	0.93000	-
SP-154	Second Portage	Silicon (D)	0.25900	0.0500	mg/L	-	-	0.18000	-
SP-154	Second Portage	Silicon (T)	0.30000	0.1000	mg/L	-	-	0.20000	-
SP-154	Second Portage	TDS	22.20000	3.0000	mg/L	-	-	19.00000	-
SP-154	Second Portage	Total Alkalinity	10.70000	1.0000	mg/L	-	-	8.70000	-
SP-155	Second Portage	Bicarbonate alkalinity	10.80000	1.0000	mg/L	-	-	8.70000	-
SP-155	Second Portage	Calcium (T)	3.62000	0.0500	mg/L	-	-	2.39000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
SP-155	Second Portage	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
SP-155	Second Portage	Conductivity	35.40000	2.0000	µS/cm	-	-	27.40000	-
SP-155	Second Portage	Copper (D)	0.00124	0.0002	mg/L	-	0.002	0.00120	-
SP-155	Second Portage	Hardness	14.10000	0.6000	mg/L	-	-	9.50000	-
SP-155	Second Portage	Magnesium (T)	1.22000	0.0050	mg/L	-	-	0.93000	-
SP-155	Second Portage	Silicon (D)	0.26200	0.0500	mg/L	-	-	0.18000	Uncertain
SP-155	Second Portage	Silicon (T)	0.31000	0.1000	mg/L	-	-	0.20000	-
SP-155	Second Portage	TDS	21.90000	3.0000	mg/L	-	-	19.00000	-
SP-155	Second Portage	Total Alkalinity	10.80000	1.0000	mg/L	-	-	8.70000	-
TPE-154	Third Portage - East Basin	Calcium (T)	2.48000	0.0500	mg/L	-	-	2.39000	-
TPE-154	Third Portage - East Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPE-154	Third Portage - East Basin	Conductivity	29.00000	2.0000	µS/cm	-	-	27.40000	-
TPE-154	Third Portage - East Basin	Hardness	10.00000	0.6000	mg/L	-	-	9.50000	-
TPE-154	Third Portage - East Basin	Magnesium (T)	0.93600	0.0050	mg/L	-	-	0.93000	-
TPE-155	Third Portage - East Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPE-155	Third Portage - East Basin	Conductivity	28.10000	2.0000	µS/cm	-	-	27.40000	-
TPE-155	Third Portage - East Basin	Hardness	9.76000	0.6000	mg/L	-	-	9.50000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
TPE-155	Third Portage - East Basin	Magnesium (T)	0.93800	0.0050	mg/L	-	-	0.93000	-
TPN-154	Third Portage - North Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPN-154	Third Portage - North Basin	Silicon (T)	0.21000	0.1000	mg/L	-	-	0.20000	-
TPN-155	Third Portage - North Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
WAL-123	Wally	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
WAL-124	Wally	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-

[1]Bold values are above the threshold as well as above the trigger value.

[2]Results failing to meet reliability checks are indicated as uncertain.

Table 5: Trigger and threshold exceedances at Whale Tail Pit sampling stations

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
A20-65	Lake A20	Bicarbonate alkalinity	15.80000	1.0000	mg/L	-	-	9.6000	-
A20-65	Lake A20	Calcium (T)	5.14000	0.0500	mg/L	-	-	4.6000	-
A20-65	Lake A20	Conductivity	52.60000	2.0000	µS/cm	-	-	48.6000	-
A20-65	Lake A20	Hardness	18.60000	0.6000	mg/L	-	-	17.4000	-
A20-65	Lake A20	Potassium (T)	1.26000	0.0500	mg/L	-	-	0.8400	-
A20-65	Lake A20	Sodium (T)	1.08000	0.0500	mg/L	-	-	0.9700	-
A20-65	Lake A20	TDS	40.00000	10.0000	mg/L	-	-	38.5000	-
A20-65	Lake A20	TKN	0.21200	0.0500	mg/L	-	-	0.1700	-
A20-65	Lake A20	Total Alkalinity	15.80000	1.0000	mg/L	-	-	9.6000	-
A20-65	Lake A20	Total phosphorous	***0.00920***	0.0020	mg/L	-	0.004	0.0045	-
A20-66	Lake A20	Bicarbonate alkalinity	10.30000	1.0000	mg/L	-	-	9.6000	-
A20-66	Lake A20	Calcium (T)	5.21000	0.0500	mg/L	-	-	4.6000	-
A20-66	Lake A20	Conductivity	54.20000	2.0000	µS/cm	-	-	48.6000	-
A20-66	Lake A20	Hardness	18.80000	0.6000	mg/L	-	-	17.4000	-
A20-66	Lake A20	Magnesium (T)	1.42000	0.0050	mg/L	-	-	1.4100	-
A20-66	Lake A20	Potassium (T)	1.30000	0.0500	mg/L	-	-	0.8400	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
A20-66	Lake A20	Sodium (T)	1.07000	0.0500	mg/L	-	-	0.9700	-
A20-66	Lake A20	TKN	0.21200	0.0500	mg/L	-	-	0.1700	-
A20-66	Lake A20	Total Alkalinity	10.30000	1.0000	mg/L	-	-	9.6000	-
A20-66	Lake A20	Total phosphorous	***0.00500***	0.0020	mg/L	-	0.004	0.0045	-
A76-63	Lake A76	Bicarbonate alkalinity	11.90000	1.0000	mg/L	-	-	9.6000	-
A76-63	Lake A76	Calcium (T)	8.76000	0.0500	mg/L	-	-	4.6000	-
A76-63	Lake A76	Conductivity	86.90000	2.0000	µS/cm	-	-	48.6000	-
A76-63	Lake A76	Hardness	31.00000	0.6000	mg/L	-	-	17.4000	-
A76-63	Lake A76	Magnesium (T)	2.21000	0.0050	mg/L	-	-	1.4100	-
A76-63	Lake A76	Potassium (T)	1.84000	0.0500	mg/L	-	-	0.8400	-
A76-63	Lake A76	Sodium (T)	1.32000	0.0500	mg/L	-	-	0.9700	-
A76-63	Lake A76	TDS	53.80000	10.0000	mg/L	-	-	38.5000	-
A76-63	Lake A76	TKN	0.18400	0.0500	mg/L	-	-	0.1700	-
A76-63	Lake A76	Total Alkalinity	11.90000	1.0000	mg/L	-	-	9.6000	-
A76-64	Lake A76	Bicarbonate alkalinity	11.80000	1.0000	mg/L	-	-	9.6000	-
A76-64	Lake A76	Calcium (T)	8.80000	0.0500	mg/L	-	-	4.6000	-
A76-64	Lake A76	Conductivity	86.10000	2.0000	µS/cm	-	-	48.6000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
A76-64	Lake A76	Hardness	31.20000	0.6000	mg/L	-	-	17.4000	-
A76-64	Lake A76	Magnesium (T)	2.23000	0.0050	mg/L	-	-	1.4100	-
A76-64	Lake A76	Potassium (T)	1.86000	0.0500	mg/L	-	-	0.8400	-
A76-64	Lake A76	Sodium (T)	1.34000	0.0500	mg/L	-	-	0.9700	-
A76-64	Lake A76	TDS	65.20000	10.0000	mg/L	-	-	38.5000	-
A76-64	Lake A76	Total Alkalinity	11.80000	1.0000	mg/L	-	-	9.6000	-
DS1-62	Lake DS1	Total phosphorous	***0.00520***	0.0020	mg/L	-	0.004	0.0045	-
MAM-71	Mammoth	Bicarbonate alkalinity	14.50000	1.0000	mg/L	-	-	9.6000	-
MAM-71	Mammoth	Calcium (T)	11.90000	0.0500	mg/L	-	-	4.6000	-
MAM-71	Mammoth	Conductivity	118.00000	2.0000	µS/cm	-	-	48.6000	-
MAM-71	Mammoth	Hardness	42.70000	0.6000	mg/L	-	-	17.4000	-
MAM-71	Mammoth	Magnesium (T)	3.15000	0.0050	mg/L	-	-	1.4100	-
MAM-71	Mammoth	Potassium (T)	2.82000	0.0500	mg/L	-	-	0.8400	-
MAM-71	Mammoth	Sodium (T)	2.26000	0.0500	mg/L	-	-	0.9700	-
MAM-71	Mammoth	TDS	72.80000	10.0000	mg/L	-	-	38.5000	-
MAM-71	Mammoth	TKN	0.25500	0.0500	mg/L	-	-	0.1700	-
MAM-71	Mammoth	Total Alkalinity	14.50000	1.0000	mg/L	-	-	9.6000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
MAM-72	Mammoth	Bicarbonate alkalinity	13.90000	1.0000	mg/L	-	-	9.6000	-
MAM-72	Mammoth	Calcium (T)	10.80000	0.0500	mg/L	-	-	4.6000	-
MAM-72	Mammoth	Conductivity	107.00000	2.0000	µS/cm	-	-	48.6000	-
MAM-72	Mammoth	Hardness	38.80000	0.6000	mg/L	-	-	17.4000	-
MAM-72	Mammoth	Magnesium (T)	2.87000	0.0050	mg/L	-	-	1.4100	-
MAM-72	Mammoth	Potassium (T)	2.61000	0.0500	mg/L	-	-	0.8400	-
MAM-72	Mammoth	Sodium (T)	1.96000	0.0500	mg/L	-	-	0.9700	-
MAM-72	Mammoth	TDS	71.50000	10.0000	mg/L	-	-	38.5000	-
MAM-72	Mammoth	Tin (T)	0.00033	0.0001	mg/L	-	-	0.0002	-
MAM-72	Mammoth	TKN	0.18800	0.0500	mg/L	-	-	0.1700	-
MAM-72	Mammoth	Total Alkalinity	13.90000	1.0000	mg/L	-	-	9.6000	-
NEM-71	Nemo	Bicarbonate alkalinity	10.40000	1.0000	mg/L	-	-	9.6000	-
NEM-71	Nemo	Calcium (T)	9.43000	0.0500	mg/L	-	-	4.6000	-
NEM-71	Nemo	Conductivity	84.50000	2.0000	µS/cm	-	-	48.6000	-
NEM-71	Nemo	Hardness	31.70000	0.6000	mg/L	-	-	17.4000	-
NEM-71	Nemo	Magnesium (T)	1.98000	0.0050	mg/L	-	-	1.4100	-
NEM-71	Nemo	Potassium (T)	1.44000	0.0500	mg/L	-	-	0.8400	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
NEM-71	Nemo	TDS	68.80000	10.0000	mg/L	-	-	38.5000	-
NEM-71	Nemo	Total Alkalinity	10.40000	1.0000	mg/L	-	-	9.6000	-
NEM-72	Nemo	Bicarbonate alkalinity	10.40000	1.0000	mg/L	-	-	9.6000	-
NEM-72	Nemo	Calcium (T)	9.47000	0.0500	mg/L	-	-	4.6000	-
NEM-72	Nemo	Conductivity	84.60000	2.0000	µS/cm	-	-	48.6000	-
NEM-72	Nemo	Hardness	32.00000	0.6000	mg/L	-	-	17.4000	-
NEM-72	Nemo	Magnesium (T)	2.02000	0.0050	mg/L	-	-	1.4100	-
NEM-72	Nemo	Potassium (T)	1.47000	0.0500	mg/L	-	-	0.8400	-
NEM-72	Nemo	TDS	63.50000	10.0000	mg/L	-	-	38.5000	-
NEM-72	Nemo	Total Alkalinity	10.40000	1.0000	mg/L	-	-	9.6000	-
WTS-71	Whale Tail South	Bicarbonate alkalinity	16.70000	1.0000	mg/L	-	-	9.6000	-
WTS-71	Whale Tail South	Calcium (T)	10.10000	0.0500	mg/L	-	-	4.6000	-
WTS-71	Whale Tail South	Conductivity	108.00000	2.0000	µS/cm	-	-	48.6000	-
WTS-71	Whale Tail South	Hardness	37.00000	0.6000	mg/L	-	-	17.4000	-
WTS-71	Whale Tail South	Magnesium (T)	2.85000	0.0050	mg/L	-	-	1.4100	-
WTS-71	Whale Tail South	Potassium (T)	2.51000	0.0500	mg/L	-	-	0.8400	-
WTS-71	Whale Tail South	Sodium (T)	2.24000	0.0500	mg/L	-	-	0.9700	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
WTS-71	Whale Tail South	TDS	71.30000	10.0000	mg/L	-	-	38.5000	-
WTS-71	Whale Tail South	Titanium (T)	0.00090	0.0009	mg/L	MDL	-	0.0006	-
WTS-71	Whale Tail South	TKN	0.23000	0.0500	mg/L	-	-	0.1700	-
WTS-71	Whale Tail South	Total Alkalinity	16.70000	1.0000	mg/L	-	-	9.6000	-
WTS-71	Whale Tail South	Total phosphorous	***0.00540***	0.0020	mg/L	-	0.004	0.0045	-
WTS-72	Whale Tail South	Bicarbonate alkalinity	18.90000	1.0000	mg/L	-	-	9.6000	-
WTS-72	Whale Tail South	Calcium (T)	10.20000	0.0500	mg/L	-	-	4.6000	-
WTS-72	Whale Tail South	Conductivity	106.00000	2.0000	µS/cm	-	-	48.6000	-
WTS-72	Whale Tail South	Hardness	37.40000	0.6000	mg/L	-	-	17.4000	-
WTS-72	Whale Tail South	Magnesium (T)	2.90000	0.0050	mg/L	-	-	1.4100	-
WTS-72	Whale Tail South	Potassium (T)	2.54000	0.0500	mg/L	-	-	0.8400	-
WTS-72	Whale Tail South	Sodium (T)	2.31000	0.0500	mg/L	-	-	0.9700	-
WTS-72	Whale Tail South	TDS	69.00000	10.0000	mg/L	-	-	38.5000	-
WTS-72	Whale Tail South	Titanium (T)	0.00071	0.0003	mg/L	-	-	0.0006	-
WTS-72	Whale Tail South	TKN	0.20500	0.0500	mg/L	-	-	0.1700	-
WTS-72	Whale Tail South	Total Alkalinity	18.90000	1.0000	mg/L	-	-	9.6000	-
WTS-72	Whale Tail South	Total phosphorous	***0.00510***	0.0020	mg/L	-	0.004	0.0045	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]

[1]Bold values are above the threshold as well as above the trigger value.

[2]Results failing to meet reliability checks are indicated as uncertain.

2.1 Result Reliability Checks

Two preliminary analyses were conducted to assess the reliability of sample results. Samples failing either one of these tests have been flagged as uncertain, and warrant further evaluation.

The first analysis compares dissolved and total concentrations for a given parameters at each location. Samples where dissolved concentrations are greater than total with a relative percent difference (RPD) of more than 30% are considered potentially unreliable. All samples failing to meet this reliability check are summarized in Table 7.

The second analysis compares parameter concentrations from the two sampling stations located within each water body (either lake or basin). Parameters for which the difference between these two intra-lake samples was greater than a factor of 5 (or a factor of 10 if at least one of the samples was within a factor of 10 of the MDL) are considered potentially unreliable. All samples in this sampling event met this reliability check.

Table 7: Samples with uncertain reliability due to differences in dissolved and total parameter results.

Area	Sample ID	ID_Name	Parameter	Result (T)	Result (D)	MDL (T)	MDL (D)	RPD
Meadowbank	TPN-154	Third Portage - North Basin	Molybdenum	0.00005	0.000101	MDL	-	67.5
Meadowbank	TPN-154	Third Portage - North Basin	Arsenic	0.00012	0.00024	-	-	66.7
Meadowbank	PDL-107	Pipedream	Nickel	0.00064	0.00118	-	-	59.3
Meadowbank	SP-155	Second Portage	Tin	0.0001	0.00018	MDL	-	57.1
Meadowbank	TPN-154	Third Portage - North Basin	Strontium	0.00641	0.0107	-	-	50.1
Meadowbank	INUG-142	Inuggugayualik	Silicon	0.1	0.163	-	-	47.9
Meadowbank	INUG-142	Inuggugayualik	Uranium	0.000041	0.000066	-	-	46.7
Meadowbank	INUG-142	Inuggugayualik	Manganese	0.00107	0.00158	-	-	38.5
Meadowbank	TPN-154	Third Portage - North Basin	Barium	0.00189	0.00264	-	-	33.1
Meadowbank	INUG-142	Inuggugayualik	Aluminum	0.0041	0.0057	-	-	32.7
Whale Tail Pit	A76-63	Lake A76	Tin	0.0001	0.00014	MDL	-	33.3

3. Laboratory & Field Quality Control Results

ALS' laboratory QC samples for water are:

- *Laboratory duplicates* (LD) - these samples provide insights into the precision of laboratory analyses. Duplicate aliquots are taken from the samples and run through part (aliquots taken post digestion) or all (aliquots taken from the sample bottle) the laboratory analytical process.
- *Laboratory control samples* (LCS) - these samples provide insights into whether the laboratory systems are working as intended. They are comprised of a mixture of analyte-free water to which known amounts of the method analytes are added. They are essentially an internal version of a certified reference material.
- *Matrix spikes* (MS) - these samples involve the analysis of actual samples, to which a known amount of method analytes are added in amounts high enough that the spikes are clearly discernible relative to existing concentrations. These samples provide insights into the degree that the sample matrix could interfere with analyses.
- *Matrix blanks* (MB) - these samples are analyzed to assess background interference or contamination that exists in the analytical system that could lead to elevated concentrations or false positive data. These samples are comprised of analyte-free water.

The following field QC samples were collected and submitted blind to ALS:

- *Field duplicates* (FD) - these samples provide insights into (a) variability in field conditions and (b) the precision of laboratory analyses. Duplicate samples are collected from the same location and treated independently through the sampling and analysis process.
- *Deionized blanks* (DB) - these samples 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.
- *Equipment blanks* (EB) - these samples 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.
- *Travel blanks* (TB) - these samples 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.

3.1 Overall QC Results

Overall laboratory and field QC results are summarized in Table 8.

Table 8: Summary of laboratory and field QC results by sample type.

	QC_Element	Pass	Fail	ND
Laboratory	Lab Duplicate	1,056	12*	0
	Lab Control Sample	896	0	0
	Matrix Spike	784	0	65
	Matrix Blank	910	0	0
Field	Field Duplicate	440	3	0
	Deionized Water Blank	105	0	0
	Equipment Blank	101	2	0
	Travel Blank	100	1	0

* Lab duplicates that failed are QC samples from another client.

3.2 Laboratory Duplicates

In this sampling event, 12 laboratory duplicates failed to meet the QC objectives. Laboratory duplicate results not meeting QC objectives are summarized in Table 9.

Table 9: Details for laboratory duplicate results not meeting QC objectives.

QC_Lot	ALS_QC_ID[1]	Analyte	RPD	DIFFx	LD.QC
563019	ANONYMOUS	cadmium, total	199.6	57,945.0	Fail
563022	ANONYMOUS	cadmium, total	199.6	389,616.0	Fail
563019	ANONYMOUS	selenium, total	199.6	477,510.0	Fail
563022	ANONYMOUS	selenium, total	199.6	4,515,480.0	Fail
562646	ANONYMOUS	Kjeldahl nitrogen, total [TKN]	101.5	16.0	Fail
563022	ANONYMOUS	cadmium, total	199.6	389,616.0	Fail
563024	ANONYMOUS	cadmium, total	199.6	13,546.2	Fail
563022	ANONYMOUS	selenium, total	199.6	4,515,480.0	Fail
563024	ANONYMOUS	selenium, total	199.6	493,510.0	Fail

QC_Lot	ALS_QC_ID[1]	Analyte	RPD	DIFFx	LD.QC
566968	ANONYMOUS	cadmium, total	199.6	93,907.2	Fail
566968	ANONYMOUS	cobalt, total	199.6	1,198.9	Fail
566968	ANONYMOUS	selenium, total	199.6	527,446.0	Fail

[1]ALS_QC_ID listing of 'Anonymous' indicates QC sample from another client used.

3.3 Laboratory Control Samples

All laboratory control sample results met laboratory QC objectives.

3.4 Matrix Spike

All matrix spike results met laboratory QC objectives.

In addition, some parameters had spike levels too low to confidently quantify them relative to existing concentrations in the sample. Consequently, QC results for these results could not be calculated (see Table 10).

Table 10: Analytes not determined for matrix spikes.

QC_Lot	Analyte	ALS_QC_ID[1]
563019	barium, total	Anonymous
563019	calcium, total	Anonymous
563019	magnesium, total	Anonymous
563019	sodium, total	Anonymous
563019	strontium, total	Anonymous
563019	sulfur, total	Anonymous
563022	barium, total	Anonymous
563022	calcium, total	Anonymous
563022	magnesium, total	Anonymous
563022	sodium, total	Anonymous
563022	strontium, total	Anonymous
563022	sulfur, total	Anonymous
567078	magnesium, dissolved	Anonymous

QC_Lot	Analyte	ALS_QC_ID[1]
561226	arsenate [As V]	Anonymous
563022	barium, total	Anonymous
563022	calcium, total	Anonymous
563022	magnesium, total	Anonymous
563022	sodium, total	Anonymous
563022	strontium, total	Anonymous
563022	sulfur, total	Anonymous
563024	barium, total	Anonymous
563024	calcium, total	Anonymous
563024	magnesium, total	Anonymous
563024	strontium, total	Anonymous
566968	calcium, total	Anonymous
566968	magnesium, total	Anonymous
566968	manganese, total	Anonymous
566968	sodium, total	Anonymous
566968	strontium, total	Anonymous
566968	sulfur, total	Anonymous
566968	uranium, total	Anonymous
566956	calcium, dissolved	Anonymous
566956	magnesium, dissolved	Anonymous
566956	manganese, dissolved	Anonymous
566956	sodium, dissolved	Anonymous
566956	strontium, dissolved	Anonymous
566956	sulfur, dissolved	Anonymous
567386	aluminum, total	Anonymous
567386	barium, total	Anonymous
567386	boron, total	Anonymous
567386	calcium, total	Anonymous

QC_Lot	Analyte	ALS_QC_ID[1]
567386	chromium, total	Anonymous
567386	cobalt, total	Anonymous
567386	iron, total	Anonymous
567386	magnesium, total	Anonymous
567386	manganese, total	Anonymous
567386	molybdenum, total	Anonymous
567386	nickel, total	Anonymous
567386	potassium, total	Anonymous
567386	rubidium, total	Anonymous
567386	silicon, total	Anonymous
567386	sodium, total	Anonymous
567386	strontium, total	Anonymous
567386	sulfur, total	Anonymous
567386	titanium, total	Anonymous
567422	calcium, dissolved	NEM-72
567422	magnesium, dissolved	NEM-72
567422	strontium, dissolved	NEM-72
570628	silicate (as SiO2)	Anonymous
572101	calcium, total	Anonymous
572101	strontium, total	Anonymous
572188	calcium, dissolved	Anonymous
572188	strontium, dissolved	Anonymous
577307	magnesium, total	BBD-80
577348	magnesium, dissolved	BBD-80

[1]ALS_QC_ID listing of 'Anonymous' indicates QC sample from another client used.

3.5 Matrix Blank

All matrix blank results met laboratory QC objectives.

3.6 Field Duplicates

In this sampling event, 3 field duplicate samples failed to meet the QC objectives. Field duplicate sample results not meeting QC objectives are summarized in Table 11.

Table 11: Details for field duplicate results not meeting QC objectives.

QC_Lot.x	Analyte	RPD	DIFFx	FD.QC
568822	sulfate (as SO4)	90.3	4.8	Fail
	sampling volume, field	163.6	450.0	Fail
	chlorophyll a	162.3	81.0	Fail

3.7 DI Blank

All deionized water blank results met laboratory QC objectives.

3.8 Equipment Blank

In this sampling event, 2 equipment blank samples failed to meet the QC objectives. Equipment blank results not meeting QC objectives are summarized in Table 12.

Table 12: Details for equipment blank results not meeting QC objectives.

QC_Lot	ID	Analyte	Results	DL	FB.QC
577062	EB	aluminum, total	0.00390	0.0030	Fail
577062	EB	manganese, total	0.00014	0.0001	Fail

3.9 Travel Blank

In this sampling event, 1 travel blank sample failed to meet the QC objectives. Travel blank results not meeting QC objectives are summarized in Table 13.

Table 13: Details for travel blank results not meeting QC objectives.

QC_Lot	ID	Analyte	Results	DL	FB.QC
577233	TB	ammonia, total (as N)	0.0085	0.005	Fail

3.10 Holding Time Exceedances

In addition to those ALS laboratory QC samples described above, during QC screening samples were also assessed agianst recommended hold times. Parameters and associated sample numbers exceeding recommended hold times in this sampling event are shown in Table 14. Note that pH is included in the suite of field measurements and has a very short recommended hold time, so exceeding the hold time for laboratory analysis is expected and of little importance.

Table 14: Analytes and associated number of samples exceeding holding times.

ALS_Method	n
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	37
Nitrate in Water by IC (Low Level)	37
Nitrite in Water by IC (Low Level)	37
pH by Meter	37
Turbidity by Nephelometry	37
TDS by Gravimetry (Low Level)	22
TSS by Gravimetry (Low Level)	22
ALS Method Description	7
Ammonia by Fluorescence	1
Dissolved Organic Carbon by Combustion (Low Level)	1
Total Dissolved Phosphorus by Colourimetry (0.002 mg/L)	1
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	1
Total Mercury in Water by CVAAS	1
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	1
Total Phosphorus by Colourimetry (0.002 mg/L)	1

Meadowbank Mine - Water Quality Monitoring 2022

Preliminary Screening of August, 2022 Water Quality Monitoring

Azimuth Consulting Group Inc.
on behalf of Agnico Eagle Mines Ltd.

Report Date: 2022-10-04

Table of Contents

1. Introduction & Sampling Overview

This document was prepared by Azimuth Consulting Group Inc (Azimuth) to provide the Meadowbank Environment Department with a brief overview of the water chemistry results collected in August, 2022 as part of the Core Receiving Environment Monitoring Program (CREMP). CREMP water quality monitoring occurs in all summer months (July - September) as well as two through-ice sampling events in March and May. CREMP monitoring occurs at near-field, mid-field, and far-field stations in three distinct areas - the Meadowbank Mine Project, The Whale Tail Pit Project, and Baker Lake, however sampling does not occur at all stations or all areas in each sampling event. The purpose of this preliminary document is to:

1. Screen the water chemistry results from ALS against the trigger values to keep the Environment Department informed about potential changes in water quality, including the early identification of potentially anomalous data (Section 2).

2. Review the data for laboratory QC issues (blanks, duplicates, matrix spikes, etc.) and potential field quality assurance (QA) concerns, ensuring that questionable results are verified by reanalysis (Section 3).

Samples included in this report are shown in Table 1, while field blanks are shown in Table 2.

Table 1: Summary of August, 2022 samples.

Area	Sample ID	ID	ID_Name	Duplicate	Date_Sampled
Baker Lake					
	BAP-81	BAP	Baker - Akilahaarjuk Point	-	2022-08-20
	BAP-82	BAP	Baker - Akilahaarjuk Point	-	2022-08-20
	BBD-81	BBD	Baker - Barge Dock	-	2022-08-20
	BBD-82	BBD	Baker - Barge Dock	-	2022-08-20
	BPJ-81	BPJ	Baker - Proposed Jetty	-	2022-08-20
	BPJ-82	BPJ	Baker - Proposed Jetty	-	2022-08-20
Meadowbank					
	INUG-144	INUG	Inuggugayualik	-	2022-08-14
	INUG-145	INUG	Inuggugayualik	-	2022-08-14
	PDL-109	PDL	Pipedream	-	2022-08-15
	PDL-110	PDL	Pipedream	-	2022-08-15
	SP-156	SP	Second Portage	-	2022-08-19
	SP-157	SP	Second Portage	-	2022-08-19
	TPE-156	TPE	Third Portage - East Basin	AUGUST DUP-1	2022-08-18
	TPE-157	TPE	Third Portage - East Basin	-	2022-08-18
	TPN-156	TPN	Third Portage - North Basin	-	2022-08-18
	TPN-157	TPN	Third Portage - North Basin	-	2022-08-18
	WAL-125	WAL	Wally	AUGUST DUP-2	2022-08-19
	WAL-126	WAL	Wally	-	2022-08-19
Whale Tail Pit					
	A20-67	A20	Lake A20	-	2022-08-17
	A20-68	A20	Lake A20	-	2022-08-17
	A76-65	A76	Lake A76	-	2022-08-16
	A76-66	A76	Lake A76	-	2022-08-16

Area	Sample ID	ID	ID_Name	Duplicate	Date_Sampled
	DS1-63	DS1	Lake DS1	-	2022-08-16
	DS1-64	DS1	Lake DS1	AUGUST DUP-4	2022-08-16
	MAM-73	MAM	Mammoth	-	2022-08-15
	MAM-74	MAM	Mammoth	-	2022-08-15
	NEM-73	NEM	Nemo	-	2022-08-15
	NEM-74	NEM	Nemo	-	2022-08-15
	WTS-73	WTS	Whale Tail South	-	2022-08-17
	WTS-74	WTS	Whale Tail South	AUGUST DUP-3	2022-08-17

Table 2: Summary of field blanks collected in August, 2022.

Client_Sample_ID	ID_Name
AUGUST DI	DI Blank
AUGUST EB	Equipment Blank
AUGUST TB	Travel Blank

2. Trigger Screening

Sampling results were screened relative to relevant triggers and thresholds. A summary of trigger and threshold exceedances is provided in Table 3. Subsequent tables provide all sample results above trigger and threshold values for Meadowbank (Table 4), Whale Tail Pit (Table 5), and Baker Lake (Table 6). Samples exceeding triggers or thresholds but failing reliability checks (see Section 2.1) are labeled as uncertain.

Table 3: Summary of trigger and threshold exceedances in August, 2022.

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
Baker Lake				
	Chromium (D)	6	0	BAP-81, BAP-82, BBD-81, BBD-82, BPJ-81, BPJ-82
Meadowbank				
	Bicarbonate alkalinity	2	0	SP-156, SP-157
	Calcium (T)	4	0	SP-156, SP-157, TPE-156, TPE-157
	Chromium (D)	12	0	INUG-144, INUG-145, PDL-109, PDL-110, SP-156, SP-157, TPE-156, TPE-157, TPN-156, TPN-157, WAL-125, WAL-126
	Conductivity	6	0	SP-156, SP-157, TPE-156, TPE-157, WAL-125, WAL-126

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
	Hardness	6	0	PDL-110, SP-156, SP-157, TPE-156, TPE-157, TPN-156
	Magnesium (T)	4	0	SP-156, SP-157, TPE-156, TPE-157
	Reactive silica	2	0	WAL-125, WAL-126
	Silicon (D)	2	0	SP-156, SP-157
	Silicon (T)	2	0	SP-156, SP-157
	TDS	5	0	SP-156, SP-157, TPN-157, WAL-125, WAL-126
	Total Alkalinity	2	0	SP-156, SP-157
Whale Tail Pit				
	Bicarbonate alkalinity	10	0	A20-67, A20-68, A76-65, A76-66, MAM-73, MAM-74, NEM-73, NEM-74, WTS-73, WTS-74
	Calcium (T)	10	0	A20-67, A20-68, A76-65, A76-66, MAM-73, MAM-74, NEM-73, NEM-74, WTS-73, WTS-74
	Conductivity	10	0	A20-67, A20-68, A76-65, A76-66, MAM-73, MAM-74, NEM-73, NEM-74, WTS-73, WTS-74
	Hardness	10	0	A20-67, A20-68, A76-65, A76-66, MAM-73, MAM-74, NEM-73, NEM-74, WTS-73, WTS-74

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
	Lithium (D)	1	0	MAM-74
	Lithium (T)	1	0	MAM-74
	Magnesium (T)	10	0	A20-67, A20-68, A76-65, A76-66, MAM-73, MAM-74, NEM-73, NEM-74, WTS-73, WTS-74
	Potassium (T)	10	0	A20-67, A20-68, A76-65, A76-66, MAM-73, MAM-74, NEM-73, NEM-74, WTS-73, WTS-74
	Sodium (T)	8	0	A20-67, A20-68, A76-65, A76-66, MAM-73, MAM-74, WTS-73, WTS-74
	TDS	8	0	A76-65, A76-66, MAM-73, MAM-74, NEM-73, NEM-74, WTS-73, WTS-74
	Titanium (T)	2	0	WTS-73, WTS-74
	TKN	6	0	A20-67, A20-68, MAM-73, MAM-74, WTS-73, WTS-74
	Total Alkalinity	10	0	A20-67, A20-68, A76-65, A76-66, MAM-73, MAM-74, NEM-73, NEM-74, WTS-73, WTS-74
	Total phosphorous	2	3	MAM-74, WTS-73, WTS-74

* Indicates samples which failed reliability checks and are consequently uncertain.

Table 6: Trigger and threshold exceedances at Baker Lake sampling stations

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
BAP-81	Baker - Akilahaarjuk Point	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BAP-82	Baker - Akilahaarjuk Point	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BBD-81	Baker - Barge Dock	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BBD-82	Baker - Barge Dock	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BPJ-81	Baker - Proposed Jetty	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BPJ-82	Baker - Proposed Jetty	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-

[1]Bold values are above the threshold as well as above the trigger value.

[2]Results failing to meet reliability checks are indicated as uncertain.

Table 4: Trigger and threshold exceedances at Meadowbank sampling stations.

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
INUG-144	Inuggugayualik	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
INUG-145	Inuggugayualik	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
PDL-109	Pipedream	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
PDL-110	Pipedream	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
PDL-110	Pipedream	Hardness	9.5400	0.6000	mg/L	-	-	9.50000	-
SP-156	Second Portage	Bicarbonate alkalinity	9.9000	1.0000	mg/L	-	-	8.70000	-
SP-156	Second Portage	Calcium (T)	3.4800	0.0500	mg/L	-	-	2.39000	-
SP-156	Second Portage	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
SP-156	Second Portage	Conductivity	35.9000	2.0000	µS/cm	-	-	27.40000	-
SP-156	Second Portage	Hardness	13.5000	0.6000	mg/L	-	-	9.50000	-
SP-156	Second Portage	Magnesium (T)	1.1600	0.0050	mg/L	-	-	0.93000	-
SP-156	Second Portage	Silicon (D)	0.2440	0.0500	mg/L	-	-	0.18000	-
SP-156	Second Portage	Silicon (T)	0.2600	0.1000	mg/L	-	-	0.20000	-
SP-156	Second Portage	TDS	28.2000	3.0000	mg/L	-	-	19.00000	-
SP-156	Second Portage	Total Alkalinity	9.9000	1.0000	mg/L	-	-	8.70000	-
SP-157	Second Portage	Bicarbonate alkalinity	9.3000	1.0000	mg/L	-	-	8.70000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
SP-157	Second Portage	Calcium (T)	3.6800	0.0500	mg/L	-	-	2.39000	-
SP-157	Second Portage	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
SP-157	Second Portage	Conductivity	36.0000	2.0000	µS/cm	-	-	27.40000	-
SP-157	Second Portage	Hardness	13.8000	0.6000	mg/L	-	-	9.50000	-
SP-157	Second Portage	Magnesium (T)	1.1300	0.0050	mg/L	-	-	0.93000	-
SP-157	Second Portage	Silicon (D)	0.2260	0.0500	mg/L	-	-	0.18000	-
SP-157	Second Portage	Silicon (T)	0.2600	0.1000	mg/L	-	-	0.20000	-
SP-157	Second Portage	TDS	27.6000	3.0000	mg/L	-	-	19.00000	-
SP-157	Second Portage	Total Alkalinity	9.3000	1.0000	mg/L	-	-	8.70000	-
TPE-156	Third Portage - East Basin	Calcium (T)	2.4900	0.0500	mg/L	-	-	2.39000	-
TPE-156	Third Portage - East Basin	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
TPE-156	Third Portage - East Basin	Conductivity	28.6000	2.0000	µS/cm	-	-	27.40000	-
TPE-156	Third Portage - East Basin	Hardness	10.2000	0.6000	mg/L	-	-	9.50000	-
TPE-156	Third Portage - East Basin	Magnesium (T)	0.9770	0.0050	mg/L	-	-	0.93000	-
TPE-157	Third Portage - East Basin	Calcium (T)	2.5500	0.0500	mg/L	-	-	2.39000	-
TPE-157	Third Portage - East Basin	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
TPE-157	Third Portage - East Basin	Conductivity	28.5000	2.0000	µS/cm	-	-	27.40000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
TPE-157	Third Portage - East Basin	Hardness	10.4000	0.6000	mg/L	-	-	9.50000	-
TPE-157	Third Portage - East Basin	Magnesium (T)	0.9720	0.0050	mg/L	-	-	0.93000	-
TPN-156	Third Portage - North Basin	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
TPN-156	Third Portage - North Basin	Hardness	9.5300	0.6000	mg/L	-	-	9.50000	-
TPN-157	Third Portage - North Basin	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
TPN-157	Third Portage - North Basin	TDS	19.2000	3.0000	mg/L	-	-	19.00000	-
WAL-125	Wally	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
WAL-125	Wally	Conductivity	38.7000	2.0000	µS/cm	-	-	36.60000	-
WAL-125	Wally	Reactive silica	1.2100	0.5000	mg/L	-	-	1.08000	-
WAL-125	Wally	TDS	28.2000	3.0000	mg/L	-	-	25.30000	-
WAL-126	Wally	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
WAL-126	Wally	Conductivity	36.8000	2.0000	µS/cm	-	-	36.60000	-
WAL-126	Wally	Reactive silica	1.2100	0.5000	mg/L	-	-	1.08000	-
WAL-126	Wally	TDS	28.6000	3.0000	mg/L	-	-	25.30000	-

[1]Bold values are above the threshold as well as above the trigger value.

[2]Results failing to meet reliability checks are indicated as uncertain.

Table 5: Trigger and threshold exceedances at Whale Tail Pit sampling stations

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
A20-67	Lake A20	Bicarbonate alkalinity	11.30000	1.0000	mg/L	-	-	9.6000	-
A20-67	Lake A20	Calcium (T)	4.99000	0.0500	mg/L	-	-	4.6000	-
A20-67	Lake A20	Conductivity	52.70000	2.0000	µS/cm	-	-	48.6000	-
A20-67	Lake A20	Hardness	18.60000	0.6000	mg/L	-	-	17.4000	-
A20-67	Lake A20	Magnesium (T)	1.49000	0.0050	mg/L	-	-	1.4100	-
A20-67	Lake A20	Potassium (T)	1.37000	0.0500	mg/L	-	-	0.8400	-
A20-67	Lake A20	Sodium (T)	1.20000	0.0500	mg/L	-	-	0.9700	-
A20-67	Lake A20	TKN	0.17400	0.0500	mg/L	-	-	0.1700	-
A20-67	Lake A20	Total Alkalinity	11.30000	1.0000	mg/L	-	-	9.6000	-
A20-68	Lake A20	Bicarbonate alkalinity	11.10000	1.0000	mg/L	-	-	9.6000	-
A20-68	Lake A20	Calcium (T)	5.24000	0.0500	mg/L	-	-	4.6000	-
A20-68	Lake A20	Conductivity	54.40000	2.0000	µS/cm	-	-	48.6000	-
A20-68	Lake A20	Hardness	19.40000	0.6000	mg/L	-	-	17.4000	-
A20-68	Lake A20	Magnesium (T)	1.54000	0.0050	mg/L	-	-	1.4100	-
A20-68	Lake A20	Potassium (T)	1.45000	0.0500	mg/L	-	-	0.8400	-
A20-68	Lake A20	Sodium (T)	1.26000	0.0500	mg/L	-	-	0.9700	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
A20-68	Lake A20	TKN	0.21600	0.0500	mg/L	-	-	0.1700	-
A20-68	Lake A20	Total Alkalinity	11.10000	1.0000	mg/L	-	-	9.6000	-
A76-65	Lake A76	Bicarbonate alkalinity	12.50000	1.0000	mg/L	-	-	9.6000	-
A76-65	Lake A76	Calcium (T)	8.80000	0.0500	mg/L	-	-	4.6000	-
A76-65	Lake A76	Conductivity	87.90000	2.0000	µS/cm	-	-	48.6000	-
A76-65	Lake A76	Hardness	31.50000	0.6000	mg/L	-	-	17.4000	-
A76-65	Lake A76	Magnesium (T)	2.32000	0.0050	mg/L	-	-	1.4100	-
A76-65	Lake A76	Potassium (T)	2.10000	0.0500	mg/L	-	-	0.8400	-
A76-65	Lake A76	Sodium (T)	1.57000	0.0500	mg/L	-	-	0.9700	-
A76-65	Lake A76	TDS	58.20000	10.0000	mg/L	-	-	38.5000	-
A76-65	Lake A76	Total Alkalinity	12.50000	1.0000	mg/L	-	-	9.6000	-
A76-66	Lake A76	Bicarbonate alkalinity	12.50000	1.0000	mg/L	-	-	9.6000	-
A76-66	Lake A76	Calcium (T)	8.70000	0.0500	mg/L	-	-	4.6000	-
A76-66	Lake A76	Conductivity	89.30000	2.0000	µS/cm	-	-	48.6000	-
A76-66	Lake A76	Hardness	31.30000	0.6000	mg/L	-	-	17.4000	-
A76-66	Lake A76	Magnesium (T)	2.33000	0.0050	mg/L	-	-	1.4100	-
A76-66	Lake A76	Potassium (T)	2.10000	0.0500	mg/L	-	-	0.8400	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
A76-66	Lake A76	Sodium (T)	1.54000	0.0500	mg/L	-	-	0.9700	-
A76-66	Lake A76	TDS	58.50000	10.0000	mg/L	-	-	38.5000	-
A76-66	Lake A76	Total Alkalinity	12.50000	1.0000	mg/L	-	-	9.6000	-
MAM-73	Mammoth	Bicarbonate alkalinity	16.30000	1.0000	mg/L	-	-	9.6000	-
MAM-73	Mammoth	Calcium (T)	10.80000	0.0500	mg/L	-	-	4.6000	-
MAM-73	Mammoth	Conductivity	115.00000	2.0000	µS/cm	-	-	48.6000	-
MAM-73	Mammoth	Hardness	39.40000	0.6000	mg/L	-	-	17.4000	-
MAM-73	Mammoth	Magnesium (T)	3.01000	0.0050	mg/L	-	-	1.4100	-
MAM-73	Mammoth	Potassium (T)	3.07000	0.0500	mg/L	-	-	0.8400	-
MAM-73	Mammoth	Sodium (T)	2.29000	0.0500	mg/L	-	-	0.9700	-
MAM-73	Mammoth	TDS	74.20000	10.0000	mg/L	-	-	38.5000	-
MAM-73	Mammoth	TKN	0.18300	0.0500	mg/L	-	-	0.1700	-
MAM-73	Mammoth	Total Alkalinity	16.30000	1.0000	mg/L	-	-	9.6000	-
MAM-74	Mammoth	Bicarbonate alkalinity	19.20000	1.0000	mg/L	-	-	9.6000	-
MAM-74	Mammoth	Calcium (T)	12.80000	0.0500	mg/L	-	-	4.6000	-
MAM-74	Mammoth	Conductivity	135.00000	2.0000	µS/cm	-	-	48.6000	-
MAM-74	Mammoth	Hardness	45.60000	0.6000	mg/L	-	-	17.4000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
MAM-74	Mammoth	Lithium (D)	0.00220	0.0010	mg/L	-	-	0.0020	-
MAM-74	Mammoth	Lithium (T)	0.00220	0.0010	mg/L	-	-	0.0020	-
MAM-74	Mammoth	Magnesium (T)	3.32000	0.0050	mg/L	-	-	1.4100	-
MAM-74	Mammoth	Potassium (T)	3.52000	0.0500	mg/L	-	-	0.8400	-
MAM-74	Mammoth	Sodium (T)	2.92000	0.0500	mg/L	-	-	0.9700	-
MAM-74	Mammoth	TDS	77.80000	10.0000	mg/L	-	-	38.5000	-
MAM-74	Mammoth	TKN	0.19900	0.0500	mg/L	-	-	0.1700	-
MAM-74	Mammoth	Total Alkalinity	19.20000	1.0000	mg/L	-	-	9.6000	-
MAM-74	Mammoth	Total phosphorous	***0.00440***	0.0020	mg/L	-	0.004	0.0045	-
NEM-73	Nemo	Bicarbonate alkalinity	11.60000	1.0000	mg/L	-	-	9.6000	-
NEM-73	Nemo	Calcium (T)	9.08000	0.0500	mg/L	-	-	4.6000	-
NEM-73	Nemo	Conductivity	84.50000	2.0000	µS/cm	-	-	48.6000	-
NEM-73	Nemo	Hardness	30.80000	0.6000	mg/L	-	-	17.4000	-
NEM-73	Nemo	Magnesium (T)	1.98000	0.0050	mg/L	-	-	1.4100	-
NEM-73	Nemo	Potassium (T)	1.56000	0.0500	mg/L	-	-	0.8400	-
NEM-73	Nemo	TDS	61.20000	10.0000	mg/L	-	-	38.5000	-
NEM-73	Nemo	Total Alkalinity	11.60000	1.0000	mg/L	-	-	9.6000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
NEM-74	Nemo	Bicarbonate alkalinity	11.90000	1.0000	mg/L	-	-	9.6000	-
NEM-74	Nemo	Calcium (T)	9.24000	0.0500	mg/L	-	-	4.6000	-
NEM-74	Nemo	Conductivity	85.00000	2.0000	µS/cm	-	-	48.6000	-
NEM-74	Nemo	Hardness	31.30000	0.6000	mg/L	-	-	17.4000	-
NEM-74	Nemo	Magnesium (T)	2.00000	0.0050	mg/L	-	-	1.4100	-
NEM-74	Nemo	Potassium (T)	1.58000	0.0500	mg/L	-	-	0.8400	-
NEM-74	Nemo	TDS	65.20000	10.0000	mg/L	-	-	38.5000	-
NEM-74	Nemo	Total Alkalinity	11.90000	1.0000	mg/L	-	-	9.6000	-
WTS-73	Whale Tail South	Bicarbonate alkalinity	17.40000	1.0000	mg/L	-	-	9.6000	-
WTS-73	Whale Tail South	Calcium (T)	9.34000	0.0500	mg/L	-	-	4.6000	-
WTS-73	Whale Tail South	Conductivity	101.00000	2.0000	µS/cm	-	-	48.6000	-
WTS-73	Whale Tail South	Hardness	34.60000	0.6000	mg/L	-	-	17.4000	-
WTS-73	Whale Tail South	Magnesium (T)	2.75000	0.0050	mg/L	-	-	1.4100	-
WTS-73	Whale Tail South	Potassium (T)	2.71000	0.0500	mg/L	-	-	0.8400	-
WTS-73	Whale Tail South	Sodium (T)	2.30000	0.0500	mg/L	-	-	0.9700	-
WTS-73	Whale Tail South	TDS	62.50000	10.0000	mg/L	-	-	38.5000	-
WTS-73	Whale Tail South	Titanium (T)	0.00065	0.0003	mg/L	-	-	0.0006	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
WTS-73	Whale Tail South	TKN	0.21400	0.0500	mg/L	-	-	0.1700	-
WTS-73	Whale Tail South	Total Alkalinity	17.40000	1.0000	mg/L	-	-	9.6000	-
WTS-73	Whale Tail South	Total phosphorous	***0.00610***	0.0020	mg/L	-	0.004	0.0045	-
WTS-74	Whale Tail South	Bicarbonate alkalinity	16.90000	1.0000	mg/L	-	-	9.6000	-
WTS-74	Whale Tail South	Calcium (T)	9.27000	0.0500	mg/L	-	-	4.6000	-
WTS-74	Whale Tail South	Conductivity	100.00000	2.0000	µS/cm	-	-	48.6000	-
WTS-74	Whale Tail South	Hardness	34.60000	0.6000	mg/L	-	-	17.4000	-
WTS-74	Whale Tail South	Magnesium (T)	2.77000	0.0050	mg/L	-	-	1.4100	-
WTS-74	Whale Tail South	Potassium (T)	2.72000	0.0500	mg/L	-	-	0.8400	-
WTS-74	Whale Tail South	Sodium (T)	2.29000	0.0500	mg/L	-	-	0.9700	-
WTS-74	Whale Tail South	TDS	61.20000	10.0000	mg/L	-	-	38.5000	-
WTS-74	Whale Tail South	Titanium (T)	0.00067	0.0003	mg/L	-	-	0.0006	-
WTS-74	Whale Tail South	TKN	0.22500	0.0500	mg/L	-	-	0.1700	-
WTS-74	Whale Tail South	Total Alkalinity	16.90000	1.0000	mg/L	-	-	9.6000	-
WTS-74	Whale Tail South	Total phosphorous	***0.00650***	0.0020	mg/L	-	0.004	0.0045	-

[1]Bold values are above the threshold as well as above the trigger value.

[2]Results failing to meet reliability checks are indicated as uncertain.

2.1 Result Reliability Checks

Two preliminary analyses were conducted to assess the reliability of sample results. Samples failing either one of these tests have been flagged as uncertain, and warrant further evaluation.

The first analysis compares dissolved and total concentrations for a given parameters at each location. Samples where dissolved concentrations are greater than total with a relative percent difference (RPD) of more than 30% are considered potentially unreliable. All samples in this sampling event met this reliability check.

The second analysis compares parameter concentrations from the two sampling stations located within each water body (either lake or basin). Parameters for which the difference between these two intra-lake samples was greater than a factor of 5 (or a factor of 10 if at least one of the samples was within a factor of 10 of the MDL) are considered potentially unreliable. All samples in this sampling event met this reliability check.

3. Laboratory & Field Quality Control Results

ALS’ laboratory QC samples for water are:

- *Laboratory duplicates* (LD) - these samples provide insights into the precision of laboratory analyses. Duplicate aliquots are taken from the samples and run through part (aliquots taken post digestion) or all (aliquots taken from the sample bottle) the laboratory analytical process.
- *Laboratory control samples* (LCS) - these samples provide insights into whether the laboratory systems are working as intended. They are comprised of a mixture of analyte-free water to which known amounts of the method analytes are added. They are essentially an internal version of a certified reference material.
- *Matrix spikes* (MS) - these samples involve the analysis of actual samples, to which a known amount of method analytes are added in amounts high enough that the spikes are clearly discernible relative to existing concentrations. These samples provide insights into the degree that the sample matrix could interfere with analyses.
- *Matrix blanks* (MB) - these samples are analyzed to assess background interference or contamination that exists in the analytical system that could lead to elevated concentrations or false positive data. These samples are comprised of analyte-free water.

The following field QC samples were collected and submitted blind to ALS:

- *Field duplicates* (FD) - these samples provide insights into (a) variability in field conditions and (b) the precision of laboratory analyses. Duplicate samples are collected from the same location and treated independently through the sampling and analysis process.
- *Deionized blanks* (DB) - these samples 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.
- *Equipment blanks* (EB) - these samples 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.
- *Travel blanks* (TB) - these samples 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.

3.1 Overall QC Results

Overall laboratory and field QC results are summarized in Table 7.

Table 7: Summary of laboratory and field QC results by sample type.

	QC_Element	Pass	Fail	ND
Laboratory	Lab Duplicate	811	3*	0
	Lab Control Sample	655	0	0
	Matrix Spike	557	0	58
	Matrix Blank	664	1	0
Field	Field Duplicate	438	4	0
	Deionized Water Blank	110	0	0
	Equipment Blank	106	3	0
	Travel Blank	111	0	0

* Lab duplicates that failed are QC samples from another client.

3.2 Laboratory Duplicates

In this sampling event, 3 laboratory duplicates failed to meet the QC objectives. Laboratory duplicate results not meeting QC objectives are summarized in Table 8.

Table 8: Details for laboratory duplicate results not meeting QC objectives.

QC_Lot	ALS_QC_ID[1]	Analyte	RPD	DIFFx	LD.QC
628219	ANONYMOUS	cadmium, total	199.6	59,138.8	Fail
628219	ANONYMOUS	cobalt, total	199.6	90,311.4	Fail
628219	ANONYMOUS	selenium, total	199.6	559,440.0	Fail

[1]ALS_QC_ID listing of 'Anonymous' indicates QC sample from another client used.

3.3 Laboratory Control Samples

All laboratory control sample results met laboratory QC objectives.

3.4 Matrix Spike

All matrix spike results met laboratory QC objectives.

In addition, some parameters had spike levels too low to confidently quantify them relative to existing concentrations in the sample. Consequently, QC results for these results could not be calculated (see Table 9).

Table 9: Analytes not determined for matrix spikes.

QC_Lot	Analyte	ALS_QC_ID[1]
626505	phosphorus, total	Anonymous
626506	phosphorus, total dissolved	Anonymous
619710	barium, total	Anonymous
619710	boron, total	Anonymous
619710	calcium, total	Anonymous
619710	magnesium, total	Anonymous
619710	manganese, total	Anonymous
619710	molybdenum, total	Anonymous
619710	selenium, total	Anonymous
619710	sodium, total	Anonymous
619710	strontium, total	Anonymous
619710	sulfur, total	Anonymous
619785	calcium, total	Anonymous
619785	magnesium, total	Anonymous
619785	manganese, total	Anonymous
619785	sodium, total	Anonymous
619785	strontium, total	Anonymous
618946	barium, dissolved	Anonymous
618946	boron, dissolved	Anonymous
618946	calcium, dissolved	Anonymous
618946	magnesium, dissolved	Anonymous
618946	manganese, dissolved	Anonymous
618946	molybdenum, dissolved	Anonymous
618946	selenium, dissolved	Anonymous

QC_Lot	Analyte	ALS_QC_ID[1]
618946	sodium, dissolved	Anonymous
618946	strontium, dissolved	Anonymous
618946	sulfur, dissolved	Anonymous
618951	calcium, dissolved	A20-68
618951	magnesium, dissolved	A20-68
618951	strontium, dissolved	A20-68
619785	calcium, total	Anonymous
619785	magnesium, total	Anonymous
619785	manganese, total	Anonymous
619785	sodium, total	Anonymous
619785	strontium, total	Anonymous
618951	calcium, dissolved	Anonymous
618951	magnesium, dissolved	Anonymous
618951	strontium, dissolved	Anonymous
625242	barium, total	Anonymous
625242	calcium, total	Anonymous
625242	magnesium, total	Anonymous
625242	molybdenum, total	Anonymous
625242	sodium, total	Anonymous
625242	strontium, total	Anonymous
625242	sulfur, total	Anonymous
625242	uranium, total	Anonymous
627759	sodium, total	Anonymous
628219	calcium, total	Anonymous
628219	lithium, total	Anonymous
628219	magnesium, total	Anonymous
628219	manganese, total	Anonymous
628219	nickel, total	Anonymous

QC_Lot	Analyte	ALS_QC_ID[1]
628219	sodium, total	Anonymous
628219	strontium, total	Anonymous
628219	sulfur, total	Anonymous
628219	uranium, total	Anonymous
626884	magnesium, dissolved	BBD-82
626884	sodium, dissolved	BBD-82

[1]ALS_QC_ID listing of 'Anonymous' indicates QC sample from another client used.

3.5 Matrix Blank

In this sampling event, 1 matrix blanks result failed to meet the QC objectives. Matrix blank results not meeting QC objectives are summarized in Table 10.

Table 10: Details for matrix blank results not meeting QC objectives.

QC_Lot	Analyte	Result	Limit	MDL	MB.QC
632296	phosphorus, total dissolved	0.0021	0.002	-	Fail

3.6 Field Duplicates

In this sampling event, 4 field duplicate samples failed to meet the QC objectives. Field duplicate sample results not meeting QC objectives are summarized in Table 11.

Table 11: Details for field duplicate results not meeting QC objectives.

QC_Lot.x	Analyte	RPD	DIFFx	FD.QC
618691	solids, total dissolved [TDS]	40.0	3.1	Fail
626505	phosphorus, total	173.2	12.9	Fail
618946	molybdenum, dissolved	192.0	54.7	Fail
618946	molybdenum, dissolved	167.7	93.6	Fail

3.7 DI Blank

All deionized water blank results met laboratory QC objectives.

3.8 Equipment Blank

In this sampling event, 3 equipment blank samples failed to meet the QC objectives. Equipment blank results not meeting QC objectives are summarized in Table 12.

Table 12: Details for equipment blank results not meeting QC objectives.

QC_Lot	ID	Analyte	Results	DL	FB.QC
626207	EB	alkalinity, bicarbonate (as CaCO3)	1.900000	1.00000	Fail
626207	EB	alkalinity, total (as CaCO3)	1.900000	1.00000	Fail
625242	EB	lead, total	0.000055	0.00005	Fail

3.9 Travel Blank

All travel blank results met laboratory QC objectives.

3.10 Holding Time Exceedances

In addition to those ALS laboratory QC samples described above, during QC screening samples were also assessed agianst recommended hold times. Parameters and associated sample numbers exceeding recommended hold times in this sampling event are shown in Table 13. Note that pH is included in the suite of field measurements and has a very short recommended hold time, so exceeding the hold time for laboratory analysis is expected and of little importance.

Table 13: Analytes and associated number of samples exceeding holding times.

ALS_Method	n
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	39
Nitrate in Water by IC (Low Level)	39
Nitrite in Water by IC (Low Level)	39
pH by Meter	39
Turbidity by Nephelometry	39
TDS by Gravimetry (Low Level)	28
TSS by Gravimetry (Low Level)	28
ALS Method Description	4
Total Mercury in Water by CVAAS	1

Meadowbank Mine - Water Quality Monitoring 2022

Preliminary Screening of September, 2022 Water Quality Monitoring

Azimuth Consulting Group Inc.
on behalf of Agnico Eagle Mines Ltd.

Report Date: 2022-12-13

Table of Contents

1. Introduction & Sampling Overview

This document was prepared by Azimuth Consulting Group Inc (Azimuth) to provide the Meadowbank Environment Department with a brief overview of the water chemistry results collected in September, 2022 as part of the Core Receiving Environment Monitoring Program (CREMP). CREMP water quality monitoring occurs in all summer months (July - September) as well as two through-ice sampling events in March and May. CREMP monitoring occurs at near-field, mid-field, and far-field stations in three distinct areas - the Meadowbank Mine Project, The Whale Tail Pit Project, and Baker Lake, however sampling does not occur at all stations or all areas in each sampling event. The purpose of this preliminary document is to:

1. Screen the water chemistry results from ALS against the trigger values to keep the Environment Department informed about potential changes in water quality, including the early identification of potentially anomalous data (Section 2).

2. Review the data for laboratory QC issues (blanks, duplicates, matrix spikes, etc.) and potential field quality assurance (QA) concerns, ensuring that questionable results are verified by reanalysis (Section 3).

Samples included in this report are shown in Table 1, while field blanks are shown in Table 2.

Table 1: Summary of September, 2022 samples.

Area	Sample ID	ID	ID_Name	Duplicate	Date_Sampled
Baker Lake					
	BAP-83	BAP	Baker - Akilahaarjuk Point	-	2022-09-06
	BAP-84	BAP	Baker - Akilahaarjuk Point	-	2022-09-06
	BBD-83	BBD	Baker - Barge Dock	-	2022-09-06
	BBD-84	BBD	Baker - Barge Dock	-	2022-09-06
	BPJ-83	BPJ	Baker - Proposed Jetty	-	2022-09-06
	BPJ-84	BPJ	Baker - Proposed Jetty	-	2022-09-06
Meadowbank					
	INUG-146	INUG	Inuggugayualik	-	2022-09-11
	INUG-147	INUG	Inuggugayualik	SEP DUP-2	2022-09-11
	PDL-111	PDL	Pipedream	-	2022-09-14
	PDL-112	PDL	Pipedream	SEP DUP-1	2022-09-14
	SP-158	SP	Second Portage	-	2022-09-02
	SP-159	SP	Second Portage	-	2022-09-02
	TPE-158	TPE	Third Portage - East Basin	-	2022-09-02
	TPE-159	TPE	Third Portage - East Basin	-	2022-09-02
	TPN-158	TPN	Third Portage - North Basin	-	2022-09-03
	TPN-159	TPN	Third Portage - North Basin	-	2022-09-03
	WAL-127	WAL	Wally	-	2022-09-03
	WAL-128	WAL	Wally	-	2022-09-03
Whale Tail Pit					
	A20-69	A20	Lake A20	-	2022-09-02
	A20-70	A20	Lake A20	-	2022-09-02
	A76-67	A76	Lake A76	-	2022-09-16
	A76-68	A76	Lake A76	-	2022-09-16

Area	Sample ID	ID	ID_Name	Duplicate	Date_Sampled
	DS1-65	DS1	Lake DS1	SEPTEMBER DUP-4	2022-09-05
	DS1-66	DS1	Lake DS1	-	2022-09-05
	MAM-75	MAM	Mammoth	-	2022-09-04
	MAM-76	MAM	Mammoth	-	2022-09-04
	NEM-75	NEM	Nemo	SEPTEMBER DUP-3	2022-09-03
	NEM-76	NEM	Nemo	-	2022-09-03
	WTS-75	WTS	Whale Tail South	-	2022-09-03
	WTS-76	WTS	Whale Tail South	-	2022-09-03

Table 2: Summary of field blanks collected in September, 2022.

Client_Sample_ID	ID_Name
SEPTEMBER DI	DI Blank
SEPTEMBER EB	Equipment Blank
SEPTEMBER TB	Travel Blank

2. Trigger Screening

Sampling results were screened relative to relevant triggers and thresholds. A summary of trigger and threshold exceedances is provided in Table 3. Subsequent tables provide all sample results above trigger and threshold values for Meadowbank (Table 4), Whale Tail Pit (Table 5), and Baker Lake (Table 6). Samples exceeding triggers or thresholds but failing reliability checks (see Section 2.1) are labeled as uncertain.

Table 3: Summary of trigger and threshold exceedances in September, 2022.

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
Baker Lake				
	Chromium (D)	6	0	BAP-83, BAP-84, BBD-83, BBD-84, BPJ-83, BPJ-84
	Ortho-phosphate	1	0	BPJ-83
	Total phosphorous	0	3	BBD-84, BPJ-83, BPJ-84
Meadowbank				
	Bicarbonate alkalinity	2	0	SP-158, SP-159
	Calcium (T)	6	0	PDL-111, PDL-112, SP-158, SP-159, TPE-158, TPE-159

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
	Chromium (D)	12	0	INUG-146, INUG-147, PDL-111, PDL-112, SP-158, SP-159, TPE-158, TPE-159, TPN-158, TPN-159, WAL-127, WAL-128
	Conductivity	8	0	SP-158, SP-159, TPE-158, TPE-159, TPN-158, TPN-159, WAL-127, WAL-128
	Hardness	6	0	PDL-111, PDL-112, SP-158, SP-159, TPE-158, TPE-159
	Magnesium (T)	4	0	SP-158, SP-159, TPE-158, TPE-159
	Reactive silica	2	0	WAL-127, WAL-128
	Silicon (D)	2	0	SP-158, SP-159
	Silicon (T)	2	0	SP-158, SP-159
	TDS	5	0	SP-158, SP-159, TPE-159, WAL-127, WAL-128
	Tin (D)	1	0	TPN-158*
	Total Alkalinity	2	0	SP-158, SP-159
	Total phosphorous	0	1	SP-159
	Zinc (D)	2	0	TPN-158, WAL-128

Whale Tail Pit

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
	Bicarbonate alkalinity	10	0	A20-69, A20-70, A76-67, A76-68, MAM-75, MAM-76, NEM-75, NEM-76, WTS-75, WTS-76
	Calcium (T)	10	0	A20-69, A20-70, A76-67, A76-68, MAM-75, MAM-76, NEM-75, NEM-76, WTS-75, WTS-76
	Conductivity	10	0	A20-69, A20-70, A76-67, A76-68, MAM-75, MAM-76, NEM-75, NEM-76, WTS-75, WTS-76
	Hardness	10	0	A20-69, A20-70, A76-67, A76-68, MAM-75, MAM-76, NEM-75, NEM-76, WTS-75, WTS-76
	Lithium (D)	2	0	MAM-75, MAM-76
	Lithium (T)	2	0	MAM-75, MAM-76
	Magnesium (T)	10	0	A20-69, A20-70, A76-67, A76-68, MAM-75, MAM-76, NEM-75, NEM-76, WTS-75, WTS-76
	Potassium (T)	10	0	A20-69, A20-70, A76-67, A76-68, MAM-75, MAM-76, NEM-75, NEM-76, WTS-75, WTS-76
	Sodium (T)	9	0	A20-69, A20-70, A76-67, A76-68, DS1-65, MAM-75, MAM-76, WTS-75, WTS-76
	TDS	10	0	A20-69, A20-70, A76-67, A76-68, MAM-75, MAM-76, NEM-75, NEM-76, WTS-75, WTS-76
	Tin (D)	1	0	NEM-75*

Area	Parameter	Samples Exceeding Trigger	Samples Exceeding Threshold	Stations
	TKN	6	0	A76-68, MAM-75, MAM-76, NEM-76, WTS-75, WTS-76
	Total Alkalinity	10	0	A20-69, A20-70, A76-67, A76-68, MAM-75, MAM-76, NEM-75, NEM-76, WTS-75, WTS-76
	Total phosphorous	2	3	A20-69, WTS-75, WTS-76

* Indicates samples which failed reliability checks and are consequently uncertain.

Table 6: Trigger and threshold exceedances at Baker Lake sampling stations

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
BAP-83	Baker - Akilahaarjuk Point	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BAP-84	Baker - Akilahaarjuk Point	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BBD-83	Baker - Barge Dock	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BBD-84	Baker - Barge Dock	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BBD-84	Baker - Barge Dock	Total phosphorous	***0.0049***	0.0020	mg/L	-	0.004	0.00750	-
BPJ-83	Baker - Proposed Jetty	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BPJ-83	Baker - Proposed Jetty	Ortho-phosphate	0.0024	0.0010	mg/L	-	-	0.00200	-
BPJ-83	Baker - Proposed Jetty	Total phosphorous	***0.0051***	0.0020	mg/L	-	0.004	0.00750	-
BPJ-84	Baker - Proposed Jetty	Chromium (D)	0.0005	0.0005	mg/L	MDL	0.005	0.00026	-
BPJ-84	Baker - Proposed Jetty	Total phosphorous	***0.0054***	0.0020	mg/L	-	0.004	0.00750	-

[1]Bold values are above the threshold as well as above the trigger value.

[2]Results failing to meet reliability checks are indicated as uncertain.

Table 4: Trigger and threshold exceedances at Meadowbank sampling stations.

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
INUG-146	Inuggugayualik	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
INUG-147	Inuggugayualik	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
PDL-111	Pipedream	Calcium (T)	2.48000	0.0500	mg/L	-	-	2.39000	-
PDL-111	Pipedream	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
PDL-111	Pipedream	Hardness	9.83000	0.6000	mg/L	-	-	9.50000	-
PDL-112	Pipedream	Calcium (T)	2.46000	0.0500	mg/L	-	-	2.39000	-
PDL-112	Pipedream	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
PDL-112	Pipedream	Hardness	9.67000	0.6000	mg/L	-	-	9.50000	-
SP-158	Second Portage	Bicarbonate alkalinity	10.80000	1.0000	mg/L	-	-	8.70000	-
SP-158	Second Portage	Calcium (T)	3.47000	0.0500	mg/L	-	-	2.39000	-
SP-158	Second Portage	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
SP-158	Second Portage	Conductivity	35.60000	2.0000	µS/cm	-	-	27.40000	-
SP-158	Second Portage	Hardness	13.40000	0.6000	mg/L	-	-	9.50000	-
SP-158	Second Portage	Magnesium (T)	1.14000	0.0050	mg/L	-	-	0.93000	-
SP-158	Second Portage	Silicon (D)	0.24000	0.0500	mg/L	-	-	0.18000	-
SP-158	Second Portage	Silicon (T)	0.25000	0.1000	mg/L	-	-	0.20000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
SP-158	Second Portage	TDS	23.20000	3.0000	mg/L	-	-	19.00000	-
SP-158	Second Portage	Total Alkalinity	10.80000	1.0000	mg/L	-	-	8.70000	-
SP-159	Second Portage	Bicarbonate alkalinity	10.50000	1.0000	mg/L	-	-	8.70000	-
SP-159	Second Portage	Calcium (T)	3.54000	0.0500	mg/L	-	-	2.39000	-
SP-159	Second Portage	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
SP-159	Second Portage	Conductivity	35.60000	2.0000	µS/cm	-	-	27.40000	-
SP-159	Second Portage	Hardness	13.50000	0.6000	mg/L	-	-	9.50000	-
SP-159	Second Portage	Magnesium (T)	1.13000	0.0050	mg/L	-	-	0.93000	-
SP-159	Second Portage	Silicon (D)	0.22600	0.0500	mg/L	-	-	0.18000	-
SP-159	Second Portage	Silicon (T)	0.27000	0.1000	mg/L	-	-	0.20000	-
SP-159	Second Portage	TDS	20.60000	3.0000	mg/L	-	-	19.00000	-
SP-159	Second Portage	Total Alkalinity	10.50000	1.0000	mg/L	-	-	8.70000	-
SP-159	Second Portage	Total phosphorous	***0.00420***	0.0020	mg/L	-	0.004	0.00510	-
TPE-158	Third Portage - East Basin	Calcium (T)	2.46000	0.0500	mg/L	-	-	2.39000	-
TPE-158	Third Portage - East Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPE-158	Third Portage - East Basin	Conductivity	29.40000	2.0000	µS/cm	-	-	27.40000	-
TPE-158	Third Portage - East Basin	Hardness	10.00000	0.6000	mg/L	-	-	9.50000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
TPE-158	Third Portage - East Basin	Magnesium (T)	0.93900	0.0050	mg/L	-	-	0.93000	-
TPE-159	Third Portage - East Basin	Calcium (T)	2.50000	0.0500	mg/L	-	-	2.39000	-
TPE-159	Third Portage - East Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPE-159	Third Portage - East Basin	Conductivity	29.50000	2.0000	µS/cm	-	-	27.40000	-
TPE-159	Third Portage - East Basin	Hardness	10.30000	0.6000	mg/L	-	-	9.50000	-
TPE-159	Third Portage - East Basin	Magnesium (T)	0.98400	0.0050	mg/L	-	-	0.93000	-
TPE-159	Third Portage - East Basin	TDS	19.60000	3.0000	mg/L	-	-	19.00000	-
TPN-158	Third Portage - North Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPN-158	Third Portage - North Basin	Conductivity	27.50000	2.0000	µS/cm	-	-	27.40000	-
TPN-158	Third Portage - North Basin	Tin (D)	0.00075	0.0001	mg/L	-	-	0.00020	Uncertain
TPN-158	Third Portage - North Basin	Zinc (D)	0.00200	0.0010	mg/L	-	0.003	0.00180	-
TPN-159	Third Portage - North Basin	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
TPN-159	Third Portage - North Basin	Conductivity	27.70000	2.0000	µS/cm	-	-	27.40000	-
WAL-127	Wally	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
WAL-127	Wally	Conductivity	38.50000	2.0000	µS/cm	-	-	36.60000	-
WAL-127	Wally	Reactive silica	1.21000	0.5000	mg/L	-	-	1.08000	-
WAL-127	Wally	TDS	25.60000	3.0000	mg/L	-	-	25.30000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
WAL-128	Wally	Chromium (D)	0.00050	0.0005	mg/L	MDL	0.005	0.00026	-
WAL-128	Wally	Conductivity	37.50000	2.0000	µS/cm	-	-	36.60000	-
WAL-128	Wally	Reactive silica	1.20000	0.5000	mg/L	-	-	1.08000	-
WAL-128	Wally	TDS	25.60000	3.0000	mg/L	-	-	25.30000	-
WAL-128	Wally	Zinc (D)	0.00280	0.0010	mg/L	-	0.003	0.00240	-

[1]Bold values are above the threshold as well as above the trigger value.

[2]Results failing to meet reliability checks are indicated as uncertain.

Table 5: Trigger and threshold exceedances at Whale Tail Pit sampling stations

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
A20-69	Lake A20	Bicarbonate alkalinity	10.60000	1.0000	mg/L	-	-	9.6000	-
A20-69	Lake A20	Calcium (T)	5.38000	0.0500	mg/L	-	-	4.6000	-
A20-69	Lake A20	Conductivity	54.70000	2.0000	µS/cm	-	-	48.6000	-
A20-69	Lake A20	Hardness	19.80000	0.6000	mg/L	-	-	17.4000	-
A20-69	Lake A20	Magnesium (T)	1.54000	0.0050	mg/L	-	-	1.4100	-
A20-69	Lake A20	Potassium (T)	1.38000	0.0500	mg/L	-	-	0.8400	-
A20-69	Lake A20	Sodium (T)	1.21000	0.0500	mg/L	-	-	0.9700	-
A20-69	Lake A20	TDS	43.20000	10.0000	mg/L	-	-	38.5000	-
A20-69	Lake A20	Total Alkalinity	10.60000	1.0000	mg/L	-	-	9.6000	-
A20-69	Lake A20	Total phosphorous	***0.00410***	0.0020	mg/L	-	0.004	0.0045	-
A20-70	Lake A20	Bicarbonate alkalinity	10.70000	1.0000	mg/L	-	-	9.6000	-
A20-70	Lake A20	Calcium (T)	5.45000	0.0500	mg/L	-	-	4.6000	-
A20-70	Lake A20	Conductivity	56.10000	2.0000	µS/cm	-	-	48.6000	-
A20-70	Lake A20	Hardness	20.10000	0.6000	mg/L	-	-	17.4000	-
A20-70	Lake A20	Magnesium (T)	1.58000	0.0050	mg/L	-	-	1.4100	-
A20-70	Lake A20	Potassium (T)	1.42000	0.0500	mg/L	-	-	0.8400	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
A20-70	Lake A20	Sodium (T)	1.25000	0.0500	mg/L	-	-	0.9700	-
A20-70	Lake A20	TDS	38.80000	10.0000	mg/L	-	-	38.5000	-
A20-70	Lake A20	Total Alkalinity	10.70000	1.0000	mg/L	-	-	9.6000	-
A76-67	Lake A76	Bicarbonate alkalinity	12.00000	1.0000	mg/L	-	-	9.6000	-
A76-67	Lake A76	Calcium (T)	8.91000	0.0500	mg/L	-	-	4.6000	-
A76-67	Lake A76	Conductivity	87.80000	2.0000	µS/cm	-	-	48.6000	-
A76-67	Lake A76	Hardness	32.20000	0.6000	mg/L	-	-	17.4000	-
A76-67	Lake A76	Magnesium (T)	2.43000	0.0050	mg/L	-	-	1.4100	-
A76-67	Lake A76	Potassium (T)	2.04000	0.0500	mg/L	-	-	0.8400	-
A76-67	Lake A76	Sodium (T)	1.52000	0.0500	mg/L	-	-	0.9700	-
A76-67	Lake A76	TDS	70.30000	10.0000	mg/L	-	-	38.5000	-
A76-67	Lake A76	Total Alkalinity	12.00000	1.0000	mg/L	-	-	9.6000	-
A76-68	Lake A76	Bicarbonate alkalinity	11.80000	1.0000	mg/L	-	-	9.6000	-
A76-68	Lake A76	Calcium (T)	9.00000	0.0500	mg/L	-	-	4.6000	-
A76-68	Lake A76	Conductivity	86.10000	2.0000	µS/cm	-	-	48.6000	-
A76-68	Lake A76	Hardness	32.40000	0.6000	mg/L	-	-	17.4000	-
A76-68	Lake A76	Magnesium (T)	2.42000	0.0050	mg/L	-	-	1.4100	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
A76-68	Lake A76	Potassium (T)	2.07000	0.0500	mg/L	-	-	0.8400	-
A76-68	Lake A76	Sodium (T)	1.53000	0.0500	mg/L	-	-	0.9700	-
A76-68	Lake A76	TDS	62.70000	10.0000	mg/L	-	-	38.5000	-
A76-68	Lake A76	TKN	0.21300	0.0500	mg/L	-	-	0.1700	-
A76-68	Lake A76	Total Alkalinity	11.80000	1.0000	mg/L	-	-	9.6000	-
DS1-65	Lake DS1	Sodium (T)	1.06000	0.0500	mg/L	-	-	0.9700	-
MAM-75	Mammoth	Bicarbonate alkalinity	17.60000	1.0000	mg/L	-	-	9.6000	-
MAM-75	Mammoth	Calcium (T)	12.10000	0.0500	mg/L	-	-	4.6000	-
MAM-75	Mammoth	Conductivity	134.00000	2.0000	µS/cm	-	-	48.6000	-
MAM-75	Mammoth	Hardness	43.20000	0.6000	mg/L	-	-	17.4000	-
MAM-75	Mammoth	Lithium (D)	0.00210	0.0010	mg/L	-	-	0.0020	-
MAM-75	Mammoth	Lithium (T)	0.00210	0.0010	mg/L	-	-	0.0020	-
MAM-75	Mammoth	Magnesium (T)	3.15000	0.0050	mg/L	-	-	1.4100	-
MAM-75	Mammoth	Potassium (T)	3.20000	0.0500	mg/L	-	-	0.8400	-
MAM-75	Mammoth	Sodium (T)	2.62000	0.0500	mg/L	-	-	0.9700	-
MAM-75	Mammoth	TDS	87.50000	10.0000	mg/L	-	-	38.5000	-
MAM-75	Mammoth	TKN	0.20400	0.0500	mg/L	-	-	0.1700	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
MAM-75	Mammoth	Total Alkalinity	17.60000	1.0000	mg/L	-	-	9.6000	-
MAM-76	Mammoth	Bicarbonate alkalinity	19.70000	1.0000	mg/L	-	-	9.6000	-
MAM-76	Mammoth	Calcium (T)	15.60000	0.0500	mg/L	-	-	4.6000	-
MAM-76	Mammoth	Conductivity	168.00000	2.0000	µS/cm	-	-	48.6000	-
MAM-76	Mammoth	Hardness	55.20000	0.6000	mg/L	-	-	17.4000	-
MAM-76	Mammoth	Lithium (D)	0.00250	0.0010	mg/L	-	-	0.0020	-
MAM-76	Mammoth	Lithium (T)	0.00250	0.0010	mg/L	-	-	0.0020	-
MAM-76	Mammoth	Magnesium (T)	3.94000	0.0050	mg/L	-	-	1.4100	-
MAM-76	Mammoth	Potassium (T)	4.34000	0.0500	mg/L	-	-	0.8400	-
MAM-76	Mammoth	Sodium (T)	3.76000	0.0500	mg/L	-	-	0.9700	-
MAM-76	Mammoth	TDS	105.00000	10.0000	mg/L	-	-	38.5000	-
MAM-76	Mammoth	TKN	0.26000	0.0500	mg/L	-	-	0.1700	-
MAM-76	Mammoth	Total Alkalinity	19.70000	1.0000	mg/L	-	-	9.6000	-
NEM-75	Nemo	Bicarbonate alkalinity	11.20000	1.0000	mg/L	-	-	9.6000	-
NEM-75	Nemo	Calcium (T)	9.75000	0.0500	mg/L	-	-	4.6000	-
NEM-75	Nemo	Conductivity	89.80000	2.0000	µS/cm	-	-	48.6000	-
NEM-75	Nemo	Hardness	33.00000	0.6000	mg/L	-	-	17.4000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
NEM-75	Nemo	Magnesium (T)	2.11000	0.0050	mg/L	-	-	1.4100	-
NEM-75	Nemo	Potassium (T)	1.59000	0.0500	mg/L	-	-	0.8400	-
NEM-75	Nemo	TDS	64.80000	10.0000	mg/L	-	-	38.5000	-
NEM-75	Nemo	Tin (D)	0.00026	0.0001	mg/L	-	-	0.0002	Uncertain
NEM-75	Nemo	Total Alkalinity	11.20000	1.0000	mg/L	-	-	9.6000	-
NEM-76	Nemo	Bicarbonate alkalinity	11.00000	1.0000	mg/L	-	-	9.6000	-
NEM-76	Nemo	Calcium (T)	9.04000	0.0500	mg/L	-	-	4.6000	-
NEM-76	Nemo	Conductivity	88.80000	2.0000	µS/cm	-	-	48.6000	-
NEM-76	Nemo	Hardness	30.20000	0.6000	mg/L	-	-	17.4000	-
NEM-76	Nemo	Magnesium (T)	1.85000	0.0050	mg/L	-	-	1.4100	-
NEM-76	Nemo	Potassium (T)	1.44000	0.0500	mg/L	-	-	0.8400	-
NEM-76	Nemo	TDS	66.20000	10.0000	mg/L	-	-	38.5000	-
NEM-76	Nemo	TKN	0.22500	0.0500	mg/L	-	-	0.1700	-
NEM-76	Nemo	Total Alkalinity	11.00000	1.0000	mg/L	-	-	9.6000	-
WTS-75	Whale Tail South	Bicarbonate alkalinity	17.20000	1.0000	mg/L	-	-	9.6000	-
WTS-75	Whale Tail South	Calcium (T)	9.87000	0.0500	mg/L	-	-	4.6000	-
WTS-75	Whale Tail South	Conductivity	105.00000	2.0000	µS/cm	-	-	48.6000	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
WTS-75	Whale Tail South	Hardness	35.40000	0.6000	mg/L	-	-	17.4000	-
WTS-75	Whale Tail South	Magnesium (T)	2.60000	0.0050	mg/L	-	-	1.4100	-
WTS-75	Whale Tail South	Potassium (T)	2.46000	0.0500	mg/L	-	-	0.8400	-
WTS-75	Whale Tail South	Sodium (T)	2.12000	0.0500	mg/L	-	-	0.9700	-
WTS-75	Whale Tail South	TDS	69.80000	10.0000	mg/L	-	-	38.5000	-
WTS-75	Whale Tail South	TKN	0.21900	0.0500	mg/L	-	-	0.1700	-
WTS-75	Whale Tail South	Total Alkalinity	17.20000	1.0000	mg/L	-	-	9.6000	-
WTS-75	Whale Tail South	Total phosphorous	***0.00480***	0.0020	mg/L	-	0.004	0.0045	-
WTS-76	Whale Tail South	Bicarbonate alkalinity	17.20000	1.0000	mg/L	-	-	9.6000	-
WTS-76	Whale Tail South	Calcium (T)	9.26000	0.0500	mg/L	-	-	4.6000	-
WTS-76	Whale Tail South	Conductivity	105.00000	2.0000	µS/cm	-	-	48.6000	-
WTS-76	Whale Tail South	Hardness	33.50000	0.6000	mg/L	-	-	17.4000	-
WTS-76	Whale Tail South	Magnesium (T)	2.53000	0.0050	mg/L	-	-	1.4100	-
WTS-76	Whale Tail South	Potassium (T)	2.45000	0.0500	mg/L	-	-	0.8400	-
WTS-76	Whale Tail South	Sodium (T)	2.06000	0.0500	mg/L	-	-	0.9700	-
WTS-76	Whale Tail South	TDS	67.80000	10.0000	mg/L	-	-	38.5000	-
WTS-76	Whale Tail South	TKN	0.28600	0.0500	mg/L	-	-	0.1700	-

Sample ID	ID_Name	Parameter	Results[1]	DL	Units	MDL	Threshold	Trigger	Reliability[2]
WTS-76	Whale Tail South	Total Alkalinity	17.20000	1.0000	mg/L	-	-	9.6000	-
WTS-76	Whale Tail South	Total phosphorous	***0.00600***	0.0020	mg/L	-	0.004	0.0045	-

[1]Bold values are above the threshold as well as above the trigger value.

[2]Results failing to meet reliability checks are indicated as uncertain.

2.1 Result Reliability Checks

Two preliminary analyses were conducted to assess the reliability of sample results. Samples failing either one of these tests have been flagged as uncertain, and warrant further evaluation.

The first analysis compares dissolved and total concentrations for a given parameters at each location. Samples where dissolved concentrations are greater than total with a relative percent difference (RPD) of more than 30% are considered potentially unreliable. All samples failing to meet this reliability check are summarized in Table 7.

The second analysis compares parameter concentrations from the two sampling stations located within each water body (either lake or basin). Parameters for which the difference between these two intra-lake samples was greater than a factor of 5 (or a factor of 10 if at least one of the samples was within a factor of 10 of the MDL) are considered potentially unreliable. All samples in this sampling event met this reliability check.

Table 7: Samples with uncertain reliability due to differences in dissolved and total parameter results.

Area	Sample ID	ID_Name	Parameter	Result (T)	Result (D)	MDL (T)	MDL (D)	RPD
Baker Lake	BPJ-83	Baker - Proposed Jetty	Lead	0.00005	0.000182	MDL	-	113.8
Baker Lake	BBD-83	Baker - Barge Dock	Lead	0.00005	0.000098	MDL	-	64.9
Baker Lake	BBD-84	Baker - Barge Dock	Lead	0.00005	0.000088	MDL	-	55.1
Meadowbank	TPN-158	Third Portage - North Basin	Tin	0.0001	0.00075	MDL	-	152.9
Whale Tail Pit	NEM-75	Nemo	Tin	0.0001	0.00026	MDL	-	88.9

3. Laboratory & Field Quality Control Results

ALS' laboratory QC samples for water are:

- *Laboratory duplicates* (LD) - these samples provide insights into the precision of laboratory analyses. Duplicate aliquots are taken from the samples and run through part (aliquots taken post digestion) or all (aliquots taken from the sample bottle) the laboratory analytical process.
- *Laboratory control samples* (LCS) - these samples provide insights into whether the laboratory systems are working as intended. They are comprised of a mixture of analyte-free water to which known amounts of the method analytes are added. They are essentially an internal version of a certified reference material.
- *Matrix spikes* (MS) - these samples involve the analysis of actual samples, to which a known amount of method analytes are added in amounts high enough that the spikes are clearly discernible relative to existing concentrations. These samples provide insights into the degree that the sample matrix could interfere with analyses.
- *Matrix blanks* (MB) - these samples are analyzed to assess background interference or contamination that exists in the analytical system that could lead to elevated concentrations or false positive data. These samples are comprised of analyte-free water.

The following field QC samples were collected and submitted blind to ALS:

- *Field duplicates* (FD) - these samples provide insights into (a) variability in field conditions and (b) the precision of laboratory analyses. Duplicate samples are collected from the same location and treated independently through the sampling and analysis process.
- *Deionized blanks* (DB) - these samples 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.
- *Equipment blanks* (EB) - these samples 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.
- *Travel blanks* (TB) - these samples 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.

3.1 Overall QC Results

Overall laboratory and field QC results are summarized in Table 8.

Table 8: Summary of laboratory and field QC results by sample type.

	QC_Element	Pass	Fail	ND
Laboratory	Lab Duplicate	1,001	1	0
	Lab Control Sample	998	0	0
	Matrix Spike	827	2	113
	Matrix Blank	1,014	0	0
Field	Field Duplicate	421	15	0
	Deionized Water Blank	108	2	0
	Equipment Blank	100	3	0
	Travel Blank	110	0	0

3.2 Laboratory Duplicates

In this sampling event, 1 laboratory duplicate failed to meet the QC objectives. Laboratory duplicate results not meeting QC objectives are summarized in Table 9.

Table 9: Details for laboratory duplicate results not meeting QC objectives.

QC_Lot	ALS_QC_ID[1]	Analyte	RPD	DIFFx	LD.QC
674714	ANONYMOUS	selenium, dissolved	199.6	99,903.6	Fail

[1]ALS_QC_ID listing of 'Anonymous' indicates QC sample from another client used.

3.3 Laboratory Control Samples

All laboratory control sample results met laboratory QC objectives.

3.4 Matrix Spike

In this sampling event, 2 matrix spike results failed to meet the QC objectives. Matrix spike results not meeting QC objectives are summarized in Table 10.

In addition, some parameters had spike levels too low to confidently quantify them relative to existing concentrations in the sample. Consequently, QC results for these results could not be calculated (see Table 11).

Table 10: Details for matrix spike results not meeting QC objectives.

QC_Lot	Analyte	Percent	Limit	MS.QC
641089	lead, dissolved	63.0	70-130	Fail
667394	silver, dissolved	56.8	70-130	Fail

Table 11: Analytes not determined for matrix spikes.

QC_Lot	Analyte	ALS_QC_ID[1]
643175	ammonia, total (as N)	Anonymous
646851	calcium, total	Anonymous
646851	magnesium, total	Anonymous
646851	molybdenum, total	Anonymous
646851	potassium, total	Anonymous
646851	sodium, total	Anonymous
646851	strontium, total	Anonymous
646851	sulfur, total	Anonymous
647341	barium, dissolved	Anonymous
647341	calcium, dissolved	Anonymous
647341	magnesium, dissolved	Anonymous
647341	potassium, dissolved	Anonymous
647341	sodium, dissolved	Anonymous
647341	strontium, dissolved	Anonymous
647341	sulfur, dissolved	Anonymous
647338	calcium, dissolved	Anonymous
647338	magnesium, dissolved	Anonymous
647338	molybdenum, dissolved	Anonymous
647338	potassium, dissolved	Anonymous
647338	sodium, dissolved	Anonymous
647338	strontium, dissolved	Anonymous
647338	sulfur, dissolved	Anonymous

QC_Lot	Analyte	ALS_QC_ID[1]
642465	phosphorus, total	Anonymous
642467	Kjeldahl nitrogen, total [TKN]	Anonymous
641586	aluminum, total	Anonymous
641586	barium, total	Anonymous
641586	calcium, total	Anonymous
641586	copper, total	Anonymous
641586	magnesium, total	Anonymous
641586	manganese, total	Anonymous
641586	molybdenum, total	Anonymous
641586	potassium, total	Anonymous
641586	silicon, total	Anonymous
641586	sodium, total	Anonymous
641586	strontium, total	Anonymous
641586	sulfur, total	Anonymous
641588	calcium, total	Anonymous
641588	magnesium, total	Anonymous
641588	strontium, total	Anonymous
644485	barium, dissolved	MAM-76
644485	calcium, dissolved	MAM-76
644485	magnesium, dissolved	MAM-76
644485	potassium, dissolved	MAM-76
644485	sodium, dissolved	MAM-76
644485	strontium, dissolved	MAM-76
641089	calcium, dissolved	Anonymous
641089	magnesium, dissolved	Anonymous
641089	strontium, dissolved	Anonymous
650728	ammonia, total (as N)	Anonymous
654344	silicate (as SiO2)	Anonymous

QC_Lot	Analyte	ALS_QC_ID[1]
650947	calcium, total	Anonymous
650947	magnesium, total	Anonymous
650947	sodium, total	Anonymous
650947	strontium, total	Anonymous
650947	sulfur, total	Anonymous
650976	magnesium, total	BPJ-84 BPJ-84
651741	calcium, dissolved	Anonymous
651741	magnesium, dissolved	Anonymous
651741	sodium, dissolved	Anonymous
651741	strontium, dissolved	Anonymous
651741	sulfur, dissolved	Anonymous
654344	silicate (as SiO2)	Anonymous
650732	carbon, total organic [TOC]	Anonymous
650976	magnesium, total	Anonymous
651797	barium, dissolved	Anonymous
651797	boron, dissolved	Anonymous
651797	calcium, dissolved	Anonymous
651797	lithium, dissolved	Anonymous
651797	magnesium, dissolved	Anonymous
651797	manganese, dissolved	Anonymous
651797	molybdenum, dissolved	Anonymous
651797	potassium, dissolved	Anonymous
651797	rubidium, dissolved	Anonymous
651797	sodium, dissolved	Anonymous
651797	strontium, dissolved	Anonymous
651797	sulfur, dissolved	Anonymous
671421	calcium, total	Anonymous
671421	magnesium, total	Anonymous

QC_Lot	Analyte	ALS_QC_ID[1]
671421	sodium, total	Anonymous
671421	strontium, total	Anonymous
667131	arsenic, dissolved	Anonymous
667131	boron, dissolved	Anonymous
667131	calcium, dissolved	Anonymous
667131	magnesium, dissolved	Anonymous
667131	potassium, dissolved	Anonymous
667131	rubidium, dissolved	Anonymous
667131	sodium, dissolved	Anonymous
667131	strontium, dissolved	Anonymous
667131	sulfur, dissolved	Anonymous
670701	calcium, dissolved	Anonymous
670701	magnesium, dissolved	Anonymous
670701	sodium, dissolved	Anonymous
670701	strontium, dissolved	Anonymous
674714	barium, dissolved	Anonymous
674714	calcium, dissolved	Anonymous
674714	magnesium, dissolved	Anonymous
674714	strontium, dissolved	Anonymous
674714	sulfur, dissolved	Anonymous
667394	barium, dissolved	Anonymous
667394	boron, dissolved	Anonymous
667394	calcium, dissolved	Anonymous
667394	iron, dissolved	Anonymous
667394	magnesium, dissolved	Anonymous
667394	manganese, dissolved	Anonymous
667394	silicon, dissolved	Anonymous
667394	sodium, dissolved	Anonymous

QC_Lot	Analyte	ALS_QC_ID[1]
667394	strontium, dissolved	Anonymous
676187	calcium, dissolved	Anonymous
676187	magnesium, dissolved	Anonymous
676187	potassium, dissolved	Anonymous
676187	sodium, dissolved	Anonymous
676187	strontium, dissolved	Anonymous
676187	sulfur, dissolved	Anonymous

[1]ALS_QC_ID listing of 'Anonymous' indicates QC sample from another client used.

3.5 Matrix Blank

All matrix blank results met laboratory QC objectives.

3.6 Field Duplicates

In this sampling event, 15 field duplicate samples failed to meet the QC objectives. Field duplicate sample results not meeting QC objectives are summarized in Table 12.

Table 12: Details for field duplicate results not meeting QC objectives.

QC_Lot.x	Analyte	RPD	DIFFx	FD.QC
	hardness (as CaCO3), from total Ca/Mg	51.4	38.0	Fail
641586	antimony, total	174.4	13.6	Fail
641586	arsenic, total	41.4	4.7	Fail
641586	calcium, total	46.8	119.0	Fail
641586	magnesium, total	62.5	384.0	Fail
641586	manganese, total	93.8	79.8	Fail
641586	molybdenum, total	172.8	23.4	Fail
641586	potassium, total	88.0	50.0	Fail
641586	rubidium, total	63.2	12.2	Fail
641586	sodium, total	120.8	56.3	Fail
641586	strontium, total	64.3	287.0	Fail

QC_Lot.x	Analyte	RPD	DIFFx	FD.QC
641586	sulfur, total	130.0	11.6	Fail
641586	uranium, total	172.9	21.7	Fail
650976	iron, total	45.5	3.3	Fail
651797	manganese, dissolved	35.9	3.9	Fail

3.7 DI Blank

In this sampling event, 2 deionized water blank samples failed to meet the QC objectives. Deionized water blank results not meeting QC objectives are summarized in Table 14.

Table 14: Details for deionized water blank results not meeting QC objectives.

QC_Lot	ID	Analyte	Results	DL	FB.QC
662825	DI	ammonia, total (as N)	0.008600	0.00500	Fail
667394	DI	molybdenum, dissolved	0.000079	0.00005	Fail

3.8 Equipment Blank

In this sampling event, 3 equipment blank samples failed to meet the QC objectives. Equipment blank results not meeting QC objectives are summarized in Table 13.

Table 13: Details for equipment blank results not meeting QC objectives.

QC_Lot	ID	Analyte	Results	DL	FB.QC
671424	EB	aluminum, total	0.00520	0.0030	Fail
671424	EB	magnesium, total	0.00570	0.0050	Fail
671424	EB	manganese, total	0.00013	0.0001	Fail

3.9 Travel Blank

All travel blank results met laboratory QC objectives.

3.10 Holding Time Exceedances

In addition to those ALS laboratory QC samples described above, during QC screening samples were also assessed agianst recommended hold times. Parameters and associated sample numbers exceeding recommended hold times in this sampling event are shown in Table 15. Note that pH is included in the suite of field measurements and has a very short recommended hold time, so exceeding the hold time for laboratory analysis is expected and of little importance.

Table 15: Analytes and associated number of samples exceeding holding times.

ALS_Method	n
Dissolved Orthophosphate by Colourimetry (Ultra Trace Level 0.001 mg/L)	43
Nitrate in Water by IC (Low Level)	43
Nitrite in Water by IC (Low Level)	43
pH by Meter	43
Turbidity by Nephelometry	43
TDS by Gravimetry (Low Level)	14
TSS by Gravimetry (Low Level)	13
ALS Method Description	7
Alkalinity Species by Titration	4
Free Cyanide (Low Level)	1
Total Cyanide (Low Level)	1

APPENDIX B
WATER CHEMISTRY DATA AND SUPPLEMENTAL PLOTS

Appendix B1
Water Chemistry – Meadowbank Study Area Lakes

LIST OF TABLES

LIST OF FIGURES

Note: Water quality results in Meadowbank study area lakes dating as far back as the start of baseline sampling in 2006 are shown in each figure.

TABLES

Table B1-1. Water quality results from the 2022 CREMP, Meadowbank study area lakes.

Lake & Area	Aquatic Life Guideline[1]	Meadowbank Screening Values[2]			Inuggugayualik Lake (INUG)									
Month					March	March	May	May	July	July	August	August	September	September
Area-Replicate ID					INUG-138	INUG-139	INUG-140	INUG-141	INUG-142	INUG-143	INUG-144	INUG-145	INUG-146	INUG-147
Date		Triggers		Thresholds	07-Mar-2022	07-Mar-2022	06-May-2022	06-May-2022	09-Jul-2022	09-Jul-2022	14-Aug-2022	14-Aug-2022	11-Sep-2022	11-Sep-2022
Time		Meadowbank	Wally Lake		00:00	00:00	10:30	11:00	12:20	12:54	11:00	10:30	15:50	15:15
ALS Sample ID					VA22A5201-015	VA22A5201-016	VA22B0666-009	VA22B0666-010	VA22B6388-001	VA22B6388-002	VA22B9759-009	VA22B9759-010	VA22C2783-001	VA22C2783-002
Field Measurements (Surface 3m)														
Dissolved Oxygen (mg/L)					18	20	16	16	13	12	10	10	12	12
Specific Conductivity (µS/cm)					18	19	19	18	15	15	11	11	15	15
pH	6.5 - 9.0	6.4-8.15	6.54 - 8.34	6.5 - 9.0	**6.1**	7.7	6.9	6.7	6.6	6.6	6.6	**6.3**	6.8	6.8
Temperature (°C)					0.57	0.60	1.1	1.0	9.6	13	13	13	9.4	8.1
Physical Tests (mg/L)														
Conductivity (µS/cm)		27	37		18	19	22	19	16	16	17	16	17	17
Alkalinity - Total (as $CaCO_3$)		8.7	18		**9.4**	6.7	6.7	5.9	5.2	5.1	5.5	5.5	5.5	5.6
Alkalinity - Bicarbonate		8.7	18		**9.4**	6.7	6.7	5.9	5.2	5.1	5.5	5.5	5.5	5.6
Alkalinity - Carbonate		2.0	2.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity - Hydroxide					<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness (as CaCO3), dissolved		9.5	17		7.1	7.5	7.7	7.2	5.9	5.7	5.9	5.9	5.9	6.0
Hardness (as CaCO3), from total Ca/Mg					7.0	7.4	8.0	7.2	9.0	5.7	6.1	6.1	6.1	6.0
pH (Laboratory)	6.47-7.95	6.47-7.95	6.92 - 8.17	6.5 - 9.0	6.9	7.0	7.0	6.9	6.8	6.8	6.9	6.8	6.8	6.8
Total Dissolved Solids		19	25		11	12	16	12	14	14	11	12	14	14
Total Suspended Solids		3.0	3.0	5.0	<1.0	<1.0	<1.0	1.2	<1.0	<1.0	<1.0	1.6	<1.0	<1.0
Turbidity (NTU)					0.11	0.12	<0.10	<0.10	0.20	0.21	0.24	0.27	0.27	0.26
Anions and Nutrients (mg/L)														
Total Kjeldahl Nitrogen		0.17	0.16		0.16	0.14	0.14	0.13	0.11	0.11	0.10	0.10	0.15	0.13
Ammonia (as N)[3]	***equation***	0.065	0.067	0.13	0.016	0.015	0.018	0.016	<0.0050	<0.0050	0.0052	<0.0050	<0.0050	<0.0050
Bromide					<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride	120	60	60	120	0.82	0.87	0.96	0.84	0.72	0.70	0.73	0.72	0.79	0.76
Fluoride	0.12	0.088	0.080	0.12	0.063	0.073	0.071	0.064	0.053	0.053	0.059	0.058	0.067	0.064
Nitrate (as N)	3.0	1.5	1.5	3.0	0.0057	<0.0050	0.011	0.014	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	0.06	0.031	0.031	0.060	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Ortho Phosphate (as P)		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P) - Total	0.01	0.0051	0.0067	0.010	<0.0020	<0.0020	<0.0020	0.0021	0.0026	0.0035	0.0024	<0.0020	0.0034	0.0034
Phosphorus (P) - Total Diss.					<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0023	0.0022
Reactive Silica (as SiO_2)		1.0	1.1		<0.50	<0.50	0.52	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sulphate (SO_4)		65	65	128	1.1	1.2	1.3	1.1	0.93	0.88	0.87	0.85	1.0	0.93
Cyanides (mg/L)														
Free Cyanide	0.005				<0.0010		<0.0010		<0.0010		<0.0010		<0.0010	
Total Cyanide					<0.0010		<0.0010		<0.0010		<0.0010		<0.0010	
Organic / Inorganic Carbon (mg/L)														
Dissolved Organic Carbon		2.5	3.2		**2.5**	**2.9**	**2.8**	**2.6**	2.0	2.0	2.2	2.3	2.1	2.2
Total Organic Carbon		2.6	4.1		**3.4**	**2.8**	2.6	2.6	2.1	2.2	2.3	2.4	2.2	2.1
Total Metals (mg/L)														
Aluminum[3]	***equation***	0.053	0.053	0.10	0.0082	0.0077	0.0095	0.0076	0.0041	0.0090	0.0091	0.0086	0.0096	0.0091
Antimony		0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.005	0.0026	0.0026	0.0050	0.00013	0.00012	0.00017	0.00015	0.00020	0.00013	0.00015	0.00016	0.00012	0.00012
Barium		0.50	0.50	1.0	0.0022	0.0023	0.0026	0.0022	0.0028	0.0019	0.0018	0.0018	0.0017	0.0018
Beryllium		0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth					<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	1.5	0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium[3]	***equation***	0.00002	0.00002	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		2.4	4.9		1.4	1.5	1.6	1.4	2.2	1.2	1.2	1.2	1.2	1.2
Chromium[4]	0.001	0.0025	0.0026	0.0050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt	0.00077			0.00077	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper[3]	***equation***	0.0012	0.0015	0.0020	<0.00050	<0.00050	0.00089	0.00057	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron	0.3	0.15	0.16	0.30	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	0.019	0.017	0.019	0.017
Lead[3]	***equation***	0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	0.00005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		0.93	1.4		0.87	0.91	**0.98**	0.87	0.88	0.70	0.76	0.76	0.76	0.74
Manganese[3]		0.32	0.33	***See text***	0.00087	0.00093	0.00099	0.00096	0.0011	0.0024	0.0020	0.0021	0.0018	0.0016
Mercury	0.000026	0.00002	0.00002	0.00003	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.073	0.037	0.037	0.073	<0.000050	<0.000050	<0.000050	<0.000050	0.00009	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Nickel[3]	***equation***	0.013	0.013	0.025	0.00073	0.00054	<0.00050	<0.00050	<0.00050	<0.00050	0.00052	0.00094	<0.00050	<0.00050
Phosphorus		0.0051	0.0067	0.0040	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.58	0.59		0.44	0.46	0.54	0.48	0.49	0.38	0.43	0.43	0.40	0.38
Rubidium					0.00063	0.00068	0.00067	0.00060	0.00068	0.00050	0.00063	0.00057	0.00060	0.00057
Selenium	0.001	0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00005
Silicon		0.20	0.65		**0.24**	**0.26**	**0.29**	**0.26**	0.10	0.20	0.20	0.19	0.17	0.17
Silver	0.0001	0.00013	0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1.2	0.72		0.66	0.70	0.77	0.67	0.97	0.54	0.59	0.60	0.58	0.57
Strontium		1.25	1.26	2.5	0.0076	0.0080	0.0088	0.0078	0.011	0.0065	0.0065	0.0066	0.0070	0.0072
Sulfur					<0.50	<0.50	0.67	0.55	1.4	<0.50	<0.50	<0.50	<0.50	<0.50
Tellurium					<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium	0.0008	0.00041	0.00041	0.00080	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thorium					<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin		0.00020	0.00020		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.00060	0.00060		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten					<0.00010	<0.00010	<0.00010	<0.00010	0.00017	0.00014	<0.00010	<0.00010	<0.00010	<0.00010
Uranium	0.015	0.0075	0.0075	0.015	0.00006	0.00007	0.00009	0.00008	0.00004	0.00007	0.00007	0.00007	0.00006	0.00006
Vanadium		0.060	0.060	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc				0.0040	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium					<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Metals (mg/L)														
Aluminum[3]		0.026	0.026	0.050	0.0073	0.0078	0.0071	0.0055	0.0057	0.0074	0.0040	0.0044	0.0026	0.0029
Antimony		0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic		0.0026	0.0026	0.0050	0.00010	0.00012	0.00012	0.00013	0.00010	<0.00010	<0.00010	0.00014	<0.00010	<0.00010
Barium		0.50	0.50	1.0	0.0020	0.0022	0.0024	0.0022	0.0019	0.0019	0.0018	0.0017	0.0017	0.0017
Beryllium		0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth					<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron		0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium		0.00002	0.00002	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		2.4	4.9		1.4	1.5	1.6	1.5	1.2	1.1	1.2	1.1	1.2	1.2
Chromium		0.00026	0.00026	0.0050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt				0.00077	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper		0.0012	0.0015	0.0020	0.00042	0.00047	0.00065	0.00050	0.00040	0.00042	0.00044	0.00046	0.00040	0.00043
Iron		0.16	0.16	0.30	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Lead		0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		0.93	1.4		0.87	0.93	0.87	0.83	0.72	0.70	0.73	0.74	0.72	0.74
Manganese[3]		0.32	0.33	***See text***	0.00017	0.00019	0.00039	0.00032	0.0016	0.0020	0.00068	0.00060	0.00055	0.00060
Mercury		0.00002	0.00002	0.00003	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum		0.037	0.037	0.073	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Nickel		0.013	0.013	0.025	0.00053	0.00055	0.00058	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus					<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.58	0.59		0.46	0.47	0.49	0.46	0.38	0.38	0.40	0.42	0.41	0.42
Selenium		0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.18	0.67		**0.23**	**0.25**	**0.26**	**0.24**	0.16	0.18	0.15	0.16	0.13	0.14
Silver		0.00013	0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1.2	0.72		0.69	0.72	0.72	0.66	0.54	0.54	0.62	0.62	0.58	0.59
Strontium		1.3	1.3	2.5	0.0081	0.0084	0.0087	0.0079	0.0066	0.0064	0.0069	0.0065	0.0069	0.0068
Sulfur					<0.50	<0.50	<0.50	0.54	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Thallium		0.00041	0.00041	0.00080	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin		0.00020	0.00020		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.00060	0.00060		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Uranium		0.0075	0.0075	0.015	0.00007	0.00009	0.00009	0.00008	0.00007	0.00008	0.00006	0.00006	0.00006	0.00005
Vanadium		0.060	0.060	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc[3]		0.0018	0.0024	***See text***	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Speciated Metals (µg/L)														
Arsenate (As V)					<0.020			<0.020		<0.020		<0.020		<0.020
Arsenite (As III)					0.026			0.022		<0.020		<0.020		<0.020
Arsenobetaine (AsB)					<0.050			<0.050		<0.050		<0.050		<0.050
Dimethylarsinic Acid (DMA)					<0.020			<0.020		<0.020		<0.020		<0.020
Monomethylarsonic Acid (MMA)					<0.020			<0.020		<0.020		<0.020		<0.020
Plant Pigments (µg/L)														
chlorophyll a					0.26	0.65		0.70	0.20	0.17	0.52	0.54	0.94	0.59

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.
2. Trigger and threshold values were developed in *CREMP Design Document 2012* (Azimuth, 2012d) and updated in 2019. A number of thresholds were derived from methods (or sources) other than CCME guidelines. Refer to the CREMP: 2022 Plan Update (Azimuth, 2022b) for more details.
3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

123 Bolded concentrations exceed the trigger value.

123 Bolded and shaded concentrations also exceed the threshold value.

Italicized numbers are below detection limits.

underline = results were given a cautionary flag in the QC assessment (refer to **Section 3.3** for details).

~~strikethrough~~ = results flagged as unreliable in the QC assessment.

Table B1-1. Water quality results from the 2022 CREMP, Meadowbank study area lakes.

Lake & Area	Aquatic Life Guideline[1]	Meadowbank Screening Values[2]			Pipe Dream Lake (PDL)									
Month					March	March	May	May	July	July	August	August	September	September
Area-Replicate ID					PDL-103	PDL-104	PDL-105	PDL-106	PDL-107	PDL-108	PDL-109	PDL-110	PDL-111	PDL-112
Date		Triggers		Thresholds	12-Mar-2022	12-Mar-2022	06-May-2022	06-May-2022	19-Jul-2022	19-Jul-2022	15-Aug-2022	15-Aug-2022	14-Sep-2022	14-Sep-2022
Time		Meadowbank	Wally Lake		13:35	12:50	16:00	15:00	10:52	11:31	02:17	14:20	15:45	15:00
ALS Sample ID					VA22A5756-003	VA22A5756-004	VA22B0666-011	VA22B0666-012	VA22B7054-010	VA22B7054-011	VA22B9759-005	VA22B9759-006	VA22C2783-003	VA22C2783-004
Field Measurements (Surface 3m)														
Dissolved Oxygen (mg/L)					19	17	16	16	13	12	11	11	12	11
Specific Conductivity (µS/cm)					28	30	28	29	18	18	21	21	23	23
pH	6.5 - 9.0	6.4-8.15	6.54 - 8.34	6.5 - 9.0	**6.4**	**6.3**	6.7	6.8	6.7	6.8	7.0	**6.4**	7.2	7.1
Temperature (°C)					0.67	0.76	0.98	1.1	8.7	9.1	13	12	8.4	8.8
Physical Tests (mg/L)														
Conductivity (µS/cm)		27	37		**28**	**32**	**29**	**29**	23	23	24	23	24	24
Alkalinity - Total (as $CaCO_3$)		8.7	18		**10**	**12**	**9.9**	**9.7**	8.3	8.2	8.7	8.4	7.9	8.3
Alkalinity - Bicarbonate		8.7	18		**10**	**12**	**9.9**	**9.7**	8.3	8.2	8.7	8.4	7.9	8.3
Alkalinity - Carbonate		2.0	2.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity - Hydroxide					<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness (as CaCO3), dissolved		9.5	17		**11**	**12**	**11**	**11**	9.5	9.5	9.5	9.5	**9.6**	**9.7**
Hardness (as CaCO3), from total Ca/Mg					11	12	12	12	9.3	9.3	9.4	9.5	9.8	9.7
pH (Laboratory)	6.47-7.95	6.47-7.95	6.92 - 8.17	6.5 - 9.0	7.2	7.3	7.1	7.1	7.1	7.1	7.2	7.1	7.0	7.0
Total Dissolved Solids		19	25		17	**20**	16	17	16	15	15	15	18	19
Total Suspended Solids		3.0	3.0	5.0	<1.0	<1.0	1.4	1.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Turbidity (NTU)					0.13	<0.10	<0.10	<0.10	0.16	0.12	0.15	0.13	0.22	0.18
Anions and Nutrients (mg/L)														
Total Kjeldahl Nitrogen		0.17	0.16		0.11	0.12	0.11	0.13	0.094	0.093	0.083	0.080	0.11	0.11
Ammonia (as N)[3]	***equation***	0.065	0.067	0.13	0.011	0.011	0.014	0.0073	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Bromide					<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride	120	60	60	120	0.85	1.0	0.81	0.82	0.71	0.70	0.67	0.67	0.74	0.72
Fluoride	0.12	0.088	0.080	0.12	0.044	0.050	0.043	0.044	0.041	0.042	0.036	0.035	0.043	0.041
Nitrate (as N)	3.0	1.5	1.5	3.0	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	0.06	0.031	0.031	0.060	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Ortho Phosphate (as P)		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P) - Total	0.01	0.0051	0.0067	0.010	<0.0020	0.0023	<0.0020	<0.0020	<0.0020	0.0022	<0.0020	<0.0020	0.0024	0.0023
Phosphorus (P) - Total Diss.					<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0034	<0.0020	<0.0020	<0.0020	0.0020
Reactive Silica (as SiO_2)		1.0	1.1		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sulphate (SO_4)		65	65	128	2.3	2.7	2.2	2.2	1.9	1.9	1.8	1.8	1.9	1.9
Cyanides (mg/L)														
Free Cyanide	0.005				<0.0010		<0.0010		<0.0010		<0.0010		<0.0010	
Total Cyanide					<0.0010		<0.0010		<0.0010		<0.0010		<0.0010	
Organic / Inorganic Carbon (mg/L)														
Dissolved Organic Carbon		2.5	3.2		2.4	2.0	2.2	2.0	1.7	1.8	1.9	1.9	1.8	1.7
Total Organic Carbon		2.6	4.1		1.7	2.2	1.9	2.1	1.7	1.8	1.9	1.8	1.7	1.7
Total Metals (mg/L)														
Aluminum[3]	***equation***	0.053	0.053	0.10	0.0035	0.0036	0.0040	0.0035	0.0053	0.0048	0.0053	0.0042	0.0066	0.0053
Antimony		0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.005	0.0026	0.0026	0.0050	0.00022	0.00023	0.00024	0.00022	0.00030	0.00028	0.00021	0.00020	0.00020	0.00019
Barium		0.50	0.50	1.0	0.0021	0.0025	0.0024	0.0025	0.0020	0.0020	0.0020	0.0020	0.0020	0.0019
Beryllium		0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth					<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	1.5	0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium[3]	***equation***	0.00002	0.00002	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		2.4	4.9		**2.8**	**3.0**	**3.0**	**3.0**	2.4	2.3	2.4	2.4	**2.5**	**2.5**
Chromium[4]	0.001	0.0025	0.0026	0.0050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt	0.00077			0.00077	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper[3]	***equation***	0.0012	0.0015	0.0020	<0.00050	0.00051	0.00064	0.00065	0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron	0.3	0.15	0.16	0.30	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Lead[3]	***equation***	0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		0.93	1.4		**0.94**	**1.1**	**1.0**	**1.0**	0.84	0.84	0.86	0.87	0.88	0.86
Manganese[3]		0.32	0.33	***See text***	0.00032	0.00028	0.00046	0.00045	0.0013	0.0012	0.00087	0.00082	0.00097	0.00092
Mercury	0.000026	0.00002	0.00002	0.00003	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.073	0.037	0.037	0.073	0.00006	0.00006	0.00006	0.00006	<0.000050	<0.000050	<0.000050	0.00005	0.00006	0.00006
Nickel[3]	***equation***	0.013	0.013	0.025	0.00067	0.00076	0.00057	0.00052	0.00064	0.00067	0.00060	0.00064	0.00062	0.00059
Phosphorus		0.0051	0.0067	0.0040	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.58	0.59		0.38	0.44	0.46	0.47	0.36	0.36	0.40	0.40	0.37	0.36
Rubidium					0.00050	0.00058	0.00052	0.00051	0.00045	0.00043	0.00047	0.00043	0.00050	0.00044
Selenium	0.001	0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00006	<0.000050
Silicon		0.20	0.65		0.20	**0.23**	**0.21**	0.20	0.19	0.19	0.18	0.17	0.18	0.17
Silver	0.0001	0.00013	0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1.2	0.72		0.58	0.68	0.62	0.62	0.51	0.51	0.53	0.54	0.52	0.51
Strontium		1.25	1.26	2.5	0.011	0.012	0.012	0.012	0.0097	0.0097	0.011	0.010	0.011	0.011
Sulfur					1.0	1.2	0.83	0.90	0.57	0.57	<0.50	<0.50	0.60	0.58
Tellurium					<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium	0.0008	0.00041	0.00041	0.00080	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thorium					<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin		0.00020	0.00020		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.00060	0.00060		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten					<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium	0.015	0.0075	0.0075	0.015	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003
Vanadium		0.060	0.060	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc				0.0040	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium					<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Metals (mg/L)														
Aluminum[3]		0.026	0.026	0.050	0.0014	0.0014	0.0022	0.0021	0.0019	0.0018	0.0017	0.0017	0.0012	0.0015
Antimony		0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic		0.0026	0.0026	0.0050	0.00021	0.00021	0.00016	0.00018	0.00015	0.00016	0.00018	0.00018	0.00016	0.00018
Barium		0.50	0.50	1.0	0.0023	0.0026	0.0023	0.0024	0.0020	0.0020	0.0020	0.0019	0.0020	0.0020
Beryllium		0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth					<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron		0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium		0.00002	0.00002	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		2.4	4.9		**2.7**	**3.0**	**2.9**	**2.9**	**2.4**	2.4	2.4	2.4	**2.4**	**2.4**
Chromium		0.00026	0.00026	0.0050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt				0.00077	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper		0.0012	0.0015	0.0020	0.00045	0.00048	0.00048	0.00051	0.00046	0.00049	0.00044	0.00044	0.00046	0.00043
Iron		0.16	0.16	0.30	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Lead		0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		0.93	1.4		**0.96**	**1.1**	**1.0**	**1.0**	0.84	0.85	0.87	0.86	0.88	0.88
Manganese[3]		0.32	0.33	***See text***	0.00011	0.00014	0.00011	0.00011	0.00062	0.00067	0.00036	0.00036	0.00026	0.00021
Mercury		0.00002	0.00002	0.00003	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum		0.037	0.037	0.073	0.00006	0.00006	0.00006	0.00006	<0.000050	<0.000050	0.00005	<0.000050	0.00006	0.00005
Nickel		0.013	0.013	0.025	0.00067	0.00076	0.00072	0.00070	0.0012	0.00068	0.00058	0.00058	0.00057	0.00054
Phosphorus					<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.58	0.59		0.40	0.45	0.44	0.44	0.37	0.37	0.38	0.37	0.40	0.40
Selenium		0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.18	0.67		0.17	**0.18**	**0.18**	0.17	0.15	0.14	0.16	0.13	0.14	0.13
Silver		0.00013	0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1.2	0.72		0.57	0.63	0.60	0.61	0.53	0.54	0.52	0.51	0.53	0.53
Strontium		1.3	1.3	2.5	0.011	0.012	0.012	0.012	0.0098	0.0100	0.010	0.010	0.010	0.011
Sulfur					<0.50	0.59	0.75	0.86	0.59	0.53	<0.50	<0.50	<0.50	0.50
Thallium		0.00041	0.00041	0.00080	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin		0.00020	0.00020		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.00060	0.00060		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Uranium		0.0075	0.0075	0.015	0.00002	0.00002	0.00003	0.00004	0.00003	0.00003	0.00003	0.00003	0.00003	0.00003
Vanadium		0.060	0.060	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc[3]		0.0018	0.0024	***See text***	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Speciated Metals (µg/L)														
Arsenate (As V)						0.042		<0.020		<0.020		<0.020		<0.020
Arsenite (As III)						0.045		0.062		0.053		0.051		0.030
Arsenobetaine (AsB)						<0.050		<0.050		<0.050		<0.050		<0.050
Dimethylarsinic Acid (DMA)						<0.020		<0.020		0.022		<0.020		<0.020
Monomethylarsonic Acid (MMA)						<0.020		<0.020		<0.020		<0.020		<0.020
Plant Pigments (µg/L)														
chlorophyll a					<0.010	<0.010	1.2	1.1	0.29	0.19	0.24	0.27	0.93	0.98

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.
2. Trigger and threshold values were developed in *CREMP Design Document 2012* (Azimuth, 2012d) and updated in 2019. A number of thresholds were derived from methods (or sources) other than CCME guidelines. Refer to the CREMP: 2022 Plan Update (Azimuth, 2022b) for more details.
3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

123 Bolded concentrations exceed the trigger value.

123 Bolded and shaded concentrations also exceed the threshold value.

Italicized numbers are below detection limits.

underline = results were given a cautionary flag in the QC assessment (refer to **Section 3.3** for details).

~~strikethrough~~ = results flagged as unreliable in the QC assessment.

Table B1-1. Water quality results from the 2022 CREMP, Meadowbank study area lakes.

Lake & Area	Aquatic Life Guideline[1]	Meadowbank Screening Values[2]			Third Portage Lake - East Basin (TPE)									
Month					March	March	May	May	July	July	August	August	September	September
Area-Replicate ID					TPE-150	TPE-151	TPE-152	TPE-153	TPE-154	TPE-155	TPE-156	TPE-157	TPE-158	TPE-159
Date		Triggers		Thresholds	02-Mar-2022	02-Mar-2022	11-May-2022	11-May-2022	05-Jul-2022	05-Jul-2022	18-Aug-2022	18-Aug-2022	02-Sep-2022	02-Sep-2022
Time		Meadowbank	Wally Lake		00:00	00:00	09:50	10:15	13:15	13:40	00:00	00:00	13:37	14:22
ALS Sample ID					VA22A5201-006	VA22A5201-005	VA22B0666-003	VA22B0666-004	VA22B5785-001	VA22B5785-002	VA22B9756-003	VA22B9756-004	VA22C1353-005	VA22C1353-006
Field Measurements (Surface 3m)														
Dissolved Oxygen (mg/L)					18	18	18	16	13	13	11	11	12	12
Specific Conductivity (µS/cm)					32	32	39	35	27	27	23	24	29	29
pH	6.5 - 9.0	6.4-8.15	6.54 - 8.34	6.5 - 9.0	7.1	**6.3**	7.1	7.0	6.9	6.8	7.1	7.1	7.1	7.1
Temperature (°C)					0.49	0.46	1.1	0.95	7.3	7.4	13	13	9.3	9.2
Physical Tests (mg/L)														
Conductivity (µS/cm)		27	37		**34**	**37**	**39**	**36**	**29**	**28**	**29**	**29**	**29**	**30**
Alkalinity - Total (as $CaCO_3$)		8.7	18		8.4	**9.3**	**9.3**	8.5	7.8	7.4	7.8	7.8	7.3	7.0
Alkalinity - Bicarbonate		8.7	18		8.4	**9.3**	**9.3**	8.5	7.8	7.4	7.8	7.8	7.3	7.0
Alkalinity - Carbonate		2.0	2.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity - Hydroxide					<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness (as CaCO3), dissolved		9.5	17		**13**	**14**	**13**	**12**	**10.0**	**9.6**	**9.7**	**10.0**	**10**	**10**
Hardness (as CaCO3), from total Ca/Mg					13	15	14	12	10	9.8	10	10	10	10
pH (Laboratory)	6.47-7.95	6.47-7.95	6.92 - 8.17	6.5 - 9.0	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
Total Dissolved Solids		19	25		18	**21**	**21**	**19**	18	17	19	18	19	**20**
Total Suspended Solids		3.0	3.0	5.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Turbidity (NTU)					<0.10	<0.10	<0.10	<0.10	0.28	0.20	0.15	0.17	0.25	0.26
Anions and Nutrients (mg/L)														
Total Kjeldahl Nitrogen		0.17	0.16		0.12	0.13	0.11	0.10	0.084	0.084	0.090	0.11	0.059	0.13
Ammonia (as N)[3]	***equation***	0.065	0.067	0.13	0.011	0.013	0.016	0.015	<0.0050	<0.0050	<0.0050	0.018	<0.0050	<0.0050
Bromide					<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride	120	60	60	120	0.89	1.0	0.98	0.90	0.73	0.70	0.71	0.71	0.72	0.76
Fluoride	0.12	0.088	0.080	0.12	**0.089**	**0.094**	**0.091**	0.082	0.072	0.068	0.066	0.068	0.076	0.079
Nitrate (as N)	3.0	1.5	1.5	3.0	<0.0050	0.0061	0.0099	0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	0.06	0.031	0.031	0.060	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Ortho Phosphate (as P)		0.0020	0.0020		0.0012	0.0014	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P) - Total	0.01	0.0051	0.0067	0.010	0.0022	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0025	0.0024	<0.0020
Phosphorus (P) - Total Diss.					<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0022	<0.0020
Reactive Silica (as SiO_2)		1.0	1.1		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sulphate (SO_4)		65	65	128	5.4	5.9	6.0	5.5	4.6	4.3	4.4	4.4	4.5	4.6
Cyanides (mg/L)														
Free Cyanide	0.005				<0.0010			<0.0020	<0.0010		<0.0010			<0.0010
Total Cyanide					<0.0010			0.0029	<0.0010		<0.0010			<0.0010
Organic / Inorganic Carbon (mg/L)														
Dissolved Organic Carbon		2.5	3.2		1.7	2.2	1.7	1.6	1.3	1.0	1.4	2.2	2.0	2.1
Total Organic Carbon		2.6	4.1		1.6	1.8	1.8	1.6	1.5	1.3	1.5	1.6	1.5	1.4
Total Metals (mg/L)														
Aluminum[3]	***equation***	0.053	0.053	0.10	0.0030	0.0054	0.0035	<0.0030	0.0071	0.0066	0.0072	0.0073	0.0088	0.0066
Antimony		0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.005	0.0026	0.0026	0.0050	0.00053	0.00054	0.00049	0.00042	0.00056	0.00052	0.00054	0.00062	0.00057	0.00056
Barium		0.50	0.50	1.0	0.0036	0.0050	0.0040	0.0036	0.0028	0.0028	0.0027	0.0027	0.0026	0.0027
Beryllium		0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth					<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	1.5	0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium[3]	***equation***	0.00002	0.00002	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		2.4	4.9		**3.1**	**3.4**	**3.4**	**3.1**	**2.5**	2.4	**2.5**	**2.6**	**2.5**	**2.5**
Chromium[4]	0.001	0.0025	0.0026	0.0050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt	0.00077			0.00077	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper[3]	***equation***	0.0012	0.0015	0.0020	<0.00050	0.00062	0.00075	0.00071	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron	0.3	0.15	0.16	0.30	<0.010	<0.010	<0.010	<0.010	0.013	0.012	0.012	0.012	0.019	0.012
Lead[3]	***equation***	0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		0.93	1.4		**1.3**	**1.6**	**1.3**	**1.1**	**0.94**	**0.94**	**0.98**	**0.97**	**0.94**	**0.98**
Manganese[3]		0.32	0.33	***See text***	0.00051	0.00060	0.00059	0.00047	0.0016	0.0017	0.0011	0.0010	0.0011	0.0010
Mercury	0.000026	0.00002	0.00002	0.00003	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.073	0.037	0.037	0.073	0.00014	0.00015	0.00015	0.00012	0.00010	0.00010	0.00012	0.00012	0.00014	0.00012
Nickel[3]	***equation***	0.013	0.013	0.025	0.00064	0.00084	0.00057	0.00053	0.00064	0.00065	0.00056	<0.00050	<0.00050	0.00050
Phosphorus		0.0051	0.0067	0.0040	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.58	0.59		**0.64**	**0.86**	**0.71**	**0.61**	0.50	0.50	0.53	0.53	0.55	0.58
Rubidium					0.00092	0.0014	0.0011	0.00088	0.00072	0.00076	0.00088	0.00088	0.00083	0.00096
Selenium	0.001	0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.20	0.65		0.13	0.16	0.15	0.16	0.14	0.16	0.12	0.12	0.11	0.12
Silver	0.0001	0.00013	0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1.2	0.72		**1.3**	**1.7**	**1.3**	**1.2**	0.90	0.91	1.0	0.99	0.94	0.99
Strontium		1.25	1.26	2.5	0.015	0.016	0.016	0.014	0.011	0.010	0.011	0.011	0.011	0.011
Sulfur					1.7	1.9	2.5	2.2	1.3	1.3	1.7	1.4	1.4	1.5
Tellurium					<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium	0.0008	0.00041	0.00041	0.00080	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thorium					<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin		0.00020	0.00020		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.00060	0.00060		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	0.00030	<0.00030
Tungsten					<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium	0.015	0.0075	0.0075	0.015	0.00004	0.00005	0.00006	0.00005	0.00005	0.00004	0.00004	0.00005	0.00004	0.00004
Vanadium		0.060	0.060	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc				0.0040	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium					<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Metals (mg/L)														
Aluminum[3]		0.026	0.026	0.050	0.0019	0.0020	0.0018	0.0016	0.0043	0.0030	0.0027	0.0030	0.0052	0.0019
Antimony		0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic		0.0026	0.0026	0.0050	0.00043	0.00040	0.00045	0.00042	0.00049	0.00045	0.00051	0.00058	0.00053	0.00045
Barium		0.50	0.50	1.0	0.0035	0.0038	0.0039	0.0033	0.0029	0.0028	0.0027	0.0026	0.0025	0.0025
Beryllium		0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth					<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron		0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium		0.00002	0.00002	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		2.4	4.9		**3.1**	**3.3**	**3.4**	**3.2**	**2.5**	2.3	2.4	**2.4**	**2.5**	**2.4**
Chromium		0.00026	0.00026	0.0050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt				0.00077	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper		0.0012	0.0015	0.0020	0.00042	0.00046	0.00052	0.00049	0.00051	0.00047	0.00043	0.00043	0.00045	0.00032
Iron		0.16	0.16	0.30	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.013	<0.010
Lead		0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		0.93	1.4		**1.3**	**1.4**	**1.1**	**1.0**	**0.93**	0.91	**0.93**	**0.96**	**0.98**	**0.96**
Manganese[3]		0.32	0.33	***See text***	0.00012	0.00017	0.00030	0.00023	0.0013	0.0013	0.00067	0.00064	0.00095	0.00053
Mercury		0.00002	0.00002	0.00003	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum		0.037	0.037	0.073	0.00012	0.00013	0.00015	0.00013	0.00011	0.00010	0.00012	0.00012	0.00012	0.00014
Nickel		0.013	0.013	0.025	0.00059	0.00059	0.00061	0.00052	0.00062	0.00059	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus					<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.58	0.59		**0.65**	**0.69**	**0.65**	**0.60**	0.52	0.50	0.54	0.55	0.55	0.55
Selenium		0.00053	0.00053	0.0010	<0.000050	<0.000050	0.00007	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.18	0.67		0.13	0.14	0.14	0.13	0.11	0.11	0.089	0.086	0.082	0.080
Silver		0.00013	0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1.2	0.72		**1.3**	**1.4**	**1.2**	1.1	0.95	0.93	0.98	1.0	0.97	0.97
Strontium		1.3	1.3	2.5	0.014	0.015	0.015	0.014	0.011	0.011	0.012	0.012	0.011	0.011
Sulfur					1.8	2.1	2.4	1.8	1.3	1.3	1.4	1.4	1.7	1.6
Thallium		0.00041	0.00041	0.00080	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin		0.00020	0.00020		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.00060	0.00060		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Uranium		0.0075	0.0075	0.015	0.00004	0.00005	0.00005	0.00004	0.00004	0.00004	0.00004	0.00004	0.00003	0.00002
Vanadium		0.060	0.060	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc[3]		0.0018	0.0024	***See text***	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Speciated Metals (µg/L)														
Arsenate (As V)														
Arsenite (As III)														
Arsenobetaine (AsB)														
Dimethylarsinic Acid (DMA)														
Monomethylarsonic Acid (MMA)														
Plant Pigments (µg/L)														
chlorophyll a					0.23	0.49	0.34	0.55	0.29	0.25	0.25	0.26	0.074	0.15

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.
2. Trigger and threshold values were developed in *CREMP Design Document 2012* (Azimuth, 2012d) and updated in 2019. A number of thresholds were derived from methods (or sources) other than CCME guidelines. Refer to the CREMP: 2022 Plan Update (Azimuth, 2022b) for more details.
3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

123 Bolded concentrations exceed the trigger value.

123 Bolded and shaded concentrations also exceed the threshold value.

Italicized numbers are below detection limits.

underline = results were given a cautionary flag in the QC assessment (refer to **Section 3.3** for details).

~~strikethrough~~ = results flagged as unreliable in the QC assessment.

Table B1-1. Water quality results from the 2022 CREMP, Meadowbank study area lakes.

Lake & Area	Aquatic Life Guideline[1]	Meadowbank Screening Values[2]			Third Portage Lake - North Basin (TPN)									
Month					March	March	May	May	July	July	August	August	September	September
Area-Replicate ID					TPN-150	TPN-151	TPN-152	TPN-153	TPN-154	TPN-155	TPN-156	TPN-157	TPN-158	TPN-159
Date		Triggers			01-Mar-2022	01-Mar-2022	11-May-2022	11-May-2022	10-Jul-2022	10-Jul-2022	18-Aug-2022	18-Aug-2022	03-Sep-2022	03-Sep-2022
Time		Meadowbank	Wally Lake	Thresholds	00:00	00:00	08:30	09:00	09:40	10:30	00:00	00:00	09:10	09:55
ALS Sample ID					VA22A5201-004	VA22A5201-003	VA22B0666-001	VA22B0666-002	VA22B6388-004	VA22B6388-005	VA22B9756-001	VA22B9756-002	VA22C1353-003	VA22C1353-004
Field Measurements (Surface 3m)														
Dissolved Oxygen (mg/L)					17	18	17	15	14	14	11	11	11	11
Specific Conductivity (µS/cm)					33	31	36	29	27	27	22	22	27	27
pH	6.5 - 9.0	6.4-8.15	6.54 - 8.34	6.5 - 9.0	8.0	7.9	7.3	7.3	**6.5**	6.6	6.8	6.5	6.7	6.6
Temperature (°C)					0.71	0.52	1.1	1.3	9.1	5.6	12	12	9.5	9.5
Physical Tests (mg/L)														
Conductivity (µS/cm)		27	37		**34**	**32**	**37**	**30**	27	27	27	27	**28**	**28**
Alkalinity - Total (as $CaCO_3$)		8.7	18		8.4	8.0	8.6	7.0	6.8	6.6	6.7	6.9	6.6	6.5
Alkalinity - Bicarbonate		8.7	18		8.4	8.0	8.6	7.0	6.8	6.6	6.7	6.9	6.6	6.5
Alkalinity - Carbonate		2.0	2.0		*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*
Alkalinity - Hydroxide					*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*
Hardness (as CaCO3), dissolved		9.5	17		**13**	**12**	**13**	**10**	9.3	9.2	8.8	8.8	9.3	9.3
Hardness (as CaCO3), from total Ca/Mg					13	12	13	11	5.7	9.0	9.5	9.5	9.1	9.1
pH (Laboratory)	6.47-7.95	6.47-7.95	6.92 - 8.17	6.5 - 9.0	7.1	7.0	7.0	7.0	6.9	7.0	7.0	7.0	7.2	7.0
Total Dissolved Solids		19	25		18	16	**23**	17	17	17	17	**19**	17	18
Total Suspended Solids		3.0	3.0	5.0	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*
Turbidity (NTU)					*<0.10*	*<0.10*	*<0.10*	*<0.10*	0.14	0.12	0.14	0.11	0.17	0.16
Anions and Nutrients (mg/L)														
Total Kjeldahl Nitrogen		0.17	0.16		0.13	0.11	0.12	0.10	0.082	0.079	0.078	0.080	0.050	0.069
Ammonia (as N)[3]	***equation***	0.065	0.067	0.13	0.012	0.014	0.010	0.013	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	0.0067
Bromide					*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*
Chloride	120	60	60	120	1.0	0.93	1.1	0.83	0.80	0.76	0.74	0.75	0.77	0.77
Fluoride	0.12	0.088	0.080	0.12	0.084	0.081	0.083	0.068	0.061	0.059	0.060	0.060	0.064	0.069
Nitrate (as N)	3.0	1.5	1.5	3.0	0.0093	0.012	0.0084	0.0066	0.0098	0.0088	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*
Nitrite (as N)	0.06	0.031	0.031	0.060	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Ortho Phosphate (as P)		0.0020	0.0020		0.0017	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Phosphorus (P) - Total	0.01	0.0051	0.0067	0.010	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*
Phosphorus (P) - Total Diss.					*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	0.011	*<0.0020*
Reactive Silica (as SiO_2)		1.0	1.1		*<0.50*	*<0.50*	*<0.50*	*<0.50*	*<0.50*	*<0.50*	*<0.50*	*<0.50*	*<0.50*	*<0.50*
Sulphate (SO_4)		65	65	128	5.6	5.2	5.9	4.8	4.9	4.3	4.3	4.3	4.2	4.2
Cyanides (mg/L)														
Free Cyanide	0.005					*<0.0020*		*<0.0010*	*<0.0010*		*<0.0010*			*<0.0010*
Total Cyanide						*<0.0020*		*<0.0010*	*<0.0010*		*<0.0010*			*<0.0010*
Organic / Inorganic Carbon (mg/L)														
Dissolved Organic Carbon		2.5	3.2		1.7	2.0	1.8	1.8	1.4	1.3	1.6	1.4	1.5	1.5
Total Organic Carbon		2.6	4.1		2.1	1.7	1.7	1.6	1.4	1.4	1.4	1.4	1.4	1.4
Total Metals (mg/L)														
Aluminum[3]	***equation***	0.053	0.053	0.10	*<0.0030*	0.0032	*<0.0030*	*<0.0030*	0.011	0.0046	0.0046	0.0055	0.0037	0.0042
Antimony		0.0046	0.0046	0.0090	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Arsenic	0.005	0.0026	0.0026	0.0050	0.00029	0.00029	0.00026	0.00020	0.00012	0.00025	0.00020	0.00023	0.00022	0.00022
Barium		0.50	0.50	1.0	0.0038	0.0036	0.0042	0.0032	0.0019	0.0027	0.0027	0.0028	0.0027	0.0028
Beryllium		0.00012	0.00012	0.00013	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*
Bismuth					*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Boron	1.5	0.76	0.76	1.5	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Cadmium[3]	***equation***	0.00002	0.00002	0.00004	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium		2.4	4.9		**3.0**	**2.8**	**3.2**	**2.6**	1.1	2.2	2.3	2.3	2.2	2.2
Chromium[4]	0.001	0.0025	0.0026	0.0050	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Cobalt	0.00077			0.00077	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Copper[3]	***equation***	0.0012	0.0015	0.0020	*<0.00050*	*<0.00050*	0.00069	0.00056	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Iron	0.3	0.15	0.16	0.30	*<0.010*	*<0.010*	*<0.010*	*<0.010*	0.012	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Lead[3]	***equation***	0.00053	0.00053	0.0010	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Lithium		0.0020	0.0020		*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Magnesium		0.93	1.4		**1.3**	**1.2**	**1.3**	**0.98**	0.70	0.88	0.93	0.92	0.86	0.87
Manganese[3]		0.32	0.33	***See text***	0.00050	0.00033	0.00043	0.00041	0.0026	0.0011	0.0011	0.0011	0.0010	0.0010
Mercury	0.000026	0.00002	0.00002	0.00003	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Molybdenum	0.073	0.037	0.037	0.073	0.00012	0.00012	0.00013	0.00011	*<0.000050*	0.00011	0.00012	0.00010	0.00011	0.00010
Nickel[3]	***equation***	0.013	0.013	0.025	0.00055	0.00053	0.00055	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Phosphorus		0.0051	0.0067	0.0040	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*
Potassium		0.58	0.59		**0.68**	**0.62**	**0.74**	0.56	0.38	0.49	0.50	0.51	0.52	0.53
Rubidium					0.0011	0.00090	0.0011	0.00083	0.00051	0.00071	0.00070	0.00078	0.00071	0.00077
Selenium	0.001	0.00053	0.00053	0.0010	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Silicon		0.20	0.65		0.11	0.11	0.13	0.12	**0.21**	0.10	*<0.10*	*<0.10*	*<0.10*	*<0.10*
Silver	0.0001	0.00013	0.00013	0.00025	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Sodium		1.2	0.72		**1.4**	**1.3**	**1.4**	1.1	0.55	0.97	1.0	1.0	0.95	0.97
Strontium		1.25	1.26	2.5	0.014	0.013	0.014	0.012	0.0064	0.011	0.011	0.010	0.010	0.011
Sulfur					1.7	1.7	2.3	2.1	*<0.50*	1.2	1.4	1.6	1.4	1.4
Tellurium					*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*
Thallium	0.0008	0.00041	0.00041	0.00080	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Thorium					*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Tin		0.00020	0.00020		*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Titanium		0.00060	0.00060		*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*
Tungsten					*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	0.00014	0.00014	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Uranium	0.015	0.0075	0.0075	0.015	0.00004	0.00004	0.00006	0.00004	0.00008	0.00004	0.00004	0.00004	0.00004	0.00004
Vanadium		0.060	0.060	0.12	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Zinc				0.0040	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*
Zirconium					*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*
Dissolved Metals (mg/L)														
Aluminum[3]		0.026	0.026	0.050	0.0010	0.0028	0.0016	0.0020	0.0025	0.0024	0.0022	0.0022	0.0024	0.0014
Antimony		0.0046	0.0046	0.0090	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Arsenic		0.0026	0.0026	0.0050	0.00023	0.00022	0.00023	0.00019	0.00024	0.00021	0.00020	0.00021	0.00021	0.00022
Barium		0.50	0.50	1.0	0.0039	0.0035	0.0036	0.0029	0.0026	0.0028	0.0027	0.0027	0.0025	0.0026
Beryllium		0.00012	0.00012	0.00013	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*
Bismuth					*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Boron		0.76	0.76	1.5	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Cadmium		0.00002	0.00002	0.00004	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium		2.4	4.9		**3.0**	**2.8**	**3.2**	**2.6**	2.2	2.2	2.1	2.1	2.2	2.2
Chromium		0.00026	0.00026	0.0050	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Cobalt				0.00077	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Copper		0.0012	0.0015	0.0020	0.00040	0.00039	0.00056	0.00043	0.00038	0.00038	0.00038	0.00037	0.00050	0.00041
Iron		0.16	0.16	0.30	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Lead		0.00053	0.00053	0.0010	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Lithium		0.0020	0.0020		*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Magnesium		0.93	1.4		**1.3**	**1.2**	**1.1**	0.91	0.90	0.89	0.87	0.87	0.91	0.91
Manganese[3]		0.32	0.33	***See text***	0.00023	0.00020	0.00027	0.00020	0.00097	0.00084	0.00085	0.00094	0.00087	0.00081
Mercury		0.00002	0.00002	0.00003	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Molybdenum		0.037	0.037	0.073	0.00013	0.00013	0.00014	0.00012	0.00010	0.00010	0.00011	0.00011	0.00010	0.00011
Nickel		0.013	0.013	0.025	0.00056	*<0.00050*	0.00051	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Phosphorus					*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*
Potassium		0.58	0.59		**0.68**	**0.62**	**0.67**	0.53	0.50	0.50	0.52	0.52	0.54	0.54
Selenium		0.00053	0.00053	0.0010	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Silicon		0.18	0.67		0.11	0.091	0.088	0.066	0.071	0.076	0.078	0.072	0.060	0.061
Silver		0.00013	0.00013	0.00025	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Sodium		1.2	0.72		**1.4**	**1.3**	**1.3**	1.1	0.98	0.98	1.00	1.0	1.0	1.00
Strontium		1.3	1.3	2.5	0.014	0.013	0.014	0.011	0.011	0.010	0.011	0.011	0.010	0.010
Sulfur					1.9	1.7	2.0	1.5	1.3	1.4	1.4	1.5	1.5	1.4
Thallium		0.00041	0.00041	0.00080	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Tin		0.00020	0.00020		*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	~~0.00075~~	*<0.00010*
Titanium		0.00060	0.00060		*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*
Uranium		0.0075	0.0075	0.015	0.00004	0.00004	0.00005	0.00004	0.00004	0.00004	0.00004	0.00004	0.00003	0.00003
Vanadium		0.060	0.060	0.12	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Zinc[3]		0.0018	0.0024	***See text***	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	**0.0020**	0.0016
Speciated Metals (µg/L)														
Arsenate (As V)														
Arsenite (As III)														
Arsenobetaine (AsB)														
Dimethylarsinic Acid (DMA)														
Monomethylarsonic Acid (MMA)														
Plant Pigments (µg/L)														
chlorophyll a					0.48	0.38	0.69	0.74	0.12	0.11	0.36	0.16	0.18	0.22

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.
2. Trigger and threshold values were developed in *CREMP Design Document 2012* (Azimuth, 2012d) and updated in 2019. A number of thresholds were derived from methods (or sources) other than CCME guidelines. Refer to the CREMP: 2022 Plan Update (Azimuth, 2022b) for more details.
3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

123 Bolded concentrations exceed the trigger value.

123 Bolded and shaded concentrations also exceed the threshold value.

Italicized numbers are below detection limits.

underline = results were given a cautionary flag in the QC assessment (refer to **Section 3.3** for details).

~~strikethrough~~ = results flagged as unreliable in the QC assessment.

Table B1-1. Water quality results from the 2022 CREMP, Meadowbank study area lakes.

Lake & Area	Aquatic Life Guideline[1]	Meadowbank Screening Values[2]			Second Portage Lake (SP)									
Month					March	March	May	May	July	July	August	August	September	September
Area-Replicate ID					SP-150	SP-151	SP-152	SP-153	SP-154	SP-155	SP-156	SP-157	SP-158	SP-159
Date		Triggers		Thresholds	02-Mar-2022	02-Mar-2022	07-May-2022	07-May-2022	04-Jul-2022	04-Jul-2022	19-Aug-2022	19-Aug-2022	02-Sep-2022	02-Sep-2022
Time		Meadowbank	Wally Lake		00:00	00:00	10:56	11:30	16:40	17:00	00:00	00:00	11:00	10:50
ALS Sample ID					VA22A5201-007	VA22A5201-008	VA22B0666-005	VA22B0666-006	VA22B5785-003	VA22B5785-004	VA22C0250-007	VA22C0250-008	VA22C1353-001	VA22C1353-002
Field Measurements (Surface 3m)														
Dissolved Oxygen (mg/L)					18	18	16	17	13	13	11	11	12	12
Specific Conductivity (µS/cm)					40	38	45	43	35	35	34	34	35	35
pH	6.5 - 9.0	6.4-8.15	6.54 - 8.34	6.5 - 9.0	7.6	7.7	**6.0**	**6.4**	6.5	6.9	7.2	7.2	7.1	7.1
Temperature (°C)					0.67	0.68	1.7	1.8	8.0	7.5	14	14	9.1	8.9
Physical Tests (mg/L)														
Conductivity (µS/cm)		27	37		**43**	**42**	**45**	**45**	**36**	**35**	**36**	**36**	**36**	**36**
Alkalinity - Total (as $CaCO_3$)		8.7	18		**12**	**12**	**12**	**12**	**11**	**11**	**9.9**	**9.3**	**11**	**11**
Alkalinity - Bicarbonate		8.7	18		**12**	**12**	**12**	**12**	**11**	**11**	**9.9**	**9.3**	**11**	**11**
Alkalinity - Carbonate		2.0	2.0		*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*
Alkalinity - Hydroxide					*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*
Hardness (as CaCO3), dissolved		9.5	17		**18**	**16**	**18**	**18**	**14**	**14**	**14**	**14**	**14**	**14**
Hardness (as CaCO3), from total Ca/Mg					18	18	18	17	14	14	14	14	13	14
pH (Laboratory)	6.47-7.95	6.47-7.95	6.92 - 8.17	6.5 - 9.0	7.2	7.2	7.2	7.2	7.3	7.3	7.2	7.2	7.3	7.3
Total Dissolved Solids		19	25		**24**	**23**	**25**	**27**	**22**	**22**	**28**	**28**	**23**	**21**
Total Suspended Solids		3.0	3.0	5.0	*<1.0*	1.1	1.0	1.2	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*
Turbidity (NTU)					*<0.10*	*<0.10*	*<0.10*	*<0.10*	0.25	0.29	0.18	0.17	0.23	0.26
Anions and Nutrients (mg/L)														
Total Kjeldahl Nitrogen		0.17	0.16		0.16	0.12	0.12	0.12	0.11	0.12	0.089	0.086	0.10	0.10
Ammonia (as N)[3]	***equation***	0.065	0.067	0.13	0.011	0.013	0.0063	0.0095	*<0.0050*	0.013	0.0088	0.0061	*<0.0050*	*<0.0050*
Bromide					*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*
Chloride	120	60	60	120	0.89	0.97	0.97	0.97	0.81	0.81	0.76	0.77	0.76	0.76
Fluoride	0.12	0.088	0.080	0.12	**0.089**	0.083	0.078	0.078	0.065	0.064	0.069	0.069	0.069	0.070
Nitrate (as N)	3.0	1.5	1.5	3.0	*<0.0050*	0.0093	0.015	0.015	0.0074	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*
Nitrite (as N)	0.06	0.031	0.031	0.060	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Ortho Phosphate (as P)		0.0020	0.0020		0.0013	*<0.0010*	*<0.0010*	*<0.0010*	0.0011	0.0010	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Phosphorus (P) - Total	0.01	0.0051	0.0067	0.010	**0.012**	*<0.0020*	*<0.0020*	*<0.0020*	0.0020	0.0022	*<0.0020*	*<0.0020*	*<0.0020*	0.0042
Phosphorus (P) - Total Diss.					*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*
Reactive Silica (as SiO_2)		1.0	1.1		0.65	0.57	0.74	0.78	0.58	*<0.50*	0.56	0.54	0.56	0.53
Sulphate (SO_4)		65	65	128	5.4	6.0	6.1	6.1	7.1	4.8	4.5	4.5	4.9	4.8
Cyanides (mg/L)														
Free Cyanide	0.005				*<0.0010*		0.0014			*<0.0010*		*<0.0010*	*<0.0010*	
Total Cyanide					*<0.0010*		*<0.0010*			*<0.0010*		*<0.0010*	*<0.0010*	
Organic / Inorganic Carbon (mg/L)														
Dissolved Organic Carbon		2.5	3.2		**2.6**	2.2	2.2	2.4	1.9	1.8	**2.6**	2.3	2.2	1.8
Total Organic Carbon		2.6	4.1		2.5	2.3	2.2	2.3	1.9	2.2	**2.6**	2.5	2.0	1.8
Total Metals (mg/L)														
Aluminum[3]	***equation***	0.053	0.053	0.10	0.0045	0.0039	0.0041	0.0034	0.0078	0.0093	0.0056	0.0052	0.0050	0.0049
Antimony		0.0046	0.0046	0.0090	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Arsenic	0.005	0.0026	0.0026	0.0050	0.00036	0.00034	0.00036	0.00030	0.00034	0.00037	0.00036	0.00035	0.00034	0.00035
Barium		0.50	0.50	1.0	0.0036	0.0034	0.0035	0.0036	0.0028	0.0029	0.0024	0.0024	0.0023	0.0023
Beryllium		0.00012	0.00012	0.00013	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*
Bismuth					*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Boron	1.5	0.76	0.76	1.5	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Cadmium[3]	***equation***	0.00002	0.00002	0.00004	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium		2.4	4.9		**4.6**	**4.5**	**4.7**	**4.5**	**3.6**	**3.6**	**3.5**	**3.7**	**3.5**	**3.5**
Chromium[4]	0.001	0.0025	0.0026	0.0050	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Cobalt	0.00077			0.00077	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Copper[3]	***equation***	0.0012	0.0015	0.0020	0.00093	0.00088	0.0011	0.0010	0.00081	0.0010	0.00073	0.00072	0.00074	0.00079
Iron	0.3	0.15	0.16	0.30	*<0.010*	*<0.010*	*<0.010*	*<0.010*	0.018	0.018	0.019	0.015	0.021	0.025
Lead[3]	***equation***	0.00053	0.00053	0.0010	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	0.00010	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Lithium		0.0020	0.0020		*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Magnesium		0.93	1.4		**1.6**	**1.6**	**1.6**	**1.5**	**1.2**	**1.2**	**1.2**	**1.1**	**1.1**	**1.1**
Manganese[3]		0.32	0.33	***See text***	0.00067	0.00055	0.00053	0.00061	0.0018	0.0020	0.0016	0.0017	0.0015	0.0015
Mercury	0.000026	0.00002	0.00002	0.00003	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Molybdenum	0.073	0.037	0.037	0.073	0.00017	0.00016	0.00016	0.00014	0.00010	0.00012	0.00012	0.00013	0.00014	0.00014
Nickel[3]	***equation***	0.013	0.013	0.025	0.00060	0.00055	*<0.00050*	*<0.00050*	0.00051	0.00053	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Phosphorus		0.0051	0.0067	0.0040	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*
Potassium		0.58	0.59		**0.67**	**0.63**	**0.67**	**0.62**	0.50	0.51	0.53	0.53	0.55	0.55
Rubidium					0.0010	0.00090	0.00090	0.00090	0.00078	0.00076	0.00083	0.00077	0.00079	0.00083
Selenium	0.001	0.00053	0.00053	0.0010	*<0.000050*	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Silicon		0.20	0.65		**0.35**	**0.34**	**0.41**	**0.38**	**0.30**	**0.31**	**0.26**	**0.26**	**0.25**	**0.27**
Silver	0.0001	0.00013	0.00013	0.00025	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Sodium		1.2	0.72		1.1	1.0	1.0	0.98	0.74	0.74	0.77	0.76	0.79	0.78
Strontium		1.25	1.26	2.5	0.023	0.022	0.022	0.022	0.016	0.017	0.018	0.019	0.017	0.018
Sulfur					2.1	2.1	2.3	2.3	1.6	1.4	1.5	1.4	1.6	1.6
Tellurium					*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*
Thallium	0.0008	0.00041	0.00041	0.00080	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Thorium					*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Tin		0.00020	0.00020		*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Titanium		0.00060	0.00060		*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*
Tungsten					*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Uranium	0.015	0.0075	0.0075	0.015	0.00005	0.00005	0.00007	0.00006	0.00006	0.00006	0.00005	0.00005	0.00005	0.00005
Vanadium		0.060	0.060	0.12	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Zinc				0.0040	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*
Zirconium					*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*
Dissolved Metals (mg/L)														
Aluminum[3]		0.026	0.026	0.050	0.0027	0.0017	0.0021	0.0023	0.0038	0.0046	0.0024	0.0030	0.0016	0.0016
Antimony		0.0046	0.0046	0.0090	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Arsenic		0.0026	0.0026	0.0050	0.00032	0.00027	0.00028	0.00028	0.00027	0.00029	0.00037	0.00033	0.00030	0.00032
Barium		0.50	0.50	1.0	0.0034	0.0030	0.0031	0.0032	0.0027	0.0028	0.0024	0.0024	0.0023	0.0023
Beryllium		0.00012	0.00012	0.00013	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*
Bismuth					*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Boron		0.76	0.76	1.5	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Cadmium		0.00002	0.00002	0.00004	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium		2.4	4.9		**4.6**	**4.2**	**4.8**	**4.8**	**3.5**	**3.6**	**3.7**	**3.4**	**3.5**	**3.5**
Chromium		0.00026	0.00026	0.0050	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Cobalt				0.00077	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Copper		0.0012	0.0015	0.0020	0.00090	0.00076	0.00090	0.00095	0.00087	**0.0012**	0.00075	0.00072	0.00065	0.00065
Iron		0.16	0.16	0.30	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Lead		0.00053	0.00053	0.0010	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	0.00009	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Lithium		0.0020	0.0020		*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Magnesium		0.93	1.4		**1.6**	**1.5**	**1.4**	**1.4**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
Manganese[3]		0.32	0.33	***See text***	0.00016	0.00017	0.00027	0.00020	0.0012	0.0014	0.00089	0.00085	0.00084	0.00079
Mercury		0.00002	0.00002	0.00003	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Molybdenum		0.037	0.037	0.073	0.00016	0.00013	0.00014	0.00014	0.00011	0.00013	0.00012	0.00013	0.00014	0.00014
Nickel		0.013	0.013	0.025	0.00054	*<0.00050*	0.00065	*<0.00050*	0.00050	0.00054	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Phosphorus					*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*
Potassium		0.58	0.59		**0.65**	**0.59**	**0.61**	**0.63**	0.52	0.52	0.54	0.53	0.55	0.56
Selenium		0.00053	0.00053	0.0010	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Silicon		0.18	0.67		**0.36**	**0.30**	**0.36**	**0.37**	**0.26**	**0.26**	**0.24**	**0.23**	**0.24**	**0.23**
Silver		0.00013	0.00013	0.00025	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Sodium		1.2	0.72		1.1	0.99	0.95	1.00	0.77	0.78	0.84	0.82	0.83	0.84
Strontium		1.3	1.3	2.5	0.022	0.020	0.022	0.023	0.018	0.017	0.016	0.016	0.017	0.018
Sulfur					2.1	1.8	2.0	2.2	1.5	1.5	1.9	1.9	1.6	1.6
Thallium		0.00041	0.00041	0.00080	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Tin		0.00020	0.00020		*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	0.00018	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Titanium		0.00060	0.00060		*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*
Uranium		0.0075	0.0075	0.015	0.00006	0.00005	0.00006	0.00006	0.00005	0.00006	0.00005	0.00005	0.00004	0.00004
Vanadium		0.060	0.060	0.12	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Zinc[3]		0.0018	0.0024	***See text***	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	0.0013	0.0011	*<0.0010*	*<0.0010*	*<0.0010*
Speciated Metals (µg/L)														
Arsenate (As V)														
Arsenite (As III)														
Arsenobetaine (AsB)														
Dimethylarsinic Acid (DMA)														
Monomethylarsonic Acid (MMA)														
Plant Pigments (µg/L)														
chlorophyll a					0.62	0.46	0.54	0.84	0.59	0.64	0.21	0.45	0.45	0.30

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.
2. Trigger and threshold values were developed in *CREMP Design Document 2012* (Azimuth, 2012d) and updated in 2019. A number of thresholds were derived from methods (or sources) other than CCME guidelines. Refer to the CREMP: 2022 Plan Update (Azimuth, 2022b) for more details.
3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

123 Bolded concentrations exceed the trigger value.

123 Bolded and shaded concentrations also exceed the threshold value.

Italicized numbers are below detection limits.

underline = results were given a cautionary flag in the QC assessment (refer to **Section 3.3** for details).

~~strikethrough~~ = results flagged as unreliable in the QC assessment.

Table B1-1. Water quality results from the 2022 CREMP, Meadowbank study area lakes.

Lake & Area	Aquatic Life Guideline[1]	Meadowbank Screening Values[2]			Wally Lake (WAL)									
Month					March	March	May	May	July	July	August	August	September	September
Area-Replicate ID					WAL-119	WAL-120	WAL-121	WAL-122	WAL-123	WAL-124	WAL-125	WAL-126	WAL-127	WAL-128
Date		Triggers		Thresholds	06-Mar-2022	06-Mar-2022	07-May-2022	07-May-2022	05-Jul-2022	05-Jul-2022	19-Aug-2022	19-Aug-2022	03-Sep-2022	03-Sep-2022
Time		Meadowbank	Wally Lake		00:00	00:00	09:50	09:20	10:35	10:00	00:00	00:00	14:20	13:45
ALS Sample ID					VA22A5201-013	VA22A5201-014	VA22B0666-007	VA22B0666-008	VA22B5785-005	VA22B5785-006	VA22C0250-009	VA22C0250-010	VA22C1353-007	VA22C1353-008
Field Measurements (Surface 3m)														
Dissolved Oxygen (mg/L)					17	16	17	15	12	12	11	10	12	12
Specific Conductivity (µS/cm)					46	44	61	54	33	35	36	35	37	36
pH	6.5 - 9.0	6.4-8.15	6.54 - 8.34	6.5 - 9.0	**6.4**	7.5	**6.2**	**6.1**	6.9	6.6	7.1	6.9	7.0	6.8
Temperature (°C)					1.3	1.4	1.7	1.1	9.6	9.8	14	14	8.3	8.6
Physical Tests (mg/L)														
Conductivity (µS/cm)		27	37		**50**	**47**	**62**	**56**	33	36	**39**	**37**	**39**	**38**
Alkalinity - Total (as $CaCO_3$)		8.7	18		16	15	**20**	**18**	11	12	12	12	12	12
Alkalinity - Bicarbonate		8.7	18		16	15	**20**	**18**	11	12	12	12	12	12
Alkalinity - Carbonate		2.0	2.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity - Hydroxide					<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness (as CaCO3), dissolved		9.5	17		**22**	**22**	**26**	**24**	14	16	15	15	16	15
Hardness (as CaCO3), from total Ca/Mg					22	21	27	24	14	16	15	15	16	15
pH (Laboratory)	6.47-7.95	6.47-7.95	6.92 - 8.17	6.5 - 9.0	7.3	7.3	7.4	7.4	7.3	7.3	7.3	7.3	7.3	7.3
Total Dissolved Solids		19	25		24	**27**	**42**	**38**	24	25	**28**	**29**	**26**	**26**
Total Suspended Solids		3.0	3.0	5.0	<1.0	<1.0	~~**11.1**~~	1.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Turbidity (NTU)					<0.10	<0.10	<0.10	<0.10	0.32	0.32	0.16	0.18	0.31	0.33
Anions and Nutrients (mg/L)														
Total Kjeldahl Nitrogen		0.17	0.16		0.16	0.15	**0.17**	**0.19**	0.12	0.10	0.13	0.10	0.14	0.11
Ammonia (as N)[3]	***equation***	0.065	0.067	0.13	0.015	0.015	0.014	0.0068	<0.0050	<0.0050	<0.0050	0.0052	<0.0050	0.0071
Bromide					<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride	120	60	60	120	1.0	0.71	0.87	0.76	0.50	0.52	0.52	0.53	0.54	0.53
Fluoride	0.12	0.088	0.080	0.12	**0.090**	0.061	0.062	0.058	0.045	0.043	0.049	0.051	0.054	0.053
Nitrate (as N)	3.0	1.5	1.5	3.0	0.0078	0.011	0.011	0.0065	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	0.06	0.031	0.031	0.060	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Ortho Phosphate (as P)		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P) - Total	0.01	0.0051	0.0067	0.010	<0.0020	<0.0020	**0.0068**	<0.0020	0.0021	0.0022	<0.0020	<0.0020	<0.0020	<0.0020
Phosphorus (P) - Total Diss.					<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Reactive Silica (as SiO_2)		1.0	1.1		**1.4**	**1.3**	**1.8**	**1.5**	0.76	0.79	**1.2**	**1.2**	**1.2**	**1.2**
Sulphate (SO_4)		65	65	128	5.7	5.8	6.7	6.2	5.5	5.0	3.9	3.8	4.3	4.1
Cyanides (mg/L)														
Free Cyanide	0.005				<0.0010			<0.0010	<0.0010		<0.0010			<0.0010
Total Cyanide					<0.0010			<0.0010	<0.0010		<0.0010			<0.0010
Organic / Inorganic Carbon (mg/L)														
Dissolved Organic Carbon		2.5	3.2		**3.4**	**3.2**	**3.3**	**3.5**	2.4	2.6	2.7	2.7	2.9	2.6
Total Organic Carbon		2.6	4.1		2.8	3.0	3.4	3.4	2.2	2.6	3.1	3.0	2.4	2.3
Total Metals (mg/L)														
Aluminum[3]	***equation***	0.053	0.053	0.10	0.0049	0.0046	0.0064	0.0049	0.0059	0.0059	0.0042	0.0046	0.0052	0.0045
Antimony		0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.005	0.0026	0.0026	0.0050	0.00033	0.00031	0.00040	0.00033	0.00028	0.00032	0.00035	0.00035	0.00038	0.00035
Barium		0.50	0.50	1.0	0.0033	0.0030	0.0039	0.0035	0.0021	0.0021	0.0019	0.0019	0.0019	0.0018
Beryllium		0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth					<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	1.5	0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium[3]	***equation***	0.00002	0.00002	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		2.4	4.9		**5.8**	**5.6**	**7.3**	**6.5**	3.8	4.3	4.1	4.0	4.2	4.0
Chromium[4]	0.001	0.0025	0.0026	0.0050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt	0.00077			0.00077	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper[3]	***equation***	0.0012	0.0015	0.0020	**0.0018**	0.0013	**0.0019**	**0.0018**	0.0010	0.0010	0.0011	0.0010	0.0011	0.0012
Iron	0.3	0.15	0.16	0.30	<0.010	<0.010	0.013	0.011	0.013	0.013	0.015	0.016	0.022	0.017
Lead[3]	***equation***	0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		0.93	1.4		**1.8**	**1.8**	**2.1**	**1.8**	1.1	1.2	1.2	1.2	1.3	1.2
Manganese[3]		0.32	0.33	***See text***	0.0011	0.00093	0.0014	0.0012	0.0013	0.0011	0.0014	0.0015	0.0017	0.0014
Mercury	0.000026	0.00002	0.00002	0.00003	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.073	0.037	0.037	0.073	0.00015	0.00014	0.00017	0.00017	0.00011	0.00011	0.00016	0.00015	0.00019	0.00018
Nickel[3]	***equation***	0.013	0.013	0.025	0.00076	0.00055	<0.00050	0.00066	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus		0.0051	0.0067	0.0040	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.58	0.59		0.58	0.55	**0.70**	**0.61**	0.40	0.40	0.45	0.46	0.49	0.47
Rubidium					0.00077	0.00083	0.00099	0.00084	0.00057	0.00051	0.00063	0.00071	0.00074	0.00073
Selenium	0.001	0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.20	0.65		**0.72**	**0.69**	**0.89**	**0.77**	0.44	0.44	0.57	0.58	0.60	0.58
Silver	0.0001	0.00013	0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1.2	0.72		**0.79**	**0.75**	**0.92**	**0.81**	0.51	0.50	0.55	0.56	0.58	0.57
Strontium		1.25	1.26	2.5	0.029	0.028	0.037	0.035	0.018	0.020	0.023	0.022	0.023	0.022
Sulfur					2.0	1.9	2.9	2.4	1.1	1.3	1.2	1.2	1.4	1.2
Tellurium					<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium	0.0008	0.00041	0.00041	0.00080	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thorium					<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin		0.00020	0.00020		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.00060	0.00060		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten					<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium	0.015	0.0075	0.0075	0.015	0.00006	0.00006	0.00008	0.00007	0.00006	0.00006	0.00005	0.00006	0.00006	0.00005
Vanadium		0.060	0.060	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc				0.0040	<0.0030	<0.0030	<0.0030	<0.0030	**0.0048**	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium					<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Metals (mg/L)														
Aluminum[3]		0.026	0.026	0.050	0.0038	0.0037	0.0038	0.0026	0.0050	0.0038	0.0022	0.0024	0.0020	0.0023
Antimony		0.0046	0.0046	0.0090	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic		0.0026	0.0026	0.0050	0.00030	0.00030	0.00032	0.00033	0.00023	0.00026	0.00034	0.00032	0.00033	0.00032
Barium		0.50	0.50	1.0	0.0030	0.0028	0.0036	0.0035	0.0021	0.0021	0.0019	0.0019	0.0018	0.0018
Beryllium		0.00012	0.00012	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth					<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron		0.76	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium		0.00002	0.00002	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		2.4	4.9		**5.9**	**5.7**	**7.3**	**6.7**	3.7	4.2	4.1	4.1	4.1	3.9
Chromium		0.00026	0.00026	0.0050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt				0.00077	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper		0.0012	0.0015	0.0020	**0.0016**	0.0012	**0.0016**	0.0015	0.0010	0.0011	0.0010	0.0010	0.0012	0.0011
Iron		0.16	0.16	0.30	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Lead		0.00053	0.00053	0.0010	<0.000050	<0.000050	0.00007	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00006
Lithium		0.0020	0.0020		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		0.93	1.4		**1.8**	**1.8**	**2.0**	**1.8**	1.1	1.2	1.3	1.3	1.3	1.3
Manganese[3]		0.32	0.33	***See text***	0.00042	0.00028	0.00046	0.00035	0.00082	0.00066	0.00033	0.00041	0.00028	0.00036
Mercury		0.00002	0.00002	0.00003	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.00001	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum		0.037	0.037	0.073	0.00017	0.00017	0.00018	0.00019	0.00010	0.00012	0.00014	0.00015	0.00017	0.00016
Nickel		0.013	0.013	0.025	0.00073	<0.00050	0.00057	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Phosphorus					<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.58	0.59		**0.60**	0.56	**0.71**	**0.64**	0.41	0.42	0.47	0.47	0.48	0.44
Selenium		0.00053	0.00053	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.18	0.67		**0.70**	**0.68**	**0.84**	**0.75**	0.38	0.39	0.54	0.58	0.56	0.57
Silver		0.00013	0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1.2	0.72		**0.81**	**0.77**	**0.89**	**0.83**	0.53	0.52	0.59	0.60	0.59	0.56
Strontium		1.3	1.3	2.5	0.030	0.029	0.037	0.034	0.019	0.021	0.021	0.020	0.022	0.019
Sulfur					2.2	1.9	2.4	2.4	1.2	1.2	1.4	1.5	3.4	1.6
Thallium		0.00041	0.00041	0.00080	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Tin		0.00020	0.00020		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.00060	0.00060		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Uranium		0.0075	0.0075	0.015	0.00007	0.00006	0.00008	0.00007	0.00005	0.00006	0.00005	0.00005	0.00005	0.00005
Vanadium		0.060	0.060	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc[3]		0.0018	0.0024	***See text***	<0.0010	<0.0010	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	**0.0028**
Speciated Metals (µg/L)														
Arsenate (As V)														
Arsenite (As III)														
Arsenobetaine (AsB)														
Dimethylarsinic Acid (DMA)														
Monomethylarsonic Acid (MMA)														
Plant Pigments (µg/L)														
chlorophyll a					0.29	0.36	1.0	1.5	0.47	0.65	0.57	0.52	0.13	0.45

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.
2. Trigger and threshold values were developed in *CREMP Design Document 2012* (Azimuth, 2012d) and updated in 2019. A number of thresholds were derived from methods (or sources) other than CCME guidelines. Refer to the CREMP: 2022 Plan Update (Azimuth, 2022b) for more details.
3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

123 Bolded concentrations exceed the trigger value.

123 Bolded and shaded concentrations also exceed the threshold value.

Italicized numbers are below detection limits.

underline = results were given a cautionary flag in the QC assessment (refer to **Section 3.3** for details).

~~strikethrough~~ = results flagged as unreliable in the QC assessment.

Table B1-1. Water quality results from the 2022 CREMP, Meadowbank study area lakes.

Lake & Area	Aquatic Life Guideline[1]	Meadowbank Screening Values[2]			Tehek Lake (TE)		Tehek Lake - Far Field (TEFF)		Third Portage Lake - South Basin (TPS)	
Month		Triggers		Thresholds	March	March	March	March	March	March
Area-Replicate ID		Meadowbank	Wally Lake		TE-102	TE-103	TEFF-54	TEFF-55	TPS-67	TPS-68
Date					04-Mar-2022	04-Mar-2022	04-Mar-2022	04-Mar-2022	01-Mar-2022	01-Mar-2022
Time					00:00	00:00	00:00	00:00	00:00	00:00
ALS Sample ID					VA22A5201-012	VA22A5201-011	VA22A5201-009	VA22A5201-010	VA22A5201-001	VA22A5201-002
Field Measurements (Surface 3m)										
Dissolved Oxygen (mg/L)					19	20	20	21	18	17
Specific Conductivity (µS/cm)					39	36	26	29	30	32
pH	6.5 - 9.0	6.4-8.15	6.54 - 8.34	6.5 - 9.0	7.6	7.4	**6.2**	7.7	6.5	~~8.4~~
Temperature (°C)					0.46	0.52	0.34	0.31	0.63	0.59
Physical Tests (mg/L)										
Conductivity (µS/cm)		27	37		**42**	**39**	25	**29**	**31**	**40**
Alkalinity - Total (as $CaCO_3$)		8.7	18		**12**	**11**	7.3	7.9	7.7	**9.8**
Alkalinity - Bicarbonate		8.7	18		**12**	**11**	7.3	7.9	7.7	**9.8**
Alkalinity - Carbonate		2.0	2.0		*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*
Alkalinity - Hydroxide					*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*
Hardness (as CaCO3), dissolved		9.5	17		**17**	**16**	**9.6**	**11**	**12**	**14**
Hardness (as CaCO3), from total Ca/Mg					17	16	9.7	11	11	14
pH (Laboratory)	6.47-7.95	6.47-7.95	6.92 - 8.17	6.5 - 9.0	7.2	7.2	7.0	7.0	7.0	7.1
Total Dissolved Solids		19	25		**22**	**23**	14	17	18	**22**
Total Suspended Solids		3.0	3.0	5.0	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*
Turbidity (NTU)					0.10	0.11	*<0.10*	*<0.10*	*<0.10*	0.11
Anions and Nutrients (mg/L)										
Total Kjeldahl Nitrogen		0.17	0.16		0.15	**0.19**	0.10	0.12	0.13	0.14
Ammonia (as N)[3]	***equation***	0.065	0.067	0.13	0.011	0.012	0.0076	0.0090	0.015	0.015
Bromide					*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*
Chloride	120	60	60	120	1.1	0.94	0.95	0.75	0.90	1.2
Fluoride	0.12	0.088	0.080	0.12	**0.094**	0.085	0.083	0.073	0.082	**0.093**
Nitrate (as N)	3.0	1.5	1.5	3.0	*<0.0050*	*<0.0050*	0.0069	*<0.0050*	0.0068	0.0085
Nitrite (as N)	0.06	0.031	0.031	0.060	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Ortho Phosphate (as P)		0.0020	0.0020		0.0012	*<0.0010*	*<0.0010*	*<0.0010*	0.0011	*<0.0010*
Phosphorus (P) - Total	0.01	0.0051	0.0067	0.010	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*
Phosphorus (P) - Total Diss.					*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*
Reactive Silica (as SiO_2)		1.0	1.1		0.66	0.61	*<0.50*	*<0.50*	*<0.50*	*<0.50*
Sulphate (SO_4)		65	65	128	5.3	3.9	5.8	3.3	5.1	6.4
Cyanides (mg/L)										
Free Cyanide	0.005					*<0.0010*		*<0.0010*	*<0.0010*	
Total Cyanide						*<0.0010*		*<0.0010*	*<0.0010*	
Organic / Inorganic Carbon (mg/L)										
Dissolved Organic Carbon		2.5	3.2		**3.2**	**2.8**	2.1	2.4	1.7	2.0
Total Organic Carbon		2.6	4.1		2.4	2.4	1.7	2.0	1.6	2.0
Total Metals (mg/L)										
Aluminum[3]	***equation***	0.053	0.053	0.10	0.0062	0.0057	0.0048	0.0038	0.0030	0.0034
Antimony		0.0046	0.0046	0.0090	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Arsenic	0.005	0.0026	0.0026	0.0050	0.00028	0.00031	0.00017	0.00017	0.00028	0.00030
Barium		0.50	0.50	1.0	0.0037	0.0040	0.0029	0.0037	0.0037	0.0043
Beryllium		0.00012	0.00012	0.00013	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*
Bismuth					*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Boron	1.5	0.76	0.76	1.5	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Cadmium[3]	***equation***	0.00002	0.00002	0.00004	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium		2.4	4.9		**4.3**	**3.8**	2.3	**2.5**	**2.7**	**3.4**
Chromium[4]	0.001	0.0025	0.0026	0.0050	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Cobalt	0.00077			0.00077	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Copper[3]	***equation***	0.0012	0.0015	0.0020	0.00086	0.00066	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Iron	0.3	0.15	0.16	0.30	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Lead[3]	***equation***	0.00053	0.00053	0.0010	*<0.000050*	*<0.000050*	*<0.000050*	0.00007	*<0.000050*	*<0.000050*
Lithium		0.0020	0.0020		*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Magnesium		0.93	1.4		**1.5**	**1.5**	**0.94**	**1.1**	**1.1**	**1.4**
Manganese[3]		0.32	0.33	***See text***	0.00049	0.00059	0.00056	0.00048	0.00030	0.00032
Mercury	0.000026	0.00002	0.00002	0.00003	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Molybdenum	0.073	0.037	0.037	0.073	0.00013	0.00013	0.00008	0.00007	0.00013	0.000148
Nickel[3]	***equation***	0.013	0.013	0.025	0.00052	*<0.00050*	*<0.00050*	*<0.00050*	0.00050	0.00067
Phosphorus		0.0051	0.0067	0.0040	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*
Potassium		0.58	0.59		**0.67**	**0.73**	0.52	**0.64**	**0.61**	**0.76**
Rubidium					0.0012	0.0014	0.00089	0.0011	0.00086	0.0011
Selenium	0.001	0.00053	0.00053	0.0010	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	0.00008	0.00011
Silicon		0.20	0.65		**0.37**	**0.35**	**0.23**	**0.24**	0.11	0.14
Silver	0.0001	0.00013	0.00013	0.00025	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Sodium		1.2	0.72		1.1	1.1	0.80	0.97	**1.3**	**1.6**
Strontium		1.25	1.26	2.5	0.021	0.020	0.012	0.014	0.013	0.016
Sulfur					1.9	1.7	1.1	1.3	1.7	2.1
Tellurium					*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*
Thallium	0.0008	0.00041	0.00041	0.00080	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Thorium					*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Tin		0.00020	0.00020		*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Titanium		0.00060	0.00060		*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*
Tungsten					*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Uranium	0.015	0.0075	0.0075	0.015	0.00007	0.00009	0.00005	0.00006	0.00003	0.00004
Vanadium		0.060	0.060	0.12	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Zinc				0.0040	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*
Zirconium					*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*
Dissolved Metals (mg/L)										
Aluminum[3]		0.026	0.026	0.050	0.0046	0.0053	0.0023	0.0024	0.0032	0.0019
Antimony		0.0046	0.0046	0.0090	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Arsenic		0.0026	0.0026	0.0050	0.00024	0.00025	0.00014	0.00018	0.00021	0.00027
Barium		0.50	0.50	1.0	0.0036	0.0037	0.0027	0.0034	0.0036	0.0042
Beryllium		0.00012	0.00012	0.00013	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*
Bismuth					*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Boron		0.76	0.76	1.5	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Cadmium		0.00002	0.00002	0.00004	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium		2.4	4.9		**4.3**	**4.0**	2.3	**2.5**	**2.8**	**3.3**
Chromium		0.00026	0.00026	0.0050	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Cobalt				0.00077	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Copper		0.0012	0.0015	0.0020	0.00080	0.00068	0.00035	0.00038	0.00035	0.00042
Iron		0.16	0.16	0.30	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Lead		0.00053	0.00053	0.0010	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Lithium		0.0020	0.0020		*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Magnesium		0.93	1.4		**1.5**	**1.5**	**0.95**	**1.1**	**1.2**	**1.4**
Manganese[3]		0.32	0.33	***See text***	0.00020	0.00035	0.00022	0.00023	0.00021	0.00018
Mercury		0.00002	0.00002	0.00003	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Molybdenum		0.037	0.037	0.073	0.00012	0.00013	0.00006	0.00006	0.00012	0.00014
Nickel		0.013	0.013	0.025	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	0.00052	0.00059
Phosphorus					*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*
Potassium		0.58	0.59		**0.68**	**0.72**	0.51	**0.64**	**0.62**	**0.75**
Selenium		0.00053	0.00053	0.0010	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Silicon		0.18	0.67		**0.36**	**0.33**	**0.21**	**0.21**	0.097	0.11
Silver		0.00013	0.00013	0.00025	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Sodium		1.2	0.72		1.1	1.2	0.82	1.0	**1.4**	**1.6**
Strontium		1.3	1.3	2.5	0.021	0.020	0.012	0.013	0.013	0.016
Sulfur					2.1	2.0	1.2	1.1	1.8	2.1
Thallium		0.00041	0.00041	0.00080	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Tin		0.00020	0.00020		*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Titanium		0.00060	0.00060		*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*
Uranium		0.0075	0.0075	0.015	0.00008	0.00009	0.00005	0.00006	0.00004	0.00004
Vanadium		0.060	0.060	0.12	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Zinc[3]		0.0018	0.0024	***See text***	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Speciated Metals (µg/L)										
Arsenate (As V)										
Arsenite (As III)										
Arsenobetaine (AsB)										
Dimethylarsinic Acid (DMA)										
Monomethylarsonic Acid (MMA)										
Plant Pigments (µg/L)										
chlorophyll a					0.39	0.44	0.40	0.30	0.37	0.61

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.
2. Trigger and threshold values were developed in *CREMP Design Document 2012* (Azimuth, 2012d) and updated in 2019. A number of thresholds were derived from methods (or sources) other than CCME guidelines. Refer to the CREMP: 2022 Plan Update (Azimuth, 2022b) for more details.
3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

123 Bolded concentrations exceed the trigger value.

123 Bolded and shaded concentrations also exceed the threshold value.

Italicized numbers are below detection limits.

underline = results were given a cautionary flag in the QC assessment (refer to **Section 3.3** for details).

~~strikethrough~~ = results flagged as unreliable in the QC assessment.

Table B1-2. Water quality results from Third Portage Lake in 2022 compared against predicted concentrations in the FEIS.

Lake and Area		Simulated Maximum Whole Lake Concentration (mg/L) Third Portage Lake[2]				Third Portage Lake East Basin (TPE)									
Area-Replicate ID	CCME (2012) Guideline[1]	Upper Mixing Estimate (169 Mm^3)		Mid-range Mixing Estimate (92 Mm^3)		TPE-150	TPE-151	TPE-152	TPE-153	TPE-155	TPE-154	TPE-156	TPE-157	TPE-158	TPE-159
Depth (m)		Without Dike Leaching	With Dike Leaching	Without Dike Leaching	With Dike Leaching	3	3	3	3	3	3	3	3	3	3
Date						02-Mar-2022	02-Mar-2022	11-May-2022	11-May-2022	05-Jul-2022	05-Jul-2022	18-Aug-2022	18-Aug-2022	02-Sep-2022	02-Sep-2022
Physical Tests (mg/L)															
Hardness		5.7	6.0	6.0	6.4	***13***	***14***	***13***	***12***	***9.6***	***10.0***	***9.7***	***10.0***	***10***	***10***
Anions and Nutrients (mg/L)															
Alkalinity - Total		4.1	4.1	4.2	4.2	***8.4***	***9.3***	***9.3***	***8.5***	***7.4***	***7.8***	***7.8***	***7.8***	***7.3***	***7.0***
Ammonia (as N)[3]	***equation***	0.033	0.033	0.050	0.050	0.011	0.013	0.016	0.015	<0.0050	<0.0050	<0.0050	0.018	<0.0050	<0.0050
Chloride	120	0.80	0.80	1.0	1.1	0.89	1.0	0.98	0.90	0.70	0.73	0.71	0.71	0.72	0.76
Fluoride	0.12	0.070	0.080	0.070	0.090	**0.089**	***0.094***	***0.091***	**0.082**	0.068	**0.072**	0.066	0.068	**0.076**	**0.079**
Nitrate (as N)	3.0	0.035	0.036	0.057	0.059	<0.0050	0.0061	0.0099	0.010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Ortho Phosphate (as P)		0.0022	0.0022	0.0024	0.0024	0.0012	0.0014	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P) - Total	0.0040	0.0027	0.0029	0.0032	0.0035	0.0022	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0025	0.0024	<0.0020
Sulphate (SO_4)		1.7	1.7	2.0	2.0	***5.4***	***5.9***	***6.0***	***5.5***	***4.3***	***4.6***	***4.4***	***4.4***	***4.5***	***4.6***
Cyanides (mg/L)															
Total Cyanide		0	0	0	0	<0.0010	0	0	***0.0029***	0	<0.0010	<0.0010	0	0	<0.0010
Total Metals (mg/L)															
Aluminum[3]	***equation***	0.0070	0.0090	0.0070	0.010	0.0030	0.0054	0.0035	<0.0030	0.0066	**0.0071**	**0.0072**	**0.0073**	**0.0088**	0.0066
Antimony		0.00056	0.00057	0.00060	0.00062	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.0050	0.00062	0.00062	0.00072	0.00072	0.00053	0.00054	0.00049	0.00042	0.00052	0.00056	0.00054	0.00062	0.00057	0.00056
Barium		0.020	0.022	0.020	0.023	0.0036	0.0050	0.0040	0.0036	0.0028	0.0028	0.0027	0.0027	0.0026	0.0027
Beryllium		0.0010	0.0010	0.0010	0.0010	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth		0.10	0.10	0.10	0.10	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	1.5	0.00001	0.00001	0.00001	0.00001	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium[3]	***equation***	<0.000051	<0.000051	<0.000052	<0.000052	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		1.3	1.4	1.5	1.5	***3.1***	***3.4***	***3.4***	***3.1***	***2.4***	***2.5***	***2.5***	***2.6***	***2.5***	***2.5***
Chromium[4]	0.001	0.0010	0.0010	0.0010	0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt		0.0040	0.0013	0.00040	0.0017	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper[3]	***equation***	0.0012	0.0012	0.0013	0.0013	<0.00050	0.00062	0.00075	0.00071	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron	0.3	0.030	0.030	0.030	0.030	<0.010	<0.010	<0.010	<0.010	0.012	0.013	0.012	0.012	0.019	0.012
Lead[3]	***equation***	0.00060	0.00060	0.00060	0.00070	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.0050	0.0050	0.0050	0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		0.60	0.60	0.60	0.70	***1.3***	***1.6***	***1.3***	***1.1***	***0.94***	***0.94***	***0.98***	***0.97***	***0.94***	***0.98***
Manganese[3]		0.0090	0.052	0.015	0.072	0.00051	0.00060	0.00059	0.00047	0.0017	0.0016	0.0011	0.0010	0.0011	0.0010
Mercury	0.000026	0.00005	0.00005	0.00005	0.00005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.073	0.0010	0.0010	0.0010	0.0010	0.00014	0.00015	0.00015	0.00012	0.00010	0.00010	0.00012	0.00012	0.00014	0.00012
Nickel[3]	***equation***	0.0016	0.0016	0.0020	0.0021	0.00064	0.00084	0.00057	0.00053	0.00065	0.00064	0.00056	<0.00050	<0.00050	0.00050
Potassium		2.0	2.1	2.0	2.1	0.64	0.86	0.71	0.61	0.50	0.50	0.53	0.53	0.55	0.58
Selenium	0.001	0.0010	0.0010	0.0010	0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.010	0.080	0.020	0.12	***0.13***	***0.16***	***0.15***	***0.16***	***0.16***	***0.14***	**0.12**	**0.12**	**0.11**	**0.12**
Silver	0.0001	0.00002	0.00002	0.00002	0.00002	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		2.0	2.0	2.0	2.1	1.3	1.7	1.3	1.2	0.91	0.90	1.0	0.99	0.94	0.99
Strontium		0.0020	0.0050	0.0040	0.0070	***0.015***	***0.016***	***0.016***	***0.014***	***0.010***	***0.011***	***0.011***	***0.011***	***0.011***	***0.011***
Thallium	0.0008	0.00020	0.00020	0.00020	0.00020	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Uranium	0.015	0.00020	0.00020	0.00020	0.00030	0.00004	0.00005	0.00006	0.00005	0.00004	0.00005	0.00004	0.00005	0.00004	0.00004
Vanadium		0.030	0.030	0.030	0.030	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc		0.011	0.011	0.015	0.015	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

1 . CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2016.

2. Whole lake data are given for a range of mixing conditions, representing mid-range and upper mixing estimate for the north basin discharge location. The model includes treated water releases from the project (Years 1 to 4), and long-term substance loading due to leaching from the Bay-Goose dike (Cumberland, 2005).

3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.

4. Chromium CCME guideline is for Cr VI.

Formatting for indicating the parameters that exceed the model predictions in the FEIS:

Mid-range Mixing Estimate (92 Mm^3):

- ***Bold italicized*** = concentrations exceed the prediction "With Dike Leaching."
- **Bold** = concentrations exceed the prediction "Without Dike Leaching."

Upper-range Mixing Estimate (169 Mm^3):

- Bordered cells = concentrations exceed the prediction "With Dike Leaching."
- Shaded cells = concentrations exceed the prediction "Without Dike Leaching."

Italicized numbers are below detection limits.

Table B1-2. Water quality results from Third Portage Lake in 2022 compared against predicted concentrations in the FEIS.

Lake and Area		Simulated Maximum Whole Lake Concentration (mg/L) Third Portage Lake[2]				Third Portage Lake North Basin (TPN)										Third Portage Lake South Basin (TPS)	
Area-Replicate ID	CCME (2012) Guideline[1]	Upper Mixing Estimate (169 Mm^3)		Mid-range Mixing Estimate (92 Mm^3)		TPN-150	TPN-151	TPN-153	TPN-152	TPN-154	TPN-155	TPN-156	TPN-157	TPN-158	TPN-159	TPS-67	TPS-68
Depth (m)		Without Dike Leaching	With Dike Leaching	Without Dike Leaching	With Dike Leaching	3	3	3	3	3	3	3	3	3	3	3	3
Date						01-Mar-2022	01-Mar-2022	11-May-2022	11-May-2022	10-Jul-2022	10-Jul-2022	18-Aug-2022	18-Aug-2022	03-Sep-2022	03-Sep-2022	01-Mar-2022	01-Mar-2022
Physical Tests (mg/L)																	
Hardness		5.7	6.0	6.0	6.4	***13***	***12***	***10***	***13***	***9.3***	***9.2***	***8.8***	***8.8***	***9.3***	***9.3***	***12***	***14***
Anions and Nutrients (mg/L)																	
Alkalinity - Total		4.1	4.1	4.2	4.2	***8.4***	***8.0***	***7.0***	***8.6***	***6.8***	***6.6***	***6.7***	***6.9***	***6.6***	***6.5***	***7.7***	***9.8***
Ammonia (as N)[3]	***equation***	0.033	0.033	0.050	0.050	0.012	0.014	0.013	0.010	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	0.0067	0.015	0.015
Chloride	120	0.80	0.80	1.0	1.1	1.0	0.93	0.83	**1.1**	0.80	0.76	0.74	0.75	0.77	0.77	0.90	***1.2***
Fluoride	0.12	0.070	0.080	0.070	0.090	**0.084**	**0.081**	0.068	**0.083**	0.061	0.059	0.060	0.060	0.064	0.069	**0.082**	***0.093***
Nitrate (as N)	3.0	0.035	0.036	0.057	0.059	0.0093	0.012	0.0066	0.0084	0.0098	0.0088	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	0.0068	0.0085
Ortho Phosphate (as P)		0.0022	0.0022	0.0024	0.0024	0.0017	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	0.0011	*<0.0010*
Phosphorus (P) - Total	0.0040	0.0027	0.0029	0.0032	0.0035	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*
Sulphate (SO_4)		1.7	1.7	2.0	2.0	***5.6***	***5.2***	***4.8***	***5.9***	***4.9***	***4.3***	***4.3***	***4.3***	***4.2***	***4.2***	***5.1***	***6.4***
Cyanides (mg/L)																	
Total Cyanide		0	0	0	0	0	*<0.0020*	*<0.0010*	0	*<0.0010*	0	*<0.0010*	0	0	*<0.0010*	*<0.0010*	0
Total Metals (mg/L)																	
Aluminum[3]	***equation***	0.0070	0.0090	0.0070	0.010	*<0.0030*	0.0032	*<0.0030*	*<0.0030*	***0.011***	0.0046	0.0046	0.0055	0.0037	0.0042	0.0030	0.0034
Antimony		0.00056	0.00057	0.00060	0.00062	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Arsenic	0.0050	0.00062	0.00062	0.00072	0.00072	0.00029	0.00029	0.00020	0.00026	0.00012	0.00025	0.00020	0.00023	0.00022	0.00022	0.00028	0.00030
Barium		0.020	0.022	0.020	0.023	0.0038	0.0036	0.0032	0.0042	0.0019	0.0027	0.0027	0.0028	0.0027	0.0028	0.0037	0.0043
Beryllium		0.0010	0.0010	0.0010	0.0010	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*
Bismuth		0.10	0.10	0.10	0.10	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Boron	1.5	0.00001	0.00001	0.00001	0.00001	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Cadmium[3]	***equation***	<0.000051	<0.000051	<0.000052	<0.000052	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium		1.3	1.4	1.5	1.5	***3.0***	***2.8***	***2.6***	***3.2***	1.1	***2.2***	***2.3***	***2.3***	***2.2***	***2.2***	***2.7***	***3.4***
Chromium[4]	0.001	0.0010	0.0010	0.0010	0.0010	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Cobalt		0.0040	0.0013	0.00040	0.0017	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Copper[3]	***equation***	0.0012	0.0012	0.0013	0.0013	*<0.00050*	*<0.00050*	0.00056	0.00069	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Iron	0.3	0.030	0.030	0.030	0.030	*<0.010*	*<0.010*	*<0.010*	*<0.010*	0.012	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Lead[3]	***equation***	0.00060	0.00060	0.00060	0.00070	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Lithium		0.0050	0.0050	0.0050	0.0050	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Magnesium		0.60	0.60	0.60	0.70	***1.3***	***1.2***	***0.98***	***1.3***	**0.70**	***0.88***	***0.93***	***0.92***	***0.86***	***0.87***	***1.1***	***1.4***
Manganese[3]		0.0090	0.052	0.015	0.072	0.00050	0.00033	0.00041	0.00043	0.0026	0.0011	0.0011	0.0011	0.0010	0.0010	0.00030	0.00032
Mercury	0.000026	0.00005	0.00005	0.00005	0.00005	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Molybdenum	0.073	0.0010	0.0010	0.0010	0.0010	0.00012	0.00012	0.00011	0.00013	*<0.000050*	0.00011	0.00012	0.00010	0.00011	0.00010	0.00013	0.00015
Nickel[3]	***equation***	0.0016	0.0016	0.0020	0.0021	0.00055	0.00053	*<0.00050*	0.00055	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	0.00050	0.00067
Potassium		2.0	2.1	2.0	2.1	0.68	0.62	0.56	0.74	0.38	0.49	0.50	0.51	0.52	0.53	0.61	0.76
Selenium	0.001	0.0010	0.0010	0.0010	0.0010	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	0.00008	0.00011
Silicon		0.010	0.080	0.020	0.12	**0.11**	**0.11**	**0.12**	***0.13***	***0.21***	**0.10**	*<0.10*	*<0.10*	*<0.10*	*<0.10*	**0.11**	***0.14***
Silver	0.0001	0.00002	0.00002	0.00002	0.00002	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Sodium		2.0	2.0	2.0	2.1	1.4	1.3	1.1	1.4	0.55	0.97	1.0	1.0	0.95	0.97	1.3	1.6
Strontium		0.0020	0.0050	0.0040	0.0070	***0.014***	***0.013***	***0.012***	***0.014***	**0.0064**	***0.011***	***0.011***	***0.010***	***0.010***	***0.011***	***0.013***	***0.016***
Thallium	0.0008	0.00020	0.00020	0.00020	0.00020	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Uranium	0.015	0.00020	0.00020	0.00020	0.00030	0.00004	0.00004	0.00004	0.00006	0.00008	0.00004	0.00004	0.00004	0.00004	0.00004	0.00003	0.00004
Vanadium		0.030	0.030	0.030	0.030	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Zinc		0.011	0.011	0.015	0.015	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*

Notes:

1 . CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2016.

2. Whole lake data are given for a range of mixing conditions, representing mid-range and upper mixing estimate for the north basin discharge location. The model includes treated water releases from the project (Years 1 to 4), and long-term substance loading due to leaching from the Bay-Goose dike (Cumberland, 2005).

3. "***equation*** " means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.

4. Chromium CCME guideline is for Cr VI.

Formatting for indicating the parameters that exceed the model predictions in the FEIS:

Mid-range Mixing Estimate (92 Mm^3):

- ***Bold italicized*** = concentrations exceed the prediction "With Dike Leaching."
- **Bold** = concentrations exceed the prediction "Without Dike Leaching."

Upper-range Mixing Estimate (169 Mm^3):

- Bordered cells = concentrations exceed the prediction "With Dike Leaching."
- Shaded cells = concentrations exceed the prediction "Without Dike Leaching."

Italicized numbers are below detection limits.

Table B1-3. Water quality results from Second Portage Lake in 2022 compared against predicted concentrations in the FEIS.

Lake and Area		Simulated Maximum Whole Lake Concentration (mg/L) Second Portage Lake[2]				Second Portage Lake (SP)									
Area-Replicate ID	CCME (2012) Guideline[1]	Upper Mixing Estimate (169 Mm^3)		Mid-range Mixing Estimate (92 Mm^3)		SP-150	SP-151	SP-153	SP-152	SP-154	SP-155	SP-156	SP-157	SP-158	SP-159
Depth (m)		Without Dike Leaching	With Dike Leaching	Without Dike Leaching	With Dike Leaching	3	3	3	3	3	3	3	3	3	3
Date						02-Mar-2022	02-Mar-2022	07-May-2022	07-May-2022	04-Jul-2022	04-Jul-2022	19-Aug-2022	19-Aug-2022	02-Sep-2022	02-Sep-2022
Physical Tests (mg/L)															
Hardness		8.9	8.9	8.9	8.9	***18***	***16***	***18***	***18***	***14***	***14***	***14***	***14***	***14***	***14***
Anions and Nutrients (mg/L)															
Alkalinity - Total		7.0	7.0	7.0	7.0	***12***	***12***	***12***	***12***	***11***	***11***	***9.9***	***9.3***	***11***	***11***
Ammonia (as N)[3]	***equation***	0.025	0.025	0.031	0.031	0.011	0.013	0.0095	0.0063	<0.0050	0.013	0.0088	0.0061	<0.0050	<0.0050
Chloride	120	0.70	0.70	0.80	0.80	***0.89***	***0.97***	***0.97***	***0.97***	***0.81***	***0.81***	0.76	0.77	0.76	0.76
Fluoride	0.12	0.070	0.071	0.070	0.071	***0.089***	***0.083***	***0.078***	***0.078***	0.065	0.064	0.069	0.069	0.069	0.070
Nitrate (as N)	3.0	0.017	0.017	0.025	0.025	<0.0050	0.0093	0.015	0.015	0.0074	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Ortho Phosphate (as P)		0.0030	0.0030	0.0030	0.0030	0.0013	<0.0010	<0.0010	<0.0010	0.0011	0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P) - Total	0.0040	0.0030	0.0030	0.0031	0.0031	***0.012***	<0.0020	<0.0020	<0.0020	0.0020	0.0022	<0.0020	<0.0020	<0.0020	***0.0042***
Sulphate (SO_4)		2.8	2.8	2.8	2.8	***5.4***	***6.0***	***6.1***	***6.1***	***7.1***	***4.8***	***4.5***	***4.5***	***4.9***	***4.8***
Cyanides (mg/L)															
Total Cyanide		0	0	0	0	<0.0010	0	0	<0.0010	0	<0.0010	0	<0.0010	<0.0010	0
Total Metals (mg/L)															
Aluminum[3]	***equation***	0.0070	0.0070	0.0070	0.0070	0.0045	0.0039	0.0034	0.0041	***0.0078***	***0.0093***	0.0056	0.0052	0.0050	0.0049
Antimony		0.00050	0.00050	0.00050	0.00050	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.0050	0.00050	0.00050	0.00060	0.00060	0.00036	0.00034	0.00030	0.00036	0.00034	0.00037	0.00036	0.00035	0.00034	0.00035
Barium		0.020	0.020	0.020	0.020	0.0036	0.0034	0.0036	0.0035	0.0028	0.0029	0.0024	0.0024	0.0023	0.0023
Beryllium		0.0010	0.0010	0.0010	0.0010	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth		0.10	0.10	0.10	0.10	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	1.5	0.00001	0.00001	0.00001	0.00001	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium[3]	***equation***	<0.000050	<0.000050	<0.000051	<0.000051	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		2.3	2.3	2.3	2.3	***4.6***	***4.5***	***4.5***	***4.7***	***3.6***	***3.6***	***3.5***	***3.7***	***3.5***	***3.5***
Chromium[4]	0.0010	0.0010	0.0010	0.0010	0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt		0.00030	0.00040	0.00030	0.00040	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper[3]	***equation***	0.0011	0.0011	0.0011	0.0011	0.00093	0.00088	0.0010	***0.0011***	0.00081	0.0010	0.00073	0.00072	0.00074	0.00079
Iron	0.30	0.030	0.030	0.030	0.030	<0.010	<0.010	<0.010	<0.010	0.018	0.018	0.019	0.015	0.021	0.025
Lead[3]	***equation***	0.00090	0.00090	0.00090	0.00090	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00010	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.0050	0.0050	0.0050	0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		0.80	0.80	0.80	0.80	***1.6***	***1.6***	***1.5***	***1.6***	***1.2***	***1.2***	***1.2***	***1.1***	***1.1***	***1.1***
Manganese[3]		0.0044	0.0067	0.0066	0.0089	0.00067	0.00055	0.00061	0.00053	0.0018	0.0020	0.0016	0.0017	0.0015	0.0015
Mercury	0.00003	0.00005	0.00005	0.00005	0.00005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.073	0.0010	0.0010	0.0010	0.0010	0.00017	0.00016	0.00014	0.00016	0.00010	0.00012	0.00012	0.00013	0.00014	0.00014
Nickel[3]	***equation***	0.0010	0.0010	0.0010	0.0010	0.00060	0.00055	<0.00050	<0.00050	0.00051	0.00053	<0.00050	<0.00050	<0.00050	<0.00050
Potassium		2.0	2.0	2.0	2.0	0.67	0.63	0.62	0.67	0.50	0.51	0.53	0.53	0.55	0.55
Selenium	0.0010	0.0010	0.0010	0.0010	0.0010	<0.000050	0.00005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.010	0.010	0.010	0.010	***0.35***	***0.34***	***0.38***	***0.41***	***0.30***	***0.31***	***0.26***	***0.26***	***0.25***	***0.27***
Silver	0.00010	0.00001	0.00001	0.00001	0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		2.0	2.0	2.0	2.0	1.1	1.0	0.98	1.0	0.74	0.74	0.77	0.76	0.79	0.78
Strontium		0.80	0.80	0.80	0.80	0.023	0.022	0.022	0.022	0.016	0.017	0.018	0.019	0.017	0.018
Thallium	0.00080	0.00020	0.00020	0.00020	0.00020	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Uranium	0.015	0.00020	0.00020	0.00020	0.00020	0.00005	0.00005	0.00006	0.00007	0.00006	0.00006	0.00005	0.00005	0.00005	0.00005
Vanadium		0.030	0.030	0.030	0.030	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc		0.0070	0.0070	0.0090	0.0090	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2016.

2. The Second Portage Lake water quality model includes substance loading from the Third Portage and East dikes and inflow from Third Portage and Wally lakes. Changes in water quality in Second Portage Lake were modelled for two different mixing scenarios of water releases into Third Portage Lake (Cumberland, 2005).

3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.

4. Chromium CCME guideline is for Cr VI.

Formatting for indicating the parameters that exceed the model predictions in the FEIS:

Mid-range Mixing Estimate (92 Mm^3):

- ***Bold italicized*** = concentrations exceed the prediction "With Dike Leaching."
- **Bold** = concentrations exceed the prediction "Without Dike Leaching."

Upper-range Mixing Estimate (169 Mm^3):

- Bordered cells = concentrations exceed the prediction "With Dike Leaching."
- Shaded cells = concentrations exceed the prediction "Without Dike Leaching."

Italicized numbers are below detection limits.

Table B1-4. Water quality results from Wally Lake in 2022 compared against predicted concentrations in the FEIS.

Lake and Area		Simulated Maximum Whole Lake Concentration (mg/L) Wally Lake[2]		Wally Lake (WAL)									
Area-Replicate ID	CCME (2012) Guideline[1]	Without Dike Leaching	With Dike Leaching	WAL-119	WAL-120	WAL-121	WAL-122	WAL-123	WAL-124	WAL-125	WAL-126	WAL-127	WAL-128
Depth (m)				3	3	3	3	3	3	3	3	3	3
Date				06-Mar-2022	06-Mar-2022	07-May-2022	07-May-2022	05-Jul-2022	05-Jul-2022	19-Aug-2022	19-Aug-2022	03-Sep-2022	03-Sep-2022
Physical Tests (mg/L)													
Hardness		17	17	***22***	***22***	***26***	***24***	14	16	15	15	16	15
Anions and Nutrients (mg/L)													
Alkalinity - Total		13	13	***16***	***15***	***20***	***18***	11	12	12	12	12	12
Ammonia (as N)[3]	***equation***	0.089	0.089	0.015	0.015	0.014	0.0068	*<0.0050*	*<0.0050*	*<0.0050*	0.0052	*<0.0050*	0.0071
Chloride	120	0.70	0.70	***1.0***	***0.71***	***0.87***	***0.76***	0.50	0.52	0.52	0.53	0.54	0.53
Fluoride	0.12	0.050	0.050	***0.090***	***0.061***	***0.062***	***0.058***	0.045	0.043	0.049	***0.051***	***0.054***	***0.053***
Nitrate (as N)	3.0	0.10	0.10	0.0078	0.011	0.011	0.007	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*
Ortho Phosphate (as P)		0.0030	0.0030	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	0.0010	0.0010	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Phosphorus (P) - Total	0.0040	0.0039	0.0040	*<0.0020*	*<0.0020*	***0.0068***	*<0.0020*	0.0021	0.0022	*<0.0020*	*<0.0020*	*<0.0020*	*<0.0020*
Sulphate (SO_4)		5.3	5.3	***5.7***	***5.8***	***6.7***	***6.2***	***5.5***	5.0	3.9	3.8	4.3	4.1
Cyanides (mg/L)													
Total Cyanide		0	0	*<0.0010*	0	0	*<0.0010*	*<0.0010*	0	*<0.0010*	0	0	*<0.0010*
Total Metals (mg/L)													
Aluminum[3]	***equation***	0.012	0.013	0.0049	0.0046	0.0064	0.0049	0.0059	0.0059	0.0042	0.0046	0.0052	0.0045
Antimony		0.00090	0.00090	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Arsenic	0.0050	0.0050	0.0060	0.00033	0.00031	0.00040	0.00033	0.00028	0.00032	0.00035	0.00035	0.00038	0.00035
Barium		0.020	0.020	0.0033	0.0030	0.0039	0.0035	0.0021	0.0021	0.0019	0.0019	0.0019	0.0018
Beryllium		0.0010	0.0010	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*
Bismuth		0.10	0.10	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Boron	1.5	0.00001	0.00001	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Cadmium[3]	***equation***	0.00018	0.00019	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium		4.7	4.7	***5.8***	***5.6***	***7.3***	***6.5***	3.8	4.3	4.1	4.0	4.2	4.0
Chromium[4]	0.001	0.0010	0.0010	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Cobalt		0.00030	0.00030	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Copper[3]	***equation***	0.0020	0.0020	0.0018	0.0013	0.0019	0.0018	0.0010	0.0010	0.0011	0.0010	0.0011	0.0012
Iron	0.3	0.030	0.030	*<0.010*	*<0.010*	0.013	0.011	0.013	0.013	0.015	0.016	0.022	0.017
Lead[3]	***equation***	0.00070	0.00070	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Lithium		0.0050	0.0050	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Magnesium		1.3	1.3	***1.8***	***1.8***	***2.1***	***1.8***	1.1	1.2	1.2	1.2	1.3	1.2
Manganese[3]		0.0020	0.0020	0.0011	0.00093	0.0014	0.0012	0.0013	0.0011	0.0014	0.0015	0.0017	0.0014
Mercury	0.000026	0.00010	0.00010	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Molybdenum	0.073	0.0020	0.0020	0.00015	0.00014	0.00017	0.00017	0.00011	0.00011	0.00016	0.00015	0.00019	0.00018
Nickel[3]	***equation***	0.0010	0.0010	0.00076	0.00055	*<0.00050*	0.00066	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Potassium		2.0	2.0	0.58	0.55	0.70	0.61	0.40	0.40	0.45	0.46	0.49	0.47
Selenium	0.001	0.0010	0.0010	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Silicon		0.040	0.040	***0.72***	***0.69***	***0.89***	***0.77***	***0.44***	***0.44***	***0.57***	***0.58***	***0.60***	***0.58***
Silver	0.0001	0.00002	0.00002	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Sodium		2.0	2.0	0.79	0.75	0.92	0.81	0.51	0.50	0.55	0.56	0.58	0.57
Thallium	0.0008	0.00020	0.00020	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Uranium	0.015	0.00070	0.00070	0.00006	0.00006	0.00008	0.00007	0.00006	0.00006	0.00005	0.00006	0.00006	0.00005
Vanadium		0.030	0.030	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Zinc		0.013	0.013	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	0.0048	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2016.
2. Preliminary modelling of whole lake water quality in the receiving environment water bodies incorporates long-term loadings from the Vault dike and effluent releases from the Vault Attenuation pond (Cumberland, 2005).
3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. Ammonia and aluminum (t & d) guidelines vary with pH; cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

Formatting for indicating the parameters that exceed the model predictions in the FEIS:

- ***Bold italicized*** = concentrations exceed the prediction "With Dike Leaching."
- **Bold** = concentrations exceed the prediction "Without Dike Leaching."

Italicized numbers are below detection limits.

FIGURES

Figure B1-1. Laboratory-measured conductivity (µS/cm).

Note: Conductivity data from 2014 should be interpreted with caution. See Azimuth (2015) for more details.

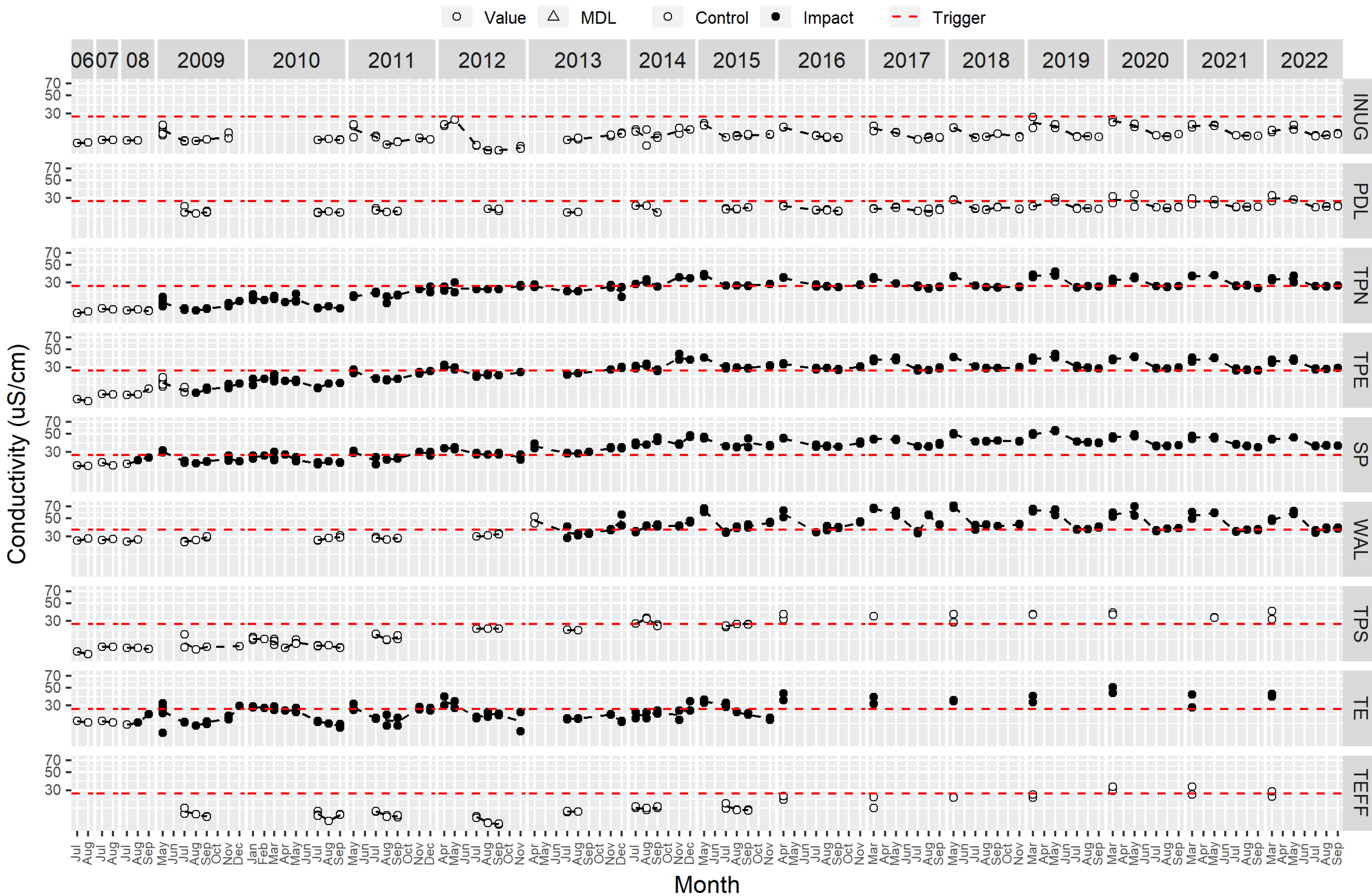


Figure B1-2. Laboratory-measured hardness (mg/L).

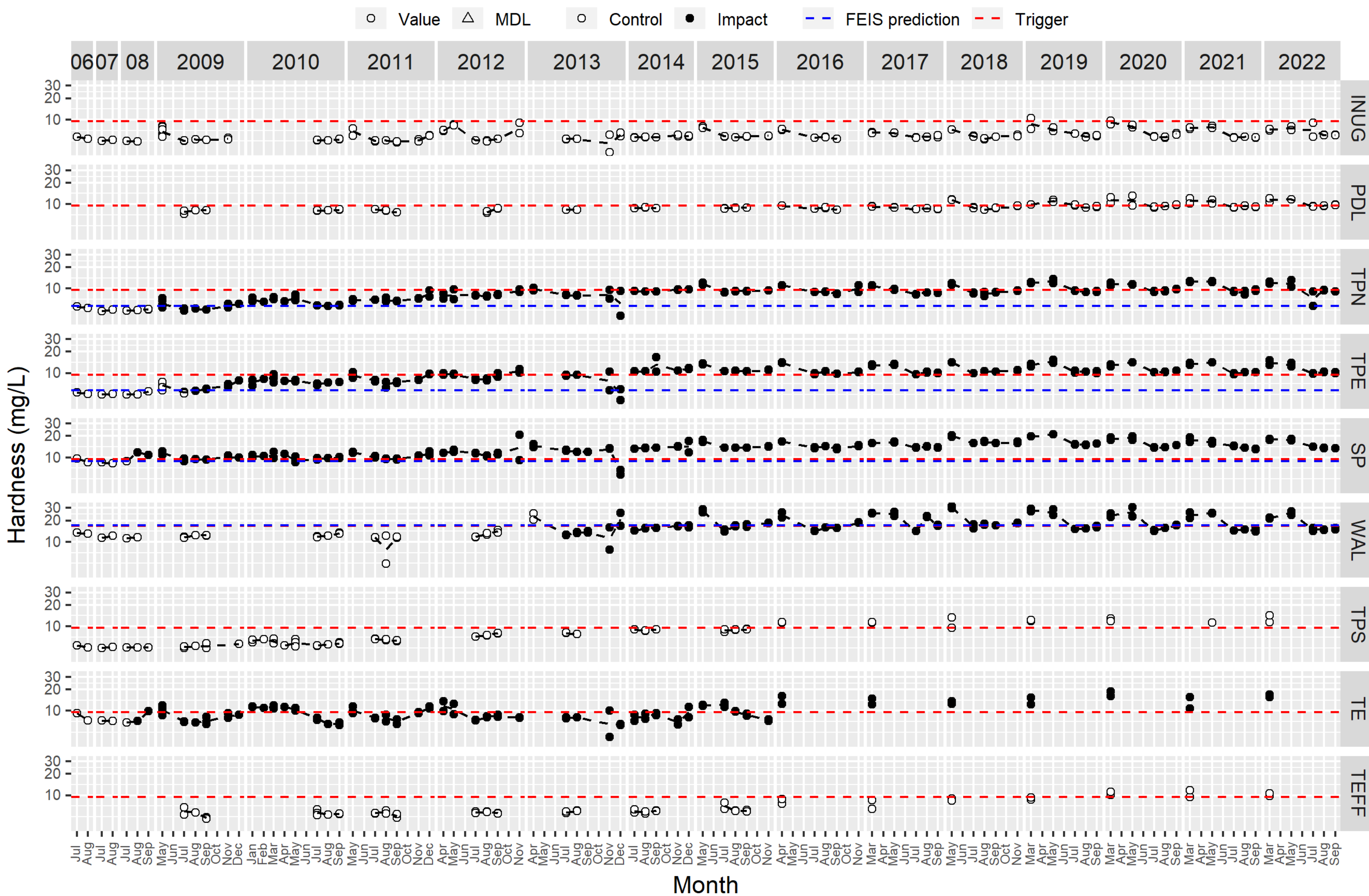


Figure B1-3. Field-measured pH.

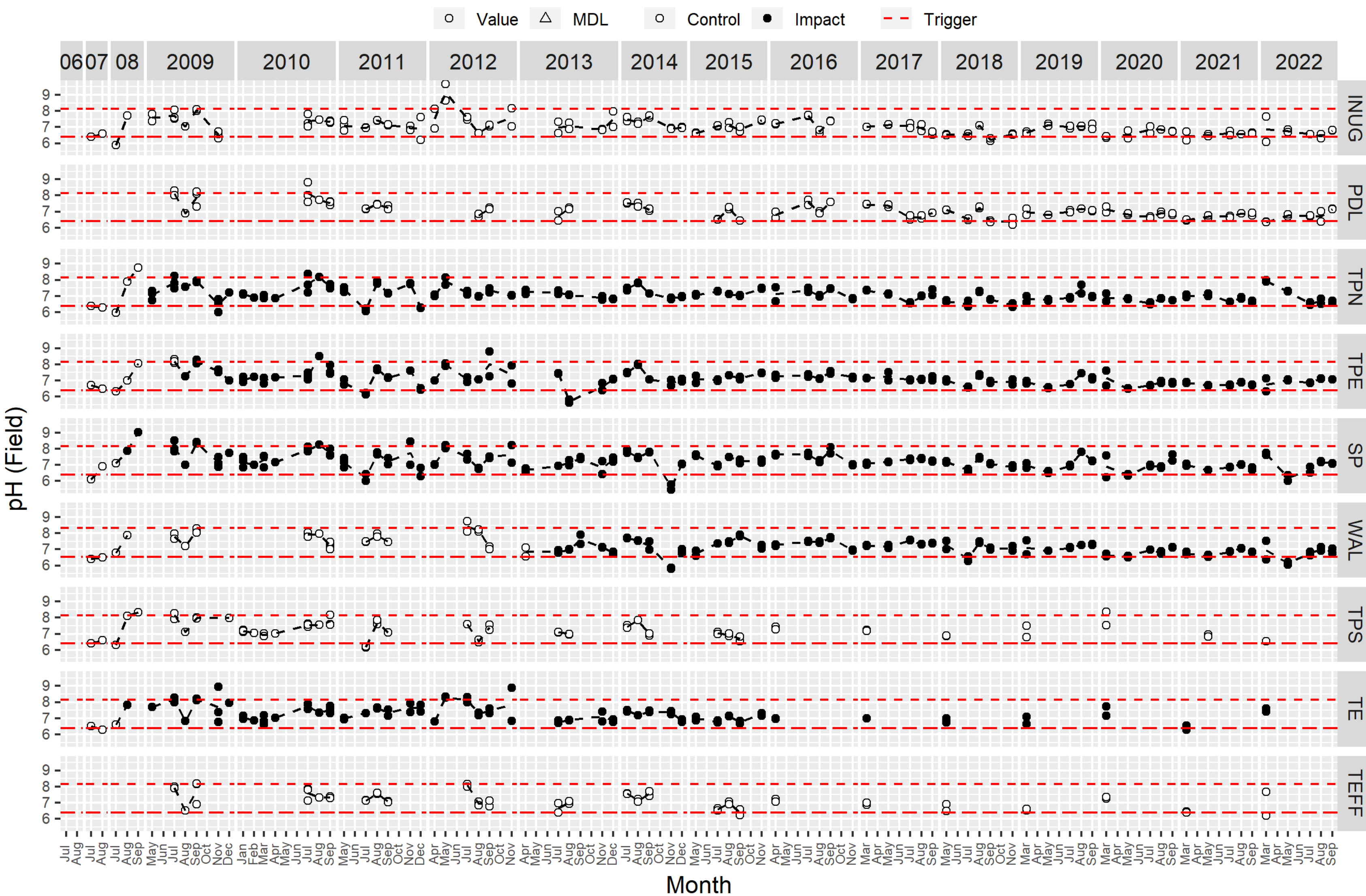


Figure B1-4. Laboratory-measured pH.

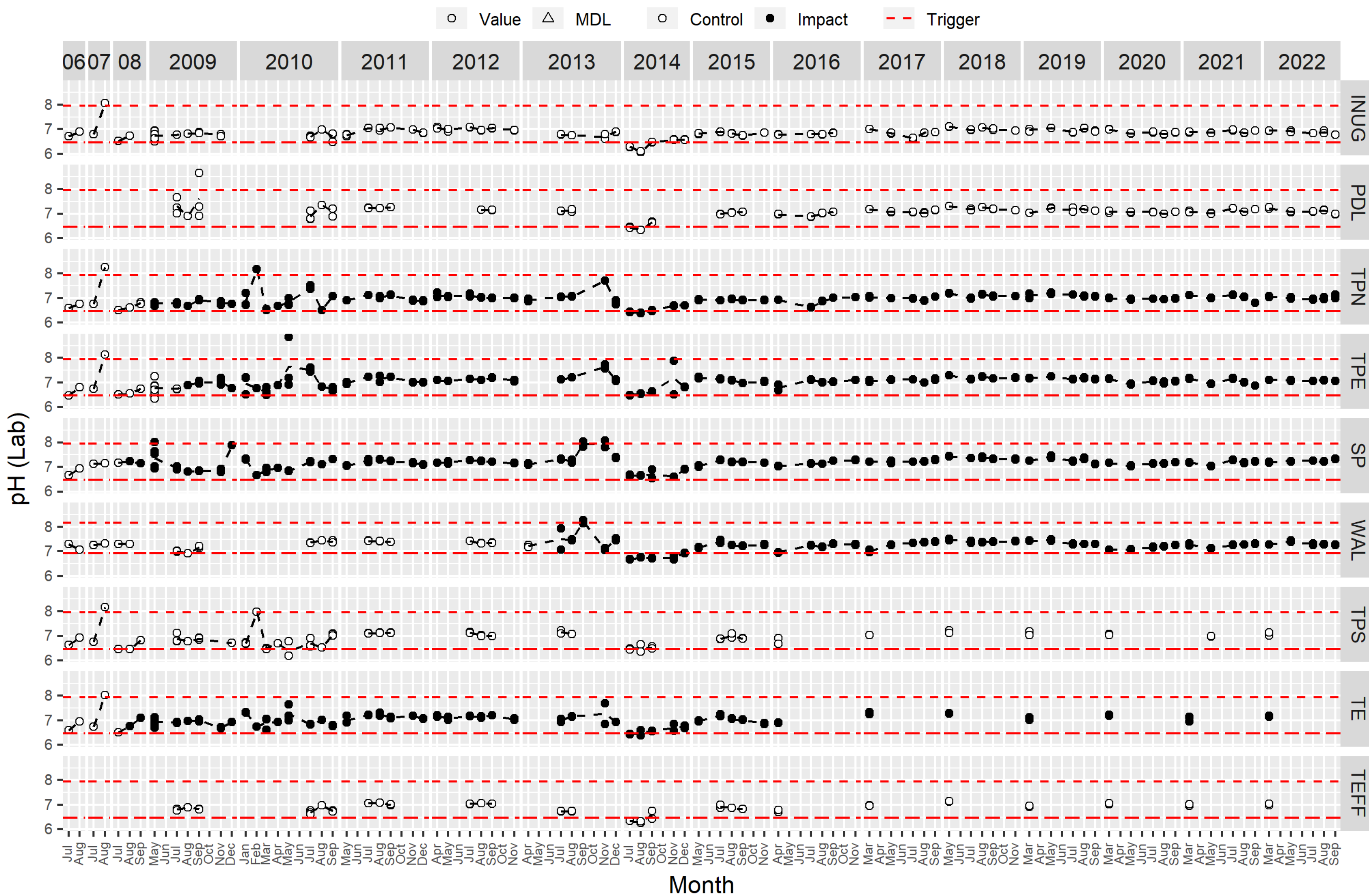


Figure B1-5. Total dissolved solids (TDS; mg/L).

Note: TDS data from 2014 were removed due to data quality concerns. See Azimuth (2015) for more details.

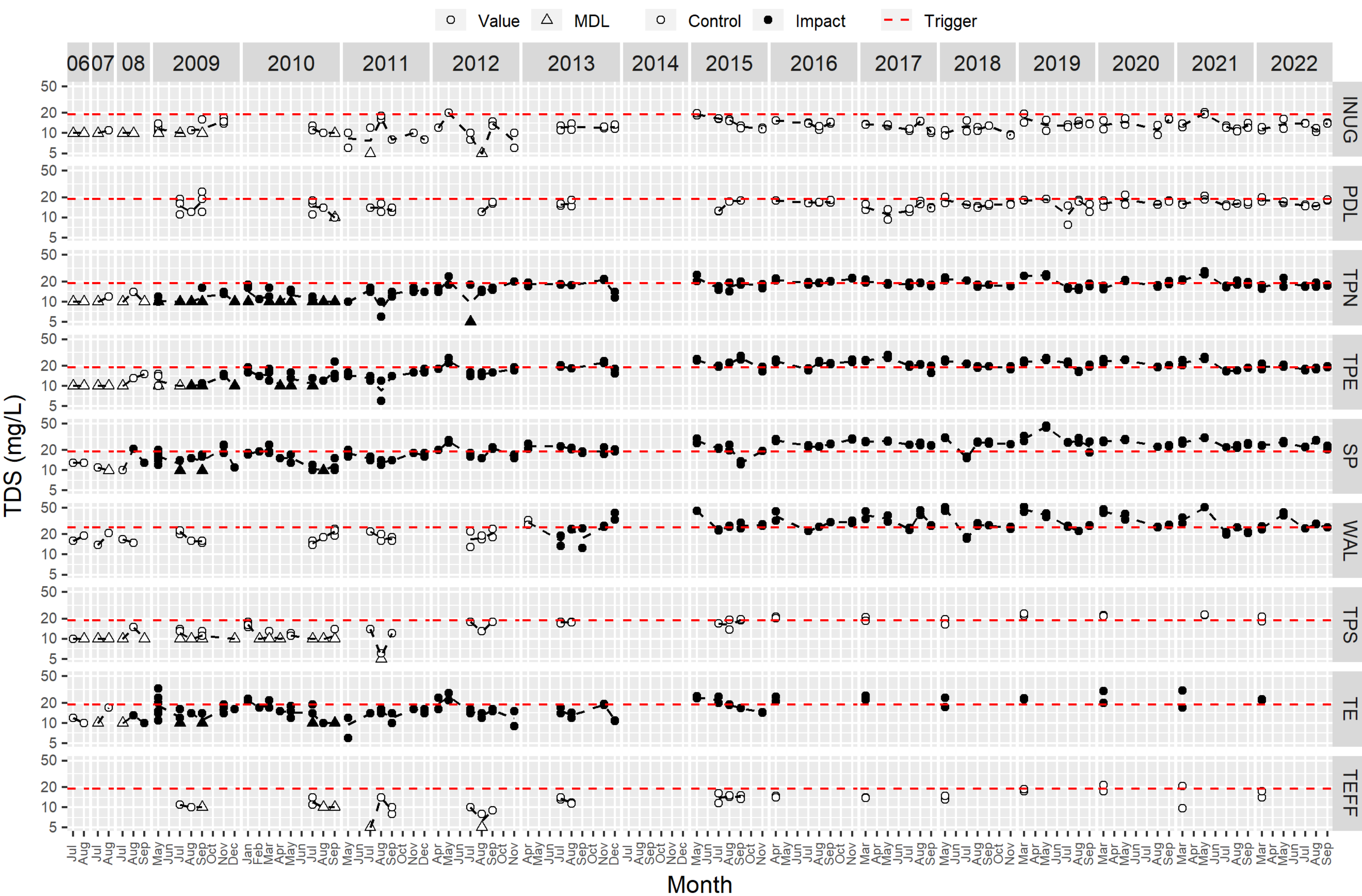


Figure B1-6. Total suspended solids (TSS; mg/L).

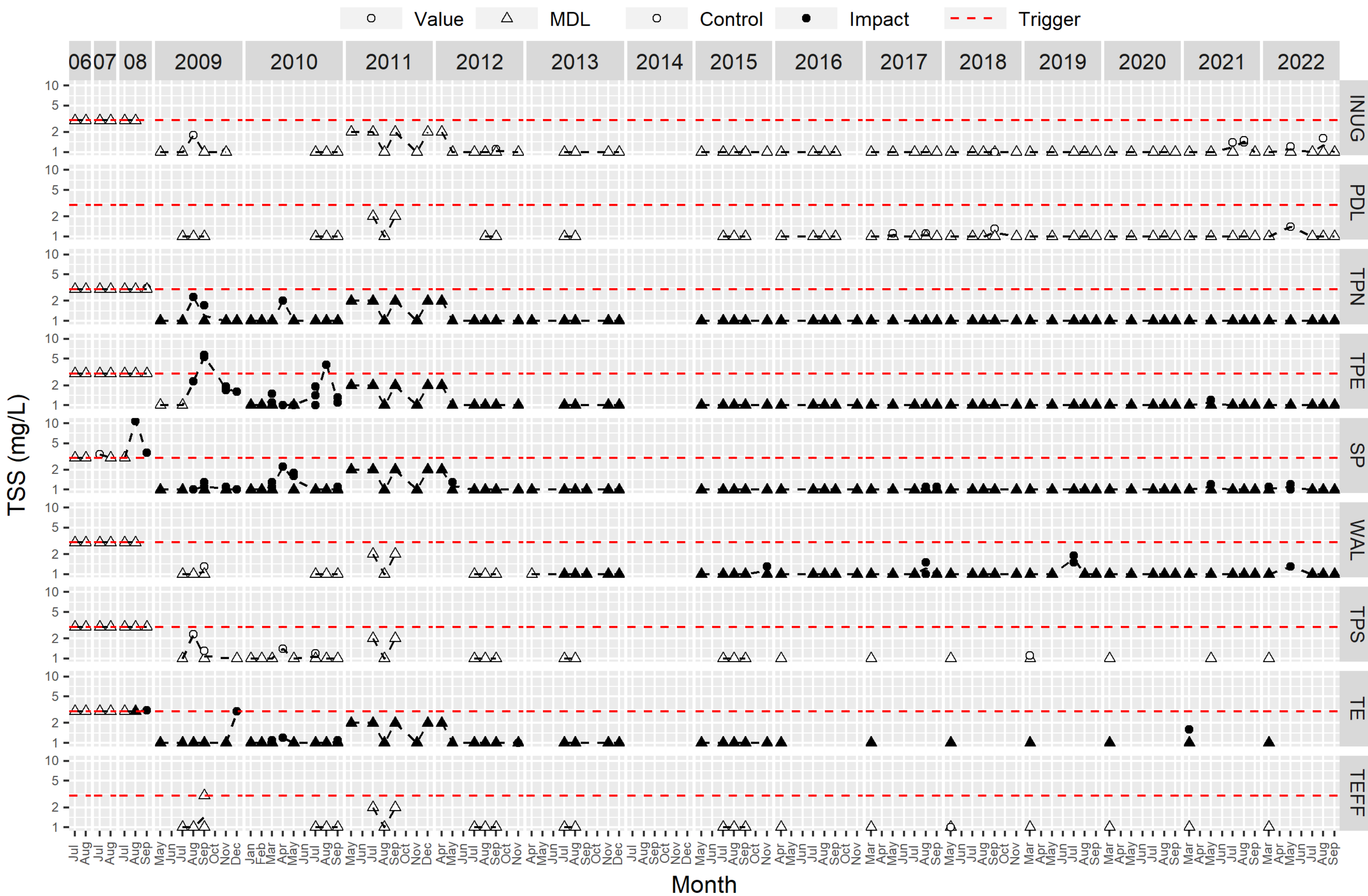


Figure B1-7. Carbonate alkalinity (mg/L).

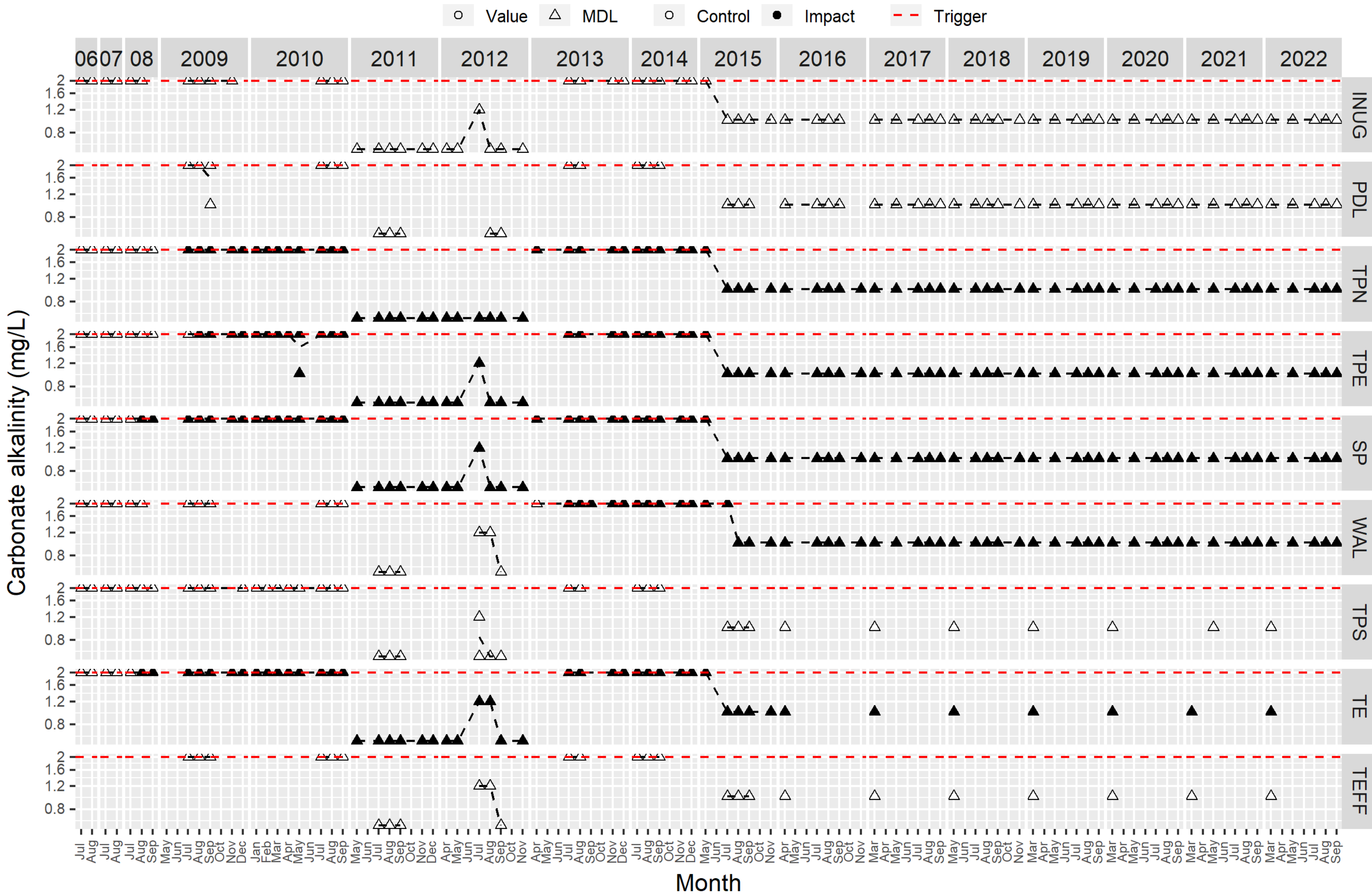


Figure B1-8. Bicarbonate alkalinity (mg/L).

Note: Bicarbonate alkalinity data from 2014 were removed due to data quality concerns. See Azimuth (2015) for more details.

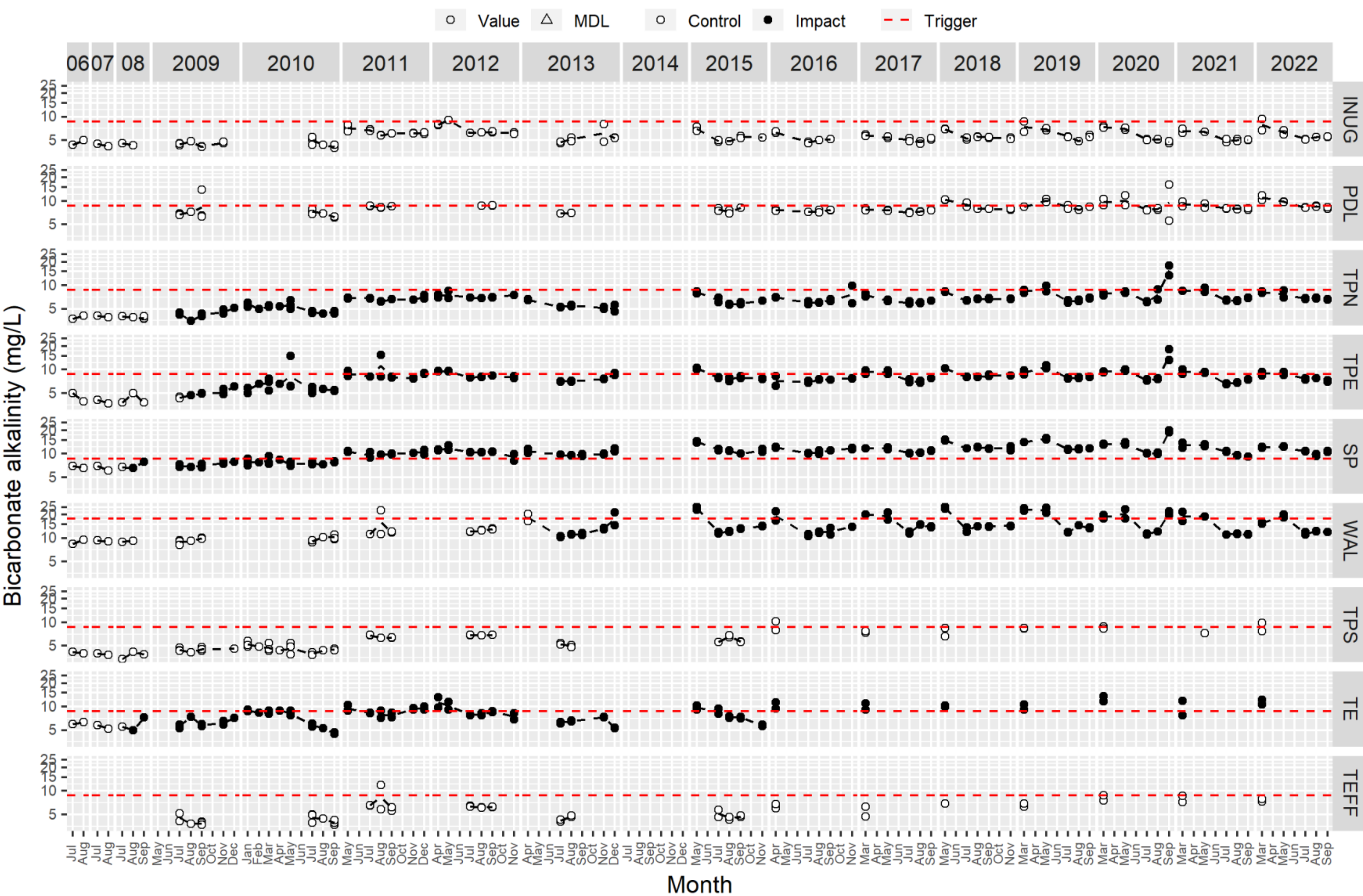


Figure B1-9. Total alkalinity (mg/L).

Note: Total alkalinity data from 2014 were removed due to data quality concerns. See Azimuth (2015) for more details.

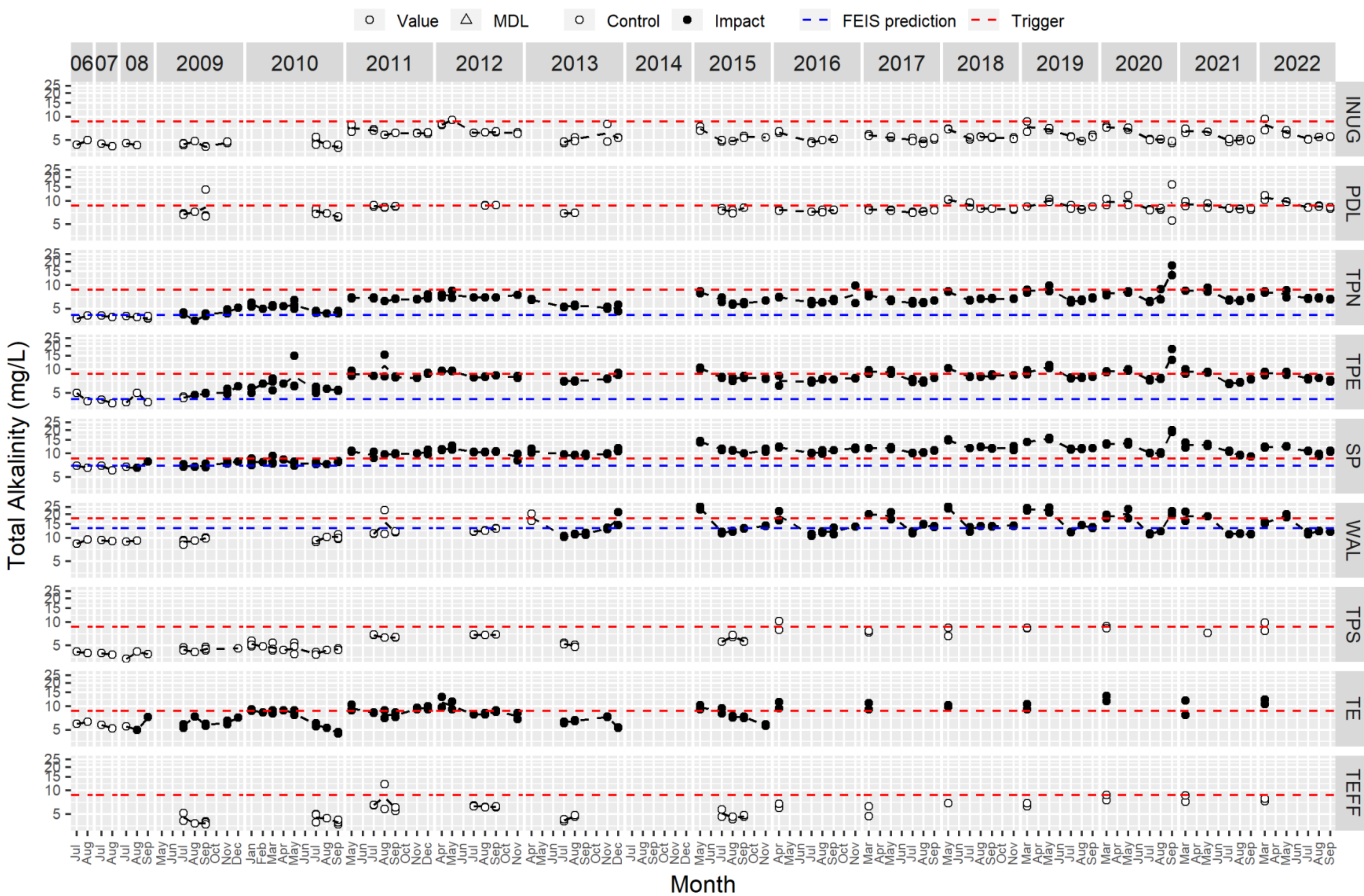


Figure B1-10. Ammonia-N (mg/L).

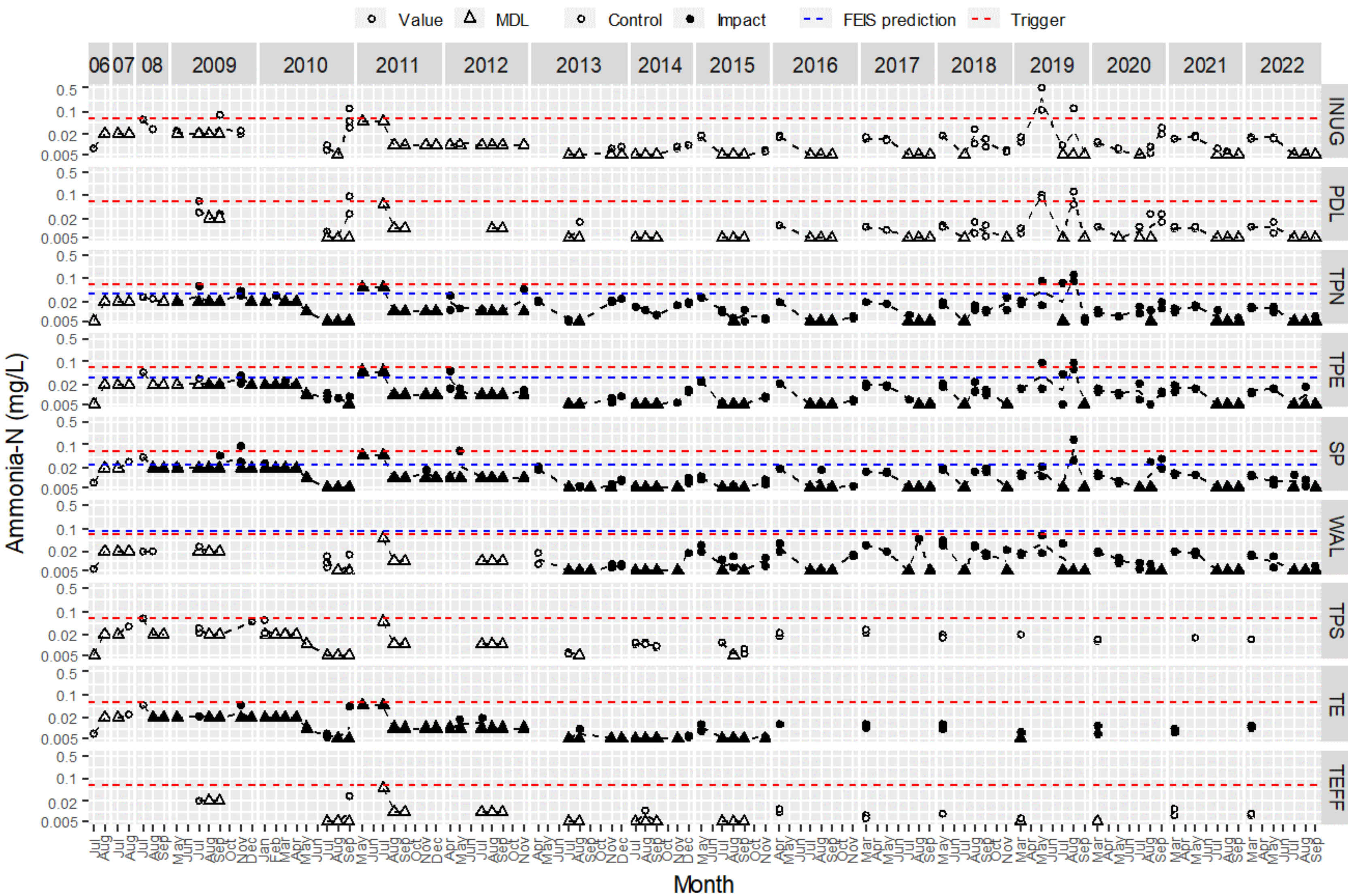


Figure B1-11. Chloride (mg/L).

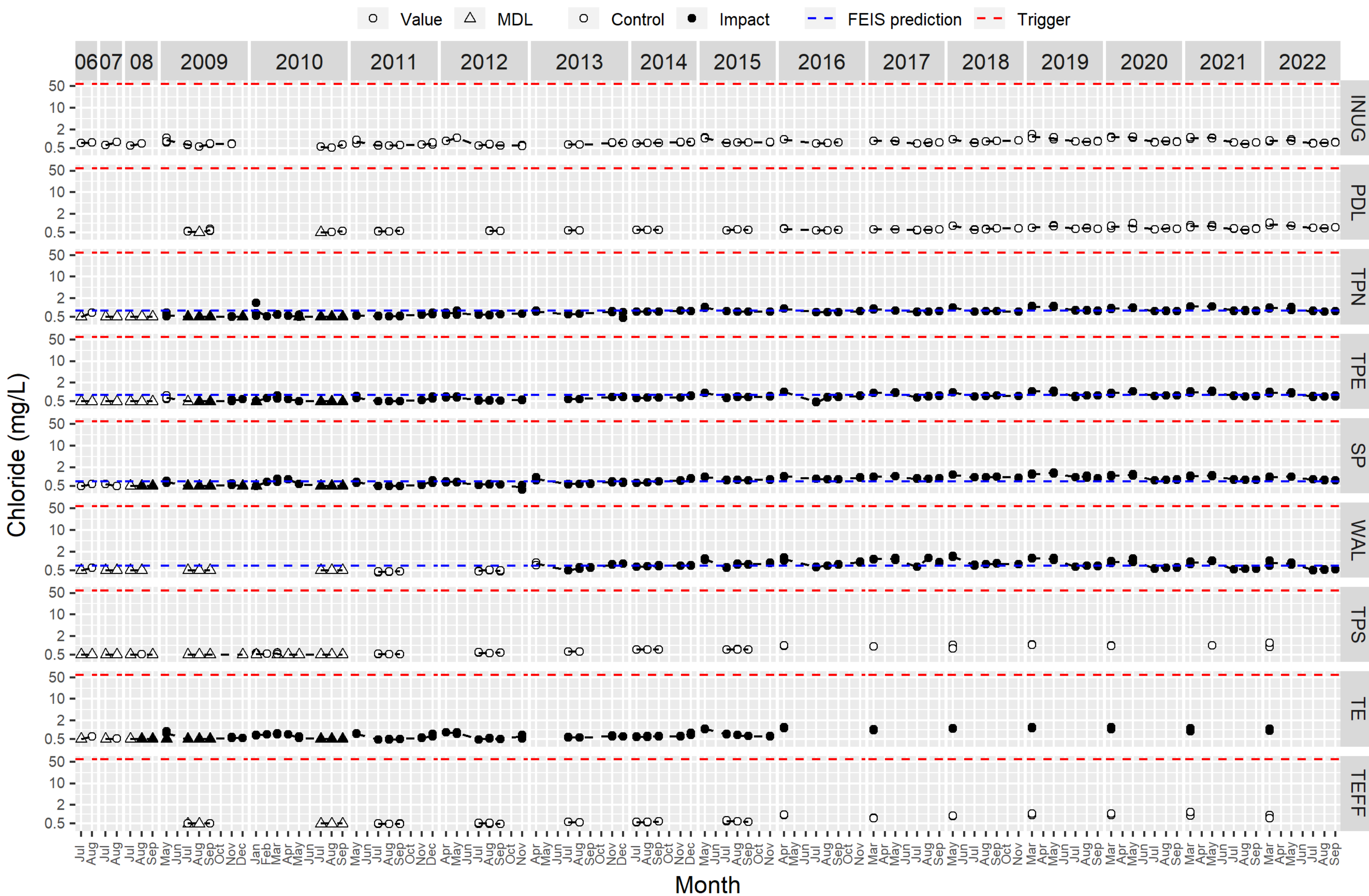


Figure B1-12. Fluoride (mg/L).

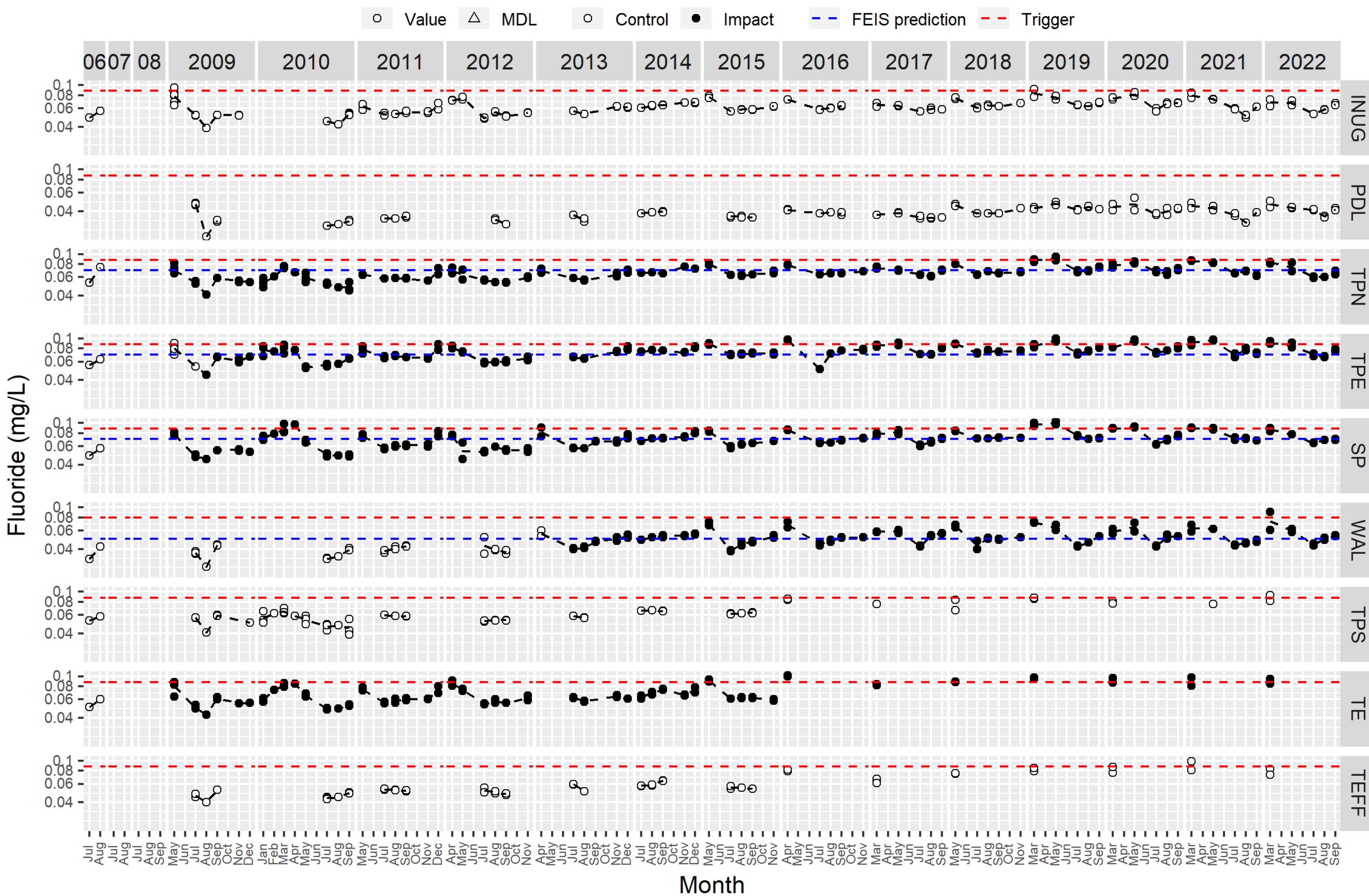


Figure B1-13. Nitrate-N (mg/L).

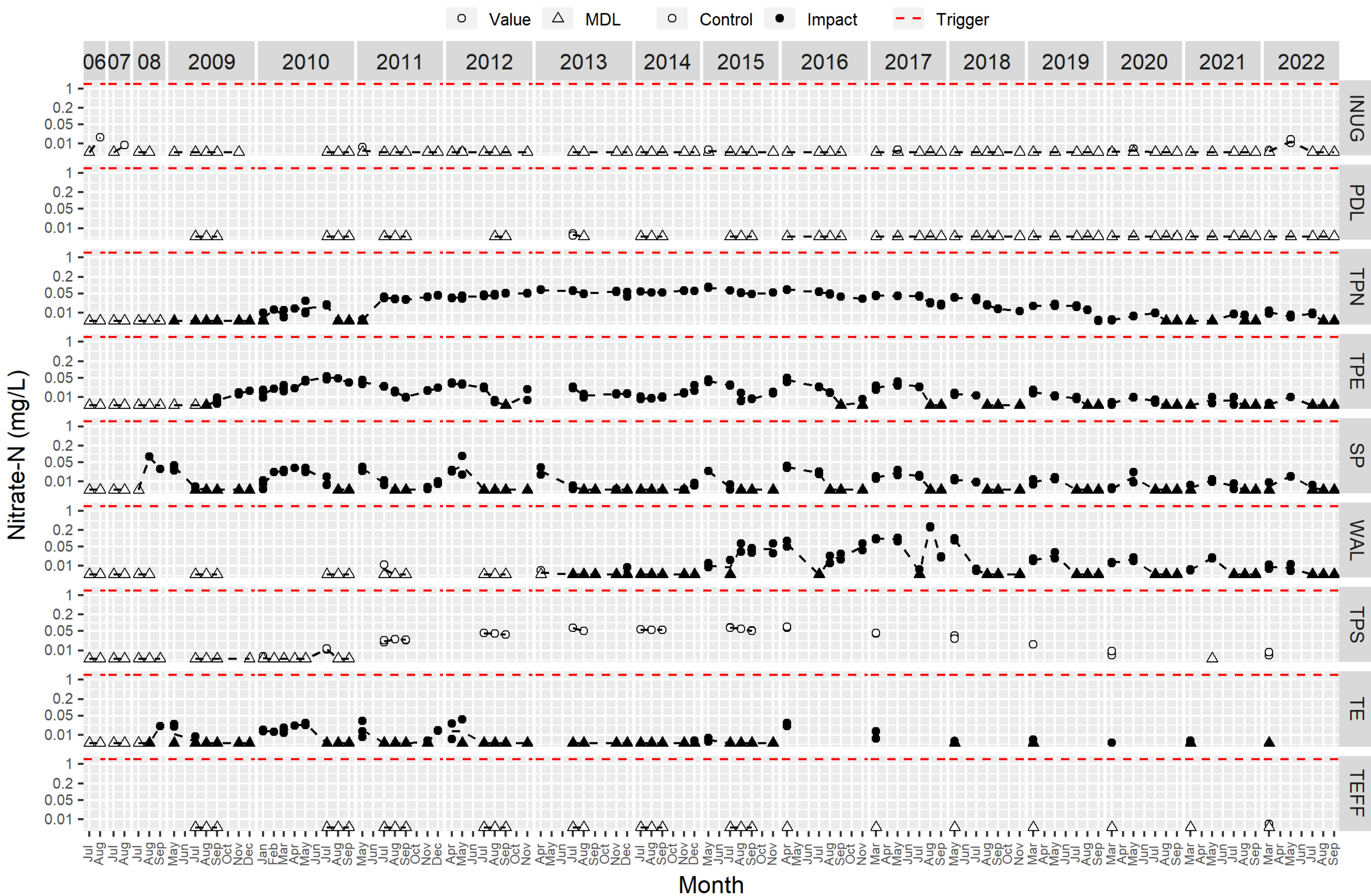


Figure B1-14. Nitrite-N (mg/L).

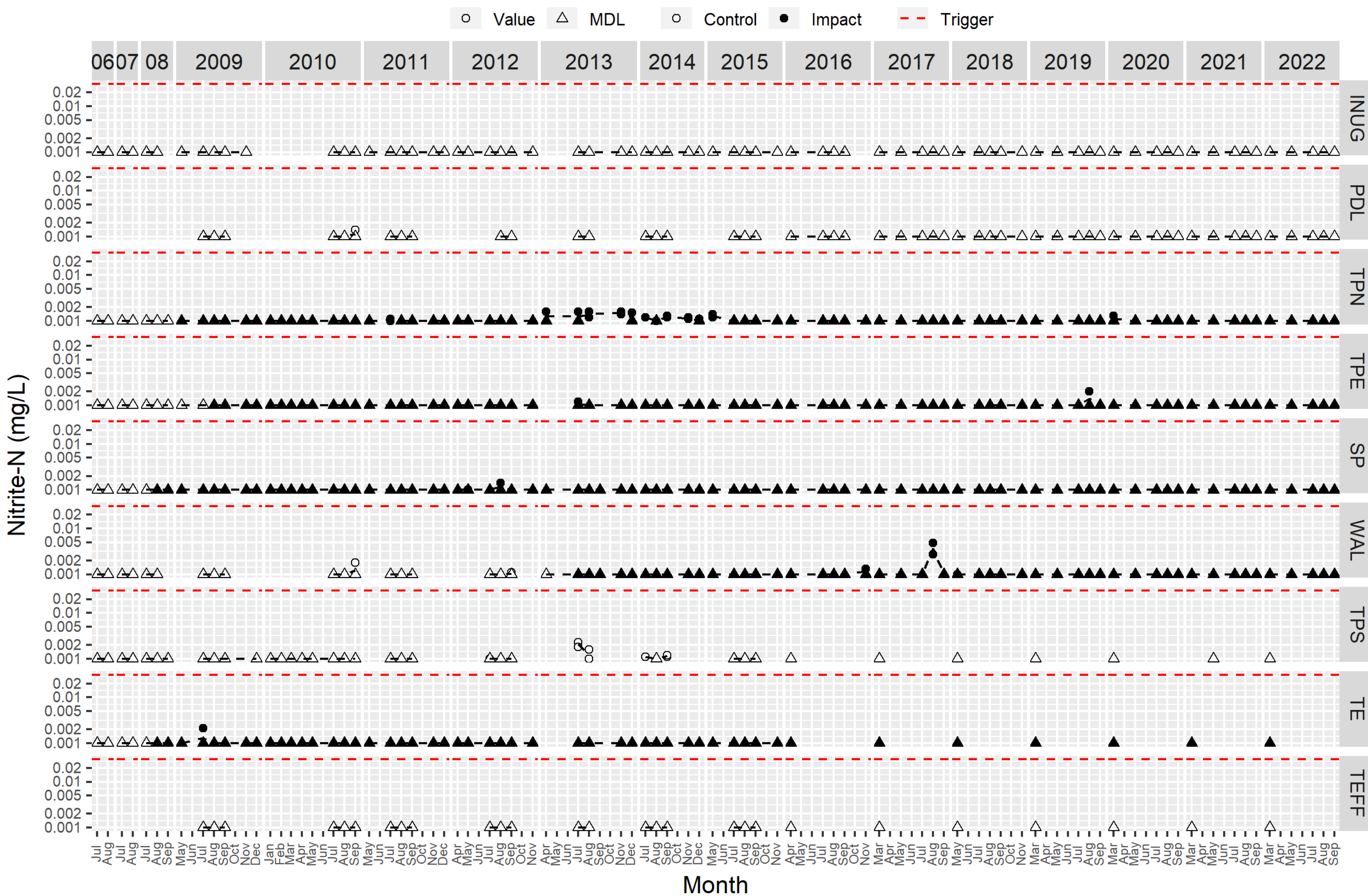


Figure B1-15. Total Kjeldahl Nitrogen (TKN; mg/L).

Note: TKN data from 2014 were removed due to data quality concerns. See Azimuth (2015) for more details.

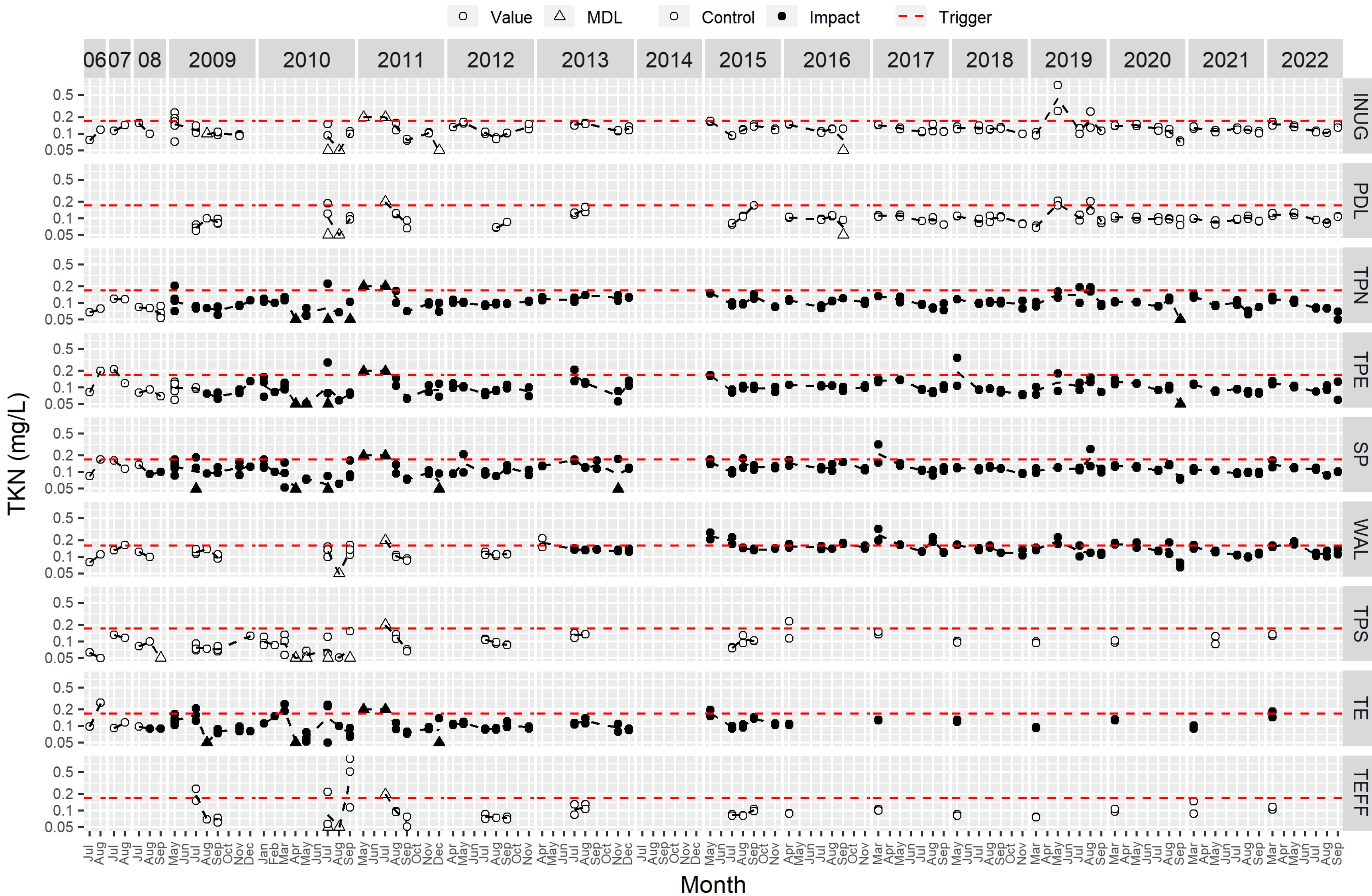


Figure B1-16. Total phosphorus (mg/L).

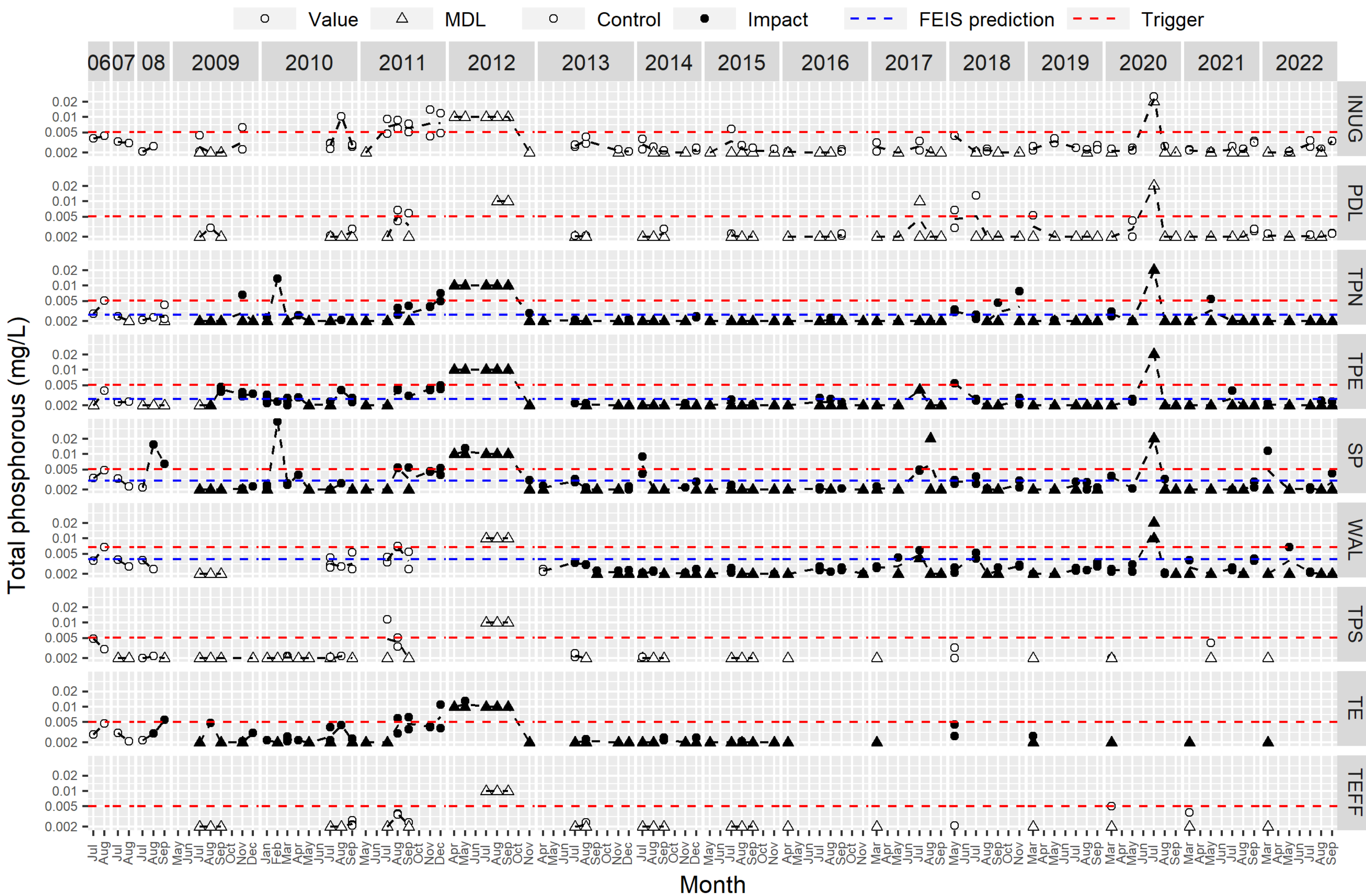


Figure B1-17. Ortho-phosphate (mg/L).

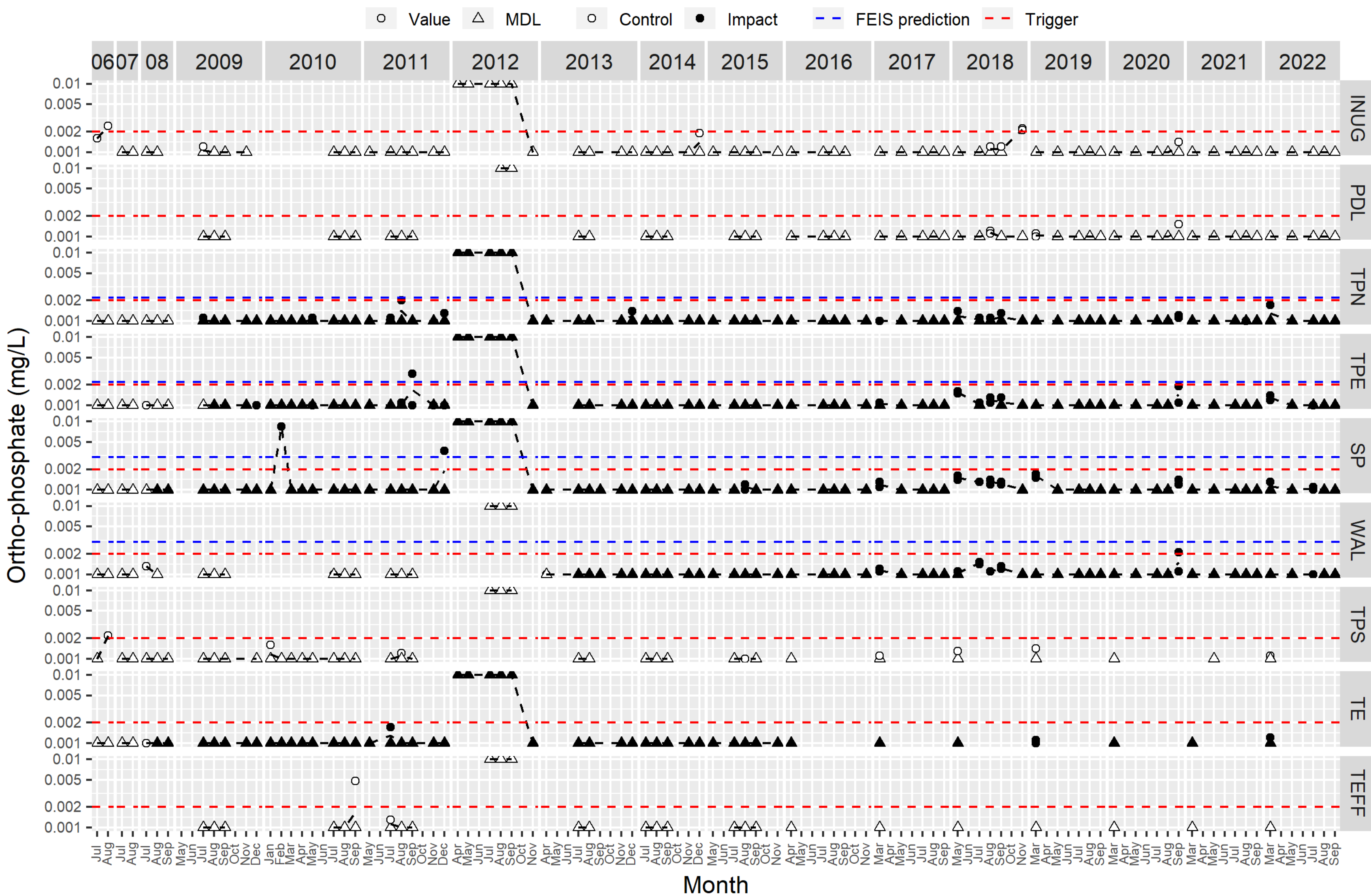


Figure B1-18. Reactive silica (mg/L).

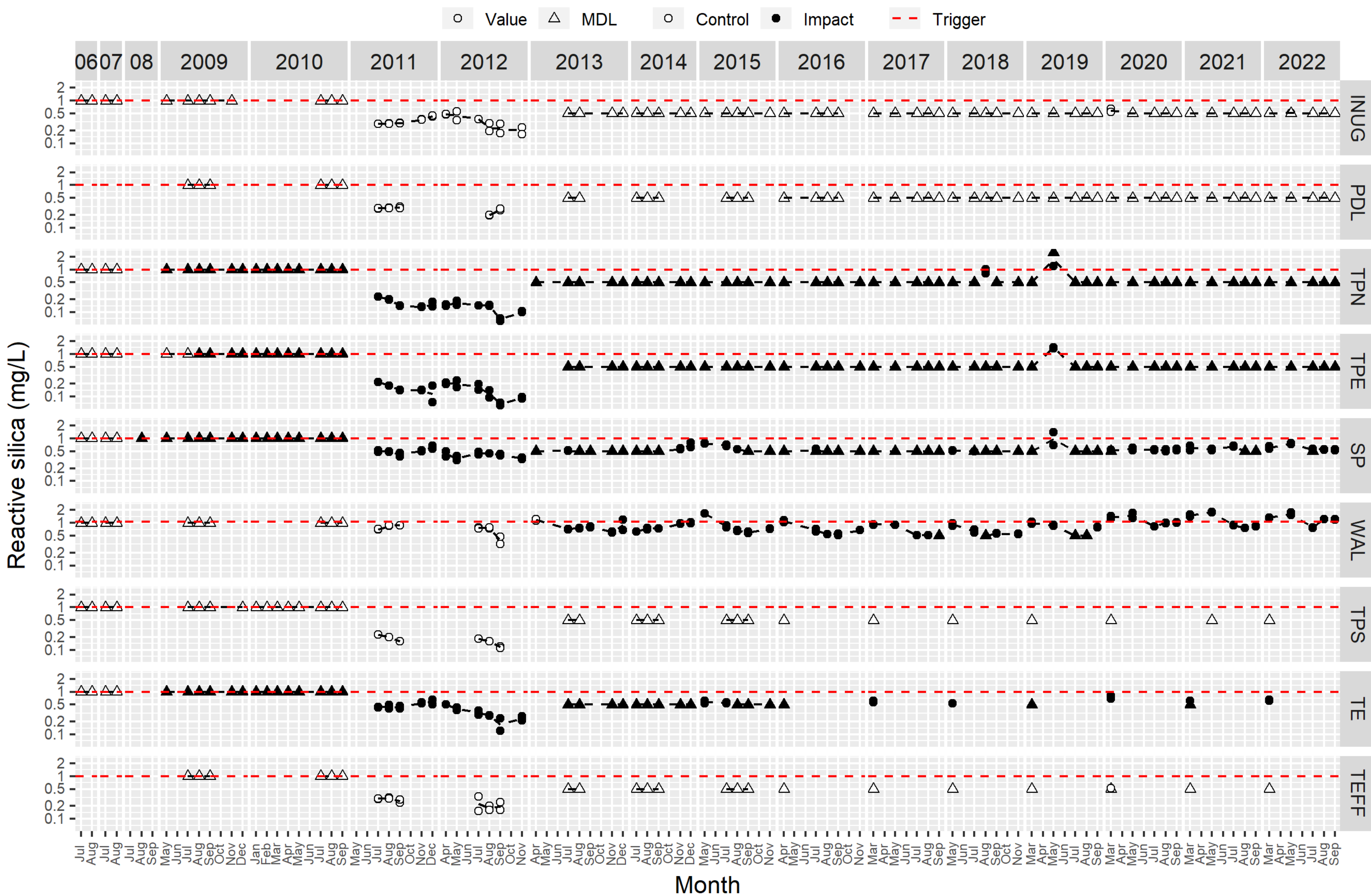


Figure B1-19. Sulphate (mg/L).

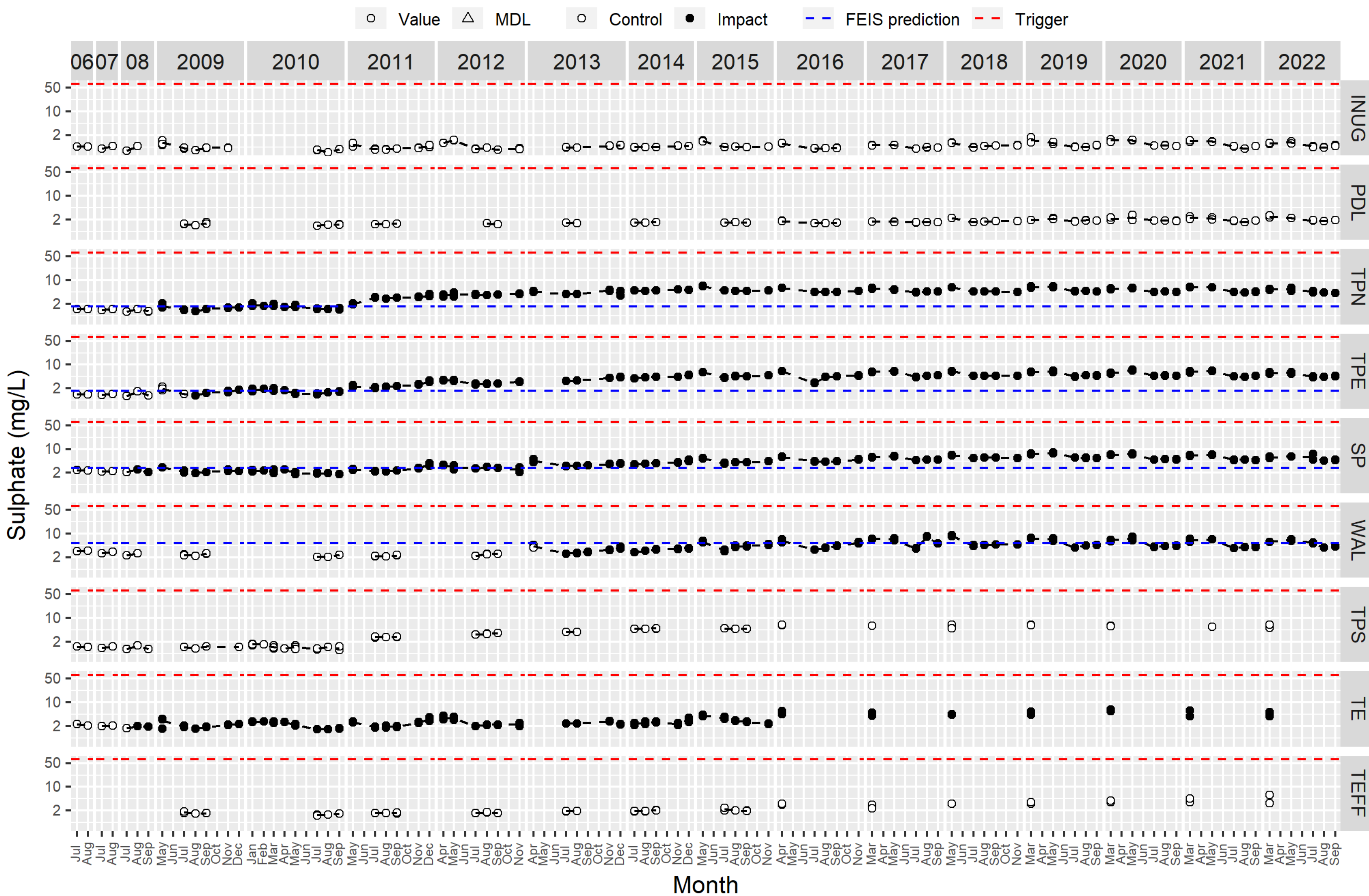


Figure B1-20. Dissolved Organic Carbon (DOC; mg/L).

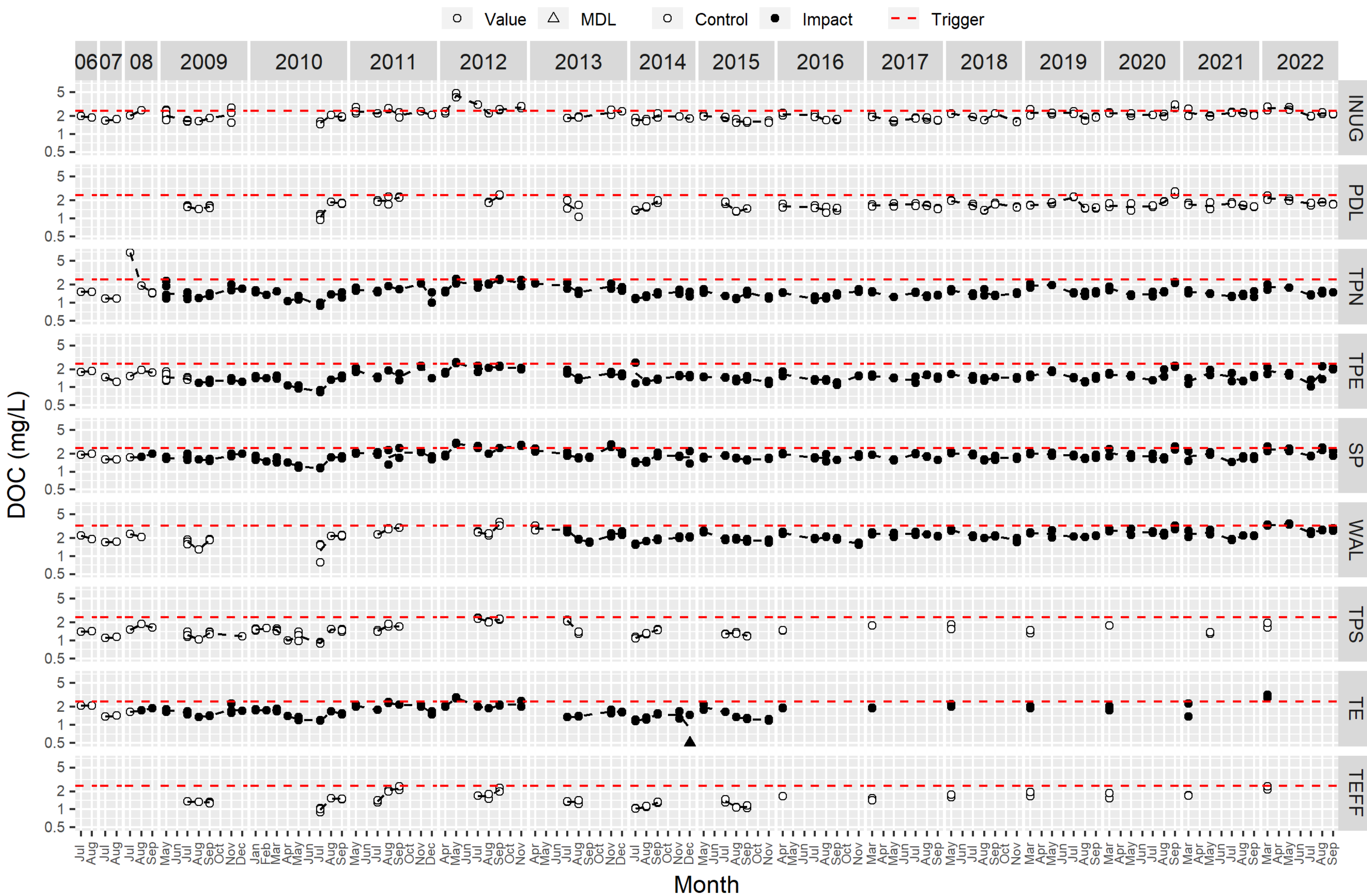


Figure B1-21. Total Organic Carbon (TOC; mg/L).

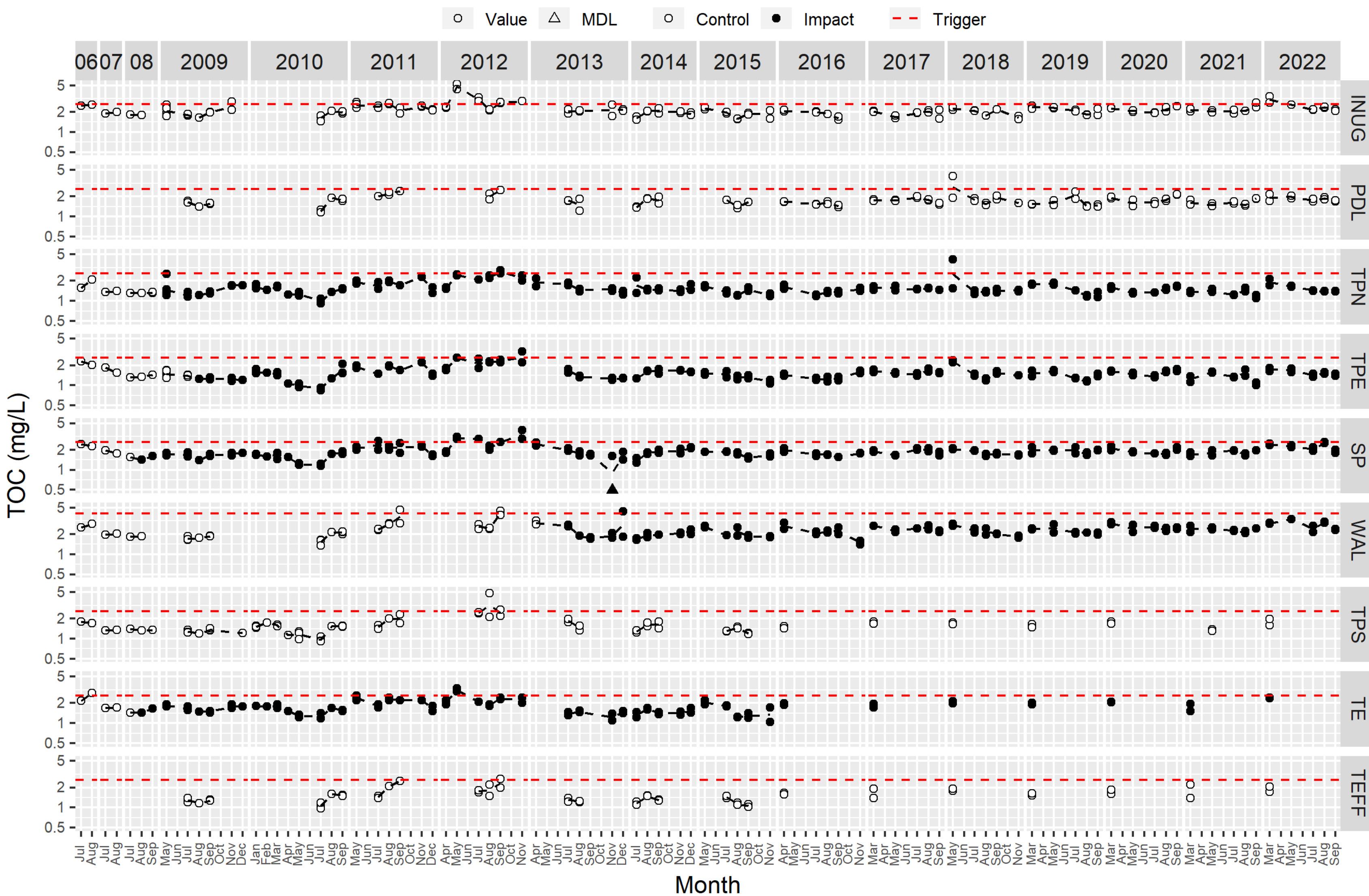


Figure B1-22. Total aluminum (mg/L).

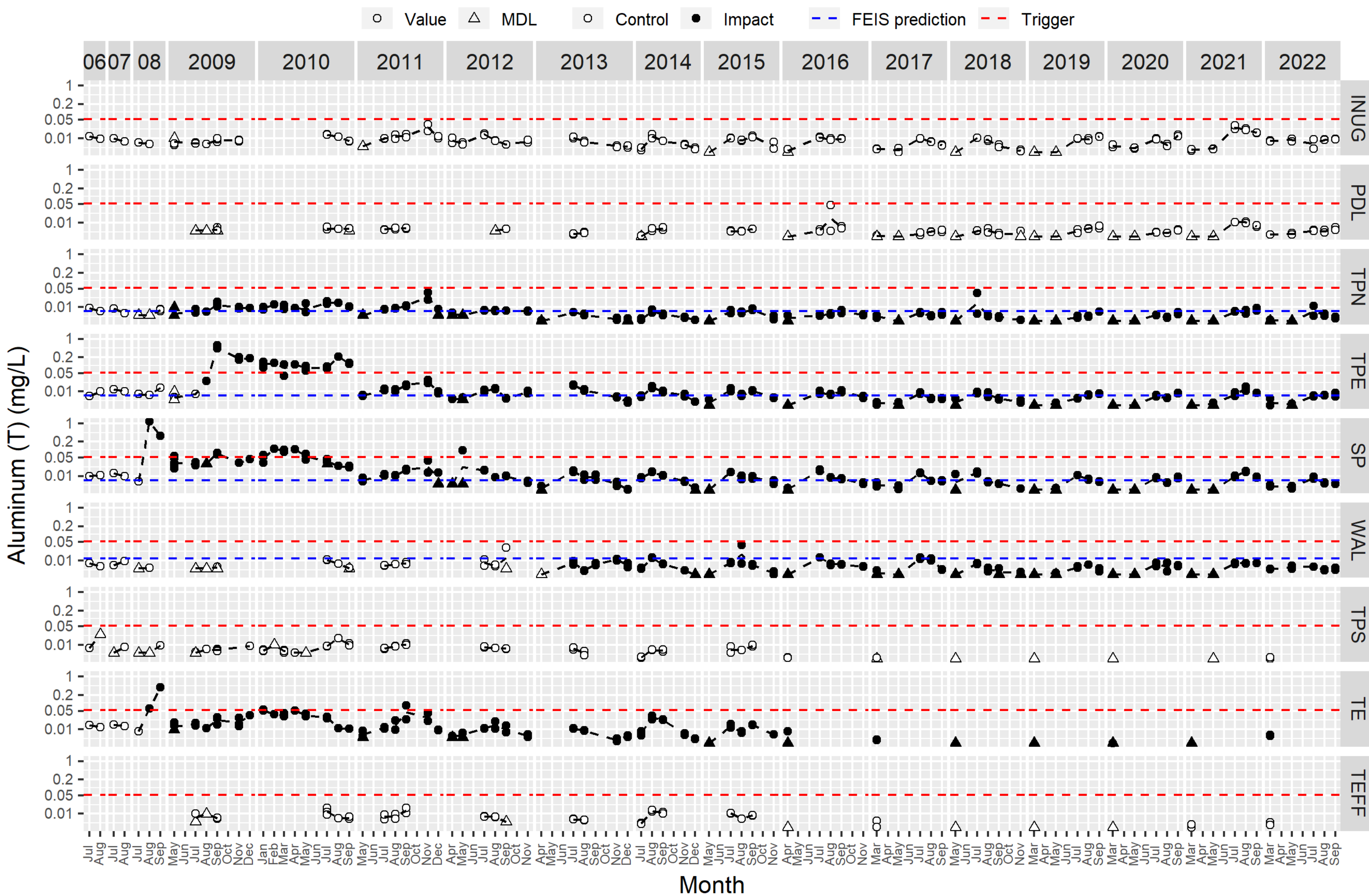


Figure B1-23. Total antimony (mg/L).

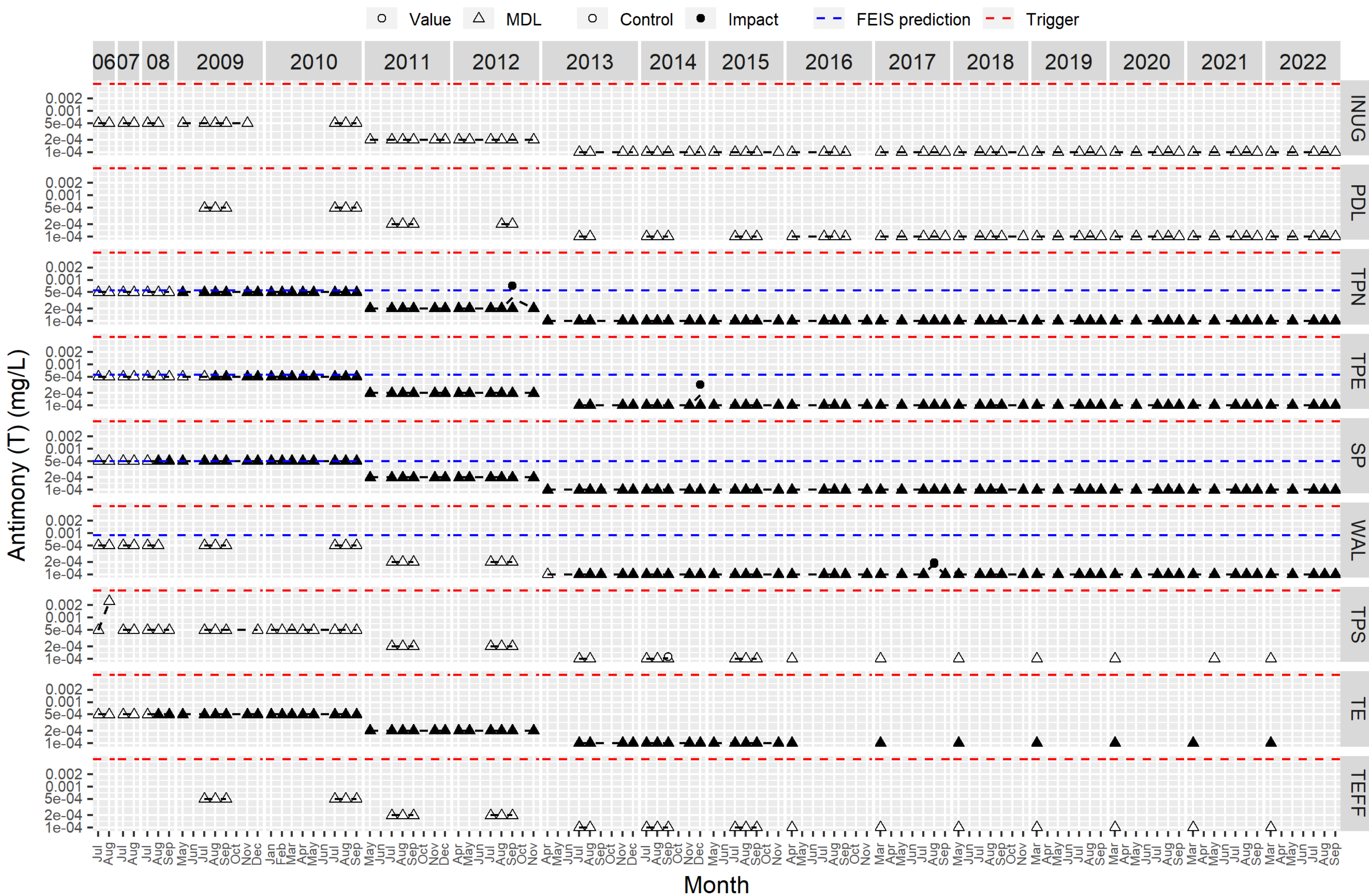


Figure B1-24. Total arsenic (mg/L).

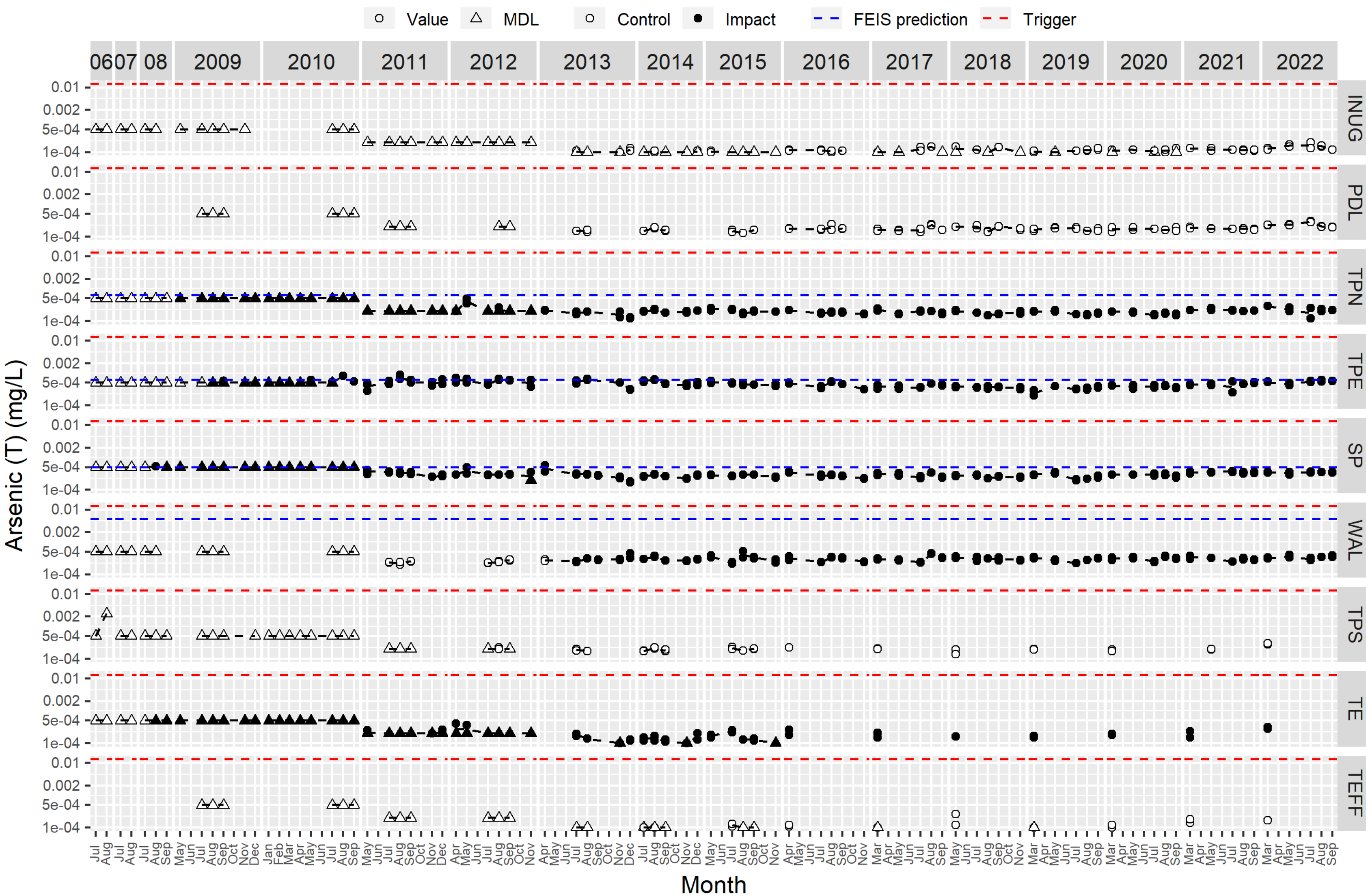


Figure B1-25. Total barium (mg/L).

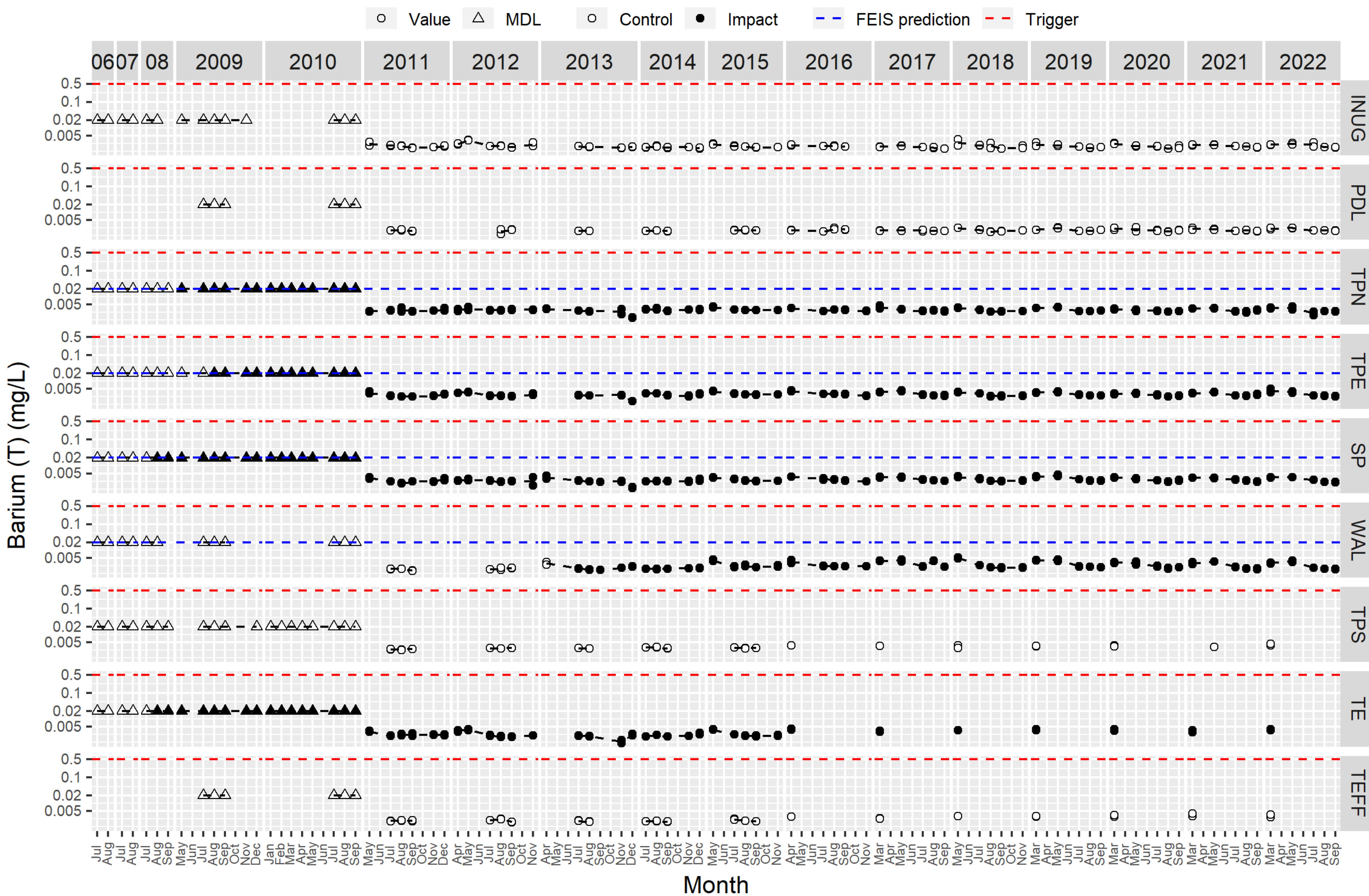


Figure B1-26. Total beryllium (mg/L).

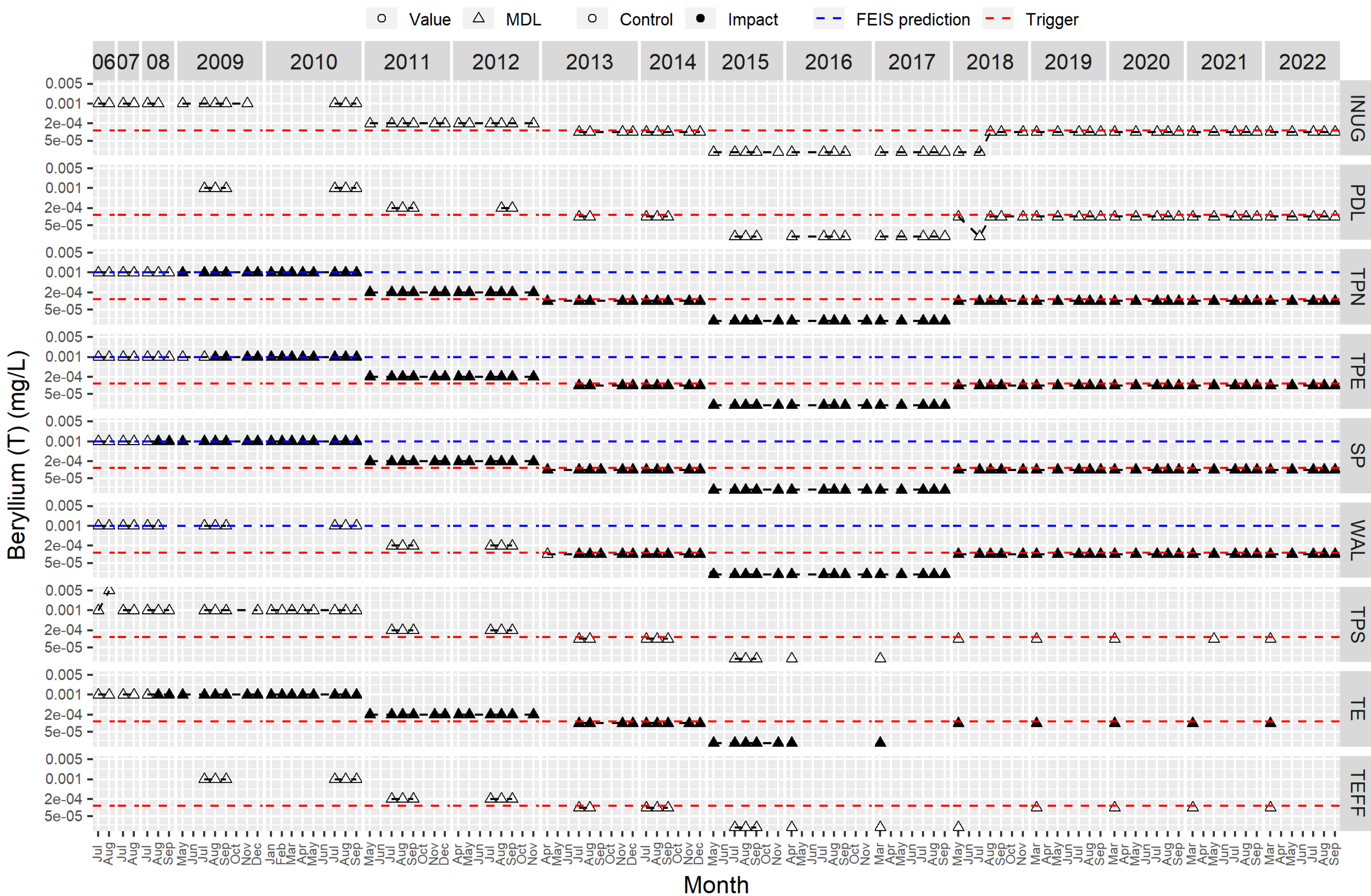


Figure B1-27. Total boron (mg/L).

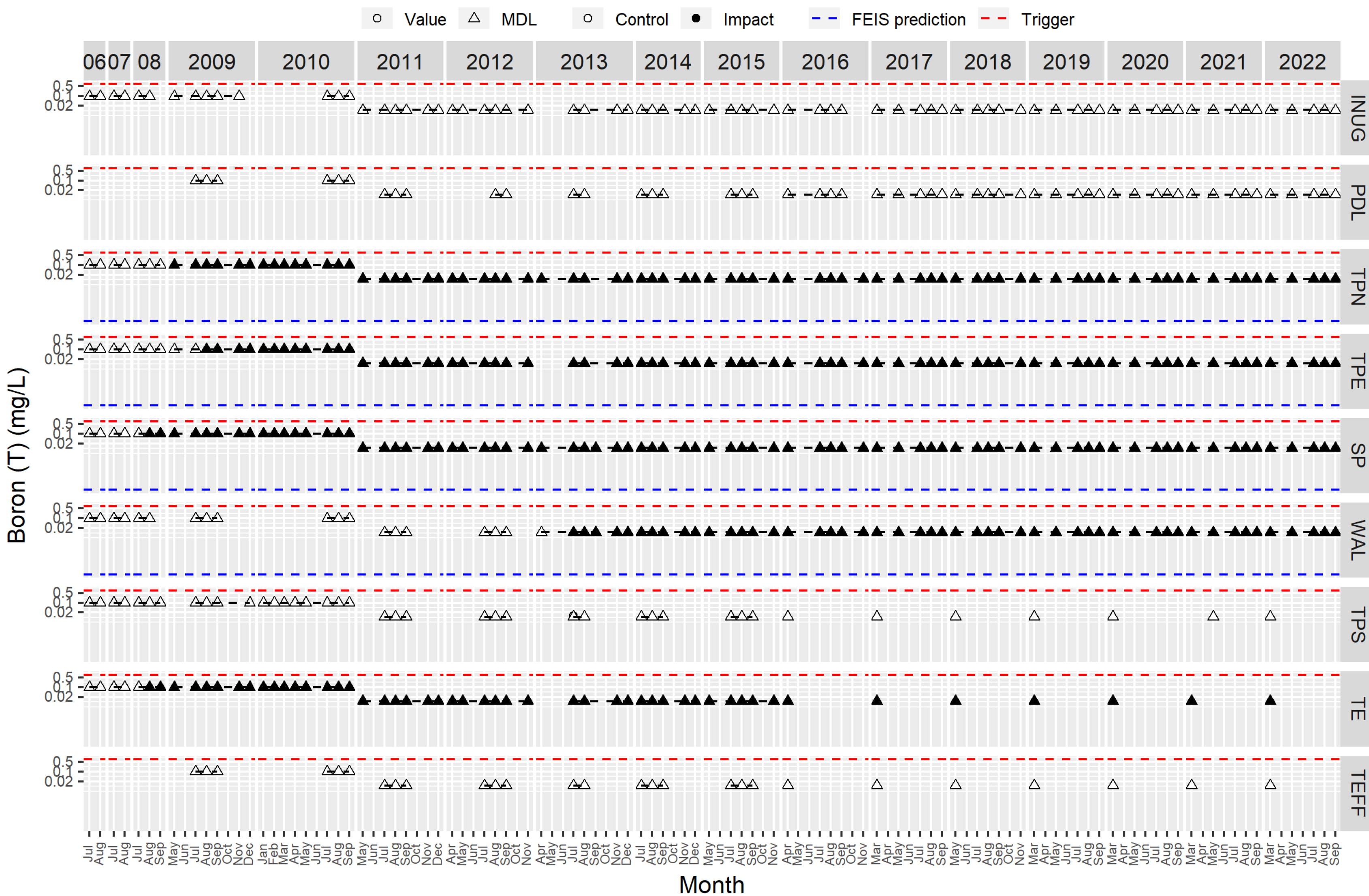


Figure B1-28. Total cadmium (mg/L).

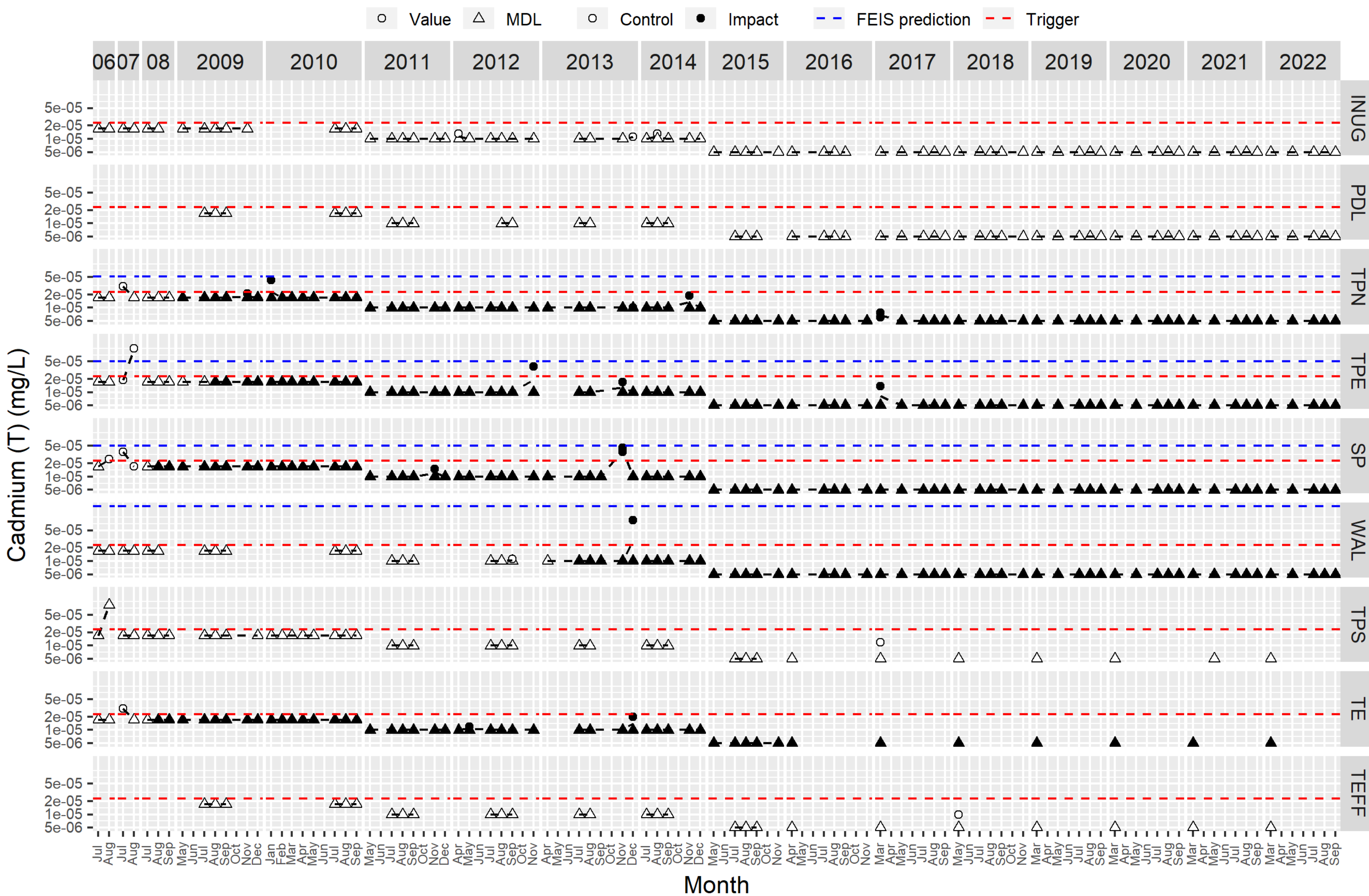


Figure B1-29. Total calcium (mg/L).

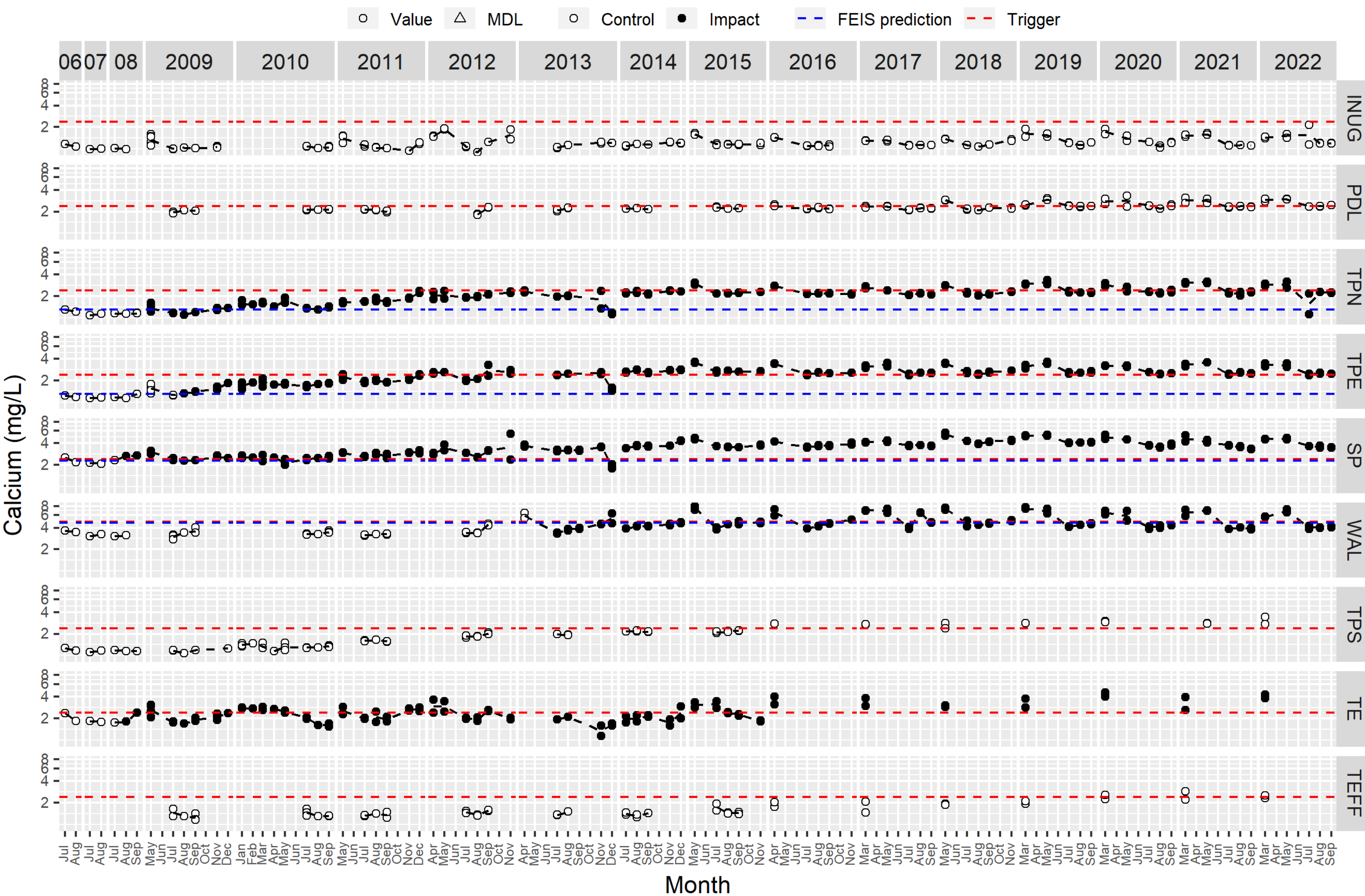


Figure B1-30. Total chromium (mg/L).

Note: The detection limit for total chromium was adjusted from 0.0001 mg/L to 0.0005 mg/L for samples collected in since May 2021.

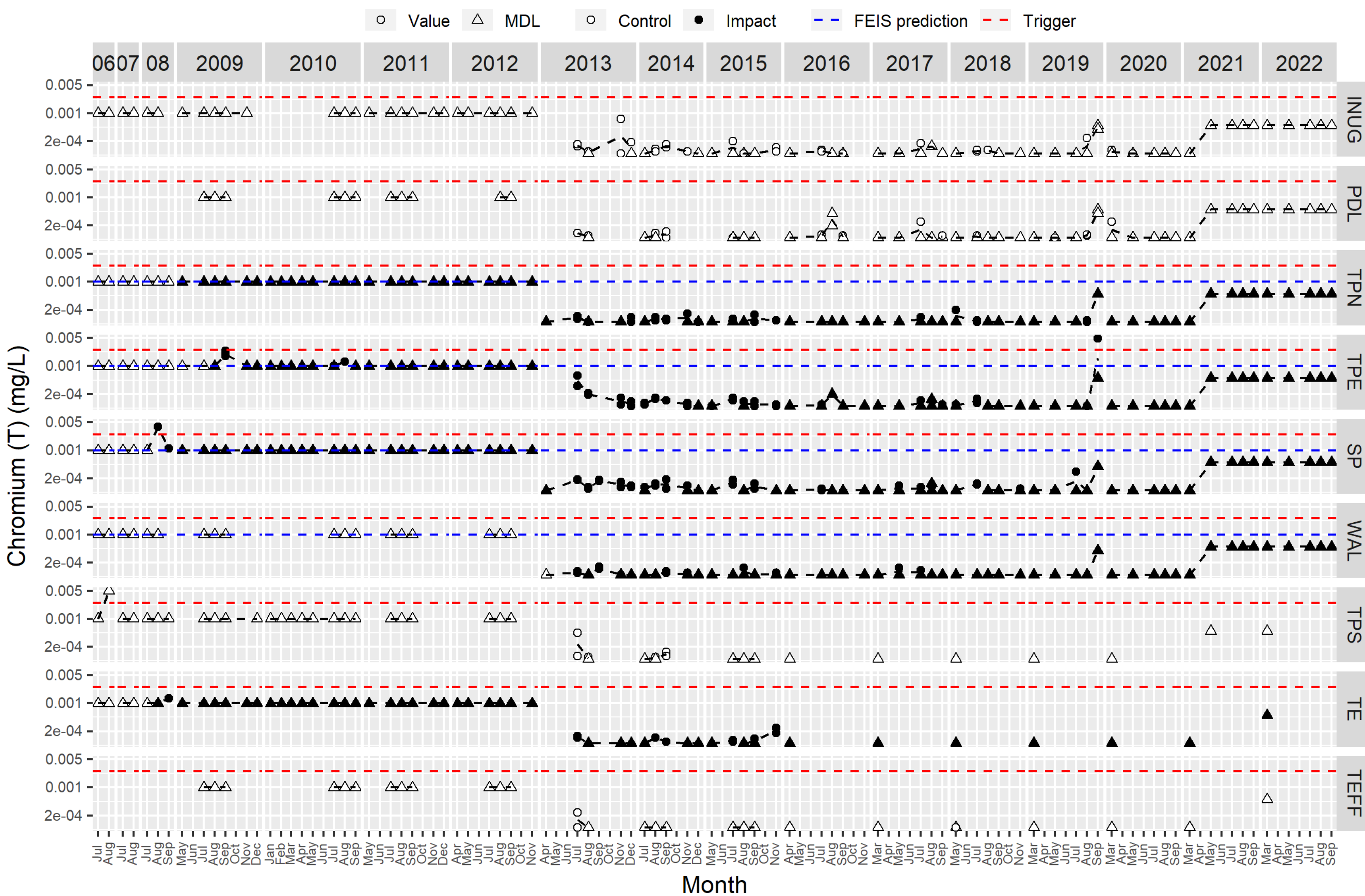


Figure B1-31. Total copper (mg/L).

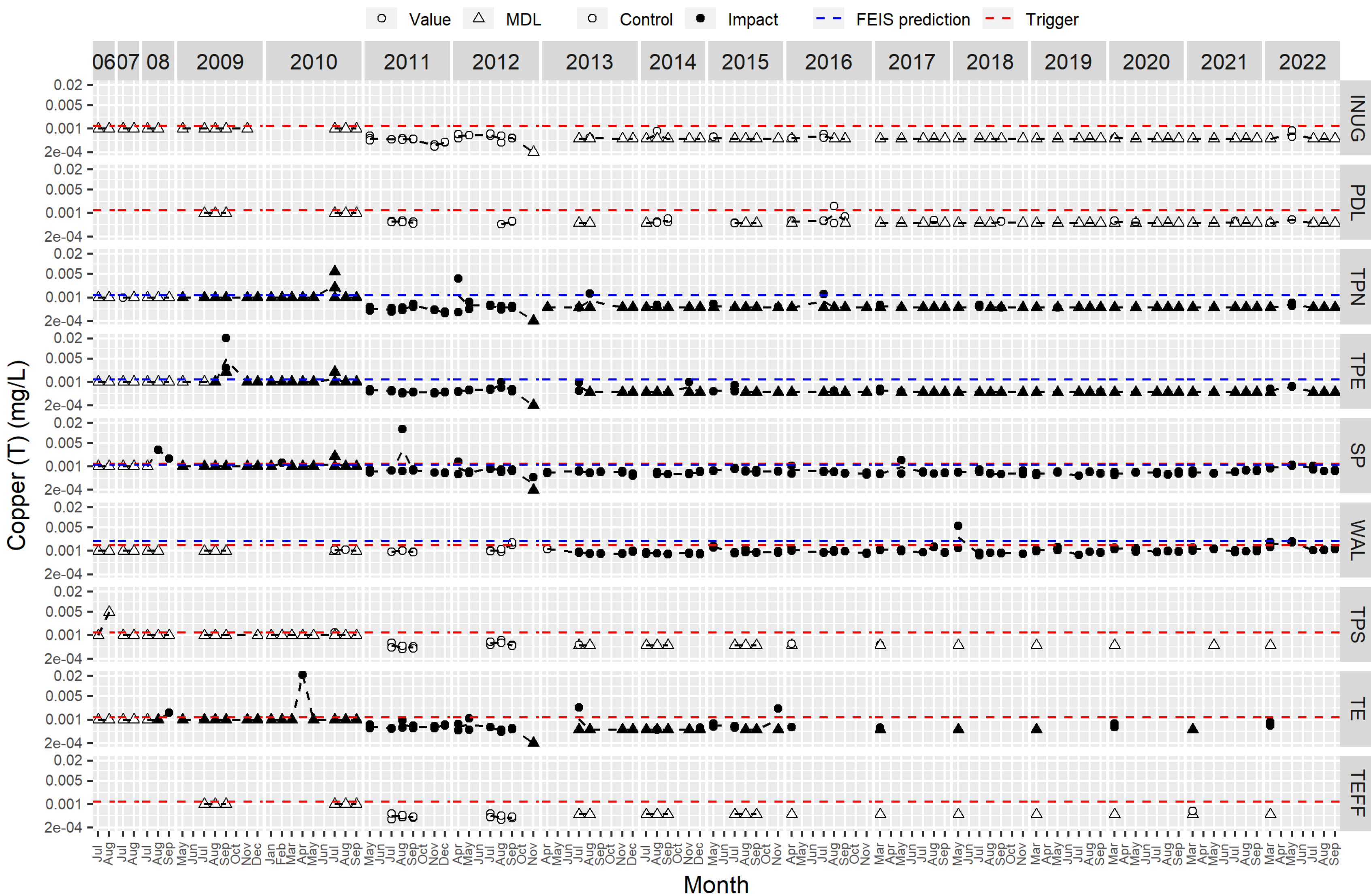


Figure B1-32. Total iron (mg/L).

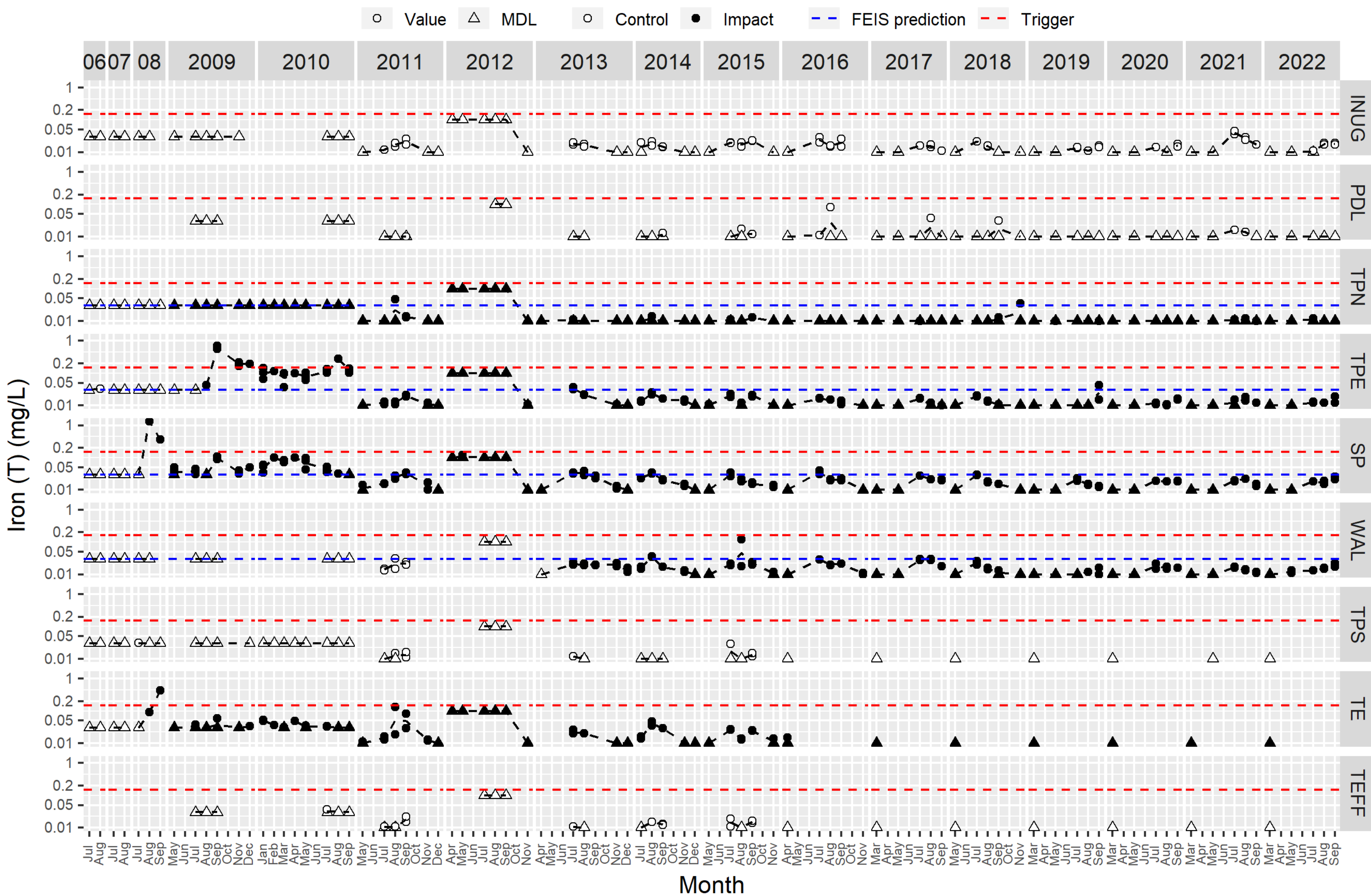


Figure B1-33. Total lead (mg/L).

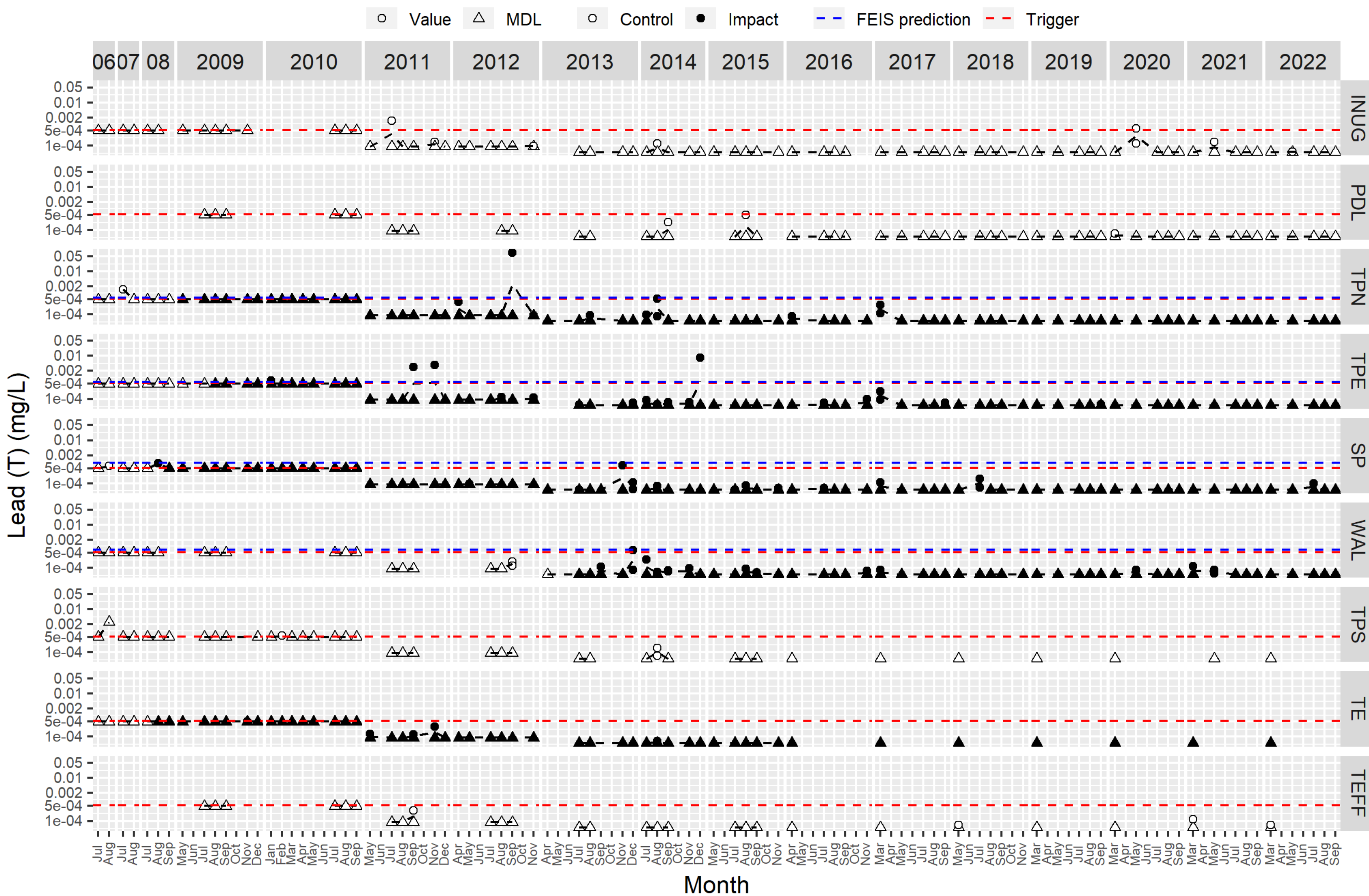


Figure B1-34. Total lithium (mg/L).

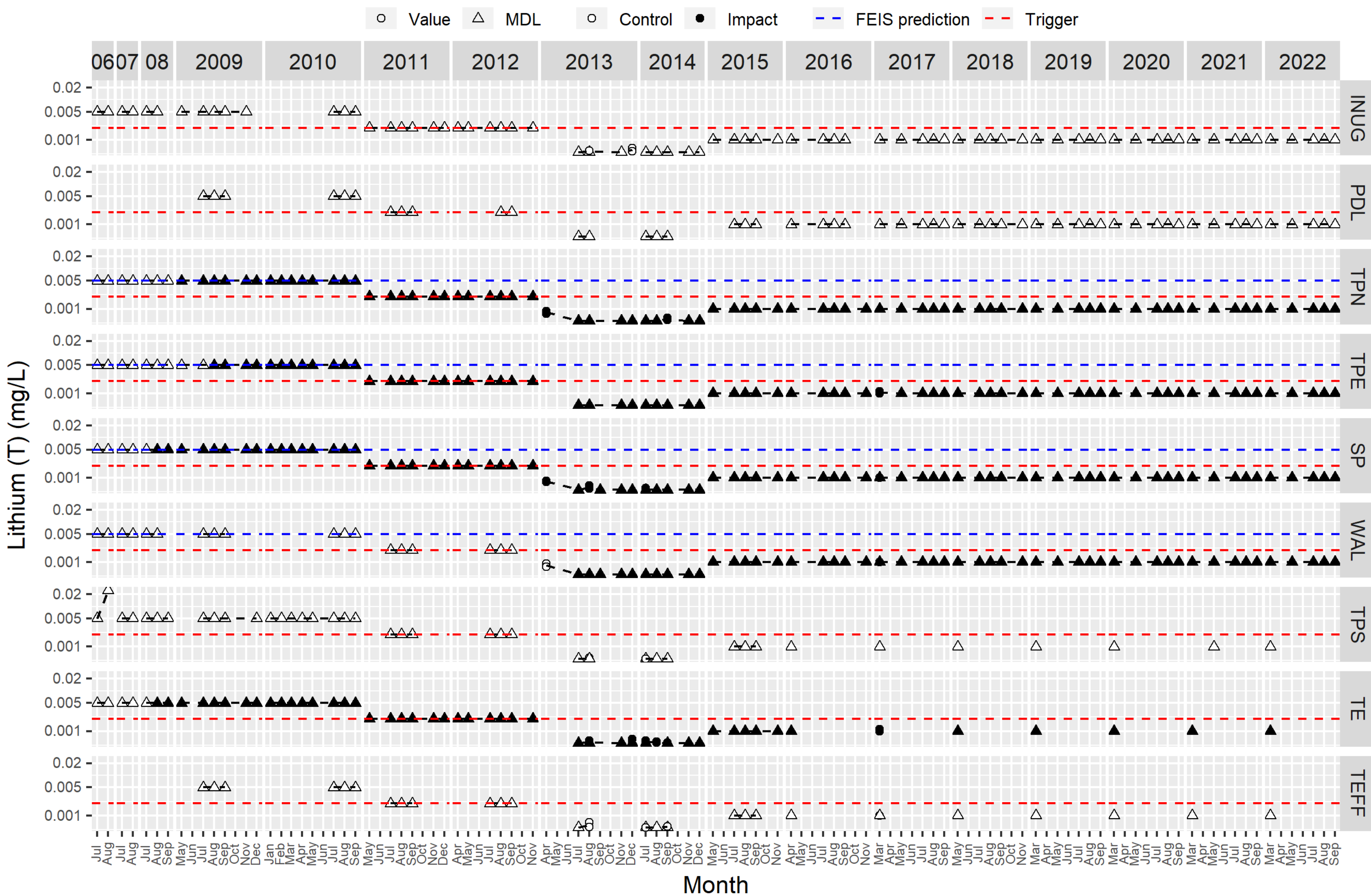


Figure B1-35. Total magnesium (mg/L).

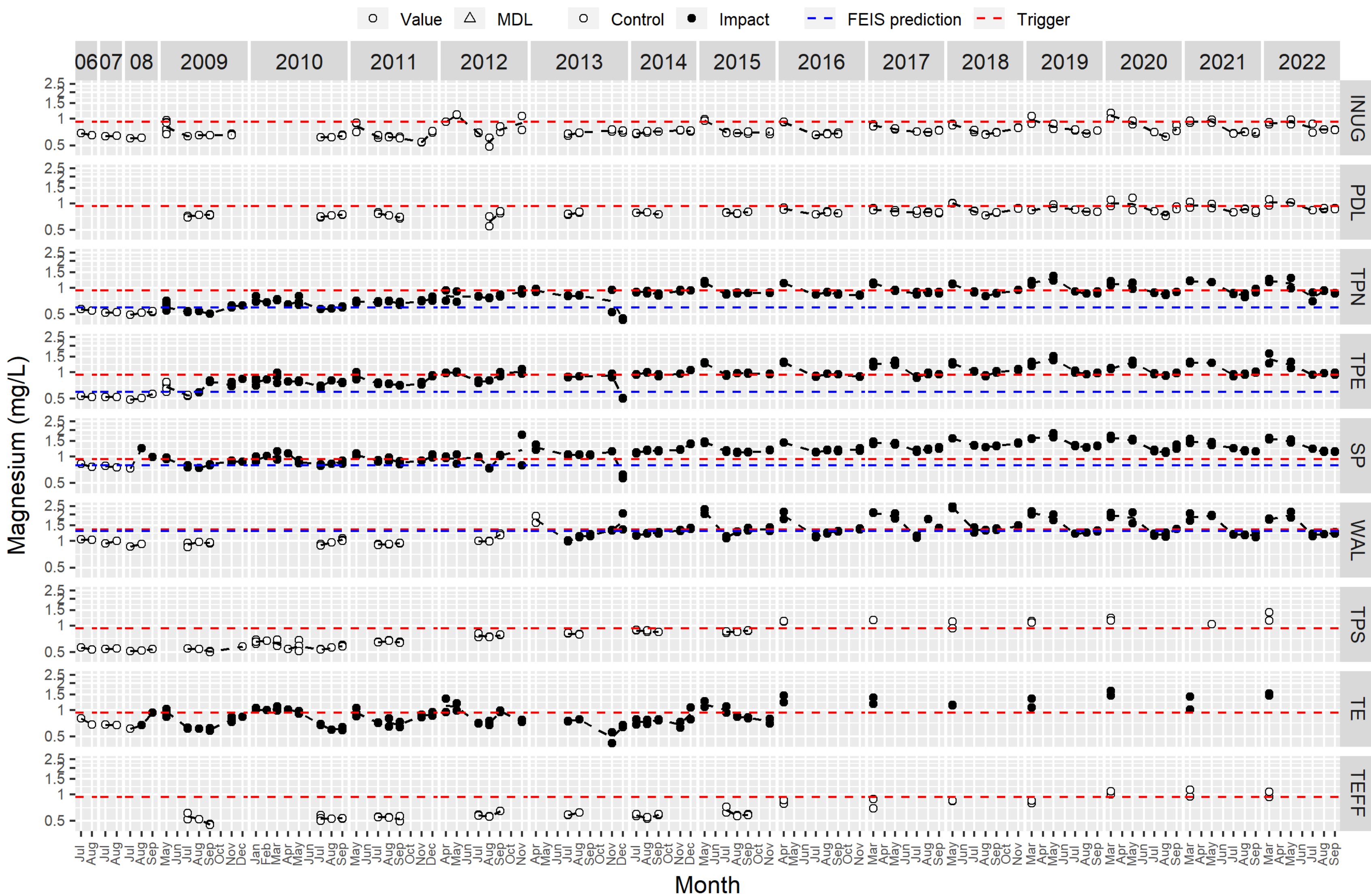


Figure B1-36. Total manganese (mg/L).

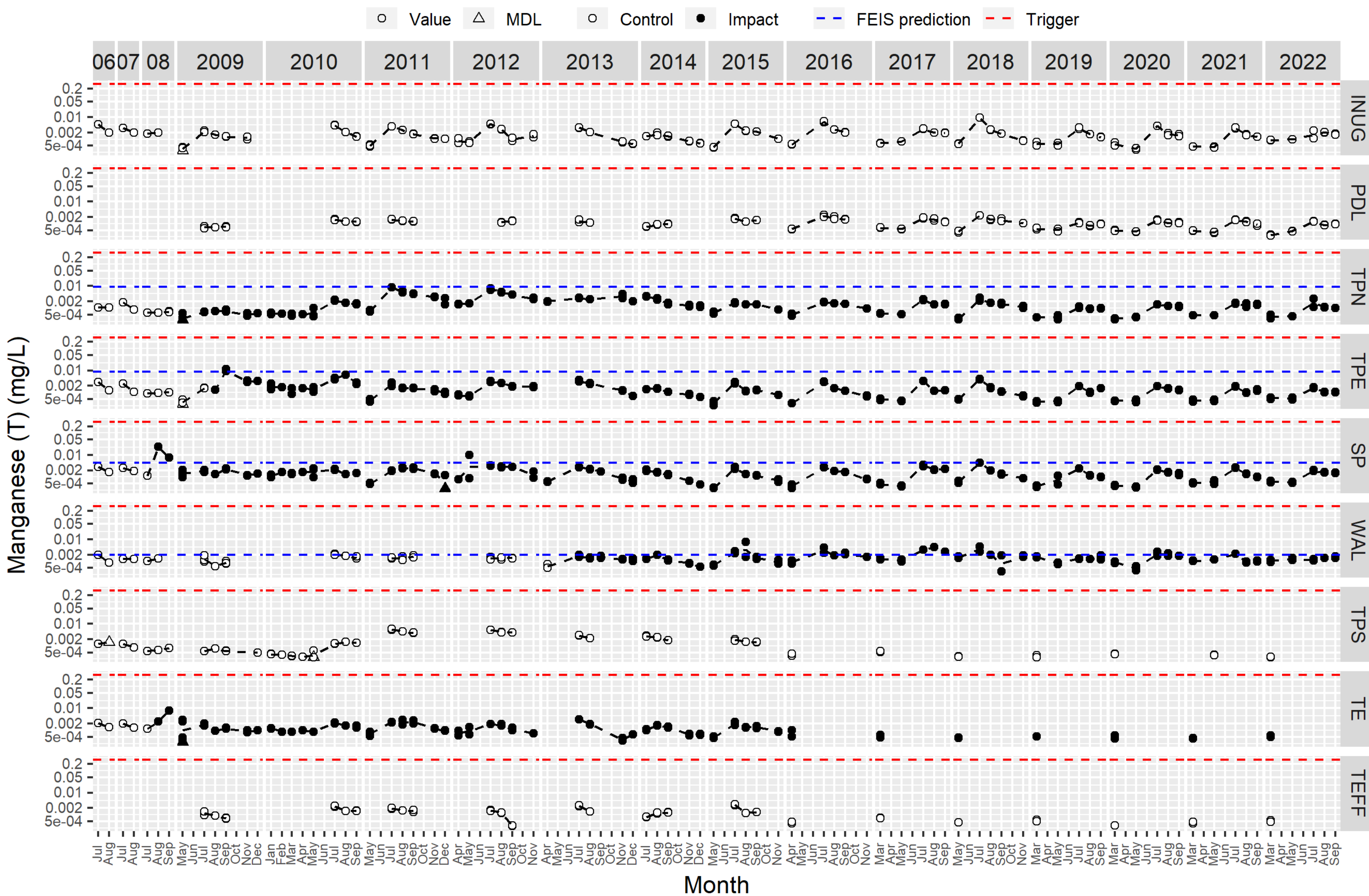


Figure B1-37. Total mercury (mg/L).

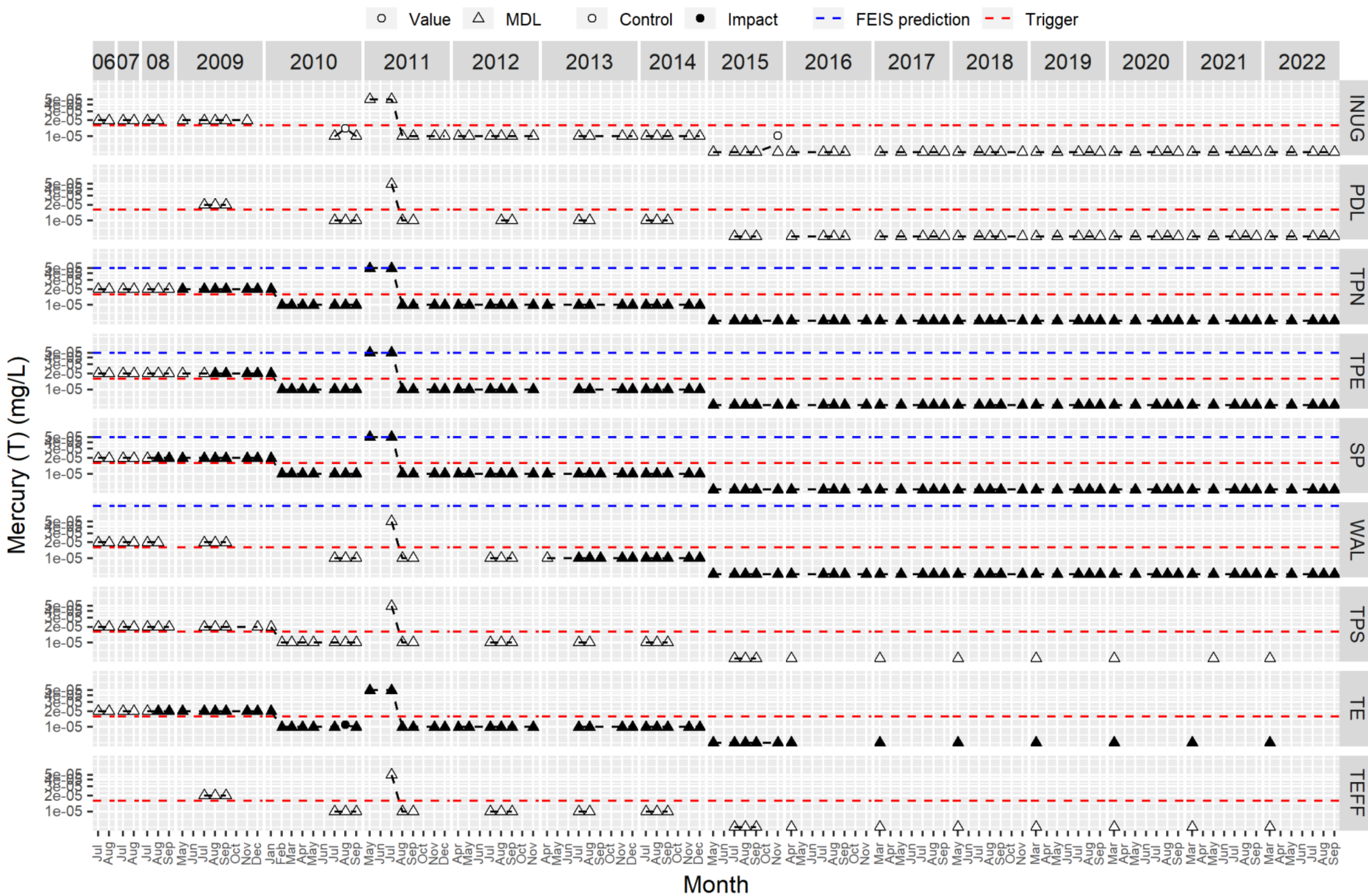


Figure B1-38. Total molybdenum (mg/L).

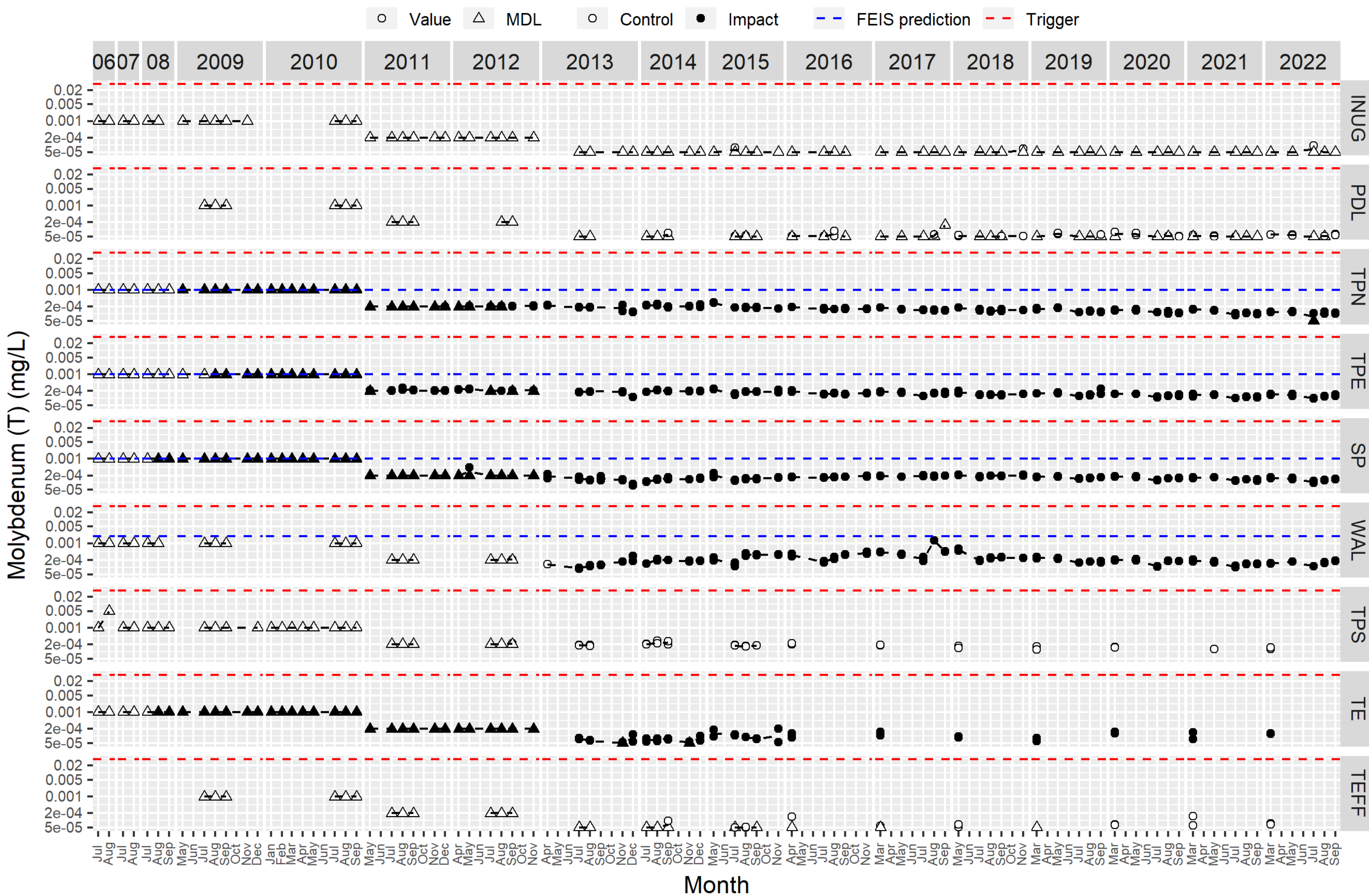


Figure B1-39. Total nickel (mg/L).

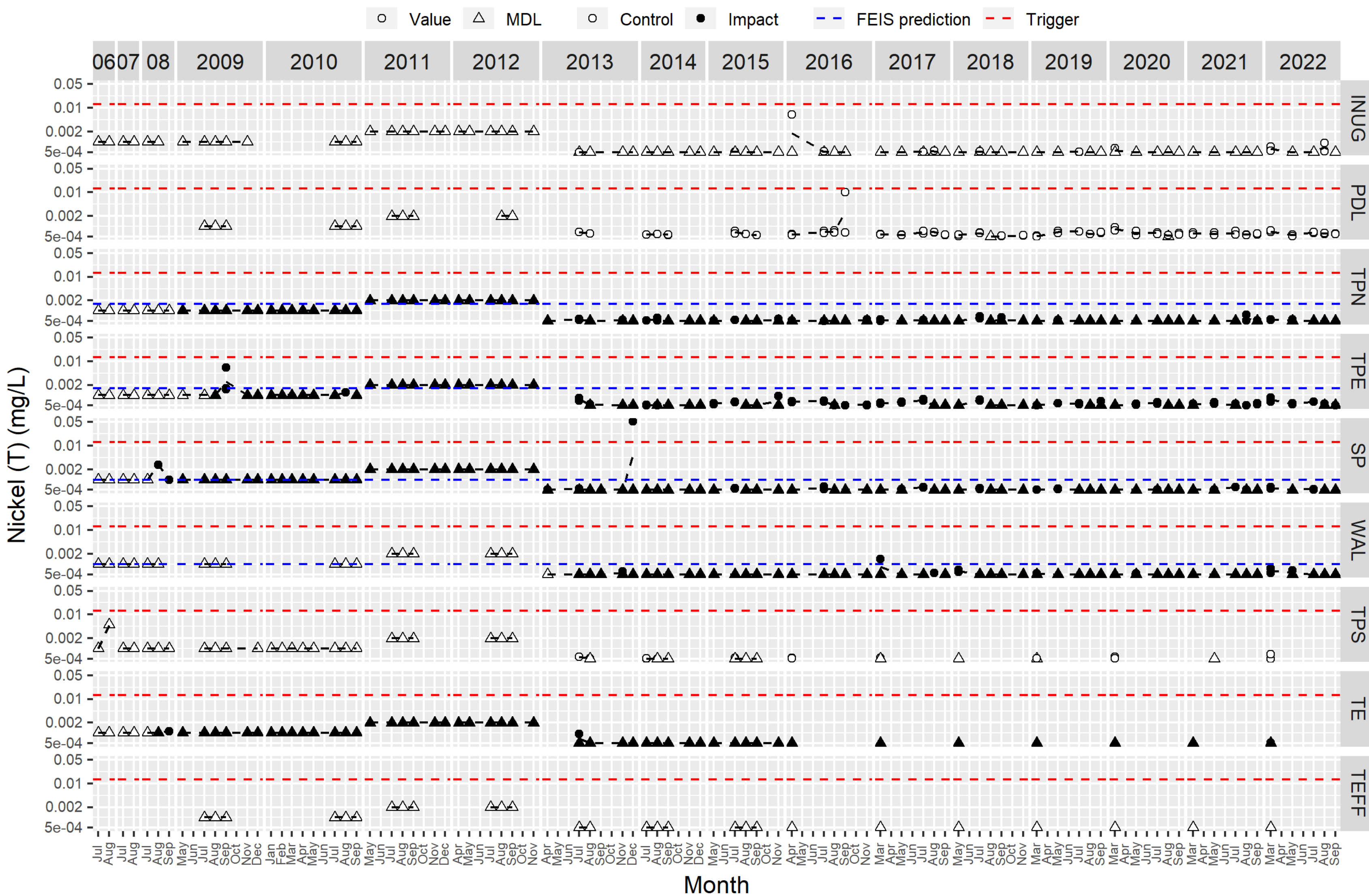


Figure B1-40. Total potassium (mg/L).

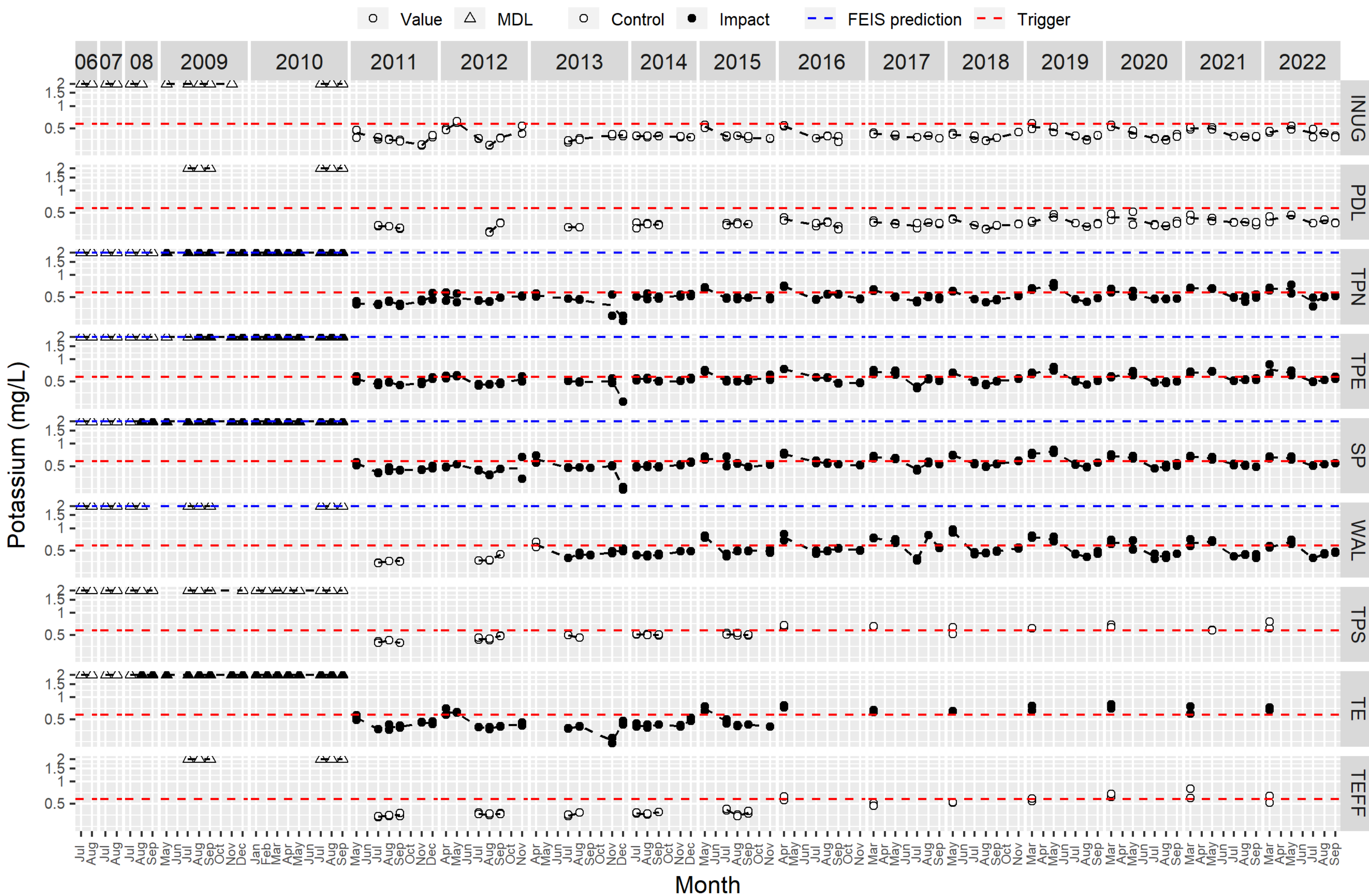


Figure B1-41. Total selenium (mg/L).

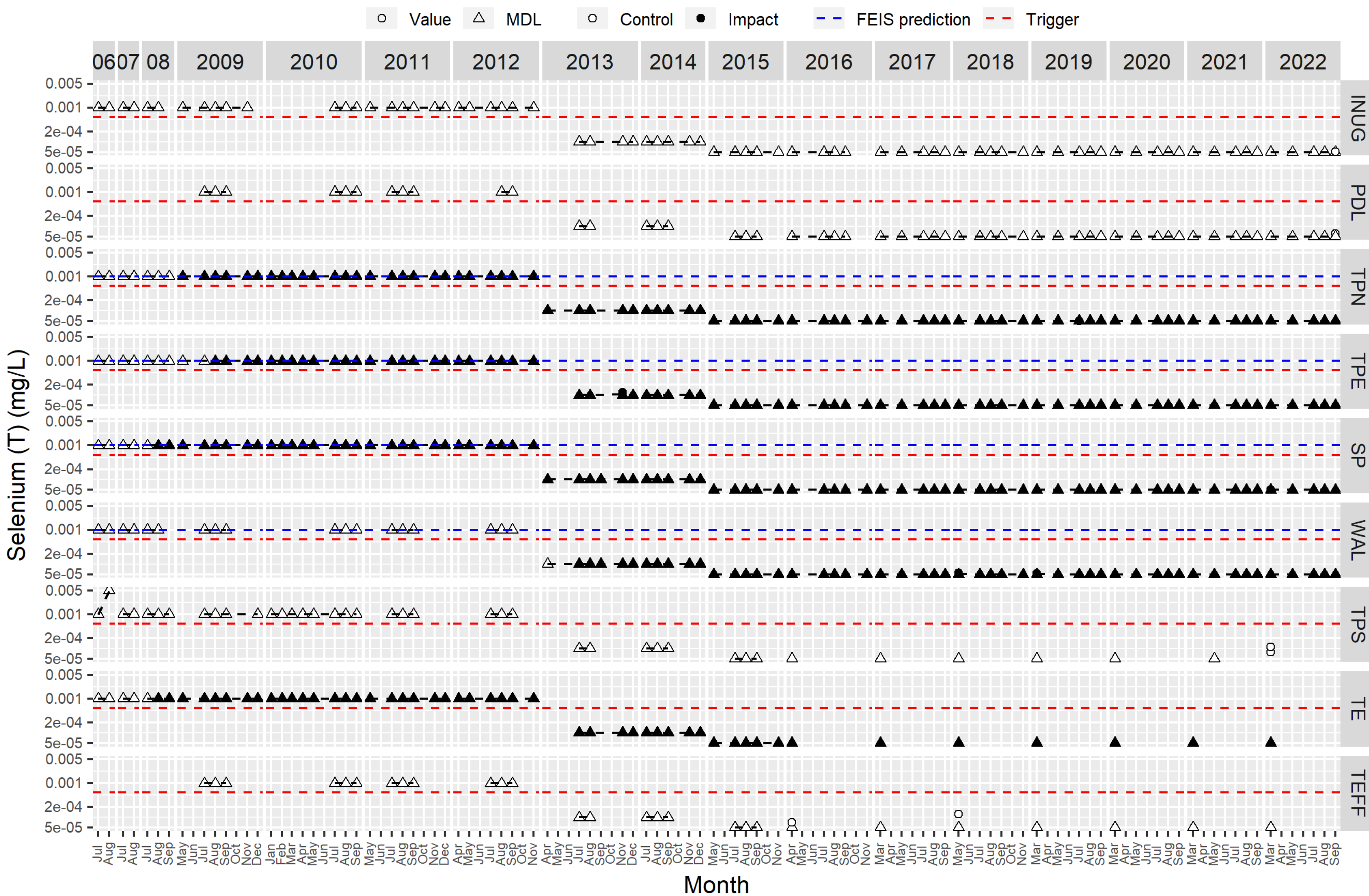


Figure B1-42. Total silicon (mg/L).

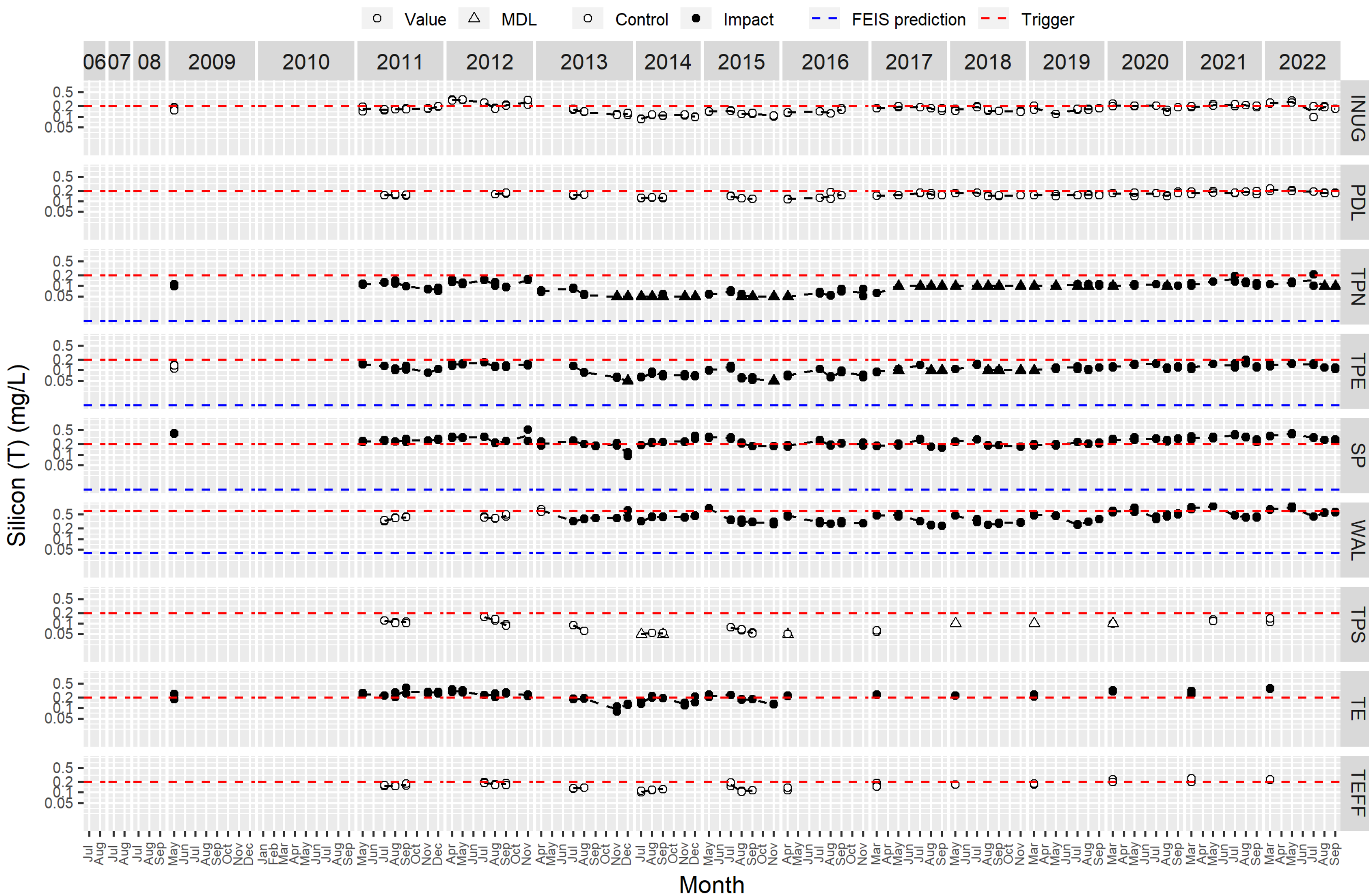


Figure B1-43. Total silver (mg/L).

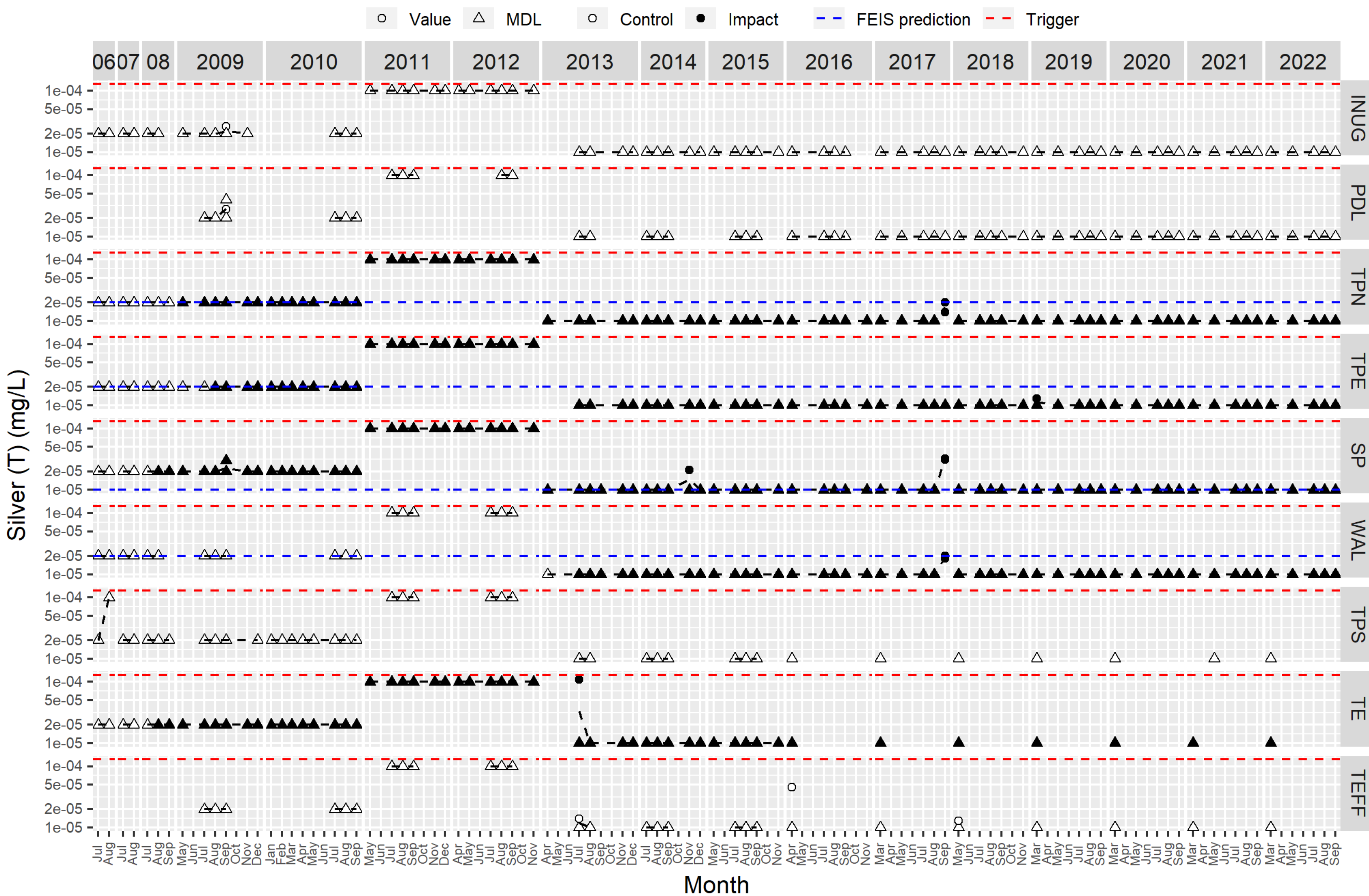


Figure B1-44. Total sodium (mg/L).

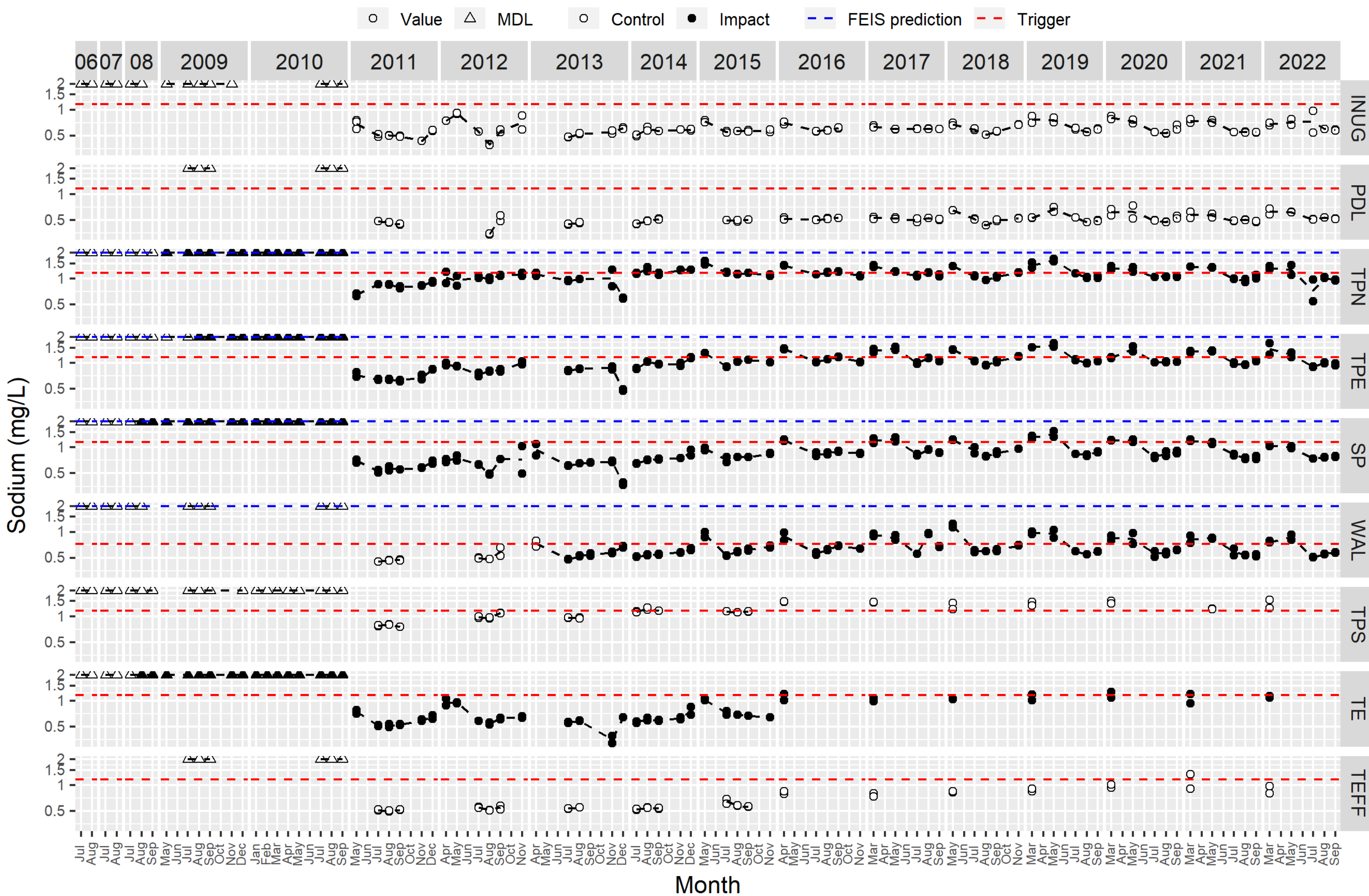


Figure B1-45. Total strontium (mg/L).

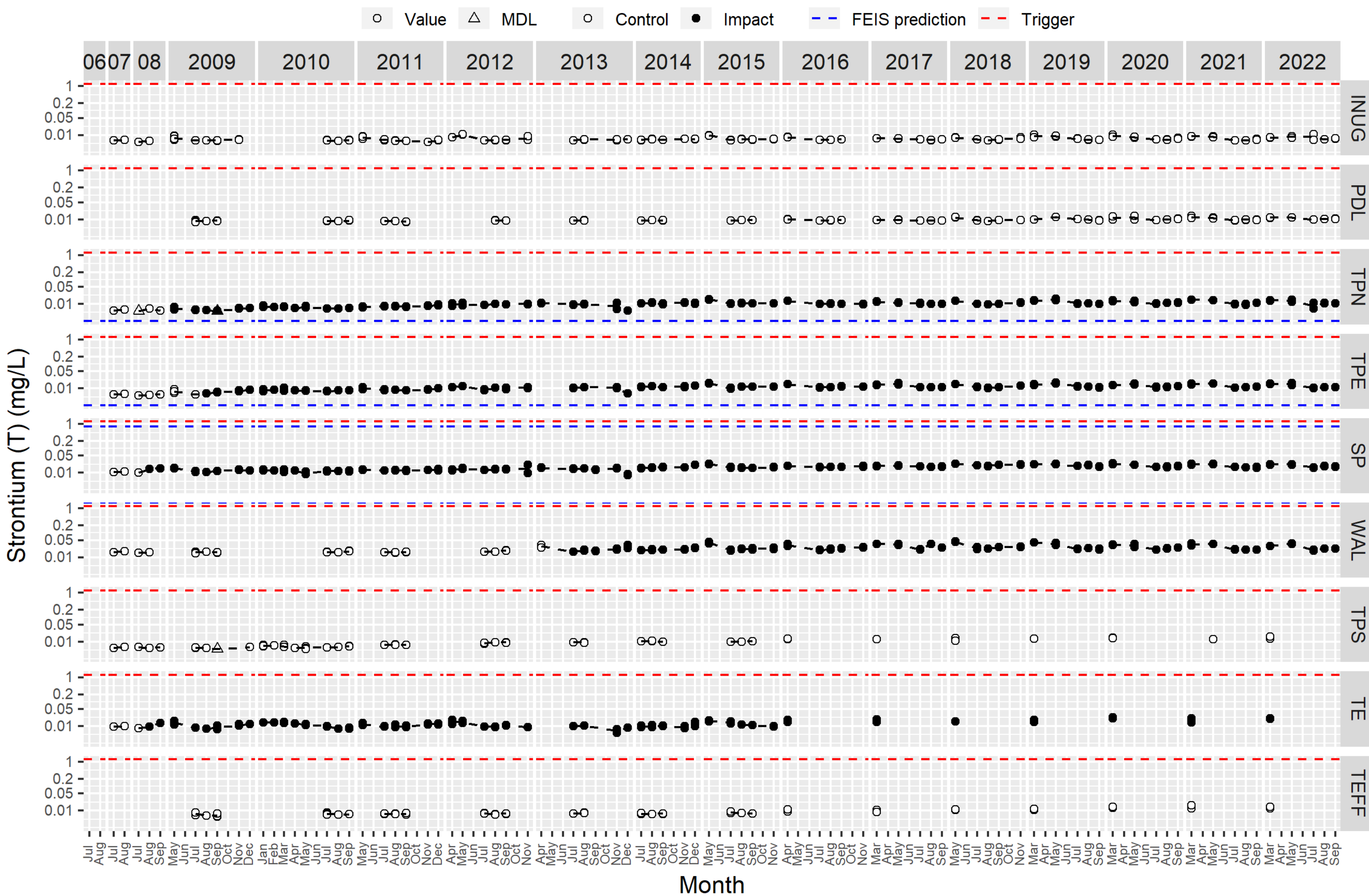


Figure B1-46. Total thallium (mg/L).

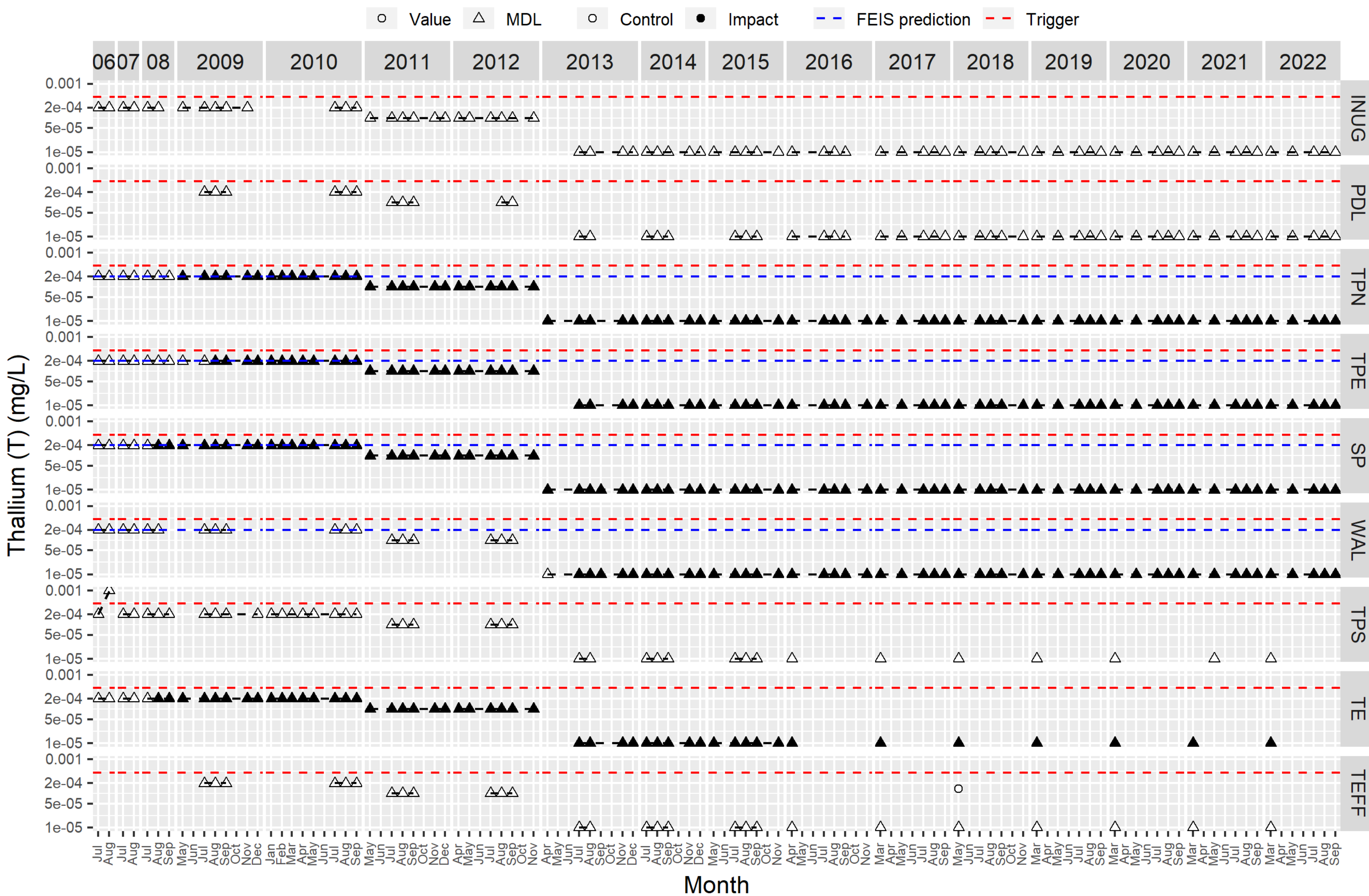


Figure B1-47. Total tin (mg/L).

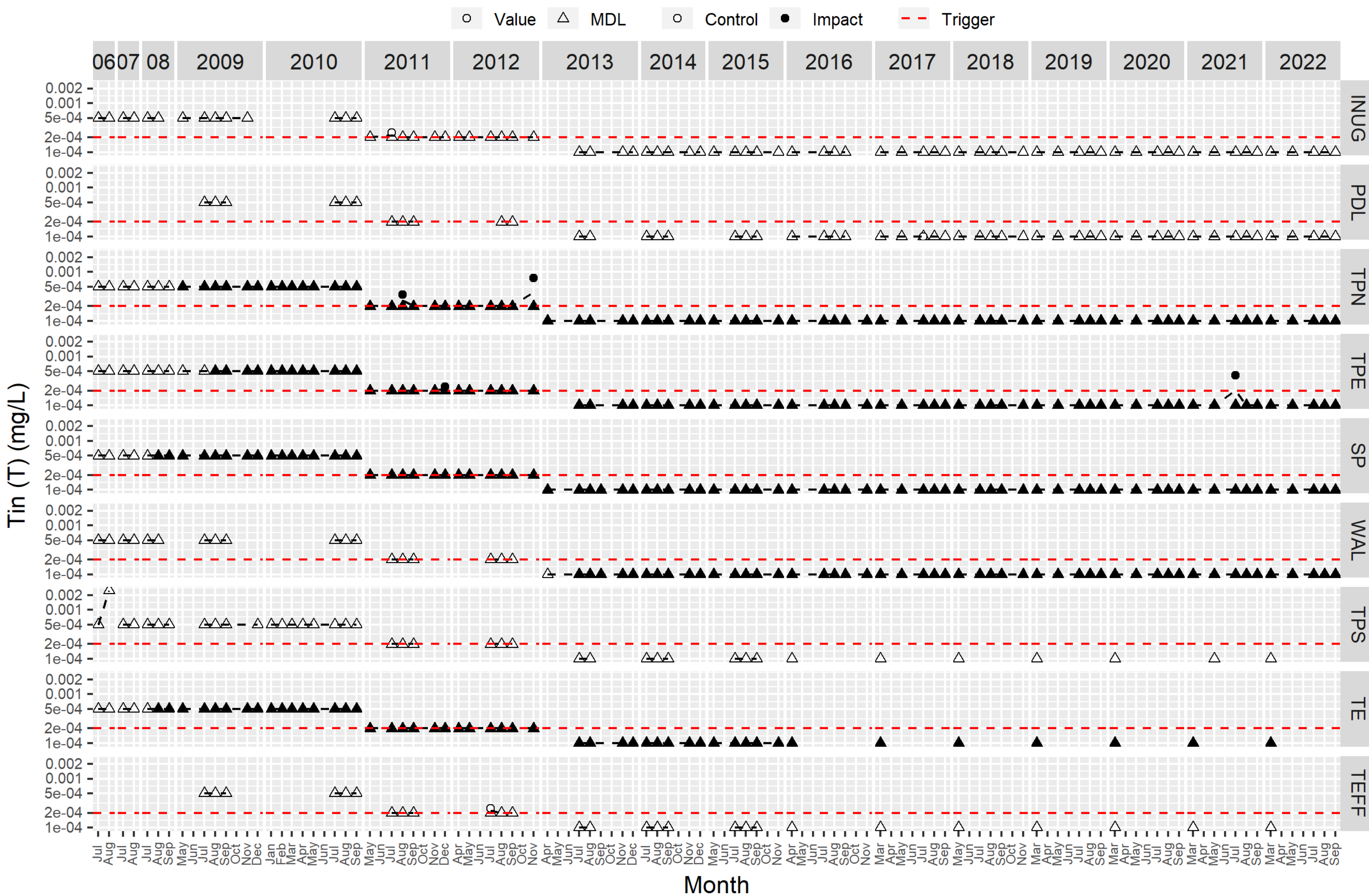


Figure B1-48. Total titanium (mg/L).

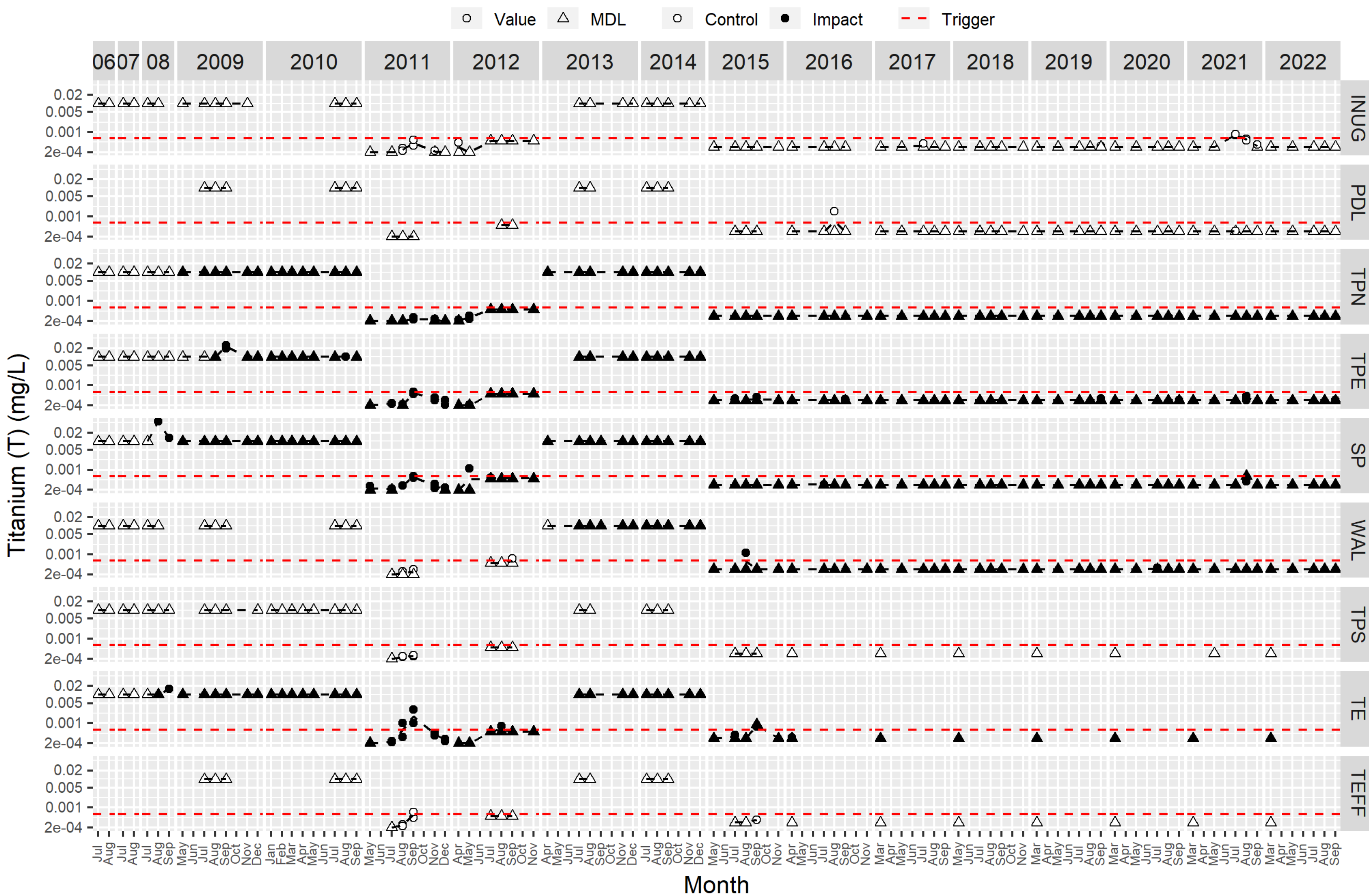


Figure B1-49. Total uranium (mg/L).

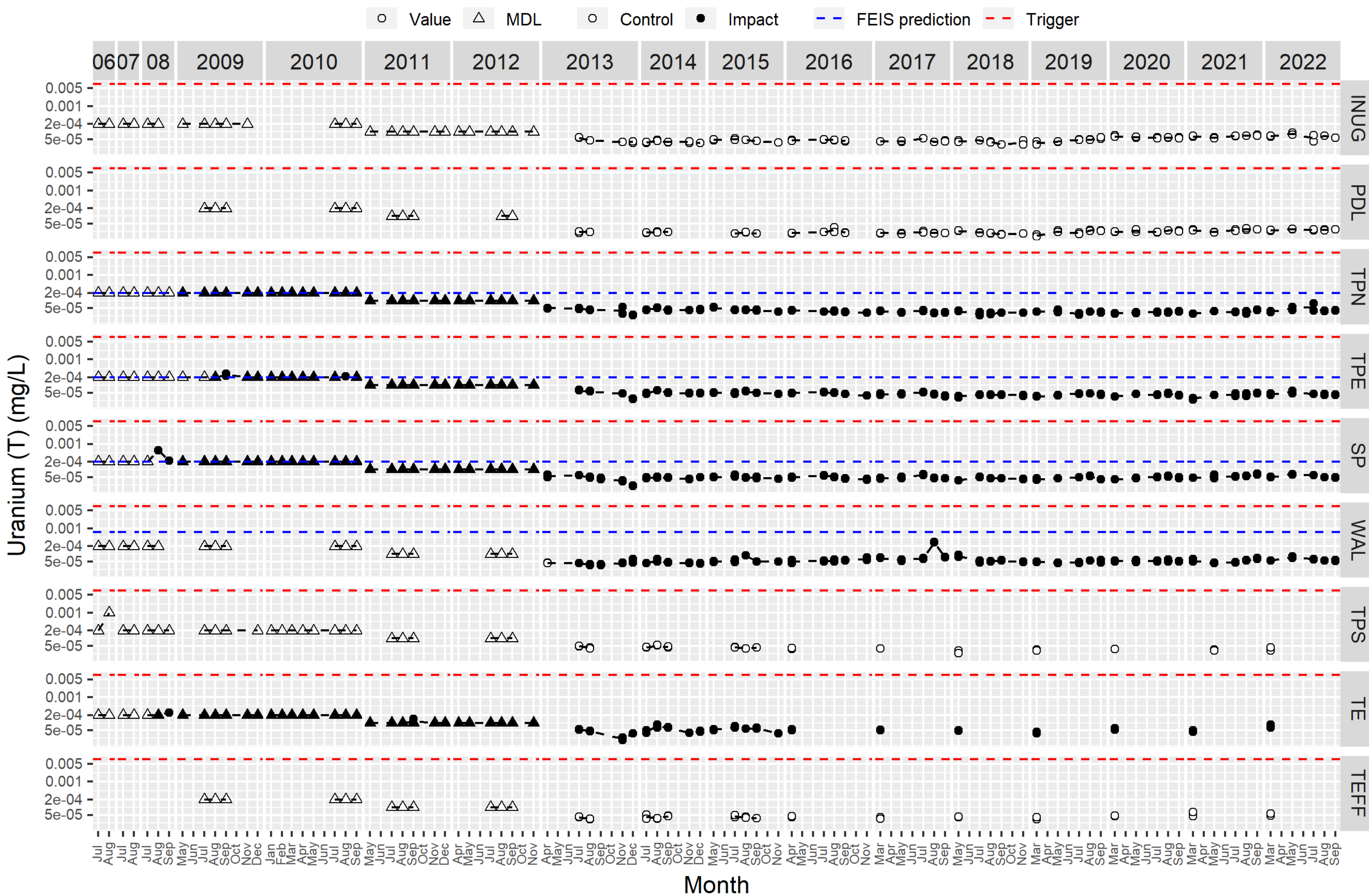


Figure B1-50. Total vanadium (mg/L).

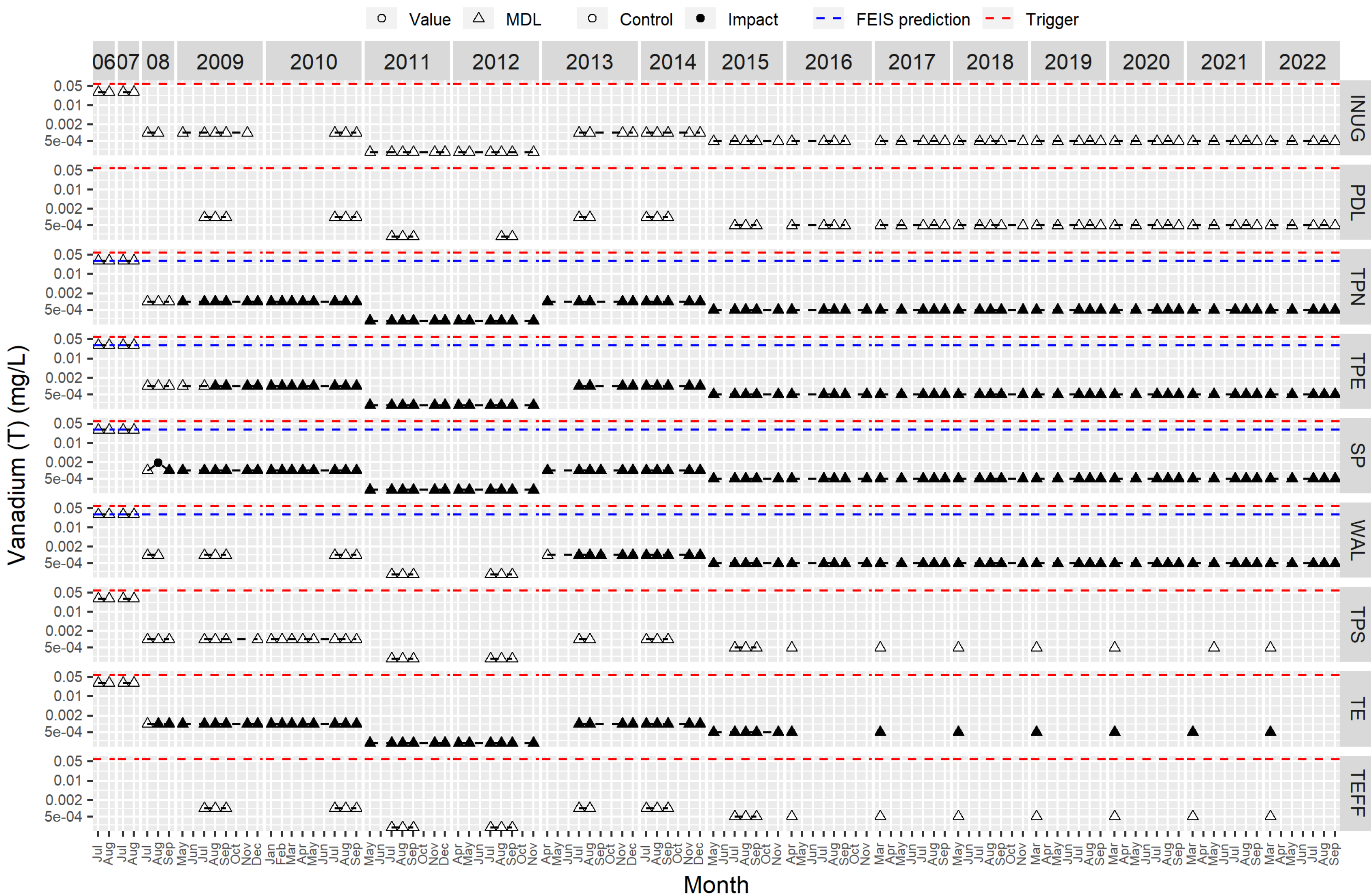


Figure B1-51. Total zinc (mg/L).

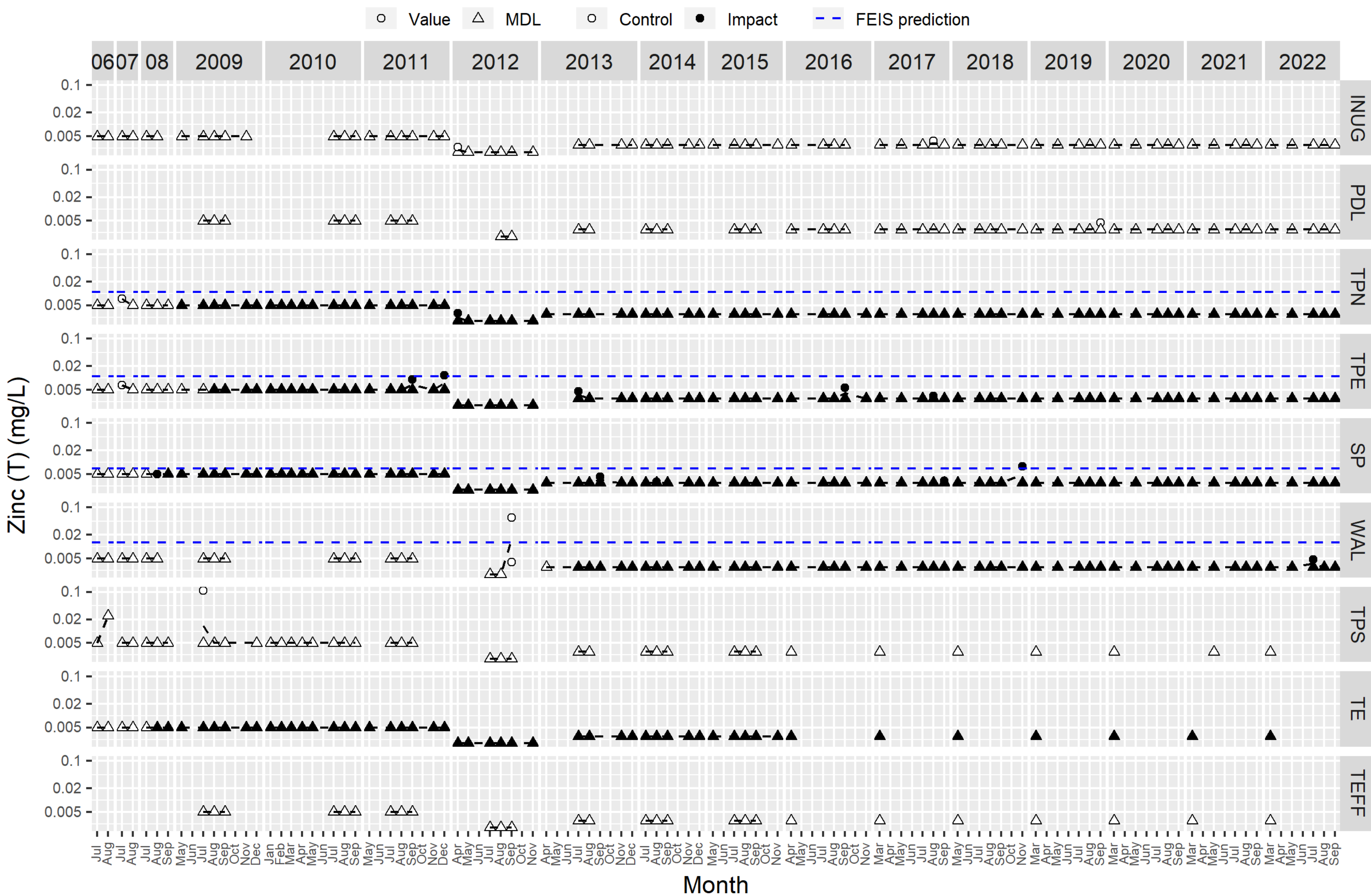


Figure B1-52. Total cyanide (mg/L).

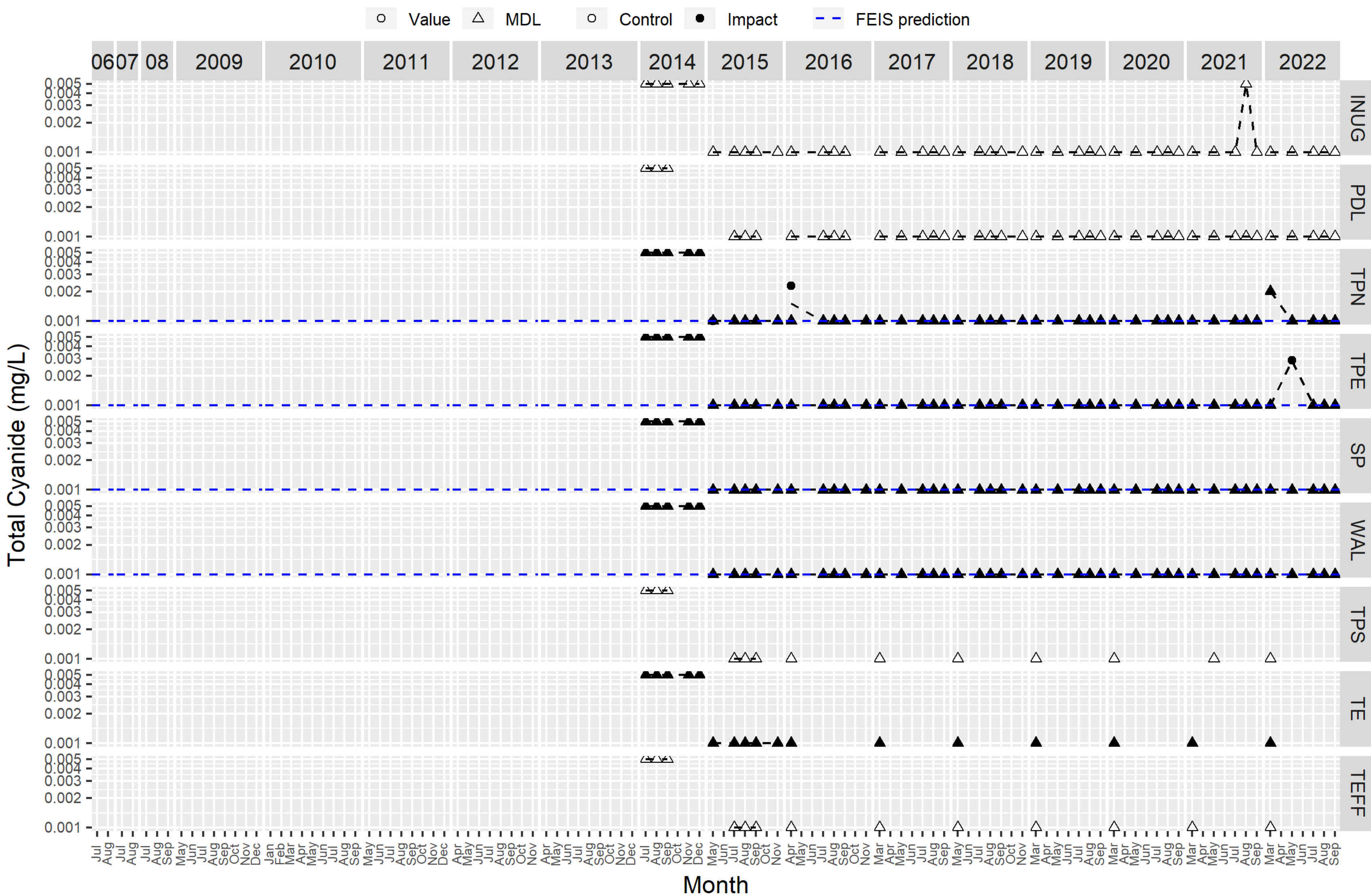


Figure B1-53. Free cyanide (mg/L).

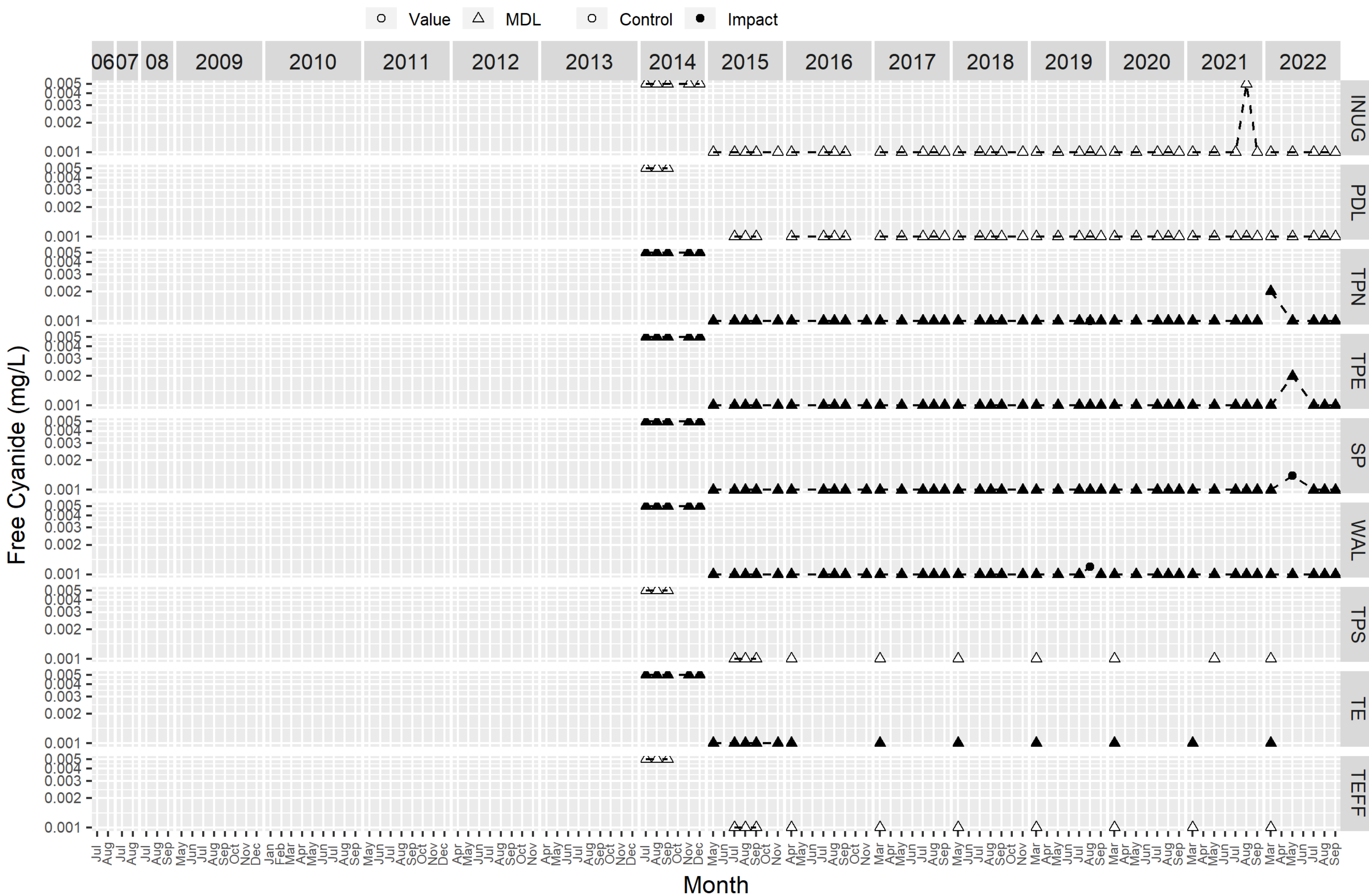


Figure B1-54. Dissolved aluminum (mg/L).

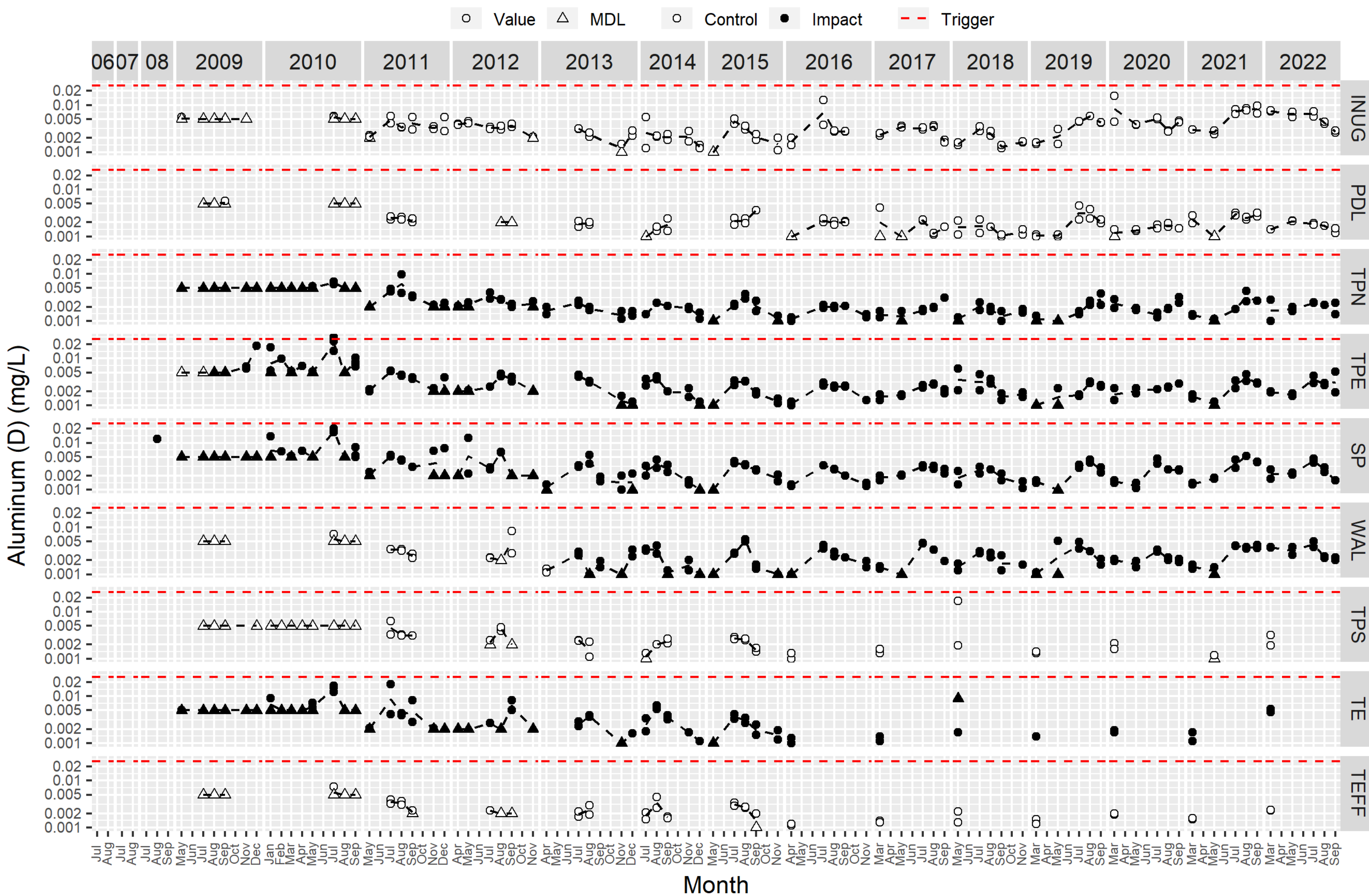


Figure B1-55. Dissolved antimony (mg/L).

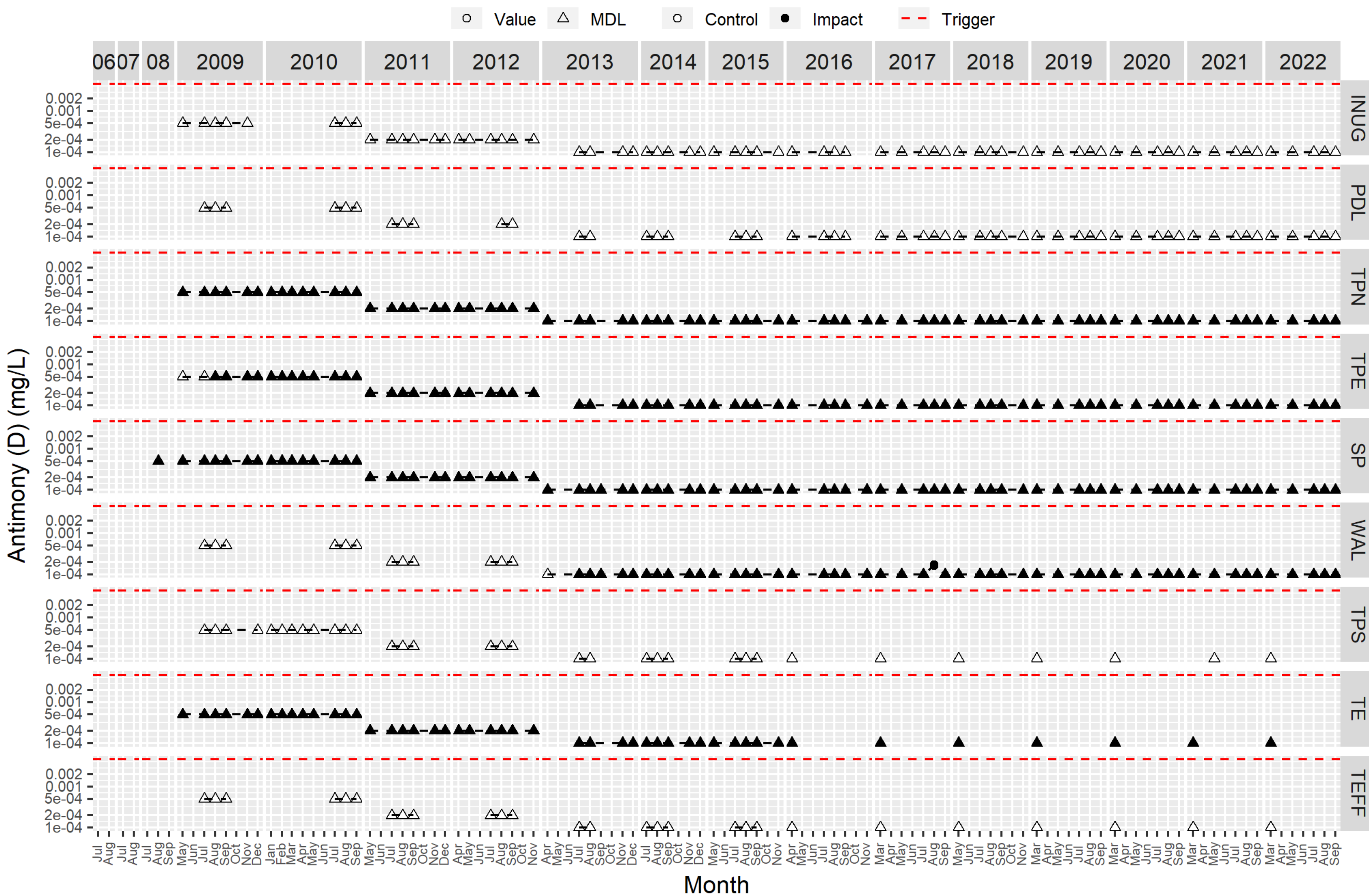


Figure B1-56. Dissolved arsenic (mg/L).

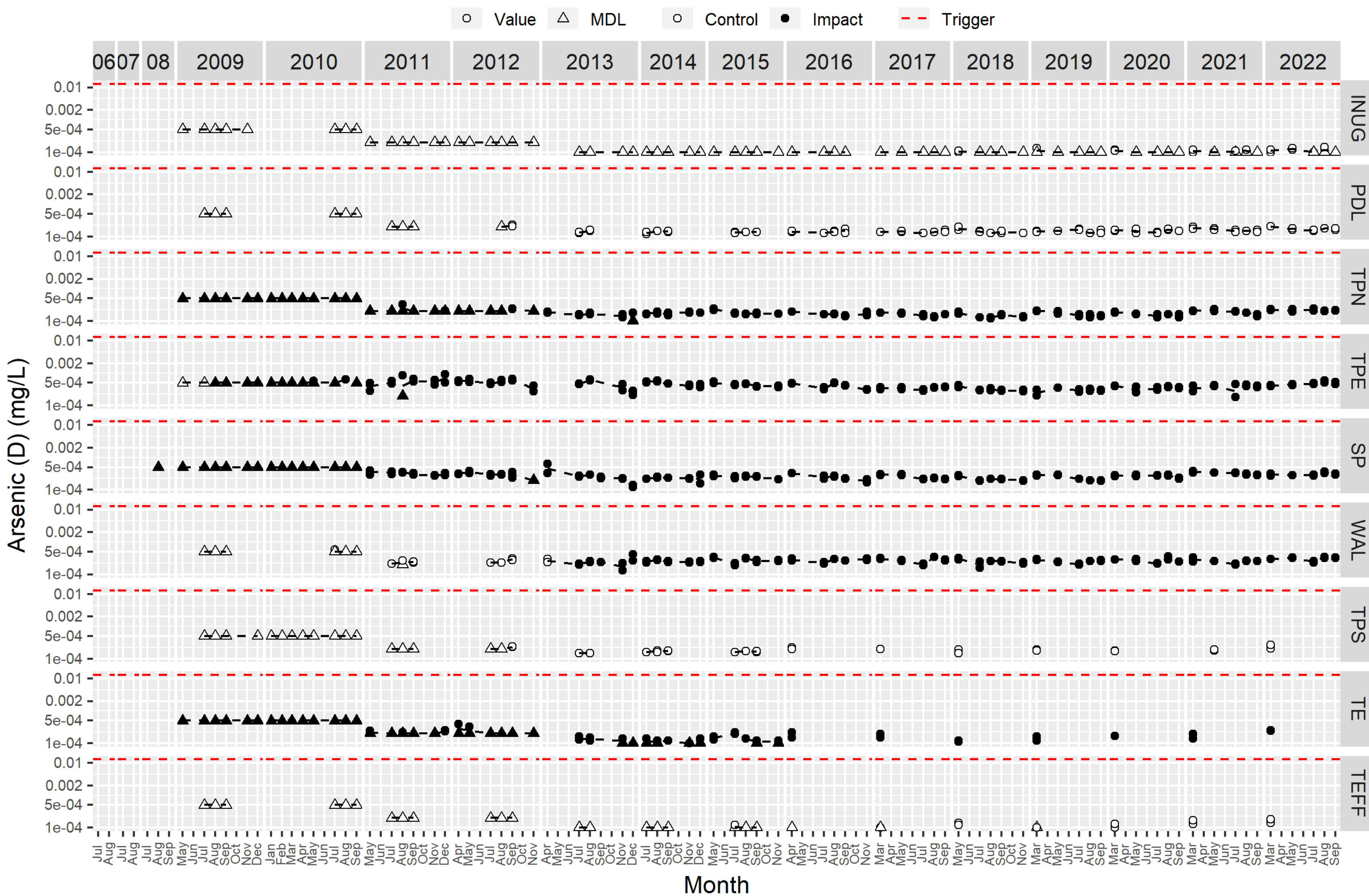


Figure B1-57. Dissolved barium (mg/L).

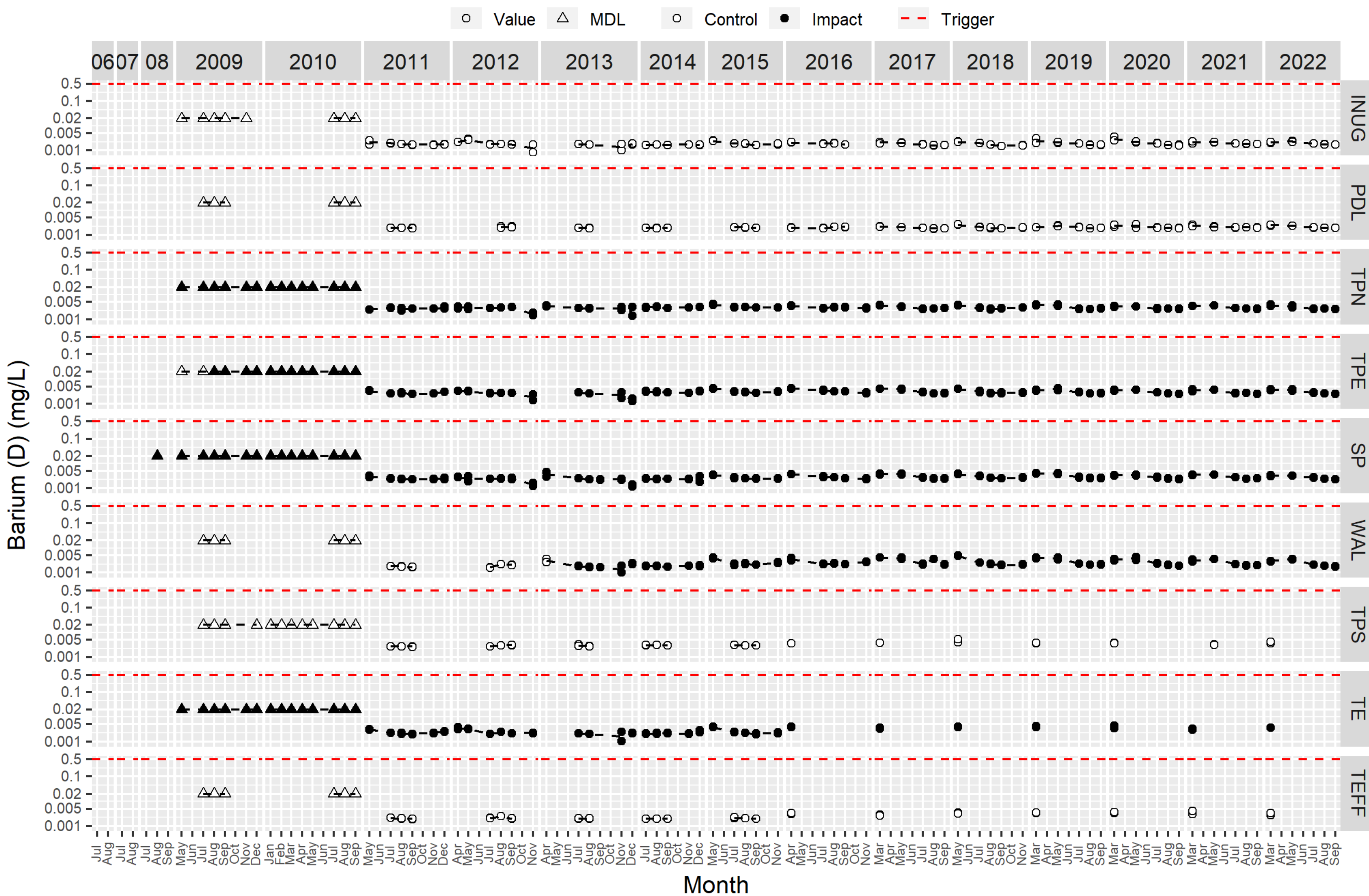


Figure B1-58. Dissolved beryllium (mg/L).

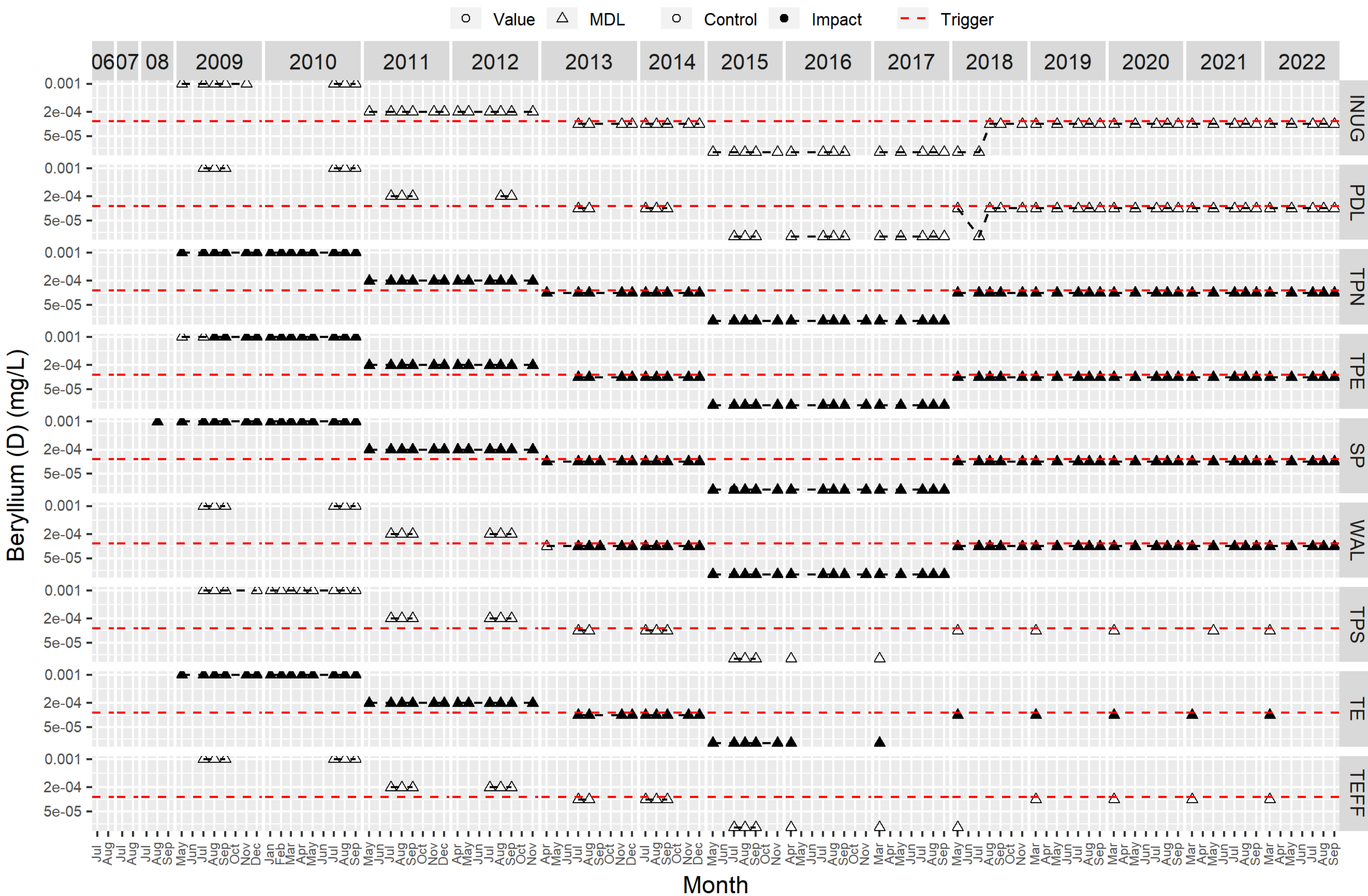


Figure B1-59. Dissolved boron (mg/L).

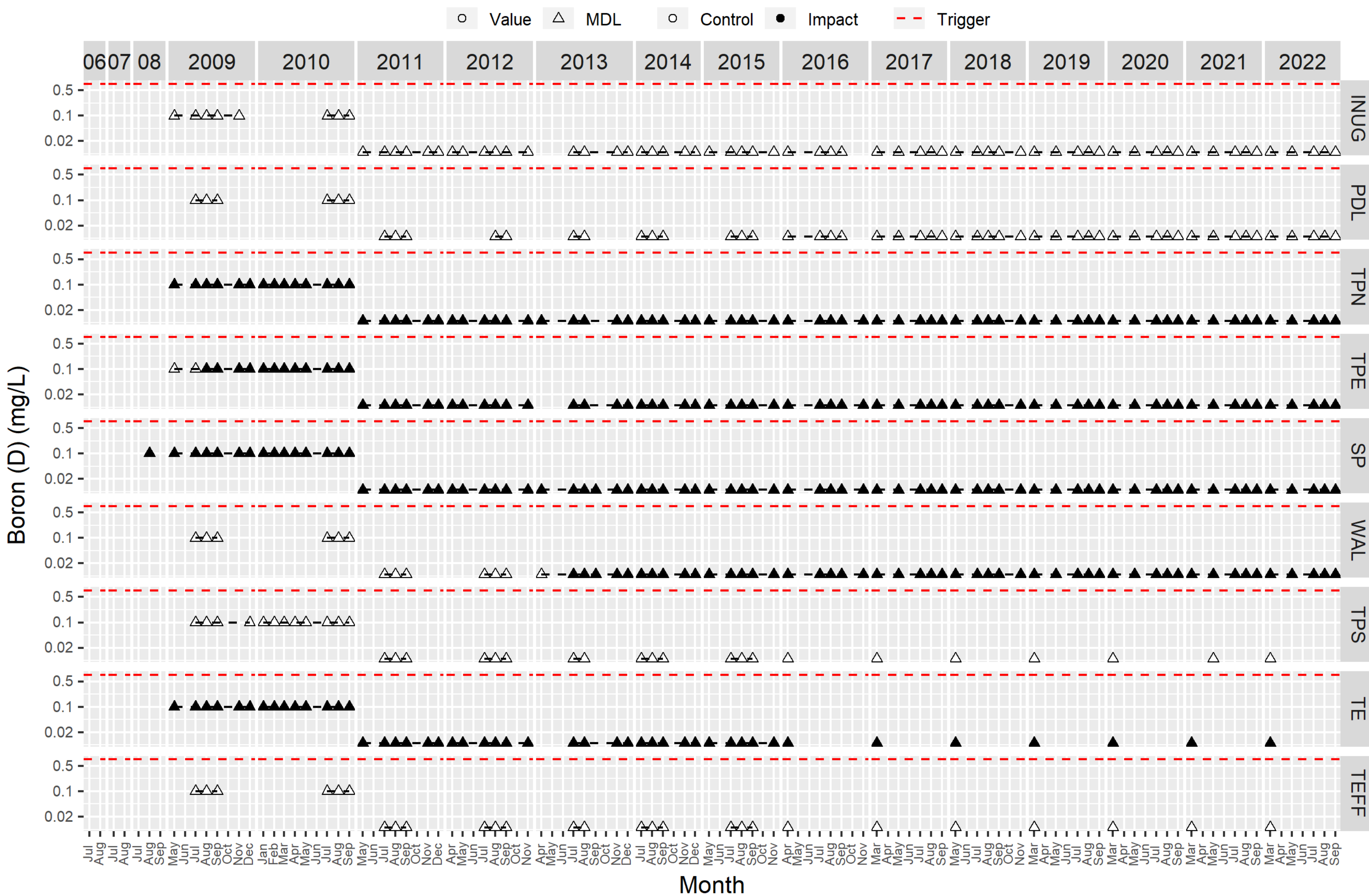


Figure B1-60. Dissolved cadmium (mg/L).

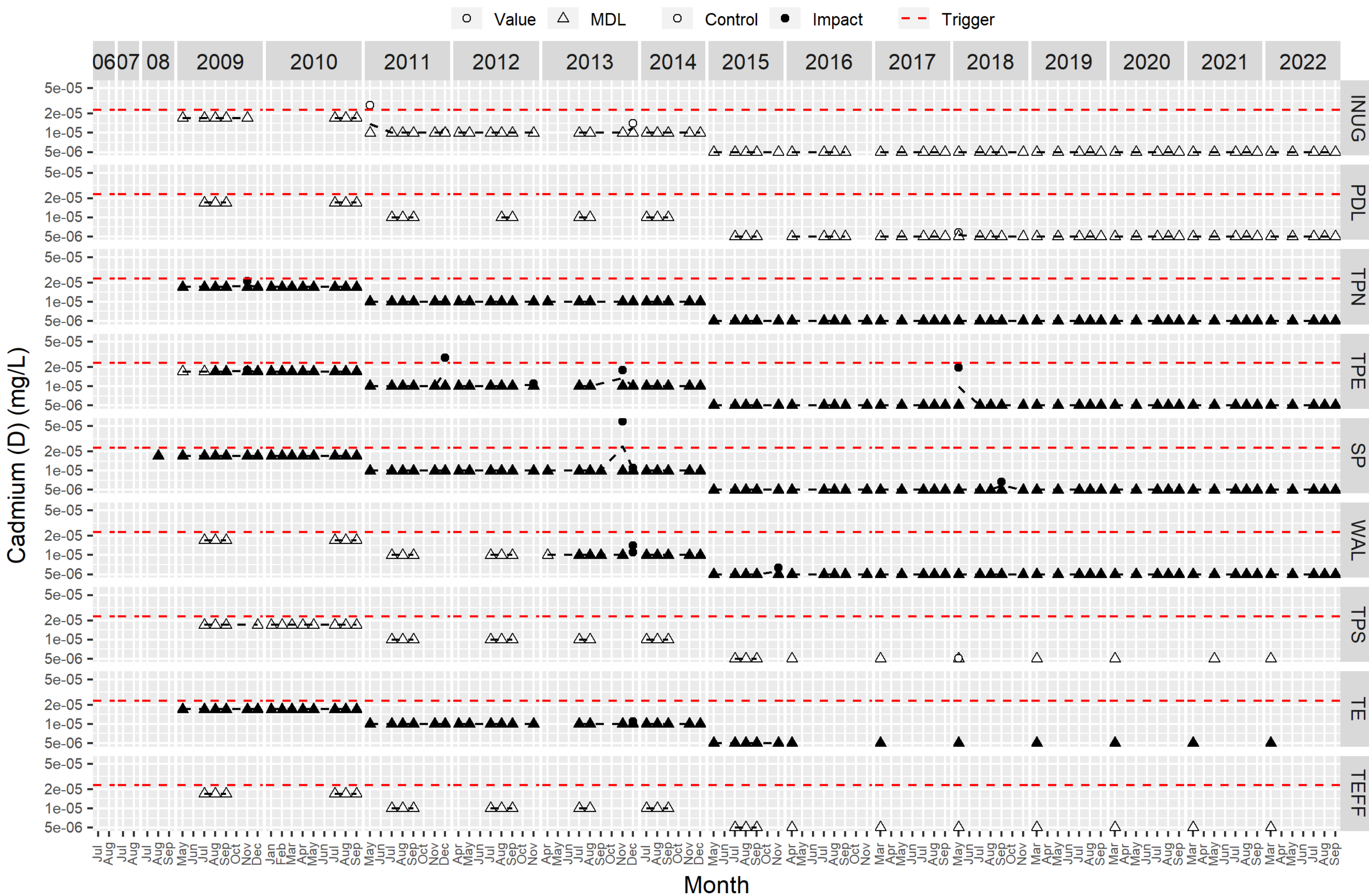


Figure B1-61. Dissolved copper (mg/L).

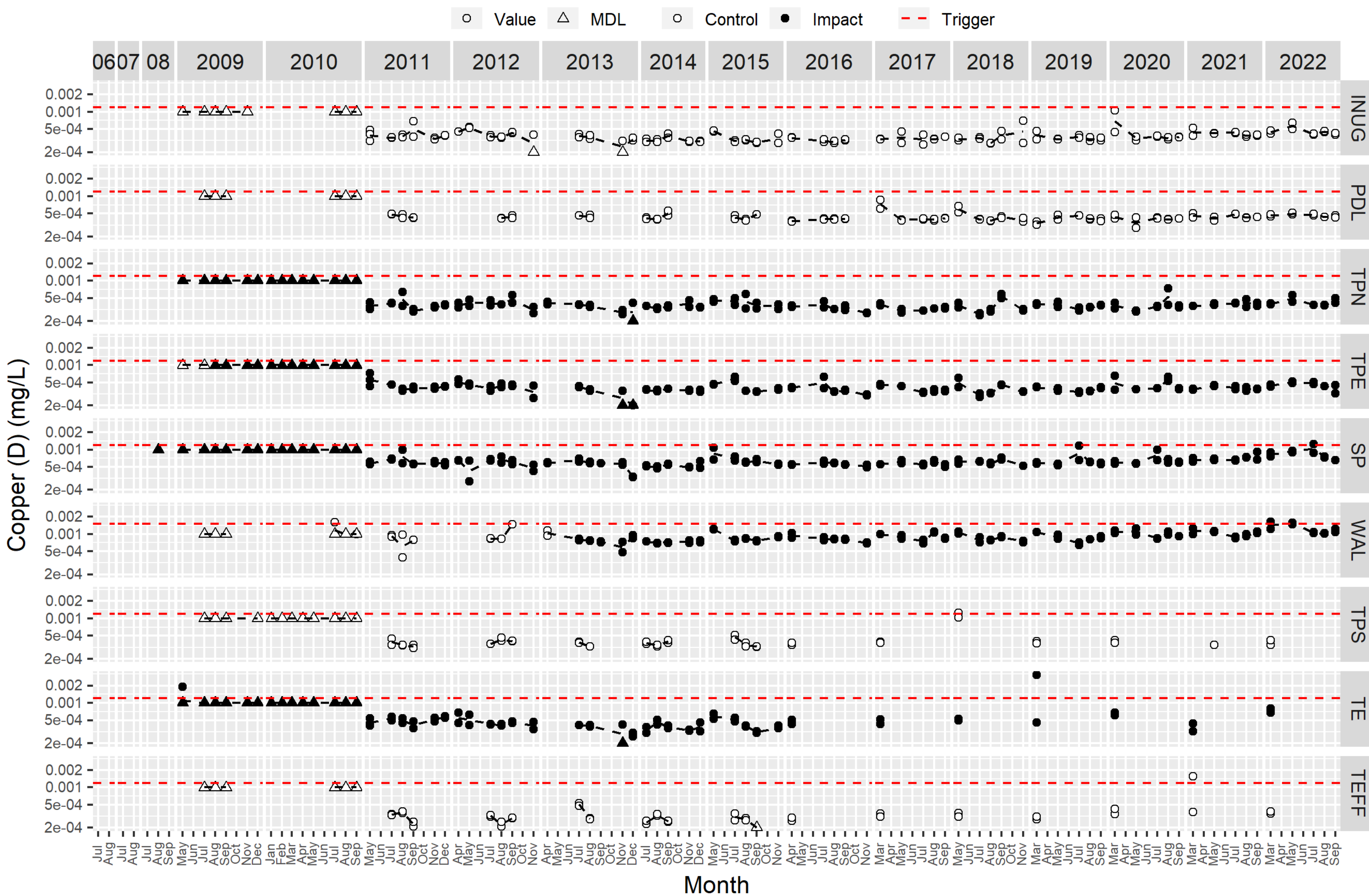


Figure B1-62. Dissolved chromium (mg/L).

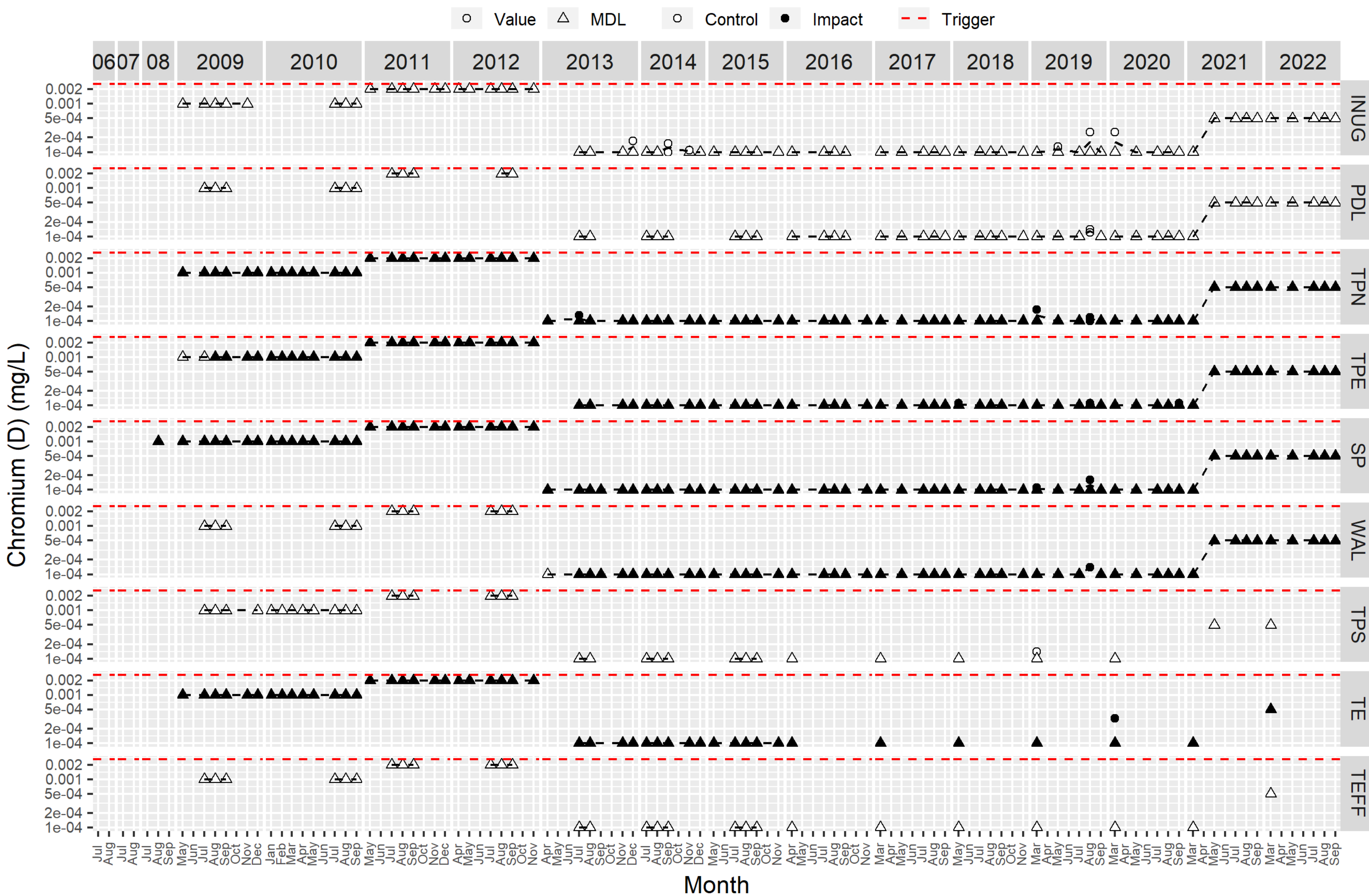


Figure B1-63. Dissolved iron (mg/L).

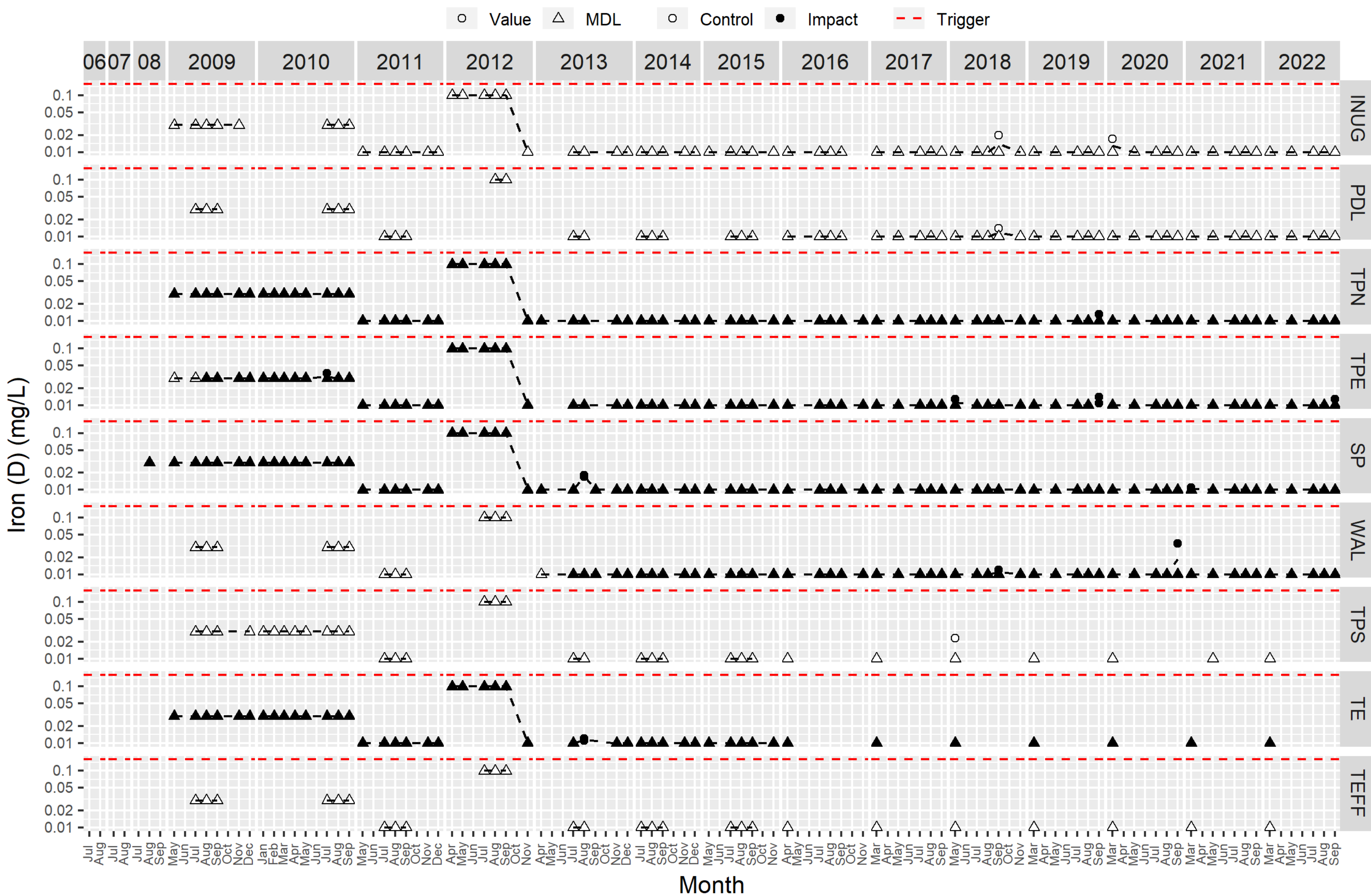


Figure B1-64. Dissolved lead (mg/L).

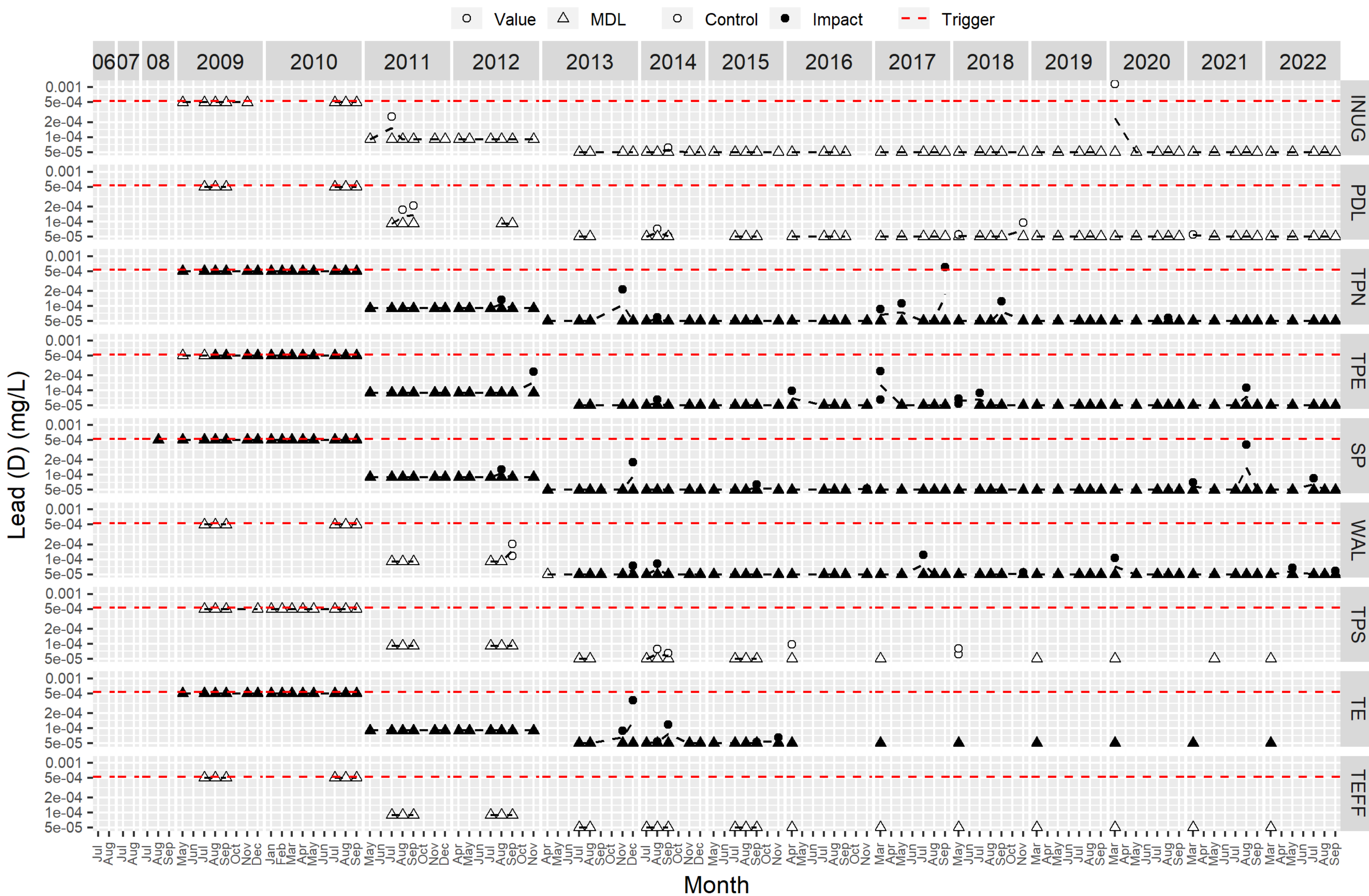


Figure B1-65. Dissolved lithium (mg/L).

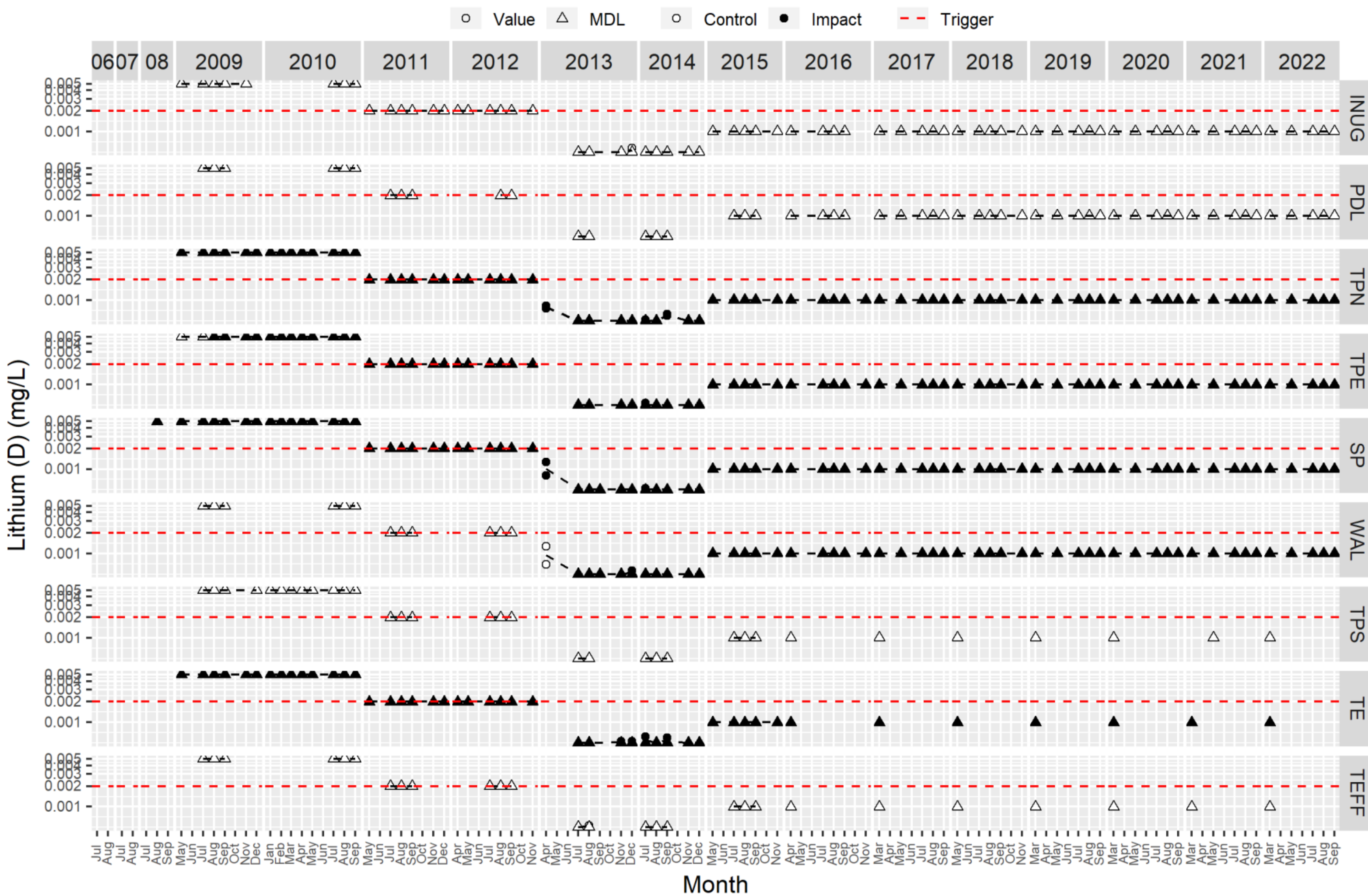


Figure B1-66. Dissolved manganese (mg/L).

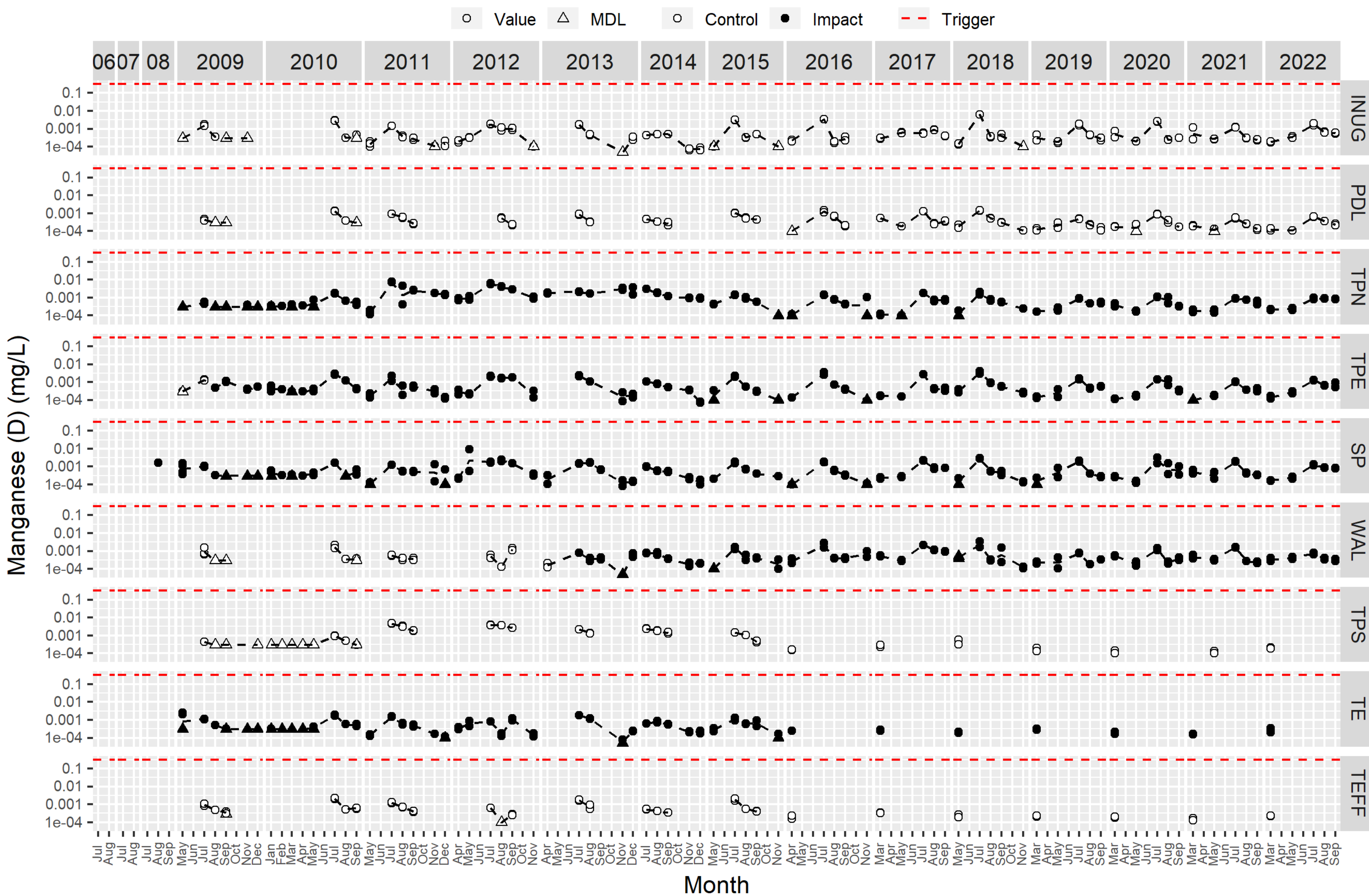


Figure B1-67. Dissolved molybdenum (mg/L).

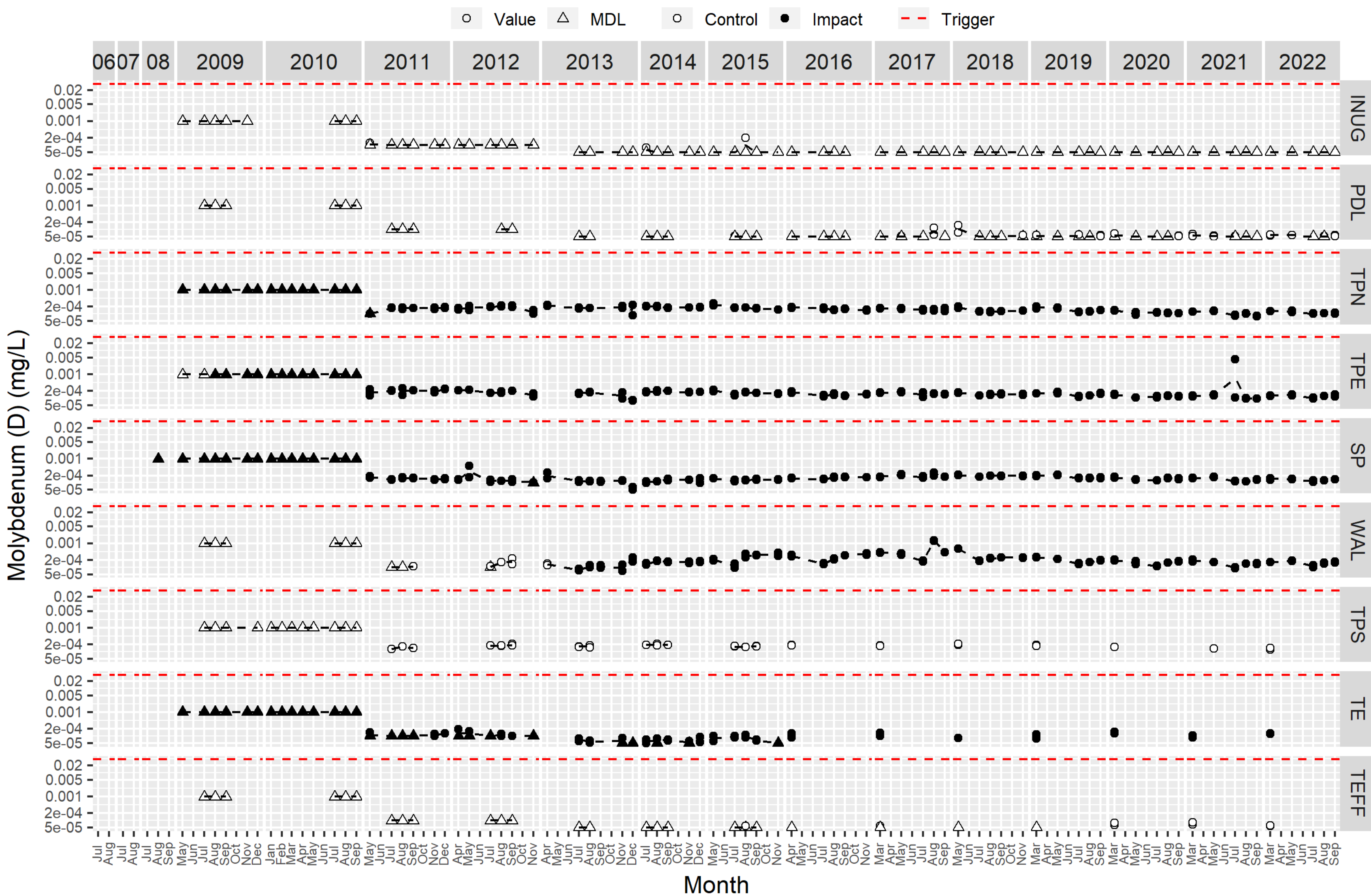


Figure B1-68. Dissolved mercury (mg/L).

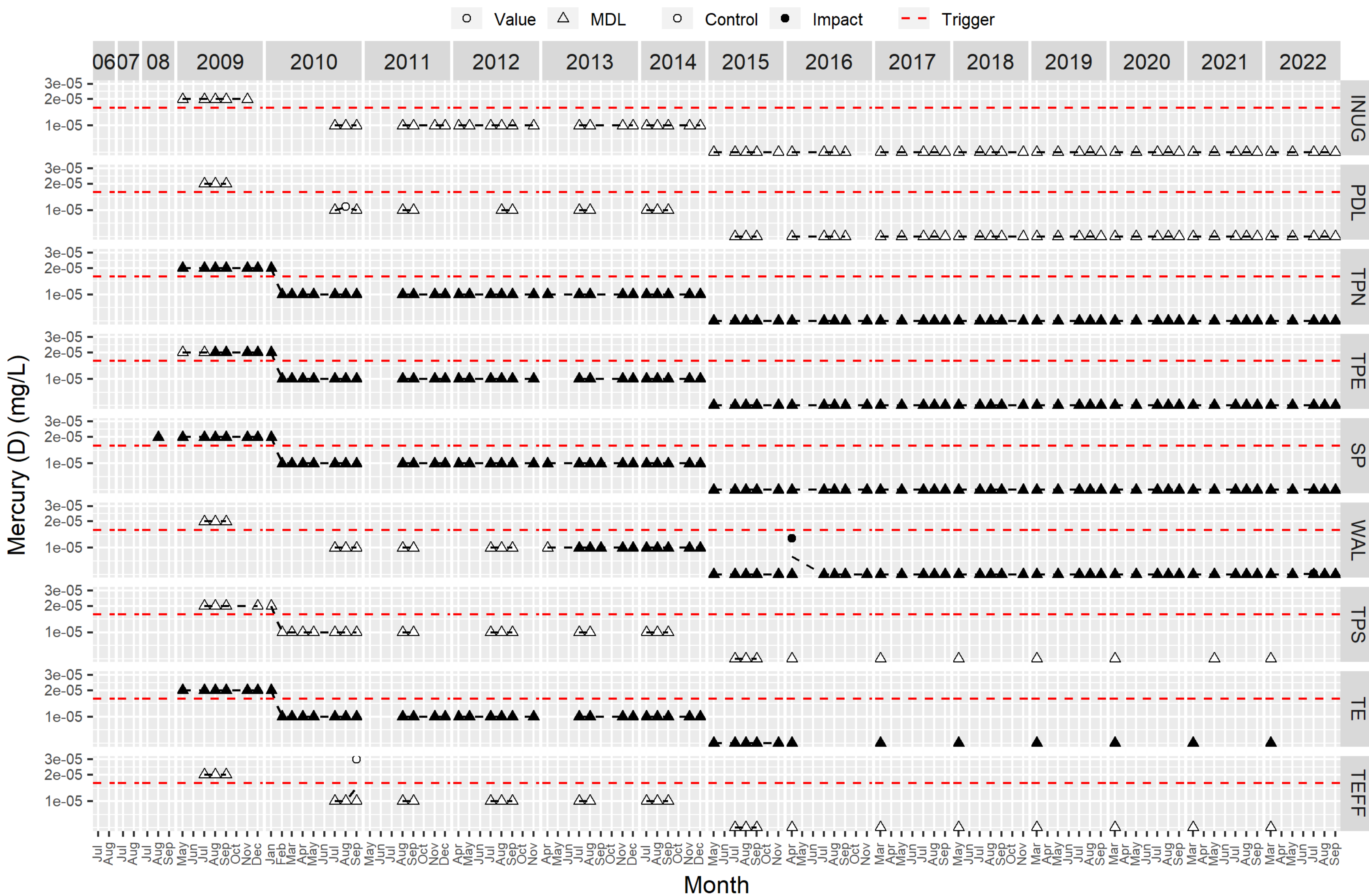


Figure B1-69. Dissolved nickel (mg/L).

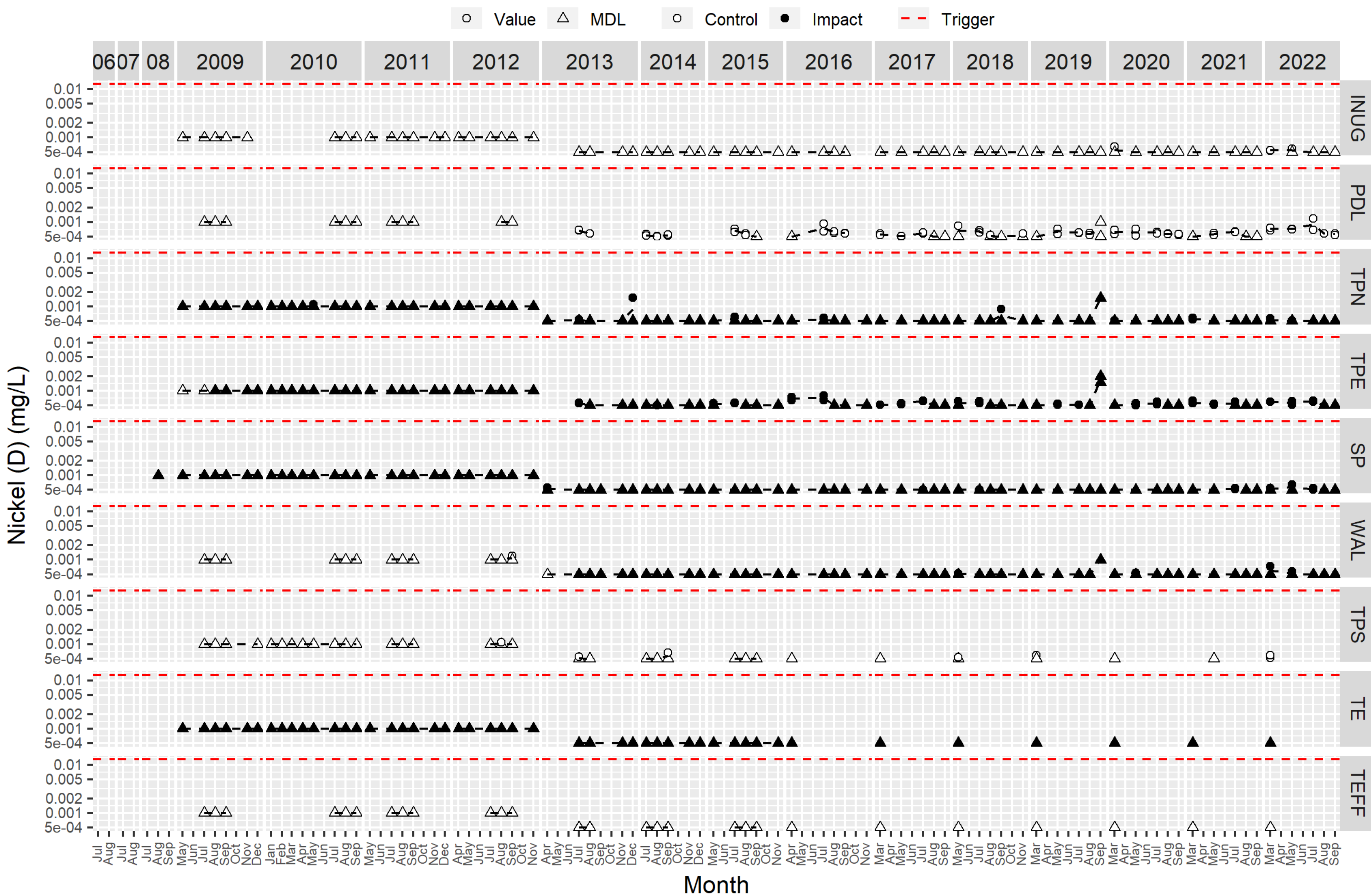


Figure B1-70. Dissolved selenium (mg/L).

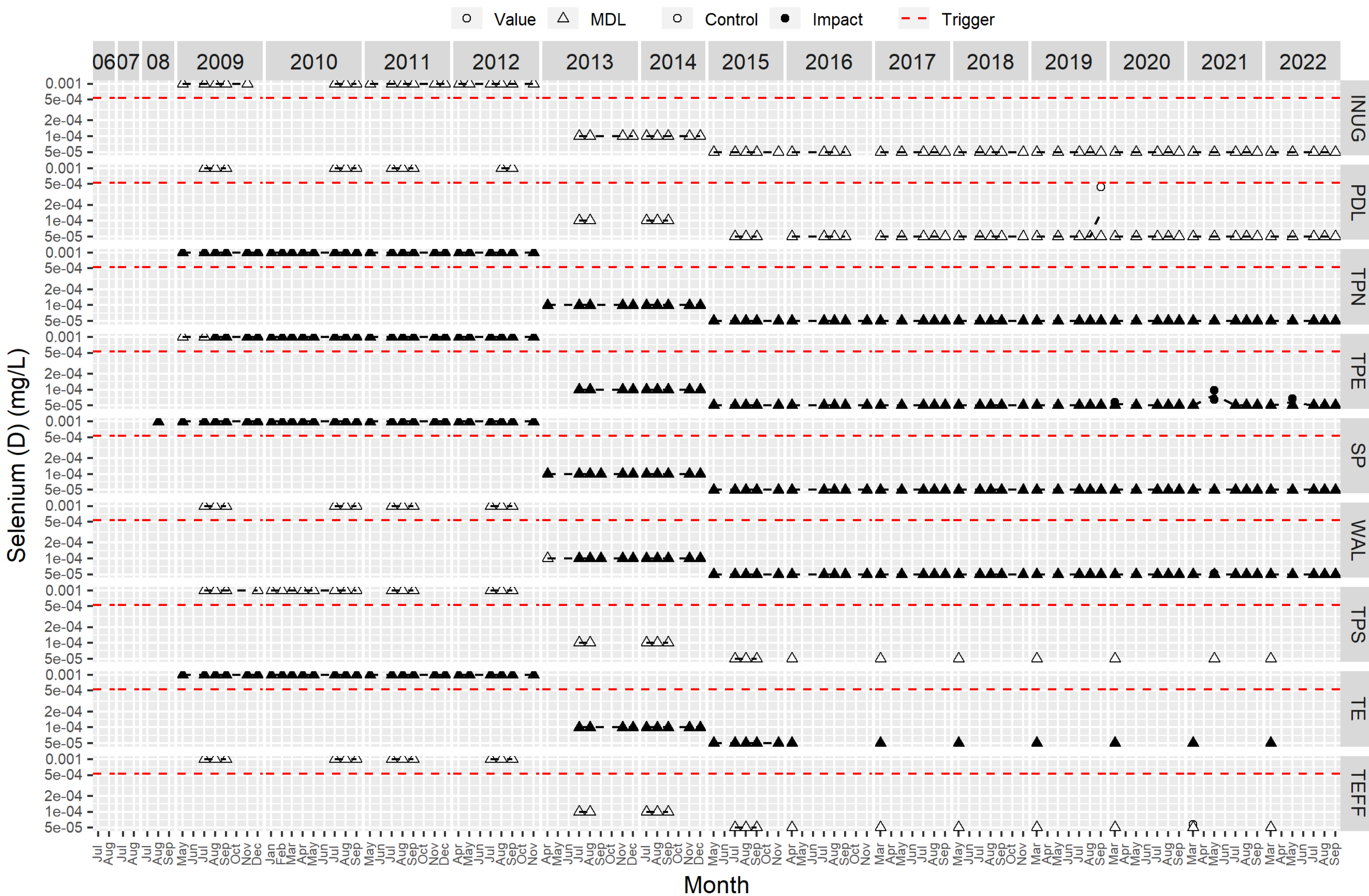


Figure B1-71. Dissolved silicon (mg/L).

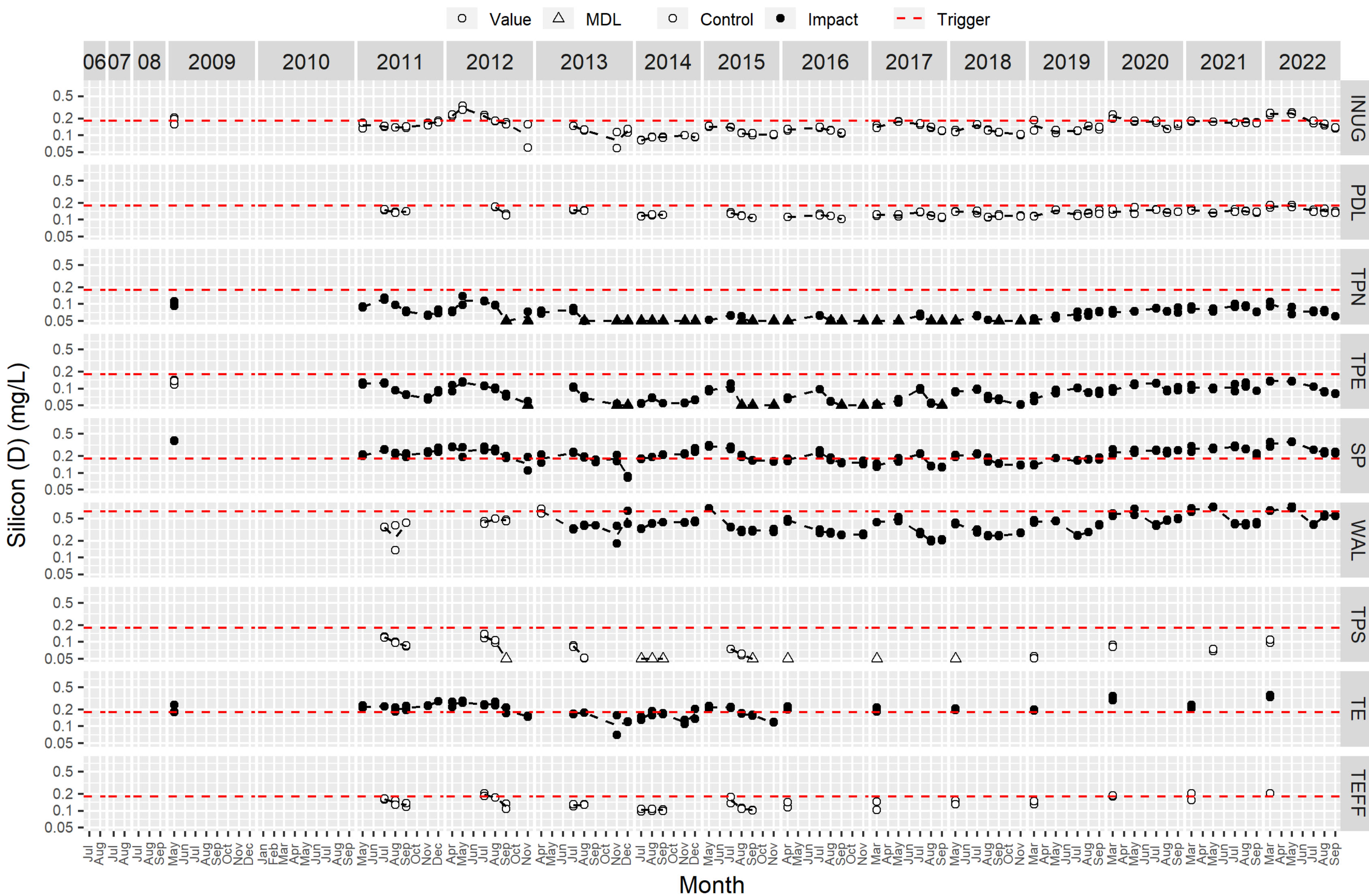


Figure B1-72. Dissolved silver (mg/L).

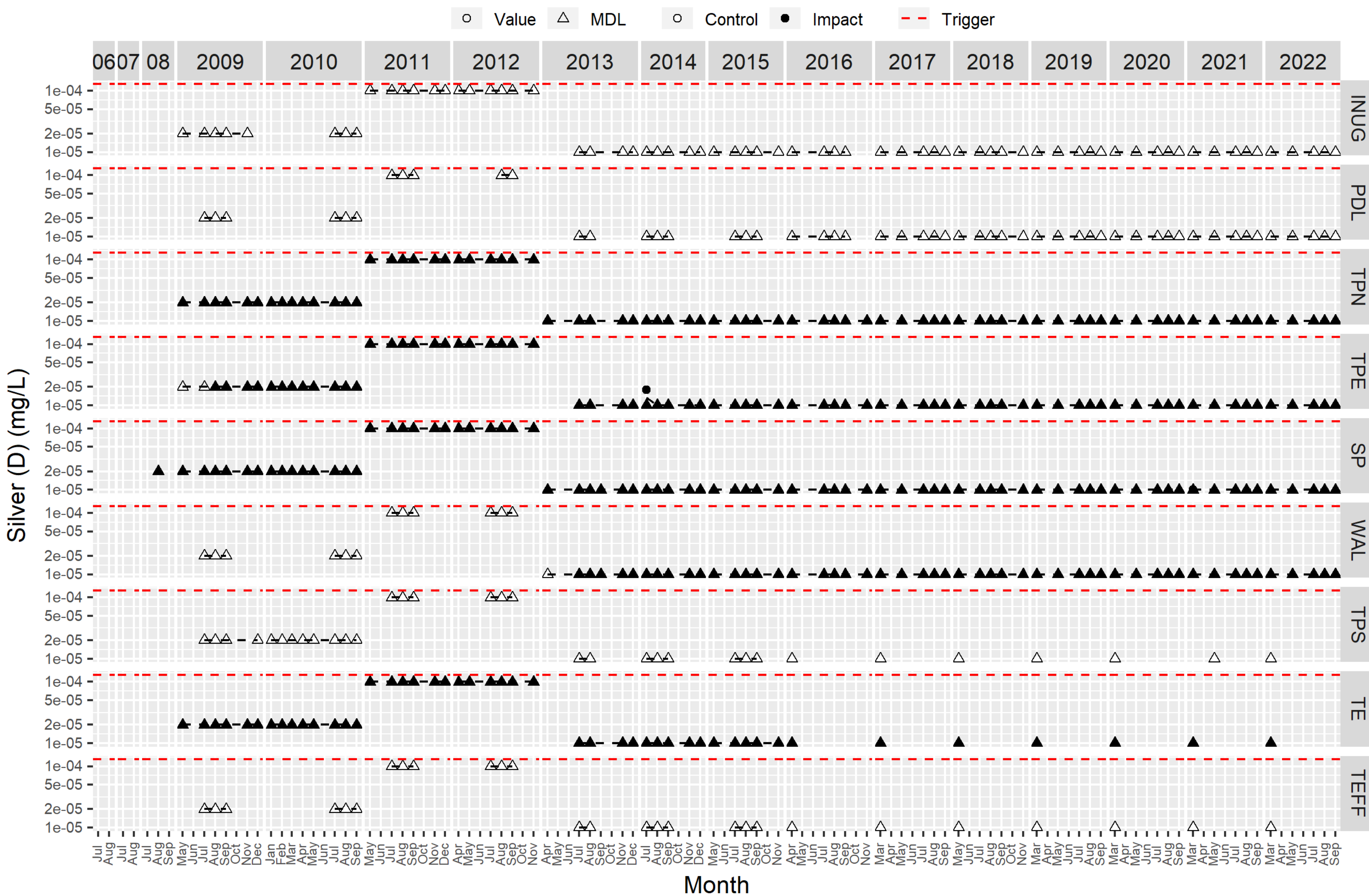


Figure B1-73. Dissolved strontium (mg/L).

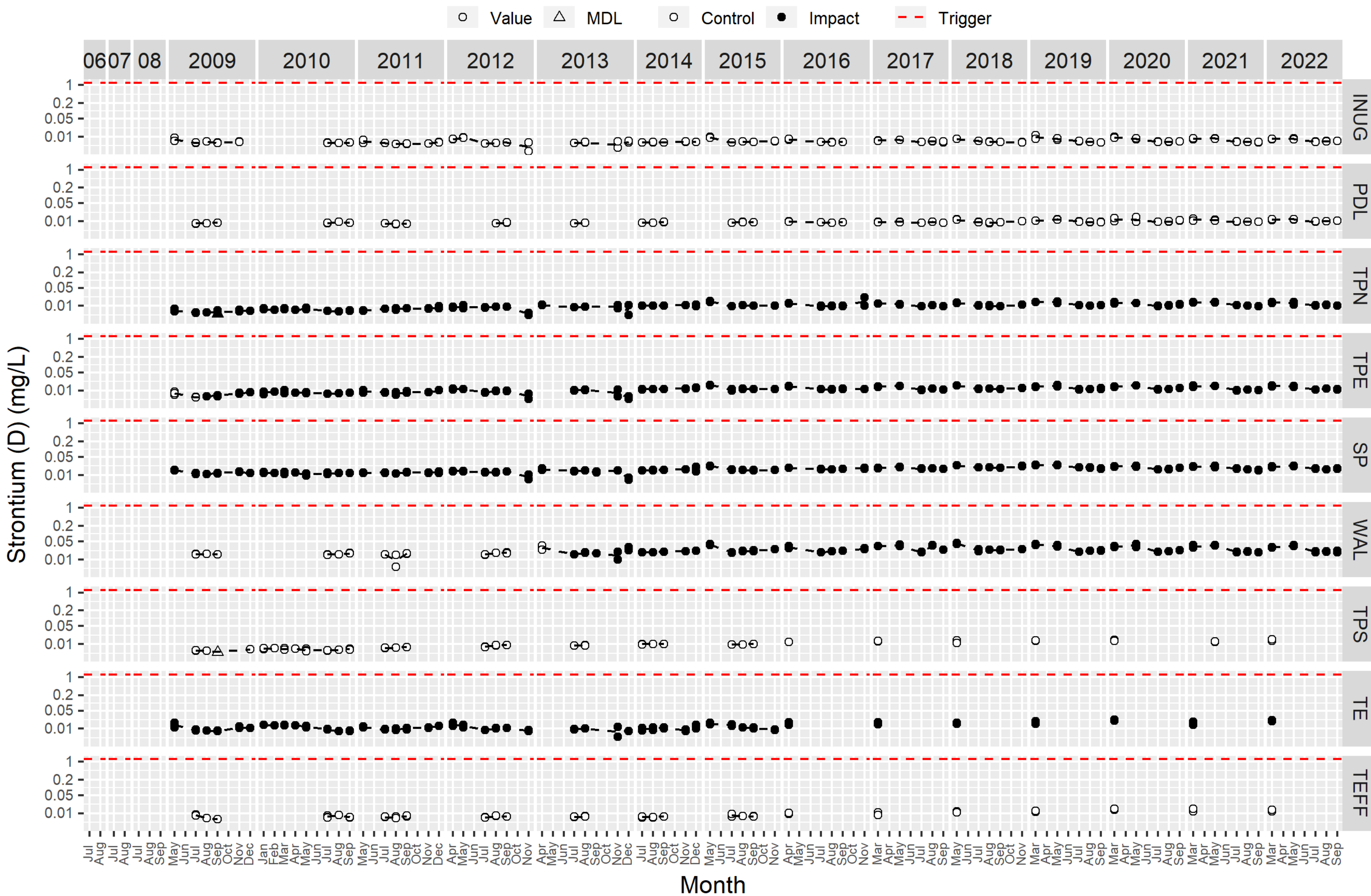


Figure B1-74. Dissolved thallium (mg/L).

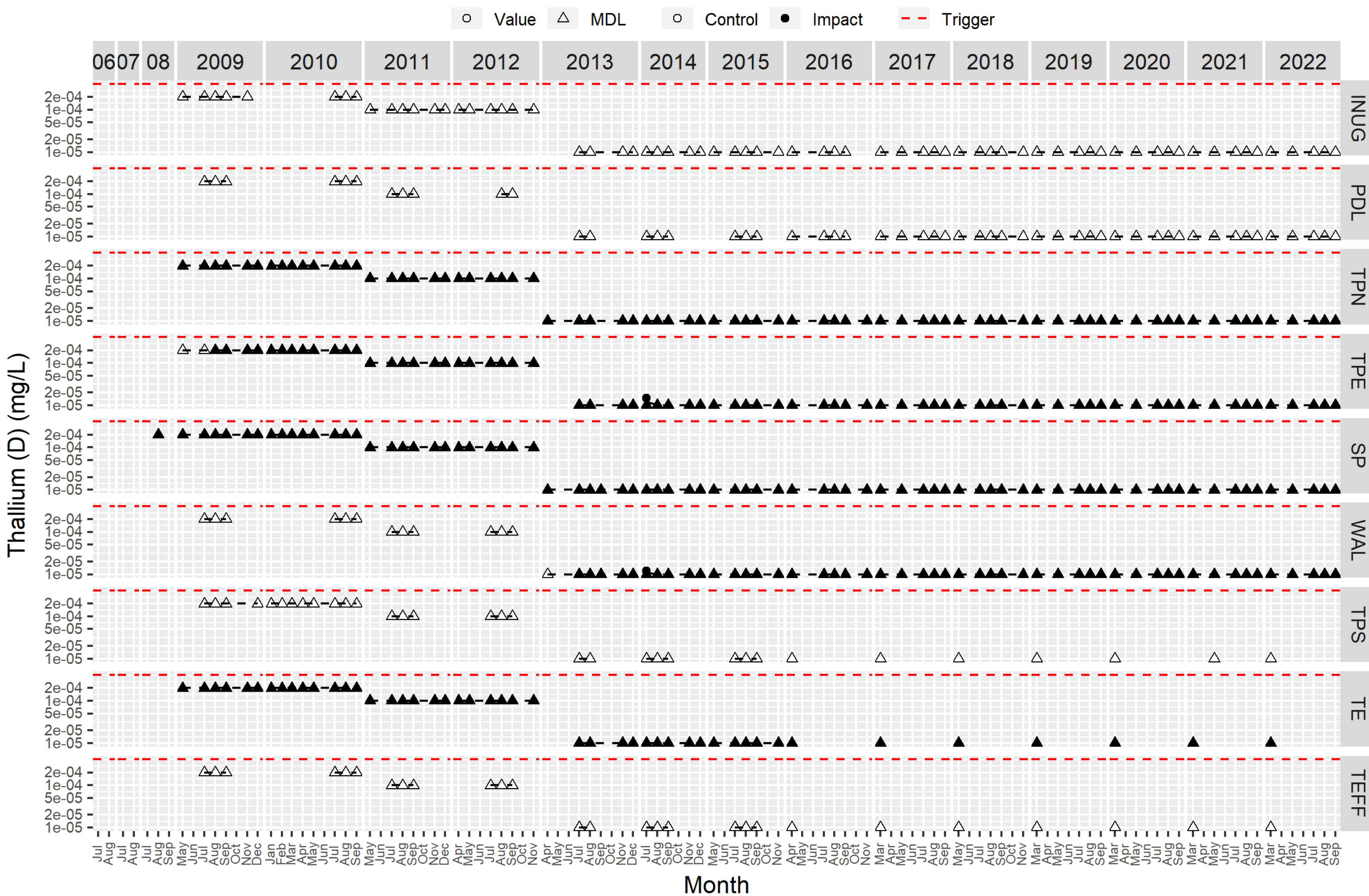


Figure B1-75. Dissolved tin (mg/L).

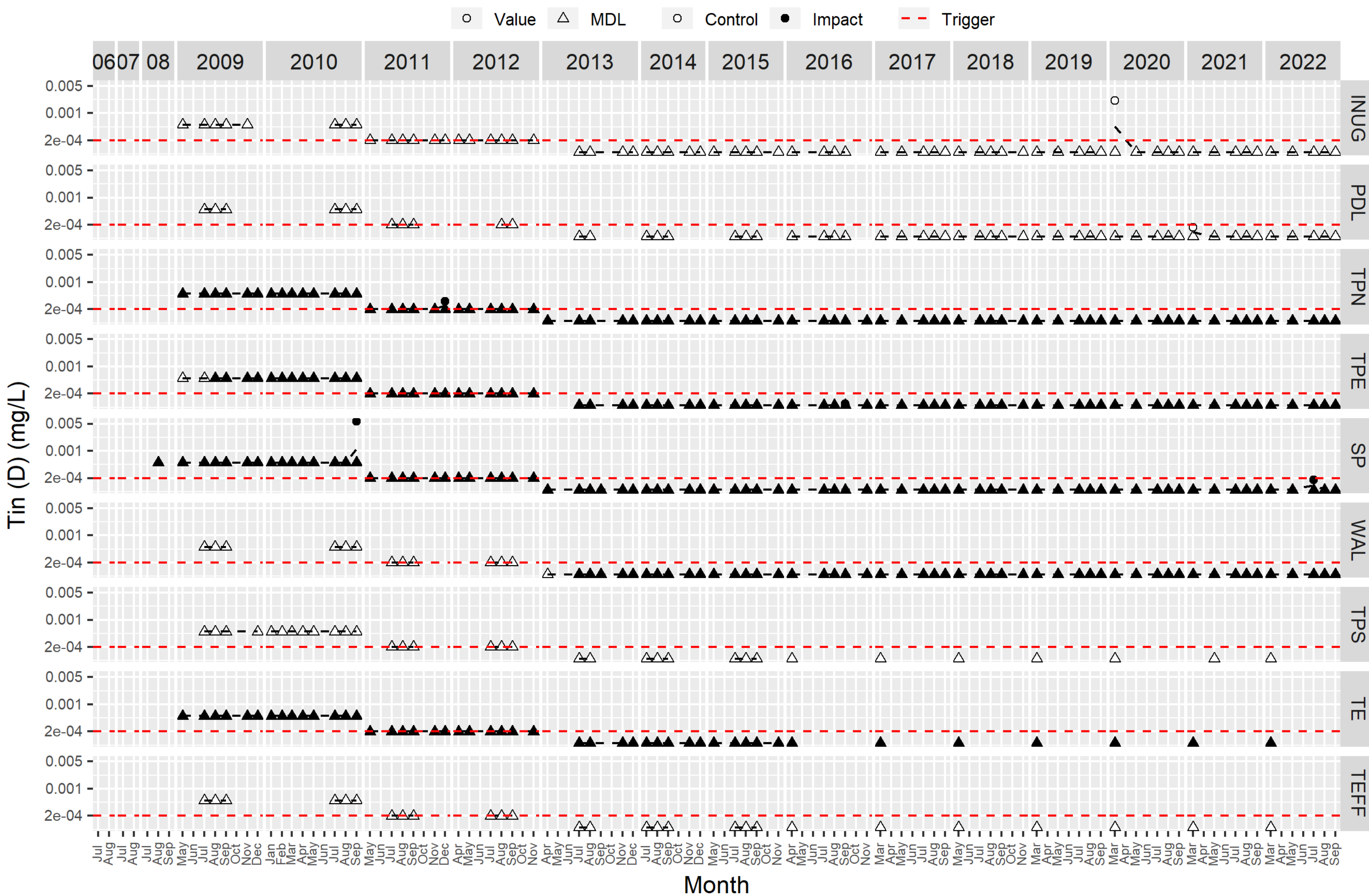


Figure B1-76. Dissolved titanium (mg/L).

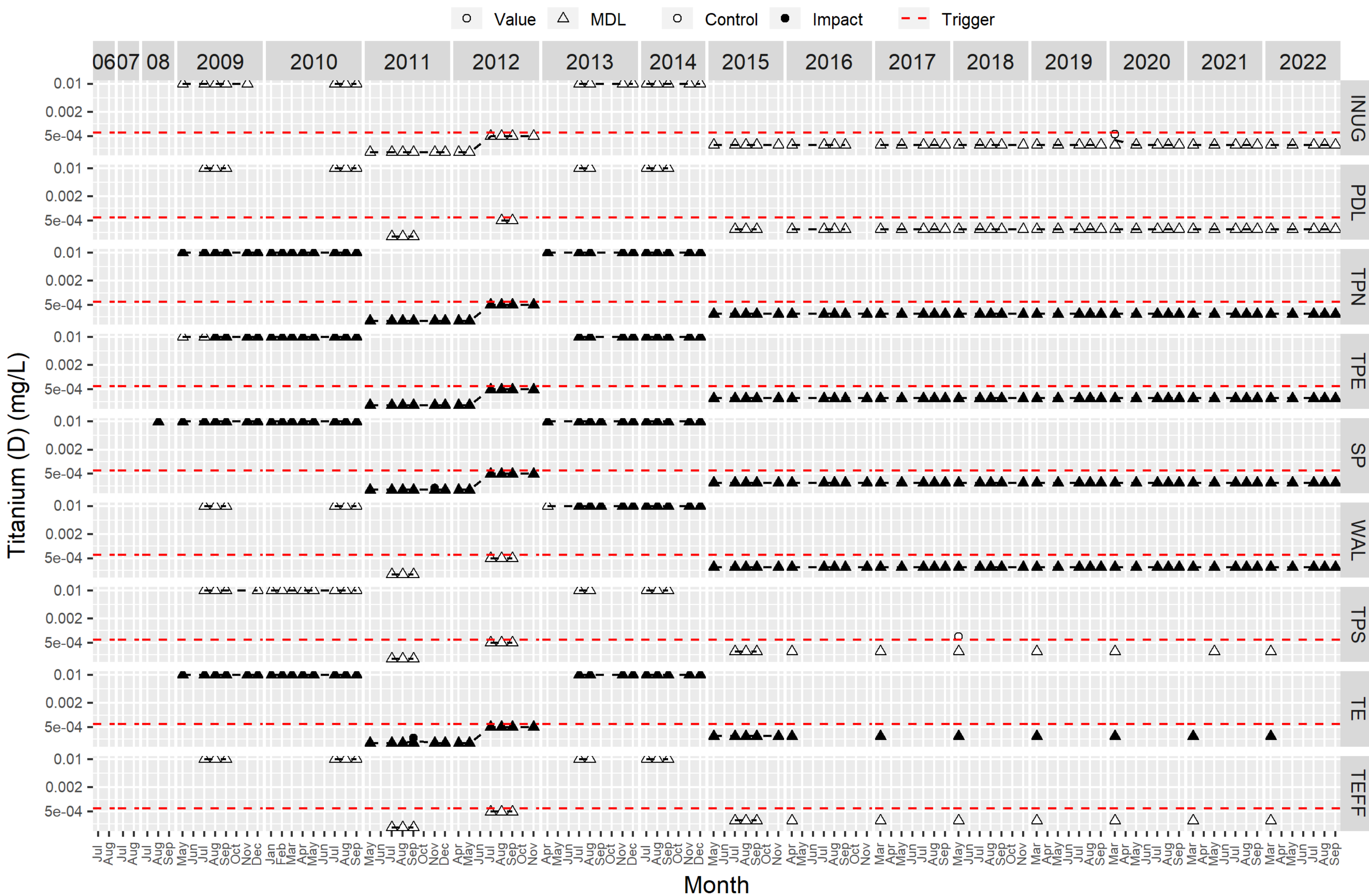


Figure B1-77. Dissolved uranium (mg/L).

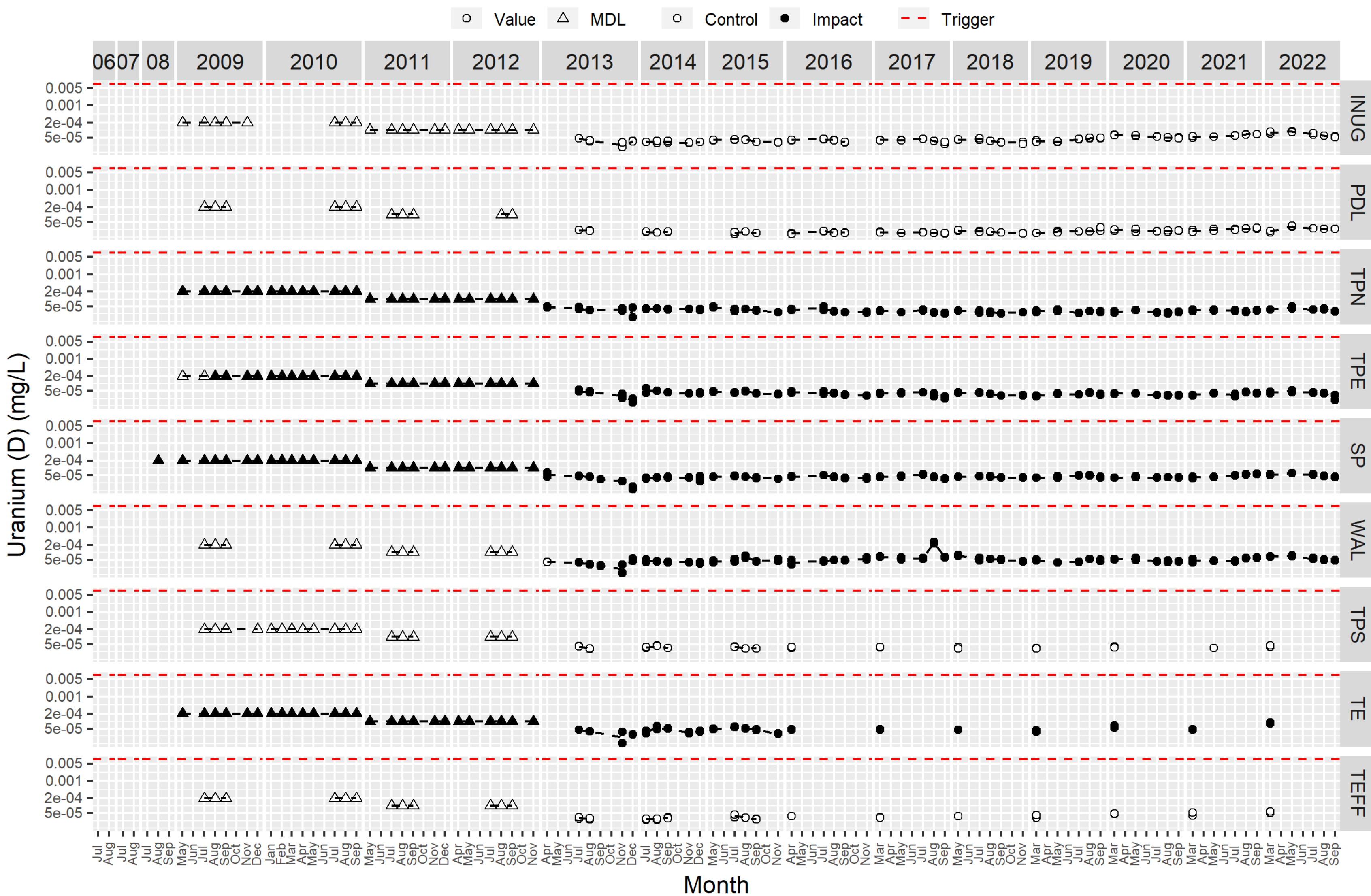


Figure B1-78. Dissolved vanadium (mg/L).

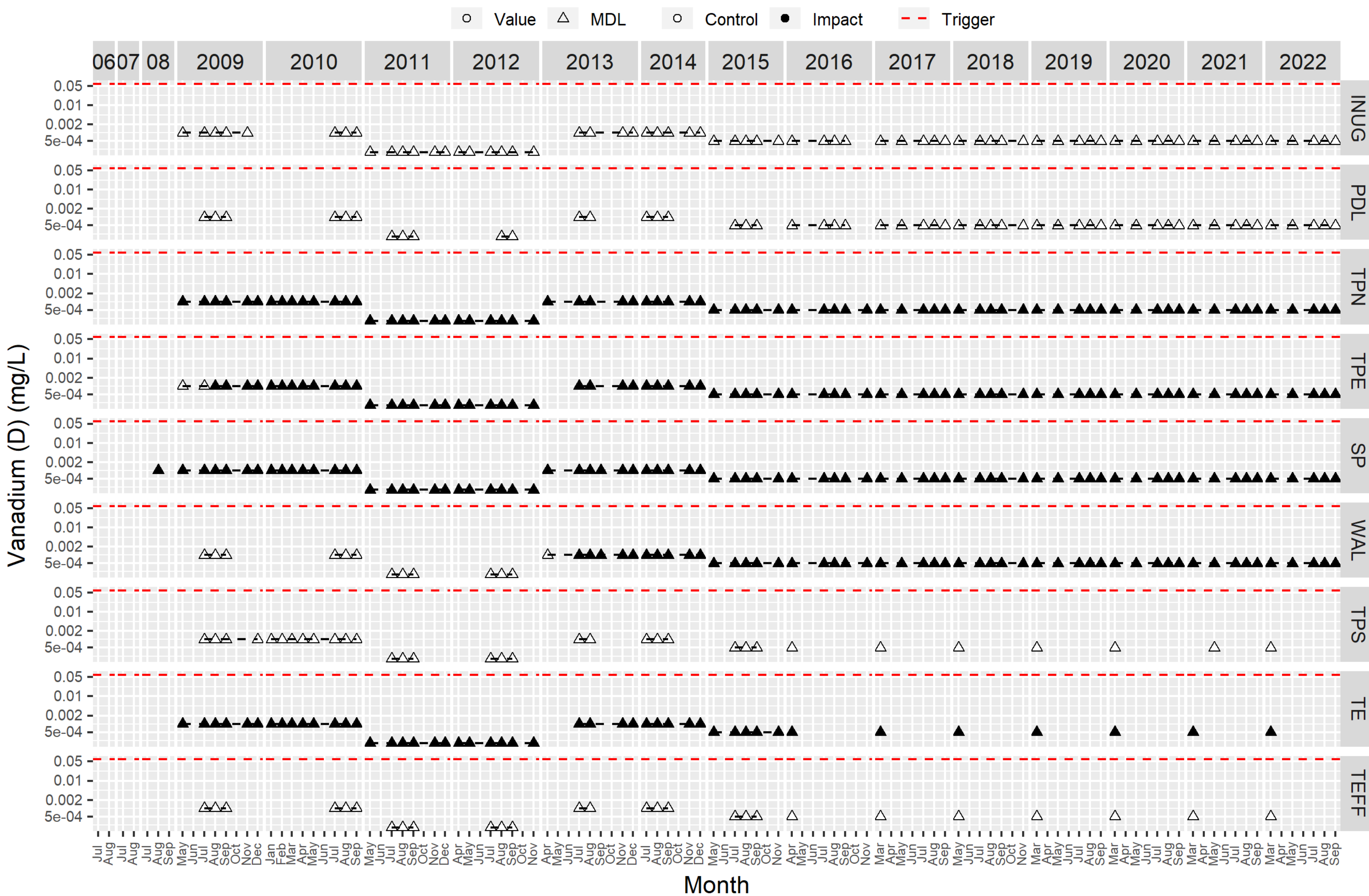
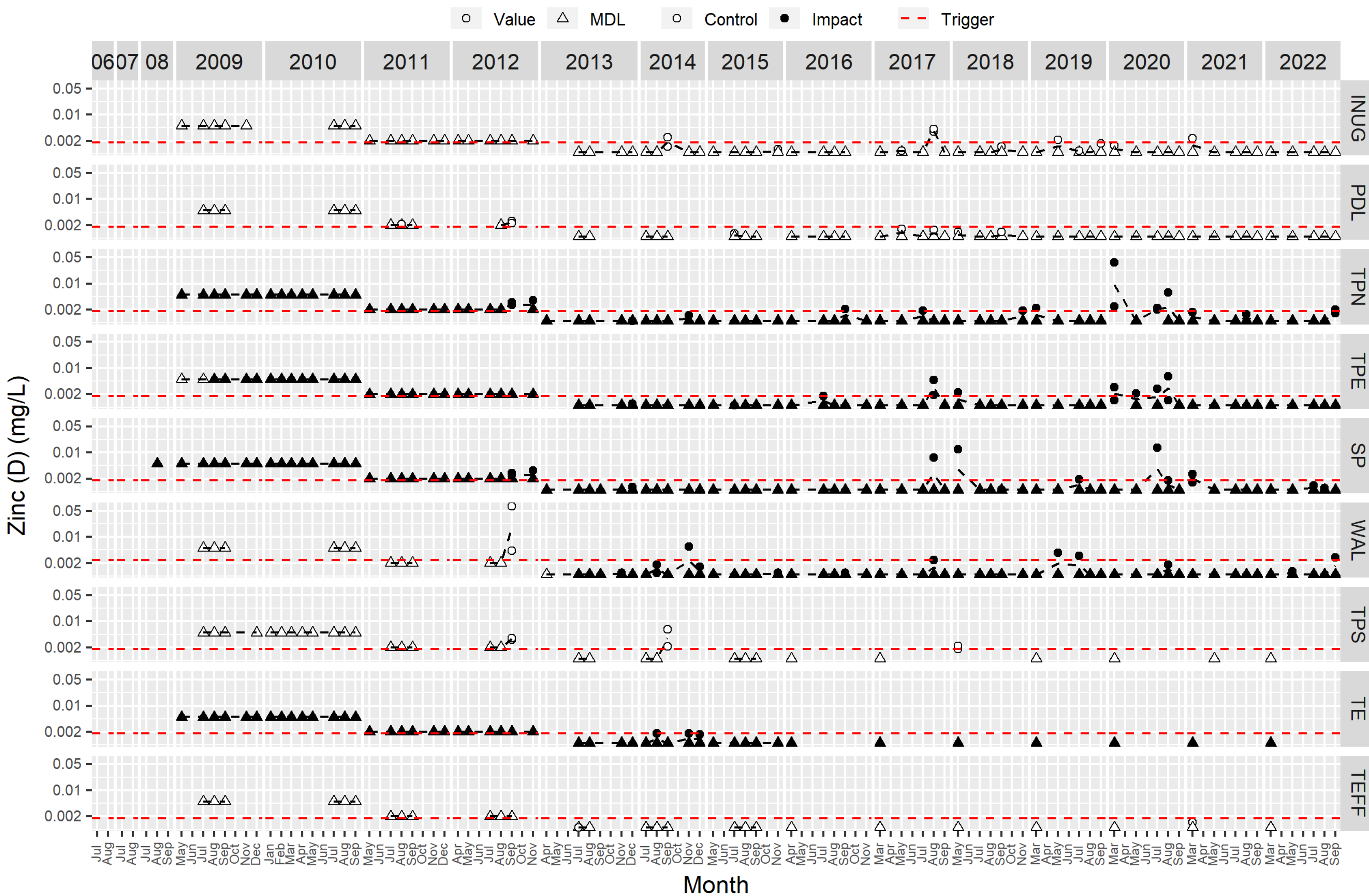


Figure B1-79. Dissolved zinc (mg/L).



REFERENCES

Azimuth. 2015. Core Receiving Environment Monitoring Program (CREMP) 2014, Meadowbank Mine. Report prepared by Azimuth Consulting Group, Vancouver, BC for Agnico Eagle Mines Ltd., Baker Lake, NU. March, 2015.

Appendix B2

Water Chemistry – Whale Tail Study Area Lakes

LIST OF TABLES

LIST OF FIGURES

Notes: Water quality results in Whale Tail study area lakes since baseline sampling in 2014 are shown. No cyanide (free or total) has been collected in Whale Tail study area lakes since 2019.

TABLES

Table B2-1. Water quality results from the 2022 CREMP, Whale Tail study area lakes.

Lake & Area	Aquatic Life Guideline[1]	WTP Screening Values[2]		Whale Tail Lake South Basin (Impoundment)									
Month				March	March	May	May	July	July	August	August	September	September
Area-Replicate ID				WTS-67	WTS-68	WTS-69	WTS-70	WTS-71	WTS-72	WTS-73	WTS-74	WTS-75	WTS-76
Date				05-Mar-2022	05-Mar-2022	06-May-2022	06-May-2022	01-Jul-2022	01-Jul-2022	17-Aug-2022	17-Aug-2022	03-Sep-2022	03-Sep-2022
Time		Triggers	Thresholds	15:10	14:45	13:15	12:38	15:35	16:05	00:00	00:00	14:15	15:00
ALS Sample ID				VA22A4994-001	VA22A4994-002	VA22B0431-001	VA22B0431-002	VA22B5784-003	VA22B5784-004	VA22B9756-007	VA22B9756-008	VA22C1407-005	VA22C1407-006
Field Measurements (3 m)													
Dissolved Oxygen (mg/L)				13.9	13.4	13.7	12.8	12.5	12.7	10.2	10.3	10.9	10.9
Specific Conductivity (µS/cm)				129	125	143	138	102	101	102	101	100	100
pH	6.5 - 9.0			6.8	6.8	7.0	7.1	7.2	7.2	7.3	7.3	7.4	7.4
Temperature (°C)				0.67	0.68	1.3	1.2	7.4	7.6	14.6	13.2	9.3	9.3
Physical Tests (mg/L)													
Conductivity (µS/cm)		48.6		**128**	**120**	**134**	**133**	**108**	**106**	**101**	**100**	**105**	**105**
Alkalinity - Total (as $CaCO_3$)		9.61		**18.0**	**17.1**	**20**	**19.7**	**16.7**	**18.9**	**17.4**	**16.9**	**17.2**	**17.2**
Alkalinity - Bicarbonate		9.60		**18.0**	**17.1**	**20**	**19.7**	**16.7**	**18.9**	**17.4**	**16.9**	**17.2**	**17.2**
Alkalinity - Carbonate		2.0		*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*
Alkalinity - Hydroxide				*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*
Hardness (as CaCO3), dissolved		17.4		**47**	**45**	**51**	**49**	**37**	**37**	**34**	**35**	**37**	**37**
Hardness (as CaCO3), from total Ca/Mg				46	44	51	50	37	37	35	35	35	34
pH (Laboratory)	6.5 - 9.0	6.57-7.97	6.5-9.0	7.1	7.1	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
Total Dissolved Solids		38.5		**84**	**83**	**96**	**92**	**71**	**69**	**63**	**61**	**70**	**68**
Total Suspended Solids		3	5	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	1.5	1.4	*<1.0*	*<1.0*
Turbidity (NTU)				0.20	0.16	0.18	0.18	1.2	0.60	0.85	1.0	0.47	0.48
Anions and Nutrients (mg/L)													
Total Kjeldahl Nitrogen		0.17		**0.26**	**0.26**	**0.32**	**0.26**	**0.23**	**0.21**	**0.21**	**0.23**	**0.22**	**0.29**
Ammonia (as N)[3]	***equation***	0.065	0.126	0.027	0.0095	0.018	0.016	0.019	0.016	0.0073	0.015	0.0073	0.0064
Bromide				0.14	0.14	0.19	0.19	0.12	0.12	0.13	0.13	0.12	0.12
Chloride	120	60.4	120	15.1	13.9	15.8	15.4	11.6	11.5	11.4	11.4	11.3	11.3
Fluoride	0.12	0.077	0.12	0.069	0.064	0.070	0.068	0.052	0.050	0.051	0.052	0.060	0.061
Nitrate (as N)	3	1.5	3	0.54	0.53	0.62	0.61	0.40	0.39	0.19	0.20	0.17	0.16
Nitrite (as N)	0.06	0.031	0.06	*<0.0010*	*<0.0010*	0.0034	0.0037	0.0018	0.0017	0.0014	0.0015	*<0.0010*	*<0.0010*
Ortho Phosphate (as P)		0.0022		0.0017	*<0.0010*	0.0010	*<0.0010*	0.0013	0.0012	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Phosphorus (P)-Total	0.01	0.0045	0.01	**0.0058**	**0.0093**	**0.0052**	**0.0049**	**0.0054**	**0.0051**	**0.0061**	**0.0065**	**0.0048**	**0.0060**
Phosphorus (P)-Total Diss.				0.0042	0.0037	0.0034	0.0027	0.0040	0.0032	0.0031	0.0034	0.0030	0.0026
Reactive Silica (as SiO_2)		1.33		1.1	1.1	**1.7**	**1.6**	1.1	1.1	*<0.50*	*<0.50*	*<0.50*	*<0.50*
Sulphate (SO_4)		64.8	128	14.4	12.8	15.0	14.6	11.1	11.0	10.6	10.6	10.6	10.5
Organic / Inorganic Carbon (mg/L)													
Dissolved Organic Carbon		2.43		**4.0**	**4.3**	**4.4**	**4.3**	**3.1**	**2.9**	**3.6**	**3.7**	**4.1**	**4.0**
Total Organic Carbon		2.42		**4.0**	**4.3**	**4.2**	**4.2**	**3.0**	**2.8**	**3.5**	**3.6**	**3.6**	**3.5**
Total Metals (mg/L)													
Aluminum[3]	***equation***	0.052	0.1	0.0057	0.0058	0.0055	0.0060	0.015	0.016	0.015	0.017	0.0082	0.012
Antimony		0.0046	0.009	0.00072	0.00066	0.0011	0.0010	0.00099	0.00098	0.00078	0.00078	0.00067	0.00062
Arsenic	0.005	0.013	0.025	0.00092	0.00082	0.0024	0.0021	0.0016	0.0016	0.0011	0.0011	0.00087	0.00086
Barium		0.5	1	0.022	0.021	0.024	0.023	0.018	0.018	0.017	0.017	0.014	0.014
Beryllium		0.000115	0.00013	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*
Bismuth				*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Boron	1.5	0.76	1.5	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Cadmium[3]	***equation***	0.000023	0.00004	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium		4.6		**12.6**	**11.8**	**14.0**	**13.9**	**10.1**	**10.2**	**9.3**	**9.3**	**9.9**	**9.3**
Chromium[4]	0.001	0.0025	0.005	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Cobalt				*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	0.00011	0.00012	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Copper[3]	***equation***	0.0013	0.002	0.00072	0.00072	0.00076	0.00072	<u>0.00059</u>	<u>0.00054</u>	0.00052	0.00050	*<0.00050*	0.00053
Iron	0.3	0.16	0.3	0.043	0.045	0.051	0.057	0.077	0.082	0.070	0.066	0.044	0.043
Lead[3]	***equation***	0.00053	0.001	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Lithium		0.002		**0.0022**	**0.0021**	**0.0024**	**0.0023**	0.0019	0.0019	0.0017	0.0017	0.0019	0.0018
Magnesium		1.41		**3.5**	**3.4**	**3.9**	**3.8**	**2.9**	**2.9**	**2.8**	**2.8**	**2.6**	**2.5**
Manganese[3]		0.32	***See text***	0.0087	0.0088	0.012	0.015	0.026	0.026	0.011	0.0091	0.0065	0.0074
Mercury	0.000026	0.000016	0.000026	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Molybdenum	0.073	0.037	0.073	<u>0.00051</u>	<u>0.00045</u>	0.00056	0.00051	0.00046	0.00044	0.00047	0.00045	<u>0.00040</u>	<u>0.00036</u>
Nickel[3]	***equation***	0.013	0.025	0.0040	0.0037	0.0056	0.0053	0.0040	0.0040	0.0022	0.0022	0.0017	0.0017
Phosphorus		0.0045	0.004	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*
Potassium		0.84		**3.1**	**3.0**	**3.6**	**3.5**	**2.5**	**2.5**	**2.7**	**2.7**	**2.5**	**2.5**
Rubidium				0.0048	0.0046	0.0052	0.0049	0.0040	0.0038	0.0044	0.0042	0.0038	0.0038
Selenium	0.001	0.00053	0.001	0.00006	*<0.000050*	0.00006	0.00007	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Silicon		0.61		**0.70**	0.61	**0.81**	**0.80**	0.56	0.58	0.14	0.15	*<0.10*	*<0.10*
Silver	0.00025	0.00013	0.00025	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Sodium		1		**2.6**	**2.5**	**2.8**	**2.8**	**2.2**	**2.3**	**2.3**	**2.3**	**2.1**	**2.1**
Strontium		1.26	2.5	0.097	0.090	0.11	0.10	0.076	0.075	0.080	0.080	0.074	0.068
Sulfur				5.2	4.8	5.2	5.0	3.6	3.8	3.7	3.5	3.4	3.4
Tellurium				*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*
Thallium	0.0008	0.00013	0.0008	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Thorium				*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Tin		0.033		*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Titanium		0.00041		*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00090*	**0.00071**	**0.00065**	**0.00067**	0.00035	*<0.00030*
Tungsten				*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Uranium	0.015	0.0002	0.015	0.00020	0.00015	**0.00023**	**0.00021**	0.00013	0.00012	0.00008	0.00008	0.00006	0.00006
Vanadium		0.0006	0.12	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Zinc[3]	0.03	0.0075	***See text***	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*
Zirconium				*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*
Dissolved Metals (mg/L)													
Aluminum[3]		0.026	0.05	0.0027	0.0034	<u>0.0060</u>	<u>0.0040</u>	0.0035	0.0037	0.0038	0.0047	<u>0.0016</u>	<u>0.0019</u>
Antimony		0.005	0.009	0.00078	0.00070	0.0011	0.0010	0.00097	0.00095	0.00077	0.00076	0.00066	0.00067
Arsenic		0.013	0.025	0.00079	0.00076	0.0020	0.0017	0.0013	0.0013	0.0010	0.0011	0.00091	0.00084
Barium		0.5	1	0.023	0.023	0.025	0.025	0.019	0.018	0.016	0.017	0.015	0.016
Beryllium		0.000115	0.00013	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*
Bismuth				*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Boron		0.76	1.5	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Cadmium		0.000023	0.00004	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium		4.6		**12.9**	**12.1**	**13.6**	**13.2**	**10.3**	**10.2**	**9.2**	**9.6**	**10.0**	**10.0**
Cesium				0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Chromium		0.0026	0.005	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Cobalt				*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Copper		0.0012	0.002	0.00065	0.00061	0.00074	0.00072	<u>0.00058</u>	<u>0.00053</u>	0.00047	0.00047	0.00067	0.00069
Iron		0.16	0.3	0.023	0.021	0.032	0.029	0.031	0.032	0.026	0.024	*<0.010*	*<0.010*
Lead		0.00053	0.001	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Lithium		0.002		**0.0021**	**0.0021**	**0.0024**	**0.0024**	0.0016	0.0016	0.0016	0.0017	0.0019	0.0018
Magnesium		1.41		**3.6**	**3.7**	**4.0**	**3.8**	**2.8**	**2.7**	**2.7**	**2.7**	**2.9**	**3.0**
Manganese[3]		0.32	***See text***	0.0010	0.00074	0.0018	0.00099	0.016	0.016	0.0014	0.00085	0.00073	0.00085
Mercury		0.000016	0.000026	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Molybdenum		0.037	0.073	0.00051	0.00042	0.00052	0.00049	0.00050	0.00047	0.00044	0.00045	<u>0.00041</u>	<u>0.00042</u>
Nickel		0.013	0.025	0.0039	0.0038	0.0054	0.0050	0.0039	0.0037	0.0020	0.0021	0.0018	0.0019
Phosphorus				*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*
Potassium		0.84		**3.1**	**3.2**	**3.6**	**3.5**	**2.6**	**2.5**	**2.7**	**2.8**	**2.9**	**2.9**
Rubidium				0.0047	0.0049	0.0050	0.0051	0.0037	0.0037	0.0042	0.0042	0.0041	0.0041
Selenium		0.00053	0.001	0.00006	0.00006	0.00006	0.00006	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Silicon		0.57		**0.62**	0.54	**0.76**	**0.79**	0.48	0.48	0.087	0.091	*<0.050*	*<0.050*
Silver		0.00013	0.00025	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Sodium		1		**2.6**	**2.6**	**2.9**	**2.9**	**2.4**	**2.3**	**2.3**	**2.4**	**2.3**	**2.4**
Strontium		1.26	2.5	0.100	0.092	0.12	0.11	0.081	0.079	0.077	0.079	0.075	0.078
Sulfur				4.6	4.1	4.8	4.5	3.4	3.7	3.9	3.5	3.4	3.5
Tellurium				*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*
Thallium		0.00041	0.0008	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Thorium				*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Tin		0.0002		*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Titanium		0.0006		*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*
Tungsten				*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Uranium		0.0075	0.015	0.00015	0.00010	0.00020	0.00019	0.00012	0.00011	0.00006	0.00007	0.00005	0.00005
Vanadium		0.06	0.12	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Zinc[3]		0.0023	***See text***	*<0.0010*	0.0014	0.0011	*<0.0010*	0.0014	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Zirconium				*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*
Speciated Metals (µg/L)													
Arsenate (As V)				0.11		0.42			0.11		0.059	0.047	
Arsenite (As III)				0.39		1.4			1.00		0.44	0.35	
Arsenobetaine (AsB)				*<0.050*		*<0.050*			*<0.050*		*<0.050*	*<0.050*	
Dimethylarsinic Acid (DMA)				*<0.020*		*<0.020*			0.13		0.21	0.21	
Monomethylarsonic Acid (MMA)				0.026		0.024			*<0.020*		*<0.020*	*<0.020*	
Plant Pigments (µg/L)													
Chlorophyll-a				*<0.010*	*<0.010*	1.1	0.93	0.82	1.1	3.2	2.7	3.4	3.3

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.
2. Trigger and threshold values are presented in *CREMP 2015 Plan Update* (Azimuth, 2015b). A number of thresholds were derived from methods (or sources) other than CCME guidelines - see Azimuth (2015b) for details.
3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

123 Bolded values exceed the trigger.

123 Bold and shaded values exceed the threshold.

Italicized numbers are below detection limits.

"-" not analyzed/not sampled

n/a = issues with the water quality probe. No data collected.

<u>underline</u> = results were given a cautionary flag in the QC assessment (refer to **Appendix A** for details).

~~strikethrough~~ = results flagged as unreliable in the QC assessment (refer to **Appendix A** for details).

Table B2-1. Water quality results from the 2022 CREMP, Whale Tail study area lakes.

Lake & Area	Aquatic Life Guideline[1]	WTP Screening Values[2]		Mammoth Lake									
Month				March	March	May	May	July	July	August	August	September	September
Area-Replicate ID				MAM-67	MAM-68	MAM-69	MAM-70	MAM-71	MAM-72	MAM-73	MAM-74	MAM-75	MAM-76
Date				05-Mar-2022	05-Mar-2022	06-May-2022	06-May-2022	08-Jul-2022	08-Jul-2022	15-Aug-2022	15-Aug-2022	04-Sep-2022	04-Sep-2022
Time		Triggers	Thresholds	08:20	09:45	15:00	15:45	14:25	13:42	00:00	00:00	14:45	14:30
ALS Sample ID				VA22A4994-003	VA22A4994-004	VA22B0431-003	VA22B0431-004	VA22B6397-003	VA22B6397-004	VA22B9759-003	VA22B9759-004	VA22C1407-007	VA22C1407-008
Field Measurements (3 m)													
Dissolved Oxygen (mg/L)				15.4	14.4	16.8	16.3	11.7	12.0	10.2	10.2	11.4	11.3
Specific Conductivity (µS/cm)				214	167	177	213	119	109	116	134	126	162
pH	6.5 - 9.0			6.6	6.7	7.0	6.8	7.5	7.5	7.4	7.3	7.4	7.4
Temperature (°C)				1.8	1.6	2.6	4.0	13.0	12.3	12.8	12.8	8.9	8.9
Physical Tests (mg/L)													
Conductivity (µS/cm)		48.6		**207**	**163**	**176**	**214**	**118**	**107**	**115**	**135**	**134**	**168**
Alkalinity - Total (as $CaCO_3$)		9.61		**24**	**18.9**	**24**	**28**	**14.5**	**13.9**	**16.3**	**19.2**	**17.6**	**19.7**
Alkalinity - Bicarbonate		9.60		**24**	**18.9**	**24**	**28**	**14.5**	**13.9**	**16.3**	**19.2**	**17.6**	**19.7**
Alkalinity - Carbonate		2.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity - Hydroxide				<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness (as CaCO3), dissolved		17.4		**77**	**60**	**65**	**79**	**43**	**39**	**41**	**47**	**46**	**56**
Hardness (as CaCO3), from total Ca/Mg				75	58	67	81	43	39	39	46	43	55
pH (Laboratory)	6.5 - 9.0	6.57-7.97	6.5-9.0	7.2	7.1	7.5	7.5	7.3	7.3	7.4	7.4	7.4	7.5
Total Dissolved Solids		38.5		**131**	**104**	**121**	**145**	**73**	**72**	**74**	**78**	**88**	**105**
Total Suspended Solids		3	5	1.2	<1.0	<1.0	<1.0	<1.0	1.0	1.5	1.4	<1.0	<1.0
Turbidity (NTU)				0.25	0.16	0.31	0.23	0.43	0.47	0.36	0.31	0.23	0.21
Anions and Nutrients (mg/L)													
Total Kjeldahl Nitrogen		0.17		**0.43**	**0.33**	**0.28**	**0.30**	**0.26**	**0.19**	**0.18**	**0.20**	**0.20**	**0.26**
Ammonia (as N)[3]	***equation***	0.065	0.126	0.063	0.046	0.024	0.023	0.0066	0.0069	0.015	0.017	0.016	0.043
Bromide				0.24	0.18	0.24	0.29	0.14	0.12	0.16	0.18	0.15	0.19
Chloride	120	60.4	120	26	19.8	21	26	14.1	12.7	13.9	16.0	14.7	18.4
Fluoride	0.12	0.077	0.12	0.074	0.060	0.064	0.072	0.048	0.046	0.045	0.049	0.054	0.061
Nitrate (as N)	3	1.5	3	0.96	0.74	0.82	0.97	0.34	0.29	0.23	0.44	0.33	0.85
Nitrite (as N)	0.06	0.031	0.06	0.0051	0.0023	0.0032	0.0041	0.0020	0.0015	0.0019	0.0046	0.0024	0.0081
Ortho Phosphate (as P)		0.0022		0.0012	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P)-Total	0.01	0.0045	0.01	**0.011**	**0.0052**	**0.0057**	0.0044	0.0040	0.0033	0.0029	0.0044	0.0030	0.0028
Phosphorus (P)-Total Diss.				0.0037	0.0039	0.0023	0.0021	<0.0020	<0.0020	<0.0020	<0.0020	0.0023	0.0021
Reactive Silica (as SiO_2)		1.33		0.93	1.0	0.66	0.58	<0.50	<0.50	<0.50	0.53	<0.50	0.76
Sulphate (SO_4)		64.8	128	28	21	23	29	13.6	12.1	14.1	17.2	15.9	22
Organic / Inorganic Carbon (mg/L)													
Dissolved Organic Carbon		2.43		**4.4**	**4.1**	**4.1**	**4.5**	**2.8**	**2.6**	**3.3**	**3.4**	**3.1**	**3.2**
Total Organic Carbon		2.42		**4.3**	**3.4**	**4.0**	**4.5**	**2.5**	**2.5**	**3.1**	**2.9**	**3.2**	**2.7**
Total Metals (mg/L)													
Aluminum[3]	***equation***	0.052	0.1	0.0032	<0.0030	<0.0030	0.0044	0.0093	0.0069	0.0050	0.0053	0.011	0.0046
Antimony		0.0046	0.009	0.0019	0.0013	0.0015	0.0019	0.00099	0.00080	0.00095	0.0013	0.00094	0.0015
Arsenic	0.005	0.013	0.025	0.0015	0.0011	0.0012	0.0014	0.0012	0.00098	0.0012	0.0016	0.0010	0.0015
Barium		0.5	1	0.034	0.025	0.030	0.037	0.018	0.017	0.016	0.018	0.017	0.021
Beryllium		0.000115	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth				<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	1.5	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium[3]	***equation***	0.000023	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		4.6		**21**	**16.4**	**18.7**	**23**	**11.9**	**10.8**	**10.8**	**12.8**	**12.1**	**15.6**
Chromium[4]	0.001	0.0025	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt				0.00011	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00013
Copper[3]	***equation***	0.0013	0.002	0.00082	0.00064	0.00074	0.0011	0.00059	0.00058	0.00061	0.00062	0.00060	0.00063
Iron	0.3	0.16	0.3	<0.010	<0.010	<0.010	0.011	0.023	0.017	0.021	0.033	0.025	0.031
Lead[3]	***equation***	0.00053	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00006	<0.000050
Lithium		0.002		**0.0032**	**0.0024**	**0.0028**	**0.0034**	0.0020	0.0017	0.0018	**0.0022**	**0.0021**	**0.0025**
Magnesium		1.41		**5.3**	**4.1**	**4.8**	**5.7**	**3.2**	**2.9**	**3.0**	**3.3**	**3.2**	**3.9**
Manganese[3]		0.32	***See text***	0.0021	0.0016	0.0029	0.0031	0.0095	0.0051	0.0058	0.012	0.0046	0.013
Mercury	0.000026	0.000016	0.000026	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.073	0.037	0.073	0.00060	0.00042	0.00047	0.00050	0.00044	0.00033	0.00050	0.00072	0.00059	0.0014
Nickel[3]	***equation***	0.013	0.025	0.0028	0.0017	0.0023	0.0031	0.0018	0.0013	0.0012	0.0021	0.0012	0.0025
Phosphorus		0.0045	0.004	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.84		**5.0**	**3.7**	**4.5**	**5.5**	**2.8**	**2.6**	**3.1**	**3.5**	**3.2**	**4.3**
Rubidium				0.0061	0.0045	0.0053	0.0064	0.0036	0.0033	0.0039	0.0045	0.0040	0.0051
Selenium	0.001	0.00053	0.001	0.00010	0.00009	0.00012	0.00014	0.00006	<0.000050	0.00006	0.00006	0.00007	0.00009
Silicon		0.61		0.50	0.54	0.35	0.32	0.13	0.11	0.16	0.27	0.23	0.38
Silver	0.00025	0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1		**3.7**	**2.8**	**3.3**	**4.0**	**2.3**	**2.0**	**2.3**	**2.9**	**2.6**	**3.8**
Strontium		1.26	2.5	0.15	0.11	0.13	0.16	0.091	0.080	0.088	0.10	0.089	0.12
Sulfur				9.7	7.4	8.0	9.9	5.0	4.4	4.9	5.9	5.3	7.6
Tellurium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium	0.0008	0.00013	0.0008	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thorium				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin		0.033		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00030	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.00041		<0.00030	<0.00030	<0.00030	<0.00030	0.00031	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium	0.015	0.0002	0.015	0.00015	0.00010	0.00012	0.00015	0.00013	0.00010	0.00011	0.00016	0.00013	**0.00022**
Vanadium		0.0006	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc[3]	0.03	0.0075	***See text***	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Metals (mg/L)													
Aluminum[3]		0.026	0.05	<0.0010	0.0013	0.0018	0.0030	0.0026	0.0029	0.0033	0.0023	0.0012	0.0015
Antimony		0.005	0.009	0.0020	0.0014	0.0015	0.0019	0.0010	0.00082	0.00092	0.0013	0.00096	0.0014
Arsenic		0.013	0.025	0.0016	0.0011	0.0011	0.0013	0.00097	0.00082	0.0011	0.0014	0.00090	0.0012
Barium		0.5	1	0.037	0.029	0.031	0.039	0.019	0.018	0.016	0.018	0.017	0.021
Beryllium		0.000115	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth				<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron		0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium		0.000023	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		4.6		**21**	**16.6**	**18.0**	**22**	**12.3**	**11.0**	**11.6**	**13.1**	**12.8**	**15.7**
Cesium				0.00002	0.00002	0.00002	0.00002	0.00001	0.00001	0.00002	0.00002	0.00002	0.00002
Chromium		0.0026	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt				0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010
Copper		0.0012	0.002	0.00077	0.00062	0.00076	0.00085	0.00053	0.00055	0.00057	0.00059	0.00071	0.00067
Iron		0.16	0.3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.014	<0.010	<0.010
Lead		0.00053	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.002		**0.0033**	**0.0025**	**0.0028**	**0.0035**	0.0020	0.0016	0.0019	**0.0022**	**0.0021**	**0.0025**
Magnesium		1.41		**5.6**	**4.4**	**5.0**	**5.8**	**3.0**	**2.8**	**3.0**	**3.4**	**3.4**	**4.0**
Manganese[3]		0.32	***See text***	<0.00010	<0.00010	0.00054	0.0017	0.0013	0.00081	0.0025	0.0098	0.0026	0.010
Mercury		0.000016	0.000026	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum		0.037	0.073	0.00061	0.00044	0.00042	0.00050	0.00043	0.00034	0.00049	0.00070	0.00060	0.0013
Nickel		0.013	0.025	0.0029	0.0020	0.0022	0.0029	0.0016	0.0012	0.0011	0.0021	0.0012	0.0024
Phosphorus				<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.84		**5.4**	**4.3**	**4.7**	**5.7**	**2.8**	**2.7**	**3.0**	**3.5**	**3.6**	**4.1**
Rubidium				0.0062	0.0046	0.0053	0.0065	0.0034	0.0033	0.0039	0.0045	0.0041	0.0051
Selenium		0.00053	0.001	0.00012	0.00011	0.00012	0.00013	0.00007	<0.000050	0.00006	0.00007	<0.000050	0.00007
Silicon		0.57		0.51	0.52	0.35	0.32	0.085	0.079	0.10	0.23	0.16	0.35
Silver		0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1		**3.8**	**3.0**	**3.4**	**4.1**	**2.2**	**2.0**	**2.3**	**2.9**	**2.8**	**3.7**
Strontium		1.26	2.5	0.15	0.12	0.14	0.17	0.093	0.082	0.088	0.10	0.093	0.11
Sulfur				9.5	7.3	7.6	9.3	4.5	4.2	4.4	5.5	5.5	6.7
Tellurium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium		0.00041	0.0008	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thorium				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin		0.0002		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.0006		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium		0.0075	0.015	0.00011	0.00007	0.00010	0.00013	0.00011	0.00009	0.00011	0.00015	0.00011	0.00019
Vanadium		0.06	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc[3]		0.0023	***See text***	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zirconium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Speciated Metals (µg/L)													
Arsenate (As V)				0.21			0.036	0.049		0.068			0.13
Arsenite (As III)				0.56			0.63	0.53		0.54			0.57
Arsenobetaine (AsB)				<0.050			<0.050	<0.050		<0.050			<0.050
Dimethylarsinic Acid (DMA)				0.28			0.22	0.11		0.11			0.20
Monomethylarsonic Acid (MMA)				0.033			0.022	<0.020		<0.020			<0.020
Plant Pigments (µg/L)													
Chlorophyll-a				<0.010	<0.010	3.4	1.2	0.81	0.76	0.83	0.82	0.56	0.49

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.

2. Trigger and threshold values are presented in *CREMP 2015 Plan Update* (Azimuth, 2015b). A number of thresholds were derived from methods (or sources) other than CCME guidelines - see Azimuth (2015b) for details.

3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.

4. Chromium CCME guideline is for Cr VI.

123 Bolded values exceed the trigger.

123 Bold and shaded values exceed the threshold.

Italicized numbers are below detection limits.

"-" not analyzed/not sampled

n/a = issues with the water quality probe. No data collected.

underline = results were given a cautionary flag in the QC assessment (refer to **Appendix A** for details).

~~strikethrough~~ = results flagged as unreliable in the QC assessment (refer to **Appendix A** for details).

Table B2-1. Water quality results from the 2022 CREMP, Whale Tail study area lakes.

Lake & Area	Aquatic Life Guideline[1]	WTP Screening Values[2]		Lake A20 (Impoundment)									
Month				March	March	May	May	July	July	August	August	September	September
Area-Replicate ID				A20-61	A20-62	A20-63	A20-64	A20-65	A20-66	A20-67	A20-68	A20-69	A20-70
Date				05-Mar-2022	05-Mar-2022	06-May-2022	06-May-2022	01-Jul-2022	01-Jul-2022	17-Aug-2022	17-Aug-2022	02-Sep-2022	02-Sep-2022
Time		Triggers	Thresholds	11:00	11:25	09:55	09:30	13:40	14:00	00:00	00:00	10:30	11:30
ALS Sample ID				VA22A4994-005	VA22A4994-006	VA22B0431-005	VA22B0431-006	VA22B5784-001	VA22B5784-002	VA22B9756-009	VA22B9756-010	VA22C1407-001	VA22C1407-002
Field Measurements (3 m)													
Dissolved Oxygen (mg/L)				15.0	14.9	14.4	14.8	12.5	12.1	10.2	10.1	10.9	11.3
Specific Conductivity (µS/cm)				71	110	72	118	51	52	53	55	53	54
pH	6.5 - 9.0			6.6	6.4	7.2	7.0	7.3	7.3	7.2	7.1	7.1	7.2
Temperature (°C)				1.2	2.3	2.6	4.1	7.2	9.1	14.4	14.6	8.8	7.9
Physical Tests (mg/L)													
Conductivity (µS/cm)		48.6		**68**	**105**	**68**	**111**	**53**	**54**	**53**	**54**	**55**	**56**
Alkalinity - Total (as $CaCO_3$)		9.61		**12.4**	**19.0**	**13.0**	**13.6**	**15.8**	**10.3**	**11.3**	**11.1**	**10.6**	**10.7**
Alkalinity - Bicarbonate		9.60		**12.4**	**19.0**	**13.0**	**13.6**	**15.8**	**10.3**	**11.3**	**11.1**	**10.6**	**10.7**
Alkalinity - Carbonate		2.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity - Hydroxide				<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness (as CaCO3), dissolved		17.4		**25**	**40**	**25**	**43**	**18.6**	**19.1**	**18.9**	**19.3**	**19.4**	**19.9**
Hardness (as CaCO3), from total Ca/Mg				25	39	26	43	18.6	18.8	18.6	19.4	19.8	20
pH (Laboratory)	6.5 - 9.0	6.57-7.97	6.5-9.0	7.0	7.0	7.3	7.3	7.2	7.2	7.2	7.2	7.2	7.2
Total Dissolved Solids		38.5		**46**	**69**	**49**	**78**	**40**	38	35	33	**43**	**39**
Total Suspended Solids		3	5	<1.0	1.2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Turbidity (NTU)				0.20	0.28	0.21	0.36	0.36	0.45	0.33	0.32	0.26	0.24
Anions and Nutrients (mg/L)													
Total Kjeldahl Nitrogen		0.17		**0.25**	**0.35**	**0.23**	**0.32**	**0.21**	**0.21**	**0.17**	**0.22**	0.17	0.17
Ammonia (as N)[3]	***equation***	0.065	0.126	0.045	0.063	0.017	0.036	0.0087	0.0081	<0.0050	<0.0050	0.0088	0.0088
Bromide				0.071	0.11	0.10	0.17	0.053	0.057	0.073	0.083	0.061	0.068
Chloride	120	60.4	120	8.5	13.1	8.6	14.3	6.1	6.2	6.2	6.4	6.2	6.3
Fluoride	0.12	0.077	0.12	0.049	0.063	0.049	0.062	0.034	0.036	0.038	0.040	0.045	0.045
Nitrate (as N)	3	1.5	3	0.099	0.23	0.11	0.17	0.044	0.043	<0.0050	<0.0050	0.0057	<0.0050
Nitrite (as N)	0.06	0.031	0.06	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Ortho Phosphate (as P)		0.0022		<0.0010	0.0013	<0.0010	<0.0010	0.0012	0.0014	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P)-Total	0.01	0.0045	0.01	**0.0062**	**0.0064**	**0.0049**	0.0045	**0.0092**	**0.0050**	0.0035	0.0034	0.0041	0.0033
Phosphorus (P)-Total Diss.				0.0036	0.0045	<0.0020	0.0022	0.0061	0.0029	0.0022	0.0023	<0.0020	0.0027
Reactive Silica (as SiO_2)		1.33		0.50	0.84	0.60	0.68	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sulphate (SO_4)		64.8	128	4.8	8.0	4.9	8.5	3.4	3.6	3.6	3.7	3.6	3.8
Organic / Inorganic Carbon (mg/L)													
Dissolved Organic Carbon		2.43		**3.6**	**4.8**	**4.1**	**5.4**	**2.6**	**2.9**	**3.3**	**3.2**	**2.9**	**2.9**
Total Organic Carbon		2.42		**3.9**	**5.1**	**4.0**	**5.7**	**2.6**	**2.8**	**3.1**	**3.1**	**3.0**	**3.1**
Total Metals (mg/L)													
Aluminum[3]	***equation***	0.052	0.1	0.0050	0.0079	0.0051	0.010	0.0073	0.0080	0.0038	0.0042	0.0040	0.0046
Antimony		0.0046	0.009	<0.00010	0.00016	<0.00010	0.00015	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.005	0.013	0.025	0.00040	0.00053	0.00034	0.00048	0.00035	0.00043	0.00034	0.00035	0.00027	0.00030
Barium		0.5	1	0.012	0.020	0.012	0.023	0.0097	0.0095	0.0081	0.0081	0.0078	0.0077
Beryllium		0.000115	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth				<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	1.5	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium[3]	***equation***	0.000023	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		4.6		**6.6**	**10.3**	**6.9**	**11.7**	**5.1**	**5.2**	**5.0**	**5.2**	**5.4**	**5.5**
Chromium[4]	0.001	0.0025	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00056	<0.00050
Cobalt				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper[3]	***equation***	0.0013	0.002	0.00053	0.00073	0.00054	0.00080	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron	0.3	0.16	0.3	0.021	0.039	0.023	0.042	0.057	0.088	0.053	0.077	0.050	0.058
Lead[3]	***equation***	0.00053	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.002		<0.0010	0.0016	0.0011	0.0017	0.0010	0.0011	<0.0010	<0.0010	0.0012	0.0012
Magnesium		1.41		**2.0**	**3.1**	**2.0**	**3.4**	1.4	**1.4**	**1.5**	**1.5**	**1.5**	**1.6**
Manganese[3]		0.32	***See text***	0.0025	0.029	0.0086	0.011	0.020	0.028	0.016	0.018	0.011	0.0088
Mercury	0.000026	0.000016	0.000026	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.073	0.037	0.073	0.00011	0.00012	0.00009	0.00008	0.00007	0.00008	0.00007	0.00008	0.00006	0.00006
Nickel[3]	***equation***	0.013	0.025	0.00078	0.0013	0.00081	0.0014	0.00067	0.00071	0.00051	0.00053	<0.00050	0.00056
Phosphorus		0.0045	0.004	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.84		**1.7**	**2.5**	**1.8**	**3.0**	**1.3**	**1.3**	**1.4**	**1.5**	**1.4**	**1.4**
Rubidium				0.0026	0.0040	0.0026	0.0044	0.0020	0.0019	0.0021	0.0022	0.0021	0.0021
Selenium	0.001	0.00053	0.001	<0.000050	<0.000050	<0.000050	0.00006	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.61		0.32	0.49	0.32	0.36	0.24	0.17	<0.10	0.12	0.11	0.12
Silver	0.00025	0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1		**2.0**	**2.2**	**1.5**	**2.5**	**1.1**	**1.1**	**1.2**	**1.3**	**1.2**	**1.3**
Strontium		1.26	2.5	0.048	0.074	0.049	0.084	0.037	0.038	0.037	0.038	0.037	0.038
Sulfur				2.0	3.0	1.6	2.9	0.97	0.94	1.1	1.5	1.2	1.3
Tellurium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium	0.0008	0.00013	0.0008	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thorium				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin		0.033		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.00041		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium	0.015	0.0002	0.015	0.00006	0.00008	0.00007	0.00008	0.00005	0.00005	0.00004	0.00004	0.00004	0.00004
Vanadium		0.0006	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc[3]	0.03	0.0075	***See text***	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Metals (mg/L)													
Aluminum[3]		0.026	0.05	0.0030	0.0034	0.0033	0.0091	0.0028	0.0033	0.0020	0.0020	0.0026	0.0017
Antimony		0.005	0.009	<0.00010	0.00016	<0.00010	0.00015	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic		0.013	0.025	0.00034	0.00053	0.00033	0.00046	0.00027	0.00033	0.00027	0.00034	0.00028	0.00026
Barium		0.5	1	0.013	0.021	0.013	0.024	0.0098	0.0097	0.0079	0.0081	0.0074	0.0071
Beryllium		0.000115	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth				<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron		0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium		0.000023	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		4.6		**6.8**	**10.6**	**6.8**	**11.3**	**5.0**	**5.2**	**5.0**	**5.1**	**5.1**	**5.3**
Cesium				<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Chromium		0.0026	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper		0.0012	0.002	0.00045	0.00064	0.00051	0.00076	0.00046	0.00042	0.00038	0.00039	0.00038	0.00034
Iron		0.16	0.3	<0.010	0.017	<0.010	0.025	0.024	0.044	0.026	0.042	0.015	0.021
Lead		0.00053	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.002		0.0010	0.0016	0.0012	0.0018	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		1.41		**2.0**	**3.2**	**2.0**	**3.5**	**1.5**	**1.5**	**1.5**	**1.6**	**1.6**	**1.6**
Manganese[3]		0.32	***See text***	<0.00010	0.0051	0.00082	0.0073	0.016	0.023	0.0086	0.011	0.0022	0.0028
Mercury		0.000016	0.000026	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum		0.037	0.073	0.00010	0.00013	0.00009	0.00008	0.00009	0.00008	0.00009	0.00008	0.00007	0.00006
Nickel		0.013	0.025	0.00077	0.0014	0.00073	0.0015	0.00063	0.00077	0.00051	0.00052	<0.00050	<0.00050
Phosphorus				<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.84		**1.7**	**2.6**	**1.8**	**3.1**	**1.3**	**1.4**	**1.3**	**1.4**	**1.4**	**1.5**
Rubidium				0.0026	0.0038	0.0026	0.0044	0.0018	0.0020	0.0022	0.0022	0.0020	0.0020
Selenium		0.00053	0.001	<0.000050	0.00005	<0.000050	0.00007	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.57		0.27	0.42	0.30	0.37	0.14	0.098	0.057	0.077	0.10	0.087
Silver		0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1		**1.5**	**2.2**	**1.6**	**2.6**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.3**
Strontium		1.26	2.5	0.047	0.075	0.052	0.090	0.037	0.039	0.037	0.036	0.037	0.038
Sulfur				1.5	2.5	1.6	3.0	1.1	1.2	1.0	1.1	1.3	1.3
Tellurium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium		0.00041	0.0008	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thorium				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin		0.0002		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.0006		<0.00030	<0.00030	<0.00030	0.00042	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium		0.0075	0.015	0.00004	0.00005	0.00005	0.00007	0.00004	0.00004	0.00003	0.00004	0.00003	0.00003
Vanadium		0.06	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc[3]		0.0023	***See text***	0.0014	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zirconium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Speciated Metals (µg/L)													
Arsenate (As V)					0.026	0.021			0.043		0.023	0.022	
Arsenite (As III)					0.15	0.098			0.079		0.060	0.020	
Arsenobetaine (AsB)					<0.050	<0.050			<0.050		<0.050	<0.050	
Dimethylarsinic Acid (DMA)					<0.020	<0.020			0.037		0.030	0.036	
Monomethylarsonic Acid (MMA)					<0.020	<0.020			<0.020		<0.020	<0.020	
Plant Pigments (µg/L)													
Chlorophyll-a				<0.010	<0.010	2.2	1.2	0.70	0.094	1.0	0.82	1.1	0.61

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.
2. Trigger and threshold values are presented in *CREMP 2015 Plan Update* (Azimuth, 2015b). A number of thresholds were derived from methods (or sources) other than CCME guidelines - see Azimuth (2015b) for details.
3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

123 Bolded values exceed the trigger.

123 Bold and shaded values exceed the threshold.

Italicized numbers are below detection limits.

"-" not analyzed/not sampled

n/a = issues with the water quality probe. No data collected.

underline = results were given a cautionary flag in the QC assessment (refer to **Appendix A** for details).

~~strikethrough~~ = results flagged as unreliable in the QC assessment (refer to **Appendix A** for details).

Table B2-1. Water quality results from the 2022 CREMP, Whale Tail study area lakes.

Lake & Area	Aquatic Life Guideline[1]	WTP Screening Values[2]		Lake A76									
Month				March	March	May	May	July	July	August	August	September	September
Area-Replicate ID				A76-59	A76-60	A76-61	A76-62	A76-63	A76-64	A76-65	A76-66	A76-67	A76-68
Date		Triggers	Thresholds	19-Mar-2022	19-Mar-2022	10-May-2022	10-May-2022	11-Jul-2022	11-Jul-2022	16-Aug-2022	16-Aug-2022	16-Sep-2022	16-Sep-2022
Time				15:44	15:05	13:35	14:16	10:25	10:45	13:30	14:15	14:25	13:50
ALS Sample ID				VA22A6100-003	VA22A6100-004	VA22B0586-011	VA22B0586-012	VA22B6607-013	VA22B6607-014	VA22B9759-007	VA22B9759-008	VA22C2788-013	VA22C2788-014
Field Measurements (3 m)													
Dissolved Oxygen (mg/L)				16.6	16.1	16.9	18.5	10.5	10.2	10.7	10.7	11.8	11.7
Specific Conductivity (µS/cm)				127	125	127	136	88	88	71	71	89	88
pH	6.5 - 9.0			6.7	6.5	7.3	7.3	7.2	7.3	6.3	7.0	7.1	6.8
Temperature (°C)				1.2	1.1	2.5	2.2	15.4	16.0	13.5	13.7	6.7	6.7
Physical Tests (mg/L)													
Conductivity (µS/cm)		48.6		**120**	**119**	**126**	**126**	**87**	**86**	**88**	**89**	**88**	**86**
Alkalinity - Total (as $CaCO_3$)		9.61		**14.9**	**15.3**	**14.8**	**14.9**	**11.9**	**11.8**	**12.5**	**12.5**	**12.0**	**11.8**
Alkalinity - Bicarbonate		9.60		**14.9**	**15.3**	**14.8**	**14.9**	**11.9**	**11.8**	**12.5**	**12.5**	**12.0**	**11.8**
Alkalinity - Carbonate		2.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity - Hydroxide				<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness (as CaCO3), dissolved		17.4		**42**	**42**	**48**	**48**	**32**	**32**	**32**	**32**	**33**	**32**
Hardness (as CaCO3), from total Ca/Mg				48	46	47	47	31	31	32	31	32	32
pH (Laboratory)	6.5 - 9.0	6.57-7.97	6.5-9.0	7.3	7.3	7.2	7.2	7.3	7.3	7.3	7.3	7.2	7.2
Total Dissolved Solids		38.5		**73**	**74**	**73**	**78**	**54**	**65**	**58**	**59**	**70**	**63**
Total Suspended Solids		3	5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Turbidity (NTU)				0.12	0.12	0.18	0.15	0.28	0.33	0.24	0.22	0.25	0.27
Anions and Nutrients (mg/L)													
Total Kjeldahl Nitrogen		0.17		0.15	0.15	0.14	0.13	**0.18**	0.16	0.15	0.13	0.16	**0.21**
Ammonia (as N)[3]	***equation***	0.065	0.126	0.021	0.027	0.0091	0.0065	<0.0050	<0.0050	<0.0050	<0.0050	0.0081	0.0084
Bromide				0.13	0.13	0.15	0.13	0.11	0.11	0.13	0.14	0.12	0.12
Chloride	120	60.4	120	16.4	16.5	18.1	16.4	11.7	11.6	11.8	11.8	11.7	11.7
Fluoride	0.12	0.077	0.12	0.045	0.043	0.048	0.043	0.035	0.035	0.035	0.036	0.042	0.042
Nitrate (as N)	3	1.5	3	0.19	0.17	0.18	0.16	0.044	0.044	0.012	0.013	0.019	0.015
Nitrite (as N)	0.06	0.031	0.06	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0014	<0.0010	<0.0010
Ortho Phosphate (as P)		0.0022		0.0013	0.0012	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P)-Total	0.01	0.0045	0.01	0.0030	0.0032	<0.0020	<0.0020	0.0029	0.0027	0.0032	<0.0020	0.0035	0.0037
Phosphorus (P)-Total Diss.				<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0036
Reactive Silica (as SiO_2)		1.33		0.76	0.81	0.83	0.83	<0.50	<0.50	<0.50	<0.50	0.53	0.53
Sulphate (SO_4)		64.8	128	12.8	12.5	13.0	12.3	9.3	9.4	9.7	9.8	10.2	10.2
Organic / Inorganic Carbon (mg/L)													
Dissolved Organic Carbon		2.43		**2.5**	2.4	2.3	2.1	**2.8**	2.3	2.4	2.3	2.2	2.0
Total Organic Carbon		2.42		2.3	2.4	**2.4**	2.3	**3.3**	2.1	2.3	2.2	2.1	2.2
Total Metals (mg/L)													
Aluminum[3]	***equation***	0.052	0.1	<0.0030	0.0030	0.0030	<0.0030	0.0058	0.0056	0.0040	0.0041	0.0056	0.0058
Antimony		0.0046	0.009	0.00037	0.00033	0.00035	0.00034	0.00024	0.00025	0.00027	0.00027	0.00024	0.00024
Arsenic	0.005	0.013	0.025	0.00037	0.00035	0.00033	0.00036	0.00029	0.00032	0.00040	0.00035	0.00032	0.00032
Barium		0.5	1	0.021	0.022	0.022	0.022	0.015	0.015	0.013	0.014	0.013	0.013
Beryllium		0.000115	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth				<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	1.5	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium[3]	***equation***	0.000023	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		4.6		**13.3**	**12.9**	**13.3**	**13.3**	**8.8**	**8.8**	**8.8**	**8.7**	**8.9**	**9.0**
Chromium[4]	0.001	0.0025	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper[3]	***equation***	0.0013	0.002	0.00066	0.00059	0.00063	0.00062	<0.00050	<0.00050	<0.00050	0.00054	<0.00050	<0.00050
Iron	0.3	0.16	0.3	<0.010	<0.010	<0.010	<0.010	0.015	0.013	0.022	0.021	0.025	0.024
Lead[3]	***equation***	0.00053	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.002		0.0014	0.0014	0.0017	0.0016	0.0015	0.0015	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		1.41		**3.6**	**3.5**	**3.3**	**3.4**	**2.2**	**2.2**	**2.3**	**2.3**	**2.4**	**2.4**
Manganese[3]		0.32	***See text***	0.0012	0.0021	0.0019	0.0016	0.0030	0.0026	0.0040	0.0040	0.0032	0.0034
Mercury	0.000026	0.000016	0.000026	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.073	0.037	0.073	0.00021	0.00020	0.00019	0.00018	0.00014	0.00014	0.00017	0.00017	0.00013	0.00014
Nickel[3]	***equation***	0.013	0.025	0.0012	0.0012	0.0012	0.0012	0.00085	0.00082	0.00074	0.00077	0.00069	0.00070
Phosphorus		0.0045	0.004	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.84		**2.9**	**2.9**	**2.8**	**2.8**	**1.8**	**1.9**	**2.1**	**2.1**	**2.0**	**2.1**
Rubidium				0.0035	0.0031	0.0033	0.0032	0.0022	0.0022	0.0024	0.0025	0.0024	0.0023
Selenium	0.001	0.00053	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.00006	<0.000050
Silicon		0.61		0.44	0.44	0.46	0.46	0.18	0.17	0.25	0.25	0.26	0.26
Silver	0.00025	0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1		**2.2**	**2.1**	**2.0**	**2.1**	**1.3**	**1.3**	**1.6**	**1.5**	**1.5**	**1.5**
Strontium		1.26	2.5	0.081	0.079	0.083	0.082	0.054	0.054	0.059	0.060	0.056	0.058
Sulfur				4.7	4.8	4.3	4.4	3.0	3.1	3.3	3.4	3.1	3.1
Tellurium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium	0.0008	0.00013	0.0008	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thorium				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin		0.033		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.00041		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium	0.015	0.0002	0.015	0.00004	0.00003	0.00003	0.00003	0.00004	0.00004	0.00003	0.00003	0.00003	0.00003
Vanadium		0.0006	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc[3]	0.03	0.0075	***See text***	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Metals (mg/L)													
Aluminum[3]		0.026	0.05	0.0016	0.0019	<0.0010	0.0013	0.0027	0.0023	0.0022	0.0023	0.0030	0.0021
Antimony		0.005	0.009	0.00035	0.00033	0.00034	0.00035	0.00023	0.00024	0.00026	0.00025	0.00023	0.00023
Arsenic		0.013	0.025	0.00035	0.00035	0.00034	0.00031	0.00029	0.00024	0.00040	0.00032	0.00030	0.00031
Barium		0.5	1	0.020	0.020	0.021	0.021	0.014	0.014	0.014	0.014	0.014	0.013
Beryllium		0.000115	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth				<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron		0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium		0.000023	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		4.6		**11.9**	**12.0**	**14.0**	**14.0**	**9.2**	**9.2**	**9.0**	**9.0**	**9.2**	**8.9**
Cesium				0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00001	<0.000010	<0.000010
Chromium		0.0026	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper		0.0012	0.002	0.00055	0.00056	0.00054	0.00064	0.00048	0.00046	0.00046	0.00046	0.00042	0.00041
Iron		0.16	0.3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	0.010	<0.010	<0.010
Lead		0.00053	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.002		0.0012	0.0012	0.0013	0.0013	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Magnesium		1.41		**3.0**	**3.0**	**3.2**	**3.2**	**2.2**	**2.2**	**2.3**	**2.3**	**2.4**	**2.4**
Manganese[3]		0.32	***See text***	0.00040	0.00049	0.00052	0.00074	0.0010	0.0013	0.0023	0.0023	0.0016	0.0016
Mercury		0.000016	0.000026	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum		0.037	0.073	0.00020	0.00019	0.00019	0.00021	0.00014	0.00015	0.00016	0.00016	0.00013	0.00013
Nickel		0.013	0.025	0.0010	0.0010	0.0011	0.0011	0.00080	0.00075	0.00073	0.00073	0.00068	0.00062
Phosphorus				<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.84		**2.6**	**2.6**	**2.8**	**2.7**	**1.9**	**1.9**	**2.1**	**2.1**	**2.1**	**2.0**
Rubidium				0.0031	0.0029	0.0033	0.0033	0.0022	0.0023	0.0024	0.0026	0.0024	0.0023
Selenium		0.00053	0.001	<0.000050	<0.000050	<0.000050	<0.000050	0.00006	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.57		0.39	0.43	0.43	0.41	0.18	0.15	0.19	0.19	0.21	0.23
Silver		0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1		**1.8**	**1.8**	**2.1**	**2.0**	**1.4**	**1.4**	**1.7**	**1.7**	**1.6**	**1.5**
Strontium		1.26	2.5	0.078	0.076	0.087	0.085	0.054	0.054	0.059	0.058	0.055	0.053
Sulfur				4.4	3.9	4.1	4.3	3.0	3.3	3.3	3.3	3.5	3.4
Tellurium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium		0.00041	0.0008	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thorium				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin		0.0002		<0.00010	<0.00010	<0.00010	<0.00010	0.00014	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.0006		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium		0.0075	0.015	0.00003	0.00003	0.00003	0.00003	0.00004	0.00004	0.00003	0.00003	0.00003	0.00003
Vanadium		0.06	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc[3]		0.0023	***See text***	<0.0010	<0.0010	<0.0010	<0.0010	0.0020	<0.0010	<0.0010	<0.0010	0.0020	<0.0010
Zirconium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Speciated Metals (µg/L)													
Arsenate (As V)				<0.020		<0.020			<0.020		0.023	<0.020	
Arsenite (As III)				0.11		0.097			0.092		0.13	0.034	
Arsenobetaine (AsB)				<0.050		<0.050			<0.050		<0.050	<0.050	
Dimethylarsinic Acid (DMA)				0.060		0.062			0.034		0.030	0.20	
Monomethylarsonic Acid (MMA)				<0.020		<0.020			<0.020		<0.020	<0.020	
Plant Pigments (µg/L)													
Chlorophyll-a				<0.010	<0.010	2.1	1.3	0.54	0.43	0.79	0.77	0.66	0.49

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.
2. Trigger and threshold values are presented in *CREMP 2015 Plan Update* (Azimuth, 2015b). A number of thresholds were derived from methods (or sources) other than CCME guidelines - see Azimuth (2015b) for details.
3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

123 Bolded values exceed the trigger.

123 Bold and shaded values exceed the threshold.

Italicized numbers are below detection limits.

"-" not analyzed/not sampled

n/a = issues with the water quality probe. No data collected.

underline = results were given a cautionary flag in the QC assessment (refer to **Appendix A** for details).

~~strikethrough~~ = results flagged as unreliable in the QC assessment (refer to **Appendix A** for details).

Table B2-1. Water quality results from the 2022 CREMP, Whale Tail study area lakes.

Lake & Area	Aquatic Life Guideline[1]	WTP Screening Values[2]		Lake DS1									
Month				March	March	May	May	July	July	August	August	September	September
Area-Replicate ID				DS1-57	DS1-58	DS1-59	DS1-60	DS1-61	DS1-62	DS1-63	DS1-64	DS1-65	DS1-66
Date		Triggers	Thresholds	19-Mar-2022	19-Mar-2022	10-May-2022	10-May-2022	05-Jul-2022	05-Jul-2022	16-Aug-2022	16-Aug-2022	05-Sep-2022	05-Sep-2022
Time				13:15	12:23	11:15	12:05	15:30	14:40	00:00	00:00	10:31	11:20
ALS Sample ID				VA22A6100-001	VA22A6100-002	VA22B0586-009	VA22B0586-010	VA22B5784-005	VA22B5784-006	VA22B9756-005	VA22B9756-006	VA22C1655-001	VA22C1655-002
Field Measurements (3 m)													
Dissolved Oxygen (mg/L)				15.5	16.1	15.1	16.7	11.8	11.2	10.5	10.6	11.6	11.2
Specific Conductivity (µS/cm)				35	62	34	57	19.9	27	30	24	36	24
pH	6.5 - 9.0			6.5	6.3	7.4	7.2	6.8	6.9	7.0	7.0	7.2	7.0
Temperature (°C)				0.47	1.4	1.2	3.5	10.6	12.7	13.8	13.5	8.9	9.5
Physical Tests (mg/L)													
Conductivity (µS/cm)		48.6		33	**61**	34	**60**	20	27	31	24	40	27
Alkalinity - Total (as $CaCO_3$)		9.61		9.2	**12.1**	7.4	**10.6**	5.6	5.8	7.1	6.4	8.5	8.1
Alkalinity - Bicarbonate		9.60		9.2	**12.1**	7.4	**10.6**	5.6	5.8	7.1	6.4	8.5	8.1
Alkalinity - Carbonate		2.0		*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*
Alkalinity - Hydroxide				*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*
Hardness (as CaCO3), dissolved		17.4		12.2	**21**	12.1	**22**	7.3	9.3	10.0	8.2	13.9	9.9
Hardness (as CaCO3), from total Ca/Mg				13.6	22	12.1	21	7.4	9.5	10.3	8.3	14.0	10.2
pH (Laboratory)	6.5 - 9.0	6.57-7.97	6.5-9.0	7.2	7.2	6.9	7.1	6.9	6.9	7.1	7.0	6.7	6.7
Total Dissolved Solids		38.5		21	37	31	30	15.6	18.1	18.2	15.0	32	22
Total Suspended Solids		3	5	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	*<1.0*	1.5	*<1.0*	*<1.0*	*<1.0*
Turbidity (NTU)				0.17	0.21	0.15	0.28	0.50	0.48	0.31	0.34	0.25	0.32
Anions and Nutrients (mg/L)													
Total Kjeldahl Nitrogen		0.17		0.13	0.15	0.10	0.14	0.16	0.12	0.13	0.12	0.11	0.12
Ammonia (as N)[3]	***equation***	0.065	0.126	0.015	0.013	0.0073	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*
Bromide				*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*
Chloride	120	60.4	120	2.2	6.6	2.9	5.8	1.4	2.6	2.9	1.8	4.1	1.8
Fluoride	0.12	0.077	0.12	0.054	0.052	0.053	0.046	0.044	0.033	0.041	0.047	0.048	0.050
Nitrate (as N)	3	1.5	3	0.042	0.051	0.035	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*	*<0.0050*
Nitrite (as N)	0.06	0.031	0.06	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Ortho Phosphate (as P)		0.0022		0.0012	0.0016	*<0.0010*	*<0.0010*	0.0010	*<0.0010*	*<0.0010*	*<0.0010*	0.0012	0.0013
Phosphorus (P)-Total	0.01	0.0045	0.01	0.0035	**0.0058**	*<0.0020*	0.0029	0.0037	**0.0052**	0.0040	0.0033	0.0028	0.0039
Phosphorus (P)-Total Diss.				0.0027	0.0026	*<0.0020*	*<0.0020*	0.0024	0.0028	0.0024	*<0.0020*	0.0022	*<0.0020*
Reactive Silica (as SiO_2)		1.33		1.1	**2.5**	1.2	**2.2**	0.56	0.56	0.67	0.53	0.78	*<0.50*
Sulphate (SO_4)		64.8	128	2.3	5.5	2.3	4.5	1.3	2.1	2.3	1.6	3.0	1.6
Organic / Inorganic Carbon (mg/L)													
Dissolved Organic Carbon		2.43		**3.2**	**3.6**	**2.7**	**3.3**	2.4	2.1	**2.7**	**2.6**	**2.9**	**3.0**
Total Organic Carbon		2.42		**3.7**	**3.7**	**2.8**	**3.4**	**2.5**	2.2	2.3	2.4	**2.7**	2.4
Total Metals (mg/L)													
Aluminum[3]	***equation***	0.052	0.1	0.013	0.013	0.012	0.011	0.015	0.011	0.0074	0.0095	0.0074	0.0093
Antimony		0.0046	0.009	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Arsenic	0.005	0.013	0.025	0.00017	0.00017	0.00014	0.00015	0.00018	0.00016	0.00014	0.00015	0.00017	0.00023
Barium		0.5	1	0.0057	0.011	0.0064	0.010	0.0041	0.0047	0.0048	0.0043	0.0055	0.0040
Beryllium		0.000115	0.00013	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*
Bismuth				*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Boron	1.5	0.76	1.5	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Cadmium[3]	***equation***	0.000023	0.00004	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium		4.6		3.3	**6.0**	3.2	**5.8**	1.9	2.6	2.8	2.1	3.9	2.6
Chromium[4]	0.001	0.0025	0.005	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Cobalt				*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Copper[3]	***equation***	0.0013	0.002	0.00059	0.00064	0.00051	0.00061	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Iron	0.3	0.16	0.3	0.042	0.032	0.020	0.022	0.046	0.045	0.050	0.030	0.089	0.029
Lead[3]	***equation***	0.00053	0.001	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Lithium		0.002		*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Magnesium		1.41		1.3	**1.7**	1.0	**1.6**	0.67	0.73	0.83	0.74	1.0	0.91
Manganese[3]		0.32	***See text***	0.0010	0.0019	0.0019	0.0031	0.0029	0.0015	0.0031	0.0016	0.0026	0.0025
Mercury	0.000026	0.000016	0.000026	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Molybdenum	0.073	0.037	0.073	0.00007	0.00009	0.00006	0.00007	*<0.000050*	*<0.000050*	0.00009	0.00005	0.00006	*<0.000050*
Nickel[3]	***equation***	0.013	0.025	0.00051	0.00060	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Phosphorus		0.0045	0.004	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*
Potassium		0.84		0.56	**1.2**	0.61	**1.1**	0.39	0.57	0.65	0.50	0.78	0.47
Rubidium				0.00077	0.0013	0.00070	0.0012	0.00057	0.00071	0.00083	0.00068	0.0010	0.00082
Selenium	0.001	0.00053	0.001	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Silicon		0.61		**0.63**	**1.2**	0.61	**1.1**	0.28	0.29	0.33	0.26	0.36	0.20
Silver	0.00025	0.00013	0.00025	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Sodium		1		**1.0**	**1.8**	**1.1**	**1.7**	0.65	0.84	0.93	0.78	**1.1**	0.81
Strontium		1.26	2.5	0.014	0.032	0.017	0.031	0.0085	0.013	0.016	0.011	0.020	0.011
Sulfur				0.84	1.9	0.84	1.7	*<0.50*	0.60	0.64	0.54	1.3	0.88
Tellurium				*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*
Thallium	0.0008	0.00013	0.0008	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Thorium				*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Tin		0.033		*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Titanium		0.00041		*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*
Tungsten				*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Uranium	0.015	0.0002	0.015	0.00007	0.00007	0.00006	0.00006	0.00005	0.00004	0.00003	0.00004	0.00003	0.00004
Vanadium		0.0006	0.12	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Zinc[3]	0.03	0.0075	***See text***	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*
Zirconium				*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*
Dissolved Metals (mg/L)													
Aluminum[3]		0.026	0.05	0.012	0.011	0.0091	0.0077	0.0089	0.0064	0.0038	0.0048	0.0024	0.0030
Antimony		0.005	0.009	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Arsenic		0.013	0.025	0.00016	0.00014	0.00010	0.00014	0.00014	0.00011	0.00013	0.00014	0.00011	0.00018
Barium		0.5	1	0.0056	0.011	0.0059	0.010	0.0043	0.0046	0.0048	0.0043	0.0056	0.0041
Beryllium		0.000115	0.00013	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*
Bismuth				*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Boron		0.76	1.5	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Cadmium		0.000023	0.00004	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium		4.6		3.0	**5.8**	3.3	**6.1**	1.8	2.5	2.6	2.1	3.8	2.4
Cesium				*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Chromium		0.0026	0.005	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Cobalt				*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Copper		0.0012	0.002	0.00054	0.00057	0.00041	0.00054	0.00035	0.00034	0.00031	0.00032	0.00048	0.00051
Iron		0.16	0.3	0.028	0.012	0.012	*<0.010*	0.020	0.024	0.019	0.013	0.015	*<0.010*
Lead		0.00053	0.001	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Lithium		0.002		*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*
Magnesium		1.41		1.2	**1.6**	0.95	**1.5**	0.67	0.72	0.83	0.73	1.1	0.94
Manganese[3]		0.32	***See text***	0.00038	0.00076	0.00088	0.0017	0.0016	0.0011	0.00043	0.00038	0.00089	0.00018
Mercury		0.000016	0.000026	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Molybdenum		0.037	0.073	0.00006	0.00008	0.00007	0.00009	*<0.000050*	0.00006	0.00008	0.00006	0.00006	0.00006
Nickel		0.013	0.025	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Phosphorus				*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*	*<0.050*
Potassium		0.84		0.53	**1.2**	0.58	**1.1**	0.40	0.57	0.66	0.49	0.80	0.47
Rubidium				0.00070	0.0012	0.00063	0.0011	0.00053	0.00064	0.00084	0.00070	0.00094	0.00068
Selenium		0.00053	0.001	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Silicon		0.57		0.55	**1.2**	0.55	**1.0**	0.25	0.24	0.30	0.23	0.34	0.19
Silver		0.00013	0.00025	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Sodium		1		0.89	**1.6**	**1.0**	**1.6**	0.67	0.86	0.94	0.78	**1.1**	0.81
Strontium		1.26	2.5	0.013	0.033	0.018	0.032	0.0091	0.014	0.016	0.011	0.020	0.010
Sulfur				0.60	1.7	0.95	1.8	0.59	0.72	0.68	*<0.50*	1.0	0.60
Tellurium				*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*
Thallium		0.00041	0.0008	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Thorium				*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Tin		0.0002		*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Titanium		0.0006		*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*	*<0.00030*
Tungsten				*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Uranium		0.0075	0.015	0.00007	0.00006	0.00006	0.00006	0.00005	0.00003	0.00003	0.00004	0.00002	0.00004
Vanadium		0.06	0.12	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Zinc[3]		0.0023	***See text***	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	*<0.0010*	0.0012	*<0.0010*	*<0.0010*
Zirconium				*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*	*<0.00020*
Speciated Metals (µg/L)													
Arsenate (As V)				0.048		*<0.020*			*<0.020*		*<0.020*	*<0.020*	
Arsenite (As III)				0.024		0.040			*<0.020*		0.038	*<0.020*	
Arsenobetaine (AsB)				*<0.050*		*<0.050*			*<0.050*		*<0.050*	*<0.050*	
Dimethylarsinic Acid (DMA)				*<0.020*		*<0.020*			*<0.020*		*<0.020*	0.022	
Monomethylarsonic Acid (MMA)				*<0.020*		*<0.020*			*<0.020*		*<0.020*	*<0.020*	
Plant Pigments (µg/L)													
Chlorophyll-a				*<0.010*	*<0.010*	1.2	2.2	0.49	0.35	0.56	0.64	0.94	1.3

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.
2. Trigger and threshold values are presented in *CREMP 2015 Plan Update* (Azimuth, 2015b). A number of thresholds were derived from methods (or sources) other than CCME guidelines - see Azimuth (2015b) for details.
3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

123 Bolded values exceed the trigger.

123 Bold and shaded values exceed the threshold.

Italicized numbers are below detection limits.

"-" not analyzed/not sampled

n/a = issues with the water quality probe. No data collected.

underline = results were given a cautionary flag in the QC assessment (refer to **Appendix A** for details).

~~strikethrough~~ = results flagged as unreliable in the QC assessment (refer to **Appendix A** for details).

Table B2-1. Water quality results from the 2022 CREMP, Whale Tail study area lakes.

Lake & Area	Aquatic Life Guideline[1]	WTP Screening Values[2]		Nemo Lake									
Month				March	March	May	May	July	July	August	August	September	September
Area-Replicate ID				NEM-67	NEM-68	NEM-69	NEM-70	NEM-71	NEM-72	NEM-73	NEM-74	NEM-75	NEM-76
Date		Triggers	Thresholds	05-Mar-2022	05-Mar-2022	06-May-2022	06-May-2022	07-Jul-2022	07-Jul-2022	15-Aug-2022	15-Aug-2022	03-Sep-2022	03-Sep-2022
Time				12:45	13:17	11:40	10:58	14:05	14:35	00:00	00:00	09:33	10:00
ALS Sample ID				VA22A4994-007	VA22A4994-008	VA22B0431-007	VA22B0431-008	VA22B6397-001	VA22B6397-002	VA22B9759-001	VA22B9759-002	VA22C1407-003	VA22C1407-004
Field Measurements (3 m)													
Dissolved Oxygen (mg/L)				15.7	15.7	17.5	16.7	12.3	12.0	10.0	9.9	10.8	10.8
Specific Conductivity (µS/cm)				109	114	118	111	86	86	85	85	86	85
pH	6.5 - 9.0			6.8	6.6	7.1	7.2	~~8.2~~	7.9	7.2	7.2	7.2	7.3
Temperature (°C)				0.80	0.78	2.0	1.9	10.0	10.7	13.2	14.3	8.9	8.9
Physical Tests (mg/L)													
Conductivity (µS/cm)		48.6		**105**	**109**	**112**	**107**	**85**	**85**	**85**	**85**	**90**	**89**
Alkalinity - Total (as $CaCO_3$)		9.61		**12.5**	**13.0**	**13.6**	**12.8**	**10.4**	**10.4**	**11.6**	**11.9**	**11.2**	**11.0**
Alkalinity - Bicarbonate		9.60		**12.5**	**13.0**	**13.6**	**12.8**	**10.4**	**10.4**	**11.6**	**11.9**	**11.2**	**11.0**
Alkalinity - Carbonate		2.0		<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Alkalinity - Hydroxide				<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Hardness (as CaCO3), dissolved		17.4		**39**	**42**	**43**	**41**	**32**	**32**	**32**	**32**	**33**	**33**
Hardness (as CaCO3), from total Ca/Mg				40	39	44	42	32	32	31	31	33	30
pH (Laboratory)	6.5 - 9.0	6.57-7.97	6.5-9.0	7.1	7.2	7.3	7.3	7.1	7.1	7.3	7.3	7.3	7.3
Total Dissolved Solids		38.5		**73**	**78**	**85**	**80**	**69**	**64**	**61**	**65**	**65**	**66**
Total Suspended Solids		3	5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Turbidity (NTU)				0.10	6.0	0.13	0.20	0.41	0.36	0.21	0.28	0.18	0.19
Anions and Nutrients (mg/L)													
Total Kjeldahl Nitrogen		0.17		0.16	**0.21**	0.15	0.16	0.13	0.14	0.13	0.12	0.11	**0.23**
Ammonia (as N)[3]	***equation***	0.065	0.126	0.021	**0.077**	0.0065	0.0064	<0.0050	0.0087	0.0052	<0.0050	<0.0050	<0.0050
Bromide				0.11	0.12	0.16	0.15	0.096	0.11	0.12	0.12	0.098	0.10
Chloride	120	60.4	120	19.0	20	20	19.3	14.6	14.8	14.8	14.8	14.7	14.6
Fluoride	0.12	0.077	0.12	0.030	0.031	0.034	0.033	0.030	0.030	0.026	0.026	0.030	0.032
Nitrate (as N)	3	1.5	3	0.014	0.015	0.021	0.021	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	0.06	0.031	0.06	<0.0010	<0.0010	<0.0010	0.0021	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Ortho Phosphate (as P)		0.0022		<0.0010	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Phosphorus (P)-Total	0.01	0.0045	0.01	0.0042	0.0038	0.0031	**0.0048**	0.0020	<0.0020	0.0024	<0.0020	0.0022	0.0027
Phosphorus (P)-Total Diss.				0.0041	0.0024	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0022
Reactive Silica (as SiO_2)		1.33		<0.50	~~5.89~~	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Sulphate (SO_4)		64.8	128	5.5	5.8	5.9	5.6	4.0	4.1	4.4	4.4	4.6	4.5
Organic / Inorganic Carbon (mg/L)													
Dissolved Organic Carbon		2.43		2.3	2.4	2.4	2.3	1.8	2.0	2.1	2.4	2.3	2.2
Total Organic Carbon		2.42		**2.6**	2.4	**3.0**	**2.5**	1.8	1.9	2.0	2.1	2.1	2.3
Total Metals (mg/L)													
Aluminum[3]	***equation***	0.052	0.1	0.0032	<0.0030	<0.0030	<0.0030	0.0072	0.011	0.0043	0.0050	0.0043	0.0044
Antimony		0.0046	0.009	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic	0.005	0.013	0.025	0.00078	0.00080	0.00078	0.00077	0.00094	0.00098	0.00098	0.0010	0.00090	0.00088
Barium		0.5	1	0.019	0.020	0.022	0.021	0.016	0.016	0.016	0.016	0.016	0.014
Beryllium		0.000115	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth				<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron	1.5	0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium[3]	***equation***	0.000023	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		4.6		**11.9**	**11.3**	**13.2**	**12.6**	**9.4**	**9.5**	**9.1**	**9.2**	**9.8**	**9.0**
Chromium[4]	0.001	0.0025	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper[3]	***equation***	0.0013	0.002	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Iron	0.3	0.16	0.3	<0.010	<0.010	<0.010	<0.010	0.021	0.024	0.014	0.015	0.015	0.014
Lead[3]	***equation***	0.00053	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.002		0.0016	0.0015	0.0019	0.0018	0.0014	0.0013	0.0013	0.0013	0.0017	0.0014
Magnesium		1.41		**2.5**	**2.6**	**2.7**	**2.5**	**2.0**	**2.0**	**2.0**	**2.0**	**2.1**	**1.9**
Manganese[3]		0.32	***See text***	0.0015	0.0015	0.0025	0.0029	0.0063	0.0065	0.0048	0.0048	0.0045	0.0043
Mercury	0.000026	0.000016	0.000026	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	0.073	0.037	0.073	0.00010	0.00010	0.00011	0.00009	0.00008	0.00009	0.00009	0.00009	0.00009	0.00008
Nickel[3]	***equation***	0.013	0.025	0.0016	0.0017	0.0019	0.0017	0.0017	0.0017	0.0013	0.0014	0.0012	0.0012
Phosphorus		0.0045	0.004	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.84		**1.8**	**1.8**	**2.0**	**1.9**	**1.4**	**1.5**	**1.6**	**1.6**	**1.6**	**1.4**
Rubidium				0.0027	0.0029	0.0030	0.0028	0.0023	0.0023	0.0025	0.0025	0.0026	0.0022
Selenium	0.001	0.00053	0.001	<0.000050	<0.000050	0.00005	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.61		0.11	0.10	0.12	0.13	<0.10	<0.10	0.12	0.10	0.12	0.11
Silver	0.00025	0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1		**1.1**	**1.2**	**1.2**	**1.2**	0.85	0.87	0.90	0.90	0.92	0.82
Strontium		1.26	2.5	0.071	0.070	0.082	0.076	0.059	0.061	0.062	0.061	0.061	0.054
Sulfur				2.3	2.4	2.1	1.8	1.5	1.5	1.6	1.5	1.6	1.4
Tellurium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium	0.0008	0.00013	0.0008	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thorium				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin		0.033		<0.00010	<0.00010	<0.00010	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium		0.00041		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium	0.015	0.0002	0.015	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002	0.00001	0.00002	0.00001
Vanadium		0.0006	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc[3]	0.03	0.0075	***See text***	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Dissolved Metals (mg/L)													
Aluminum[3]		0.026	0.05	<0.0010	<0.0010	0.0016	0.0015	0.0021	0.0040	0.0016	0.0023	0.0019	0.0018
Antimony		0.005	0.009	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic		0.013	0.025	0.00073	0.00077	0.00068	0.00067	0.00079	0.00080	0.00091	0.00098	0.00089	0.00091
Barium		0.5	1	0.021	0.021	0.023	0.021	0.017	0.017	0.015	0.016	0.015	0.016
Beryllium		0.000115	0.00013	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100	<0.000100
Bismuth				<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Boron		0.76	1.5	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Cadmium		0.000023	0.00004	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium		4.6		**11.5**	**12.7**	**12.7**	**12.2**	**9.5**	**9.6**	**9.4**	**9.5**	**9.6**	**9.7**
Cesium				0.00001	0.00001	0.00002	0.00001	0.00002	0.00002	0.00002	0.00002	0.00002	0.00002
Chromium		0.0026	0.005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper		0.0012	0.002	0.00032	0.00032	0.00035	0.00035	0.00029	0.00032	0.00032	0.00033	0.00042	0.00042
Iron		0.16	0.3	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Lead		0.00053	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium		0.002		0.0016	0.0018	0.0020	0.0019	0.0012	0.0012	0.0013	0.0013	0.0015	0.0015
Magnesium		1.41		**2.5**	**2.6**	**2.7**	**2.6**	**2.0**	**2.0**	**2.1**	**2.1**	**2.2**	**2.2**
Manganese[3]		0.32	***See text***	<0.00010	<0.00010	0.00054	0.00040	0.0034	0.0033	0.0013	0.0018	0.0018	0.0019
Mercury		0.000016	0.000026	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum		0.037	0.073	0.00010	0.00010	0.00010	0.00009	0.00009	0.00008	0.00011	0.00010	0.00009	0.00009
Nickel		0.013	0.025	0.0016	0.0017	0.0018	0.0017	0.0016	0.0016	0.0013	0.0013	0.0012	0.0013
Phosphorus				<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Potassium		0.84		**1.8**	**1.8**	**2.1**	**2.0**	**1.5**	**1.5**	**1.6**	**1.5**	**1.7**	**1.7**
Rubidium				0.0026	0.0028	0.0030	0.0026	0.0023	0.0023	0.0025	0.0024	0.0025	0.0024
Selenium		0.00053	0.001	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Silicon		0.57		0.075	0.065	0.091	0.099	<0.050	<0.050	0.067	0.060	0.082	0.084
Silver		0.00013	0.00025	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium		1		**1.2**	**1.2**	**1.2**	**1.2**	0.87	0.88	0.91	0.87	0.93	0.96
Strontium		1.26	2.5	0.072	0.075	0.087	0.083	0.061	0.061	0.062	0.059	0.060	0.060
Sulfur				1.8	2.0	1.9	1.8	1.3	1.6	1.2	1.5	1.4	1.5
Tellurium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Thallium		0.00041	0.0008	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Thorium				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin		0.0002		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	**0.00026**	<0.00010
Titanium		0.0006		<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030	<0.00030
Tungsten				<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium		0.0075	0.015	0.00001	0.00001	0.00002	0.00002	0.00001	0.00001	0.00001	0.00002	0.00001	0.00001
Vanadium		0.06	0.12	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc[3]		0.0023	***See text***	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zirconium				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Speciated Metals (µg/L)													
Arsenate (As V)				0.34			0.049	0.024		0.085			0.082
Arsenite (As III)				0.082			0.30	0.42		0.40			0.35
Arsenobetaine (AsB)				<0.050			<0.050	<0.050		<0.050			<0.050
Dimethylarsinic Acid (DMA)				<0.020			0.060	0.078		0.11			0.18
Monomethylarsonic Acid (MMA)				0.031			0.020	<0.020		<0.020			<0.020
Plant Pigments (µg/L)													
Chlorophyll-a				<0.010	<0.010	1.4	2.2	0.57	0.61	0.37	0.55	0.60	0.67

Notes:

1. CCME (Canadian Council of Ministers of the Environment) Canadian Water Quality Guidelines for the Protection of Aquatic Life, 1999, updated up to 2018.
2. Trigger and threshold values are presented in *CREMP 2015 Plan Update* (Azimuth, 2015b). A number of thresholds were derived from methods (or sources) other than CCME guidelines - see Azimuth (2015b) for details.
3. "***equation***" means that CCME guidelines (or thresholds) are calculated based on an equation which is either pH or hardness dependent. The ammonia and aluminum (t & d) guidelines vary with pH; the cadmium, copper, lead, manganese, nickel and zinc guidelines vary with hardness.
4. Chromium CCME guideline is for Cr VI.

123 Bolded values exceed the trigger.

123 Bold and shaded values exceed the threshold.

Italicized numbers are below detection limits.

"-" not analyzed/not sampled

n/a = issues with the water quality probe. No data collected.

underline = results were given a cautionary flag in the QC assessment (refer to **Appendix A** for details).

~~strikethrough~~ = results flagged as unreliable in the QC assessment (refer to **Appendix A** for details).

Table B2-2. Water chemistry data screening against FEIS predictions for Whale Tail South, 2022.

Lake & Area	WTS FEIS Predictions					Whale Tail Lake South Basin (Impoundment)									
Month						March	March	May	May	July	July	August	August	September	September
Area-Replicate ID						WTS-67	WTS-68	WTS-69	WTS-70	WTS-71	WTS-72	WTS-73	WTS-74	WTS-75	WTS-76
Date	March	May	July	August	September	05-Mar-2022	05-Mar-2022	06-May-2022	06-May-2022	01-Jul-2022	01-Jul-2022	17-Aug-2022	17-Aug-2022	03-Sep-2022	03-Sep-2022
Time						15:10	14:45	13:15	12:38	15:35	16:05	00:00	00:00	14:15	15:00
ALS Sample ID						VA22A4994-001	VA22A4994-002	VA22B0431-001	VA22B0431-002	VA22B5784-003	VA22B5784-004	VA22B9756-007	VA22B9756-008	VA22C1407-005	VA22C1407-006
Physical Tests (mg/L)															
Alkalinity - Total (as $CaCO_3$)	7.1	7.2	7.2	7.9	8.4	**18.0**	**17.1**	**20**	**19.7**	**16.7**	**18.9**	**17.4**	**16.9**	**17.2**	**17.2**
Total Dissolved Solids	21	21	22	25	26	**84**	**83**	**96**	**92**	**71**	**69**	**63**	**61**	**70**	**68**
Anions and Nutrients (mg/L)															
Ammonia (as N)	0.022	0.022	0.040	0.048	0.055	**0.027**	0.0095	0.018	0.016	0.019	0.016	0.0073	0.015	0.0073	0.0064
Chloride	5.0	5.0	5.1	5.4	5.6	**15.1**	**13.9**	**15.8**	**15.4**	**11.6**	**11.5**	**11.4**	**11.4**	**11.3**	**11.3**
Fluoride	0.038	0.040	0.040	0.043	0.045	**0.069**	**0.064**	**0.070**	**0.068**	**0.052**	**0.050**	**0.051**	**0.052**	**0.060**	**0.061**
Nitrate (as N)	0.47	0.47	0.72	0.80	0.89	**0.54**	**0.53**	**0.62**	**0.61**	0.40	0.39	0.19	0.20	0.17	0.16
Phosphorus (P)-Total	0.0065	0.0067	0.0070	0.0074	0.0079	0.0058	**0.0093**	0.0052	0.0049	0.0054	0.0051	0.0061	0.0065	0.0048	0.0060
Sulphate (SO_4)	2.8	2.8	2.9	3.4	3.8	**14.4**	**12.8**	**15.0**	**14.6**	**11.1**	**11.0**	**10.6**	**10.6**	**10.6**	**10.5**
Total Metals (mg/L)															
Aluminum	0.0039	0.0039	0.0038	0.0038	0.0039	**0.0057**	**0.0058**	**0.0055**	**0.0060**	**0.015**	**0.016**	**0.015**	**0.017**	**0.0082**	**0.012**
Antimony	0.00027	0.00027	0.00029	0.00036	0.00043	**0.00072**	**0.00066**	**0.0011**	**0.0010**	**0.00099**	**0.00098**	**0.00078**	**0.00078**	**0.00067**	**0.00062**
Arsenic	0.0047	0.0047	0.0067	0.0076	0.0087	0.00092	0.00082	0.0024	0.0021	0.0016	0.0016	0.0011	0.0011	0.00087	0.00086
Barium	0.0063	0.0063	0.0063	0.0068	0.0072	**0.022**	**0.021**	**0.024**	**0.023**	**0.018**	**0.018**	**0.017**	**0.017**	**0.014**	**0.014**
Beryllium	0.00002	0.00002	0.00002	0.00002	0.00002	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*
Bismuth	0.00005	0.00005	0.00005	0.00005	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Boron	0.027	0.027	0.027	0.032	0.036	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Cadmium	0.00001	0.00001	0.00001	0.00001	0.00001	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium	3.1	3.1	3.2	3.4	3.6	**12.6**	**11.8**	**14.0**	**13.9**	**10.1**	**10.2**	**9.3**	**9.3**	**9.9**	**9.3**
Chromium	0.00028	0.00030	0.00031	0.00036	0.00040	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Cobalt	0.00020	0.00021	0.00021	0.00024	0.00027	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	0.00011	0.00012	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Copper	0.00073	0.00075	0.00076	0.00083	0.00088	0.00072	0.00072	**0.00076**	0.00072	0.00059	0.00054	0.00052	0.00050	*<0.00050*	0.00053
Iron	0.039	0.041	0.045	0.047	0.050	**0.043**	**0.045**	**0.051**	**0.057**	**0.077**	**0.082**	**0.070**	**0.066**	0.044	0.043
Lead	0.00011	0.00012	0.00012	0.00014	0.00015	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Lithium	0.0013	0.0013	0.0013	0.0013	0.0014	**0.0022**	**0.0021**	**0.0024**	**0.0023**	**0.0019**	**0.0019**	**0.0017**	**0.0017**	**0.0019**	**0.0018**
Magnesium	1.1	1.1	1.1	1.1	1.2	**3.5**	**3.4**	**3.9**	**3.8**	**2.9**	**2.9**	**2.8**	**2.8**	**2.6**	**2.5**
Manganese	0.017	0.016	0.017	0.021	0.026	0.0087	0.0088	0.012	0.015	**0.026**	**0.026**	0.011	0.0091	0.0065	0.0074
Mercury	0.00001	0.00001	0.00001	0.00001	0.00001	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Molybdenum	0.00040	0.00040	0.00041	0.00046	0.00051	**0.00051**	**0.00045**	**0.00056**	**0.00051**	**0.00046**	**0.00044**	**0.00047**	0.00045	0.00040	0.00036
Nickel	0.0016	0.0016	0.0017	0.0021	0.0025	**0.0040**	**0.0037**	**0.0056**	**0.0053**	**0.0040**	**0.0040**	**0.0022**	**0.0022**	0.0017	0.0017
Potassium	0.73	0.73	0.76	0.89	1.00	**3.1**	**3.0**	**3.6**	**3.5**	**2.5**	**2.5**	**2.7**	**2.7**	**2.5**	**2.5**
Selenium	0.00010	0.00010	0.00011	0.00013	0.00015	0.00006	*<0.000050*	0.00006	0.00007	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Silver	0.00001	0.00001	0.00001	0.00001	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Sodium	1.6	1.7	1.7	2.0	2.2	**2.6**	**2.5**	**2.8**	**2.8**	**2.2**	**2.3**	**2.3**	**2.3**	2.1	2.1
Strontium	0.021	0.021	0.021	0.022	0.024	**0.097**	**0.090**	**0.11**	**0.10**	**0.076**	**0.075**	**0.080**	**0.080**	**0.074**	**0.068**
Thallium	0.00001	0.00001	0.00001	0.00001	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Tin	0.00011	0.00011	0.00011	0.00011	0.00011	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Uranium	0.00016	0.00016	0.00017	0.00019	0.00021	**0.00020**	0.00015	**0.00023**	**0.00021**	0.00013	0.00012	0.00008	0.00008	0.00006	0.00006
Vanadium	0.00061	0.00062	0.00062	0.00067	0.00071	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Zinc	0.0014	0.0014	0.0015	0.0016	0.0017	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*

Notes:
Formatting for indicating the parameters that exceed the model predictions in the FEIS:
123 Bolded values exceed FEIS by < 10X.
123 Bold and shaded values exceed the FEIS by ≥ 10X.
Italicized numbers are below detection limits.
"-" not analyzed/not sampled.

Table B2-3. Water chemistry data screening against FEIS predictions for Mammoth Lake, 2022.

Lake & Area	**MAM FEIS Predictions**					**Mammoth Lake**									
Month						**March**	**March**	**May**	**May**	**July**	**July**	**August**	**August**	**September**	**September**
Area-Replicate ID						MAM-67	MAM-68	MAM-69	MAM-70	MAM-71	MAM-72	MAM-73	MAM-74	MAM-75	MAM-76
Date	March	May	July	August	September	05-Mar-2022	05-Mar-2022	06-May-2022	06-May-2022	08-Jul-2022	08-Jul-2022	15-Aug-2022	15-Aug-2022	04-Sep-2022	04-Sep-2022
Time						08:20	09:45	15:00	15:45	14:25	13:42	00:00	00:00	14:45	14:30
ALS Sample ID						VA22A4994-003	VA22A4994-004	VA22B0431-003	VA22B0431-004	VA22B6397-003	VA22B6397-004	VA22B9759-003	VA22B9759-004	VA22C1407-007	VA22C1407-008
Physical Tests (mg/L)															
Alkalinity - Total (as $CaCO_3$)	10.6	10.5	8.9	9.0	8.9	**24**	**18.9**	**24**	**28**	**14.5**	**13.9**	**16.3**	**19.2**	**17.6**	**19.7**
Total Dissolved Solids	56	56	41	41	40	**131**	**104**	**121**	**145**	**73**	**72**	**74**	**78**	**88**	**105**
Anions and Nutrients (mg/L)															
Ammonia (as N)	0.061	0.061	0.046	0.046	0.046	**0.063**	0.046	0.024	0.023	0.0066	0.0069	0.015	0.017	0.016	0.043
Chloride	23	23	15.5	15.5	14.7	**26**	19.8	21	**26**	14.1	12.7	13.9	**16.0**	14.7	**18.4**
Fluoride	0.050	0.050	0.044	0.044	0.044	**0.074**	**0.060**	**0.064**	**0.072**	**0.048**	**0.046**	**0.045**	**0.049**	**0.054**	**0.061**
Nitrate (as N)	0.83	0.82	0.67	0.67	0.67	**0.96**	0.74	**0.82**	**0.97**	0.34	0.29	0.23	0.44	0.33	**0.85**
Phosphorus (P)-Total	0.0090	0.0090	0.0077	0.0077	0.0076	**0.011**	0.0052	0.0057	0.0044	0.0040	0.0033	0.0029	0.0044	0.0030	0.0028
Sulphate (SO_4)	4.8	4.8	3.9	3.9	3.9	**28**	**21**	**23**	**29**	**13.6**	**12.1**	**14.1**	**17.2**	**15.9**	**22**
Total Metals (mg/L)															
Aluminum	0.0030	0.0030	0.0033	0.0034	0.0034	**0.0032**	*<0.0030*	*<0.0030*	**0.0044**	**0.0093**	**0.0069**	**0.0050**	**0.0053**	**0.011**	**0.0046**
Antimony	0.00034	0.00034	0.00029	0.00030	0.00030	**0.0019**	**0.0013**	**0.0015**	**0.0019**	**0.00099**	**0.00080**	**0.00095**	**0.0013**	**0.00094**	**0.0015**
Arsenic	0.0077	0.0077	0.0063	0.0063	0.0063	0.0015	0.0011	0.0012	0.0014	0.0012	0.00098	0.0012	0.0016	0.0010	0.0015
Barium	0.010	0.010	0.0085	0.0085	0.0085	**0.034**	**0.025**	**0.030**	**0.037**	**0.018**	**0.017**	**0.016**	**0.018**	**0.017**	**0.021**
Beryllium	0.00002	0.00002	0.00002	0.00002	0.00002	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*	*<0.000100*
Bismuth	0.00005	0.00005	0.00005	0.00005	0.00005	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*
Boron	0.049	0.048	0.038	0.038	0.037	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*	*<0.010*
Cadmium	0.00001	0.00001	0.00001	0.00001	0.00001	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Calcium	12.2	12.1	8.4	8.4	8.0	**21**	**16.4**	**18.7**	**23**	**11.9**	**10.8**	**10.8**	**12.8**	**12.1**	**15.6**
Chromium	0.00043	0.00043	0.00036	0.00036	0.00035	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Cobalt	0.00031	0.00031	0.00026	0.00026	0.00025	0.00011	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	0.00013
Copper	0.00091	0.00091	0.00081	0.00081	0.00081	0.00082	0.00064	0.00074	**0.0011**	0.00059	0.00058	0.00061	0.00062	0.00060	0.00063
Iron	0.044	0.044	0.040	0.041	0.041	*<0.010*	*<0.010*	*<0.010*	0.011	0.023	0.017	0.021	0.033	0.025	0.031
Lead	0.00018	0.00018	0.00015	0.00015	0.00015	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	*<0.000050*	0.00006	*<0.000050*
Lithium	0.0017	0.0017	0.0015	0.0015	0.0015	**0.0032**	**0.0024**	**0.0028**	**0.0034**	**0.0020**	**0.0017**	**0.0018**	**0.0022**	**0.0021**	**0.0025**
Magnesium	1.8	1.8	1.5	1.5	1.5	**5.3**	**4.1**	**4.8**	**5.7**	**3.2**	**2.9**	**3.0**	**3.3**	**3.2**	**3.9**
Manganese	0.032	0.031	0.024	0.024	0.023	0.0021	0.0016	0.0029	0.0031	0.0095	0.0051	0.0058	0.012	0.0046	0.013
Mercury	0.00001	0.00001	0.00001	0.00001	0.00001	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*	*<0.0000050*
Molybdenum	0.0010	0.0010	0.00073	0.00073	0.00070	0.00060	0.00042	0.00047	0.00050	0.00044	0.00033	0.00050	0.00072	0.00059	**0.0014**
Nickel	0.0027	0.0027	0.0022	0.0022	0.0022	**0.0028**	0.0017	0.0023	**0.0031**	0.0018	0.0013	0.0012	0.0021	0.0012	**0.0025**
Potassium	1.1	1.1	0.93	0.93	0.93	**5.0**	**3.7**	**4.5**	**5.5**	**2.8**	**2.6**	**3.1**	**3.5**	**3.2**	**4.3**
Selenium	0.00017	0.00017	0.00014	0.00014	0.00013	0.00010	0.00009	0.00012	0.00014	0.00006	*<0.000050*	0.00006	0.00006	0.00007	0.00009
Silver	0.00002	0.00002	0.00001	0.00001	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Sodium	3.2	3.2	2.5	2.5	2.4	**3.7**	2.8	**3.3**	**4.0**	2.3	2.0	2.3	**2.9**	**2.6**	**3.8**
Strontium	0.037	0.037	0.030	0.030	0.030	**0.15**	**0.11**	**0.13**	**0.16**	**0.091**	**0.080**	**0.088**	**0.10**	**0.089**	**0.12**
Thallium	0.00001	0.00001	0.00001	0.00001	0.00001	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*	*<0.000010*
Tin	0.00012	0.00012	0.00011	0.00011	0.00011	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*	**0.00030**	*<0.00010*	*<0.00010*	*<0.00010*	*<0.00010*
Uranium	0.00034	0.00033	0.00025	0.00025	0.00024	0.00015	0.00010	0.00012	0.00015	0.00013	0.00010	0.00011	0.00016	0.00013	0.00022
Vanadium	0.00067	0.00067	0.00064	0.00064	0.00065	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*	*<0.00050*
Zinc	0.0019	0.0019	0.0017	0.0017	0.0017	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*	*<0.0030*

Notes:

Formatting for indicating the parameters that exceed the model predictions in the FEIS:

123 Bolded values exceed FEIS by < 10X.

123 Bold and shaded values exceed the FEIS by ≥ 10X.

Italicized numbers are below detection limits.

"-" not analyzed/not sampled.

FIGURES

Figure B2-1. Laboratory-measured conductivity (µS/cm).

Note: The red dashed line = trigger value. Conductivity data from 2014 should be interpreted with caution (See Azimuth [2015c] for more details).

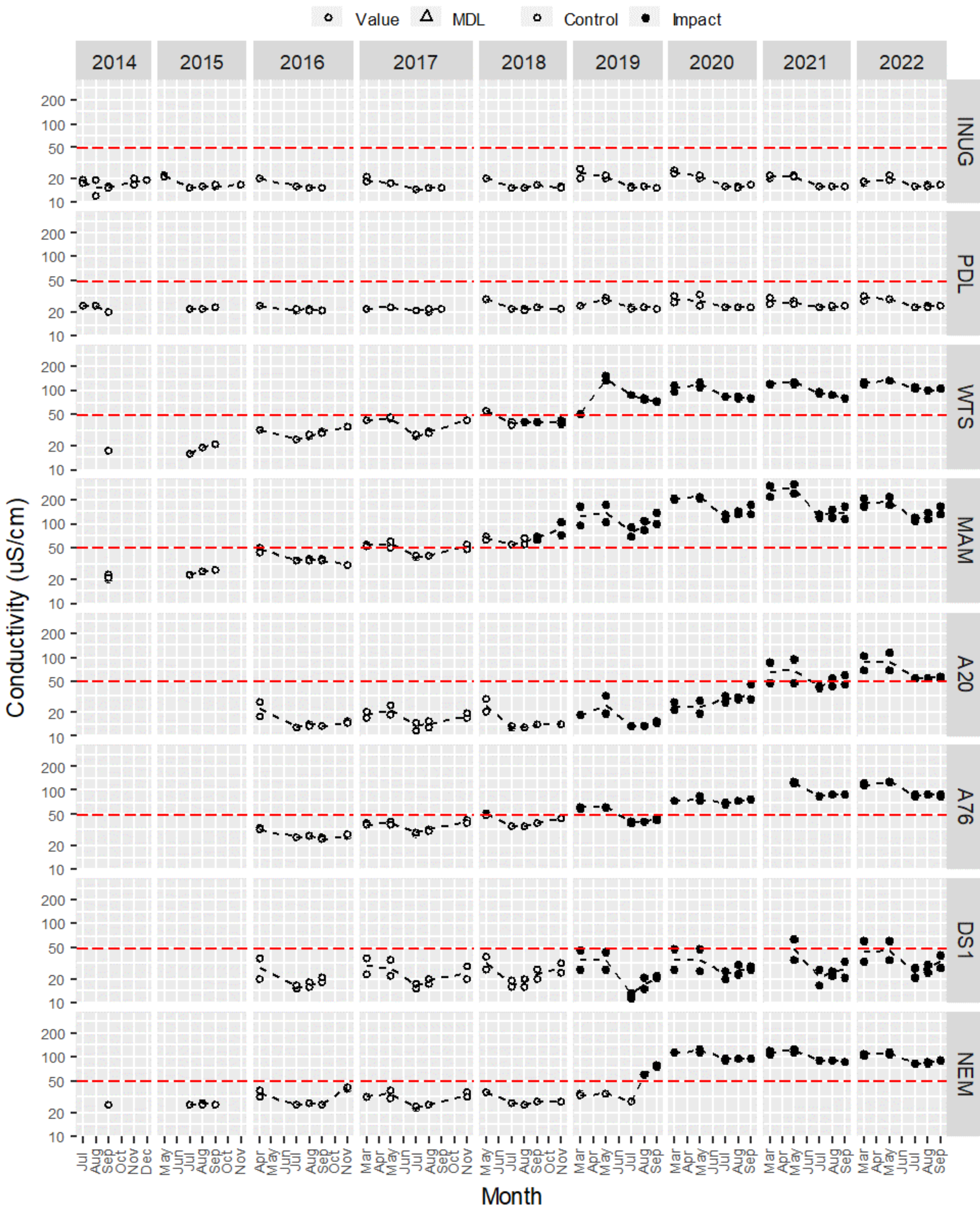


Figure B2-2. Laboratory-measured hardness (mg/L).

Note: The red dashed line = trigger value.

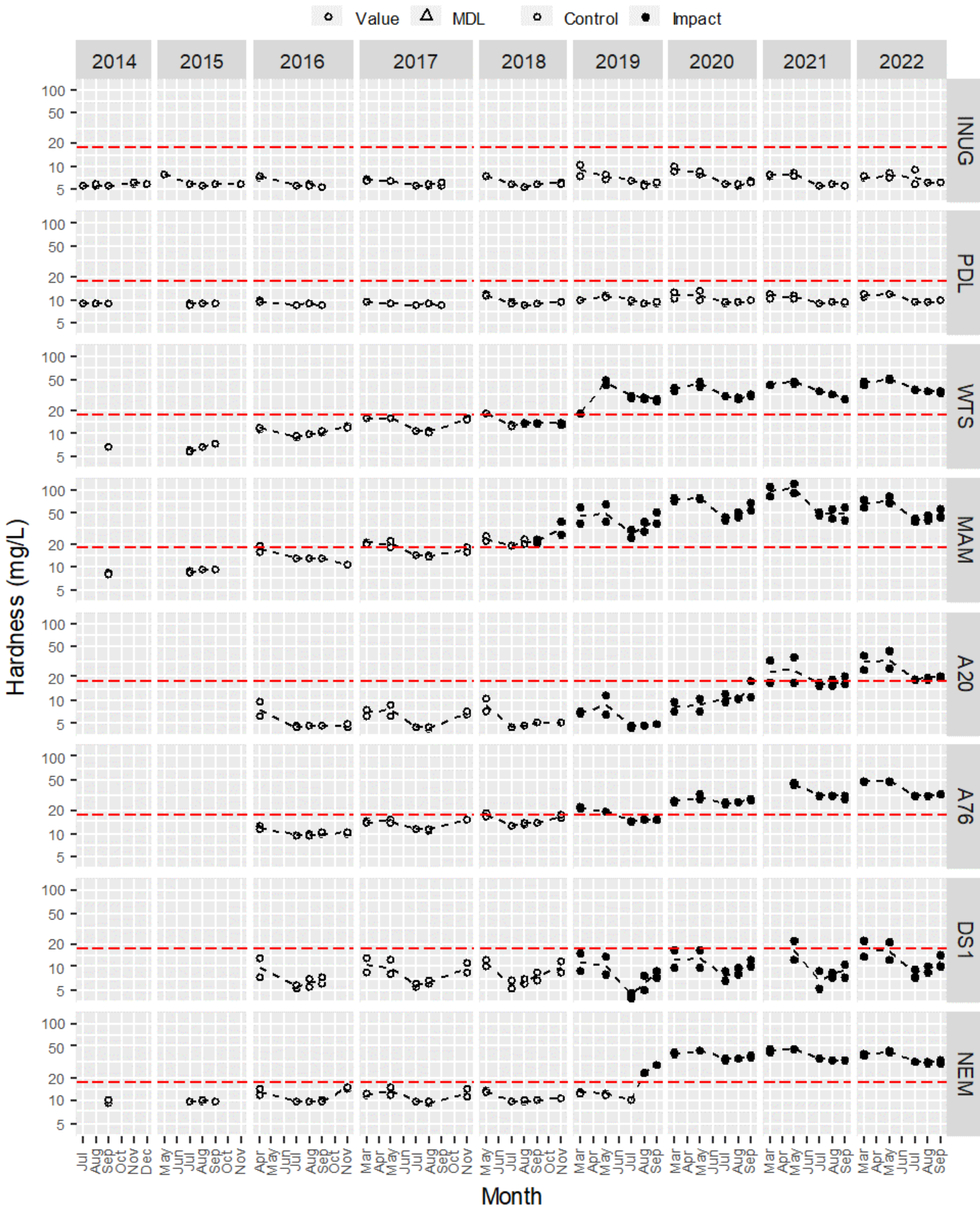


Figure B2-3. Field-measured pH.

Note: The red dashed line = trigger value.

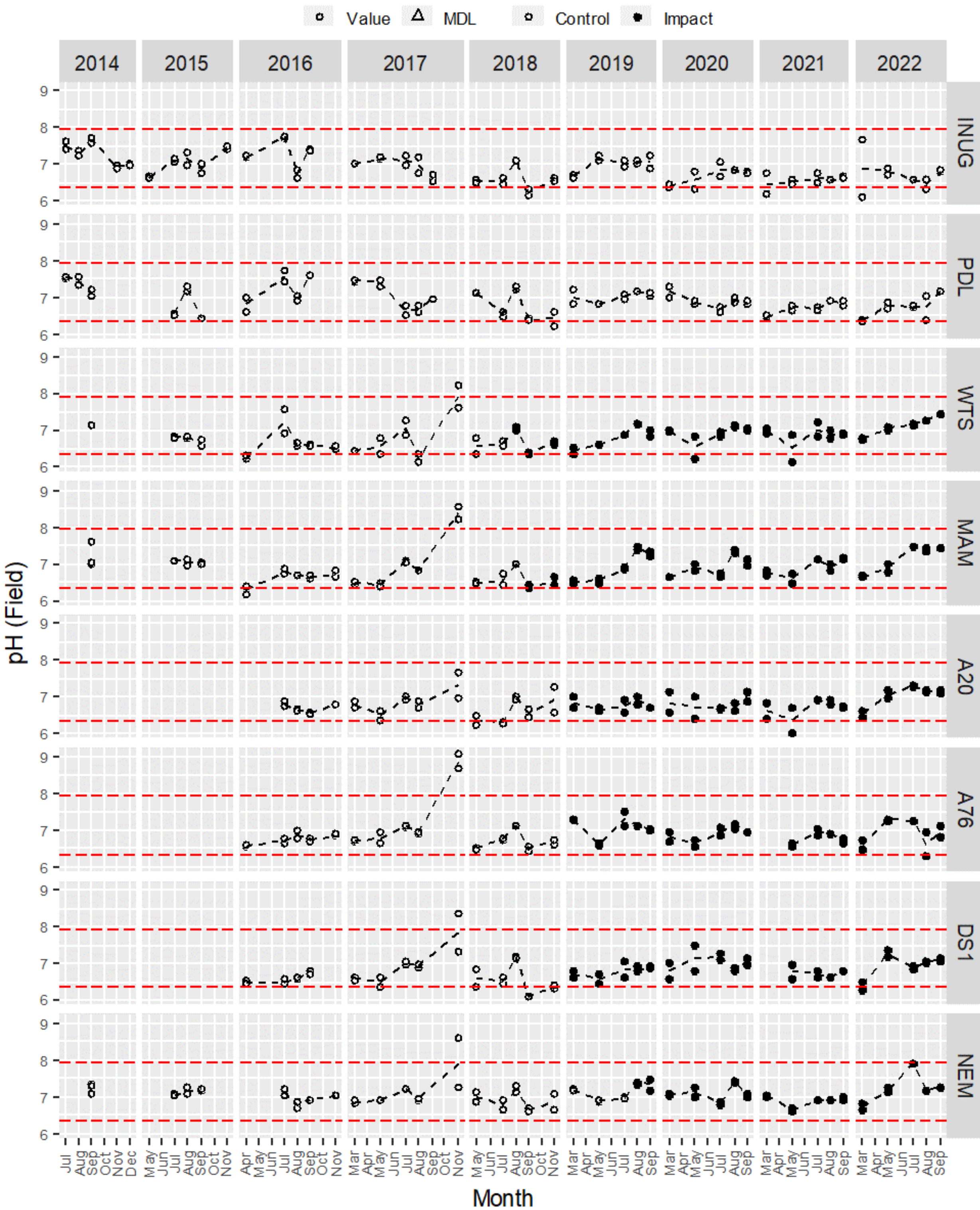


Figure B2-4. Laboratory-measured pH.

Note: The red dashed line = trigger value.

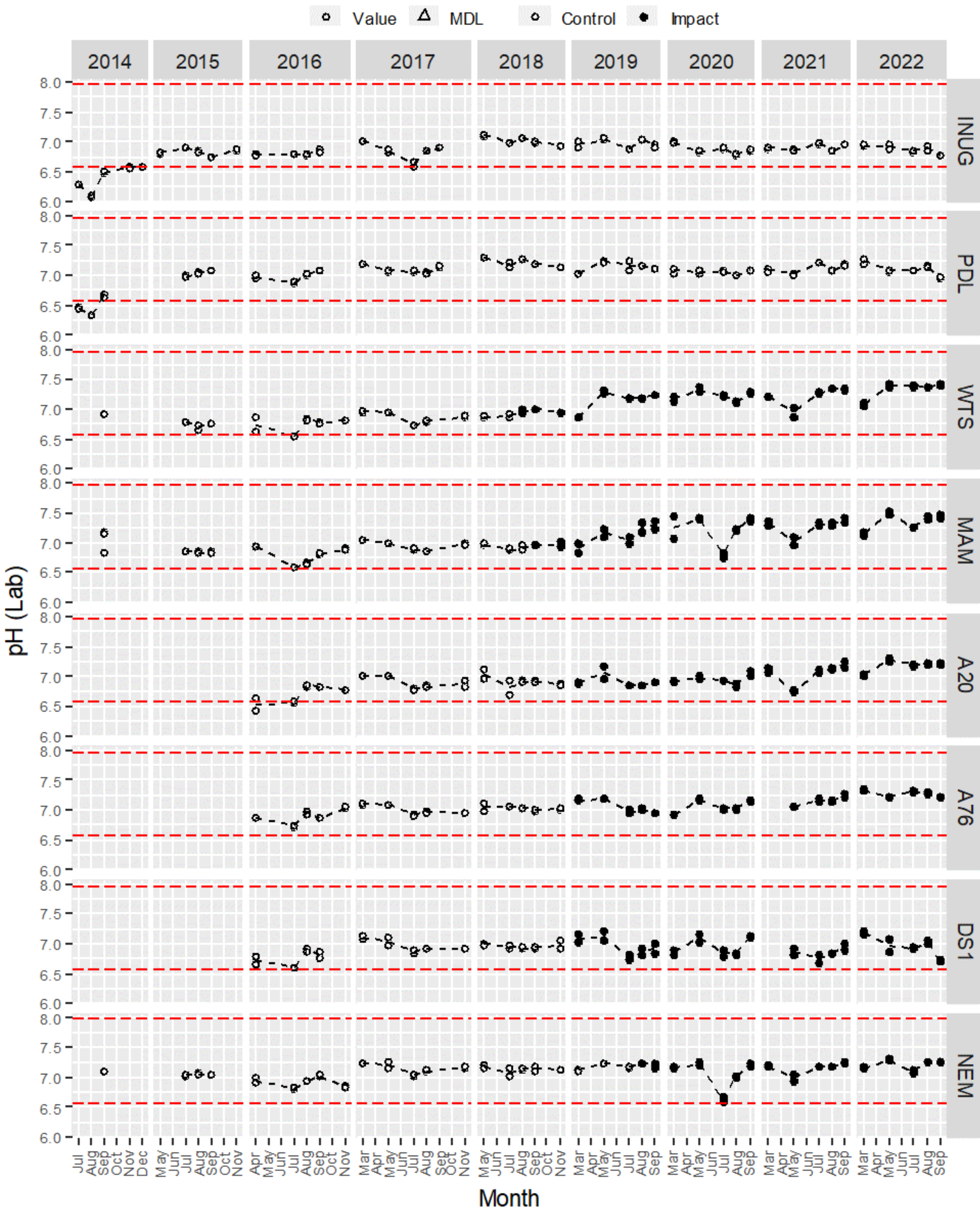


Figure B2-5. Total suspended solids (TSS; mg/L).

Note: The red dashed line = trigger value.

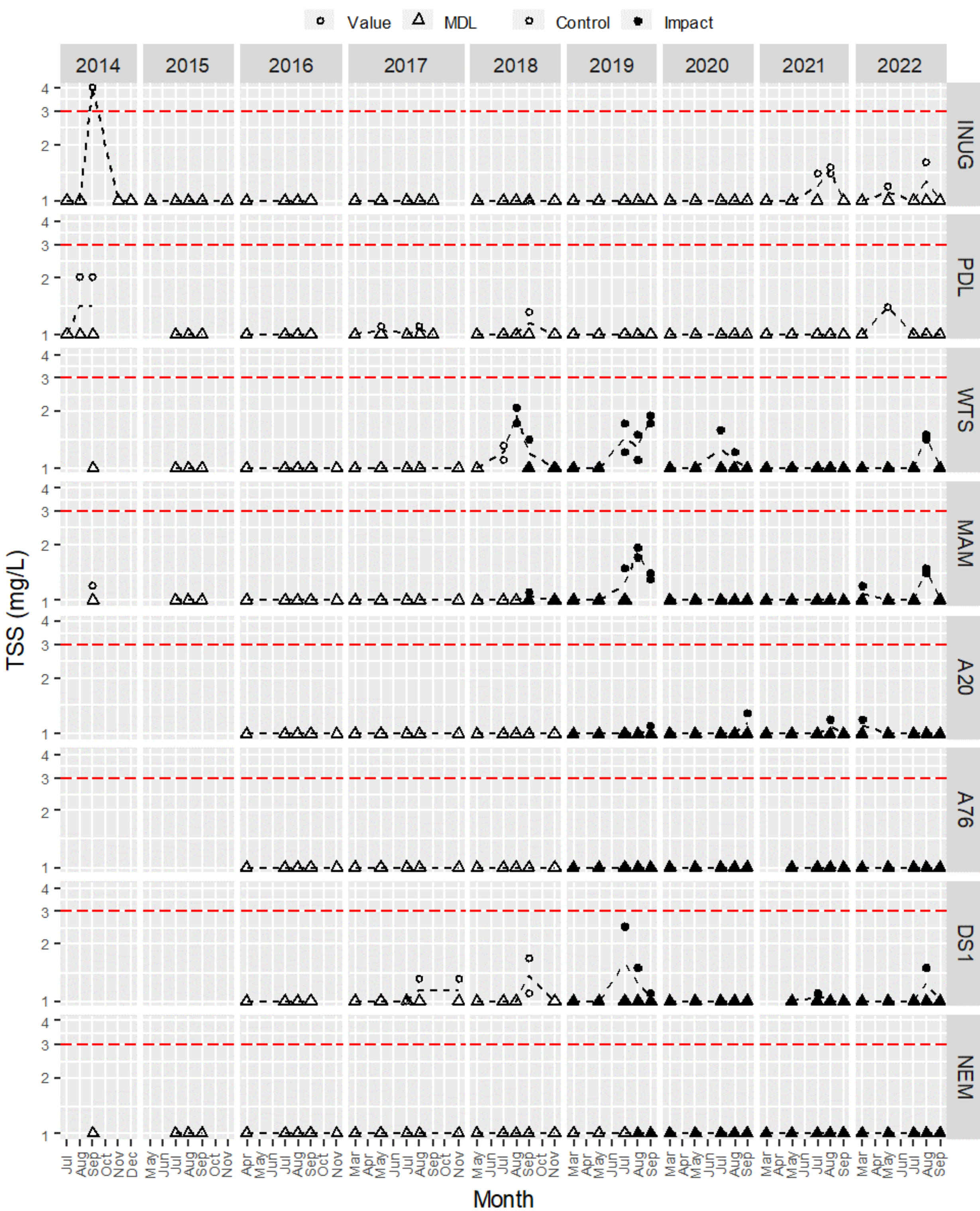


Figure B2-6. Total dissolved solids (TDS; mg/L).

Note: The red dashed line = trigger value. The blue dashed line = FEIS screening prediction. TDS data from 2014 were removed due to data quality concerns. See Azimuth (2015c) for more details.

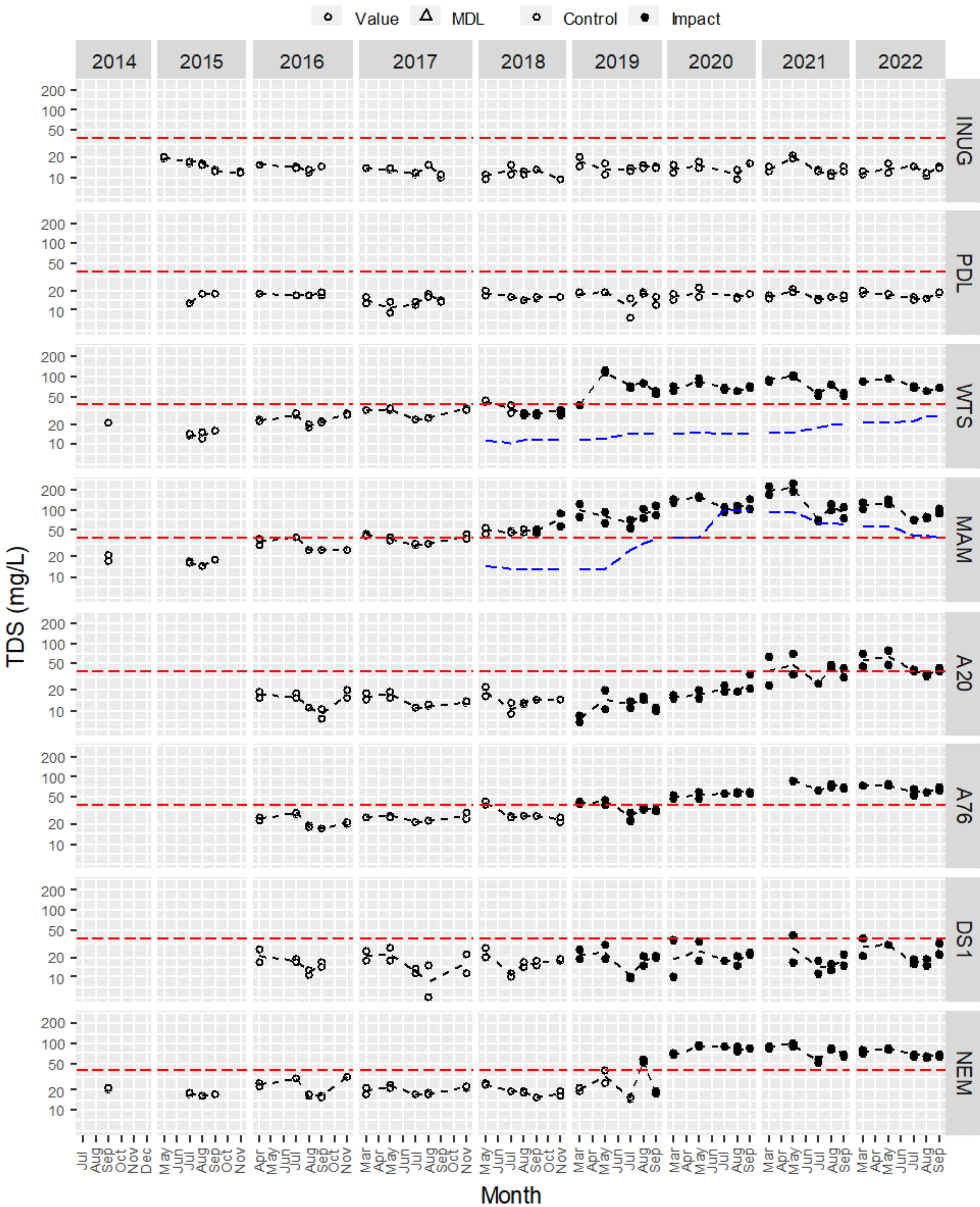


Figure B2-7. Carbonate alkalinity (mg/L).

Note: The red dashed line = trigger value.

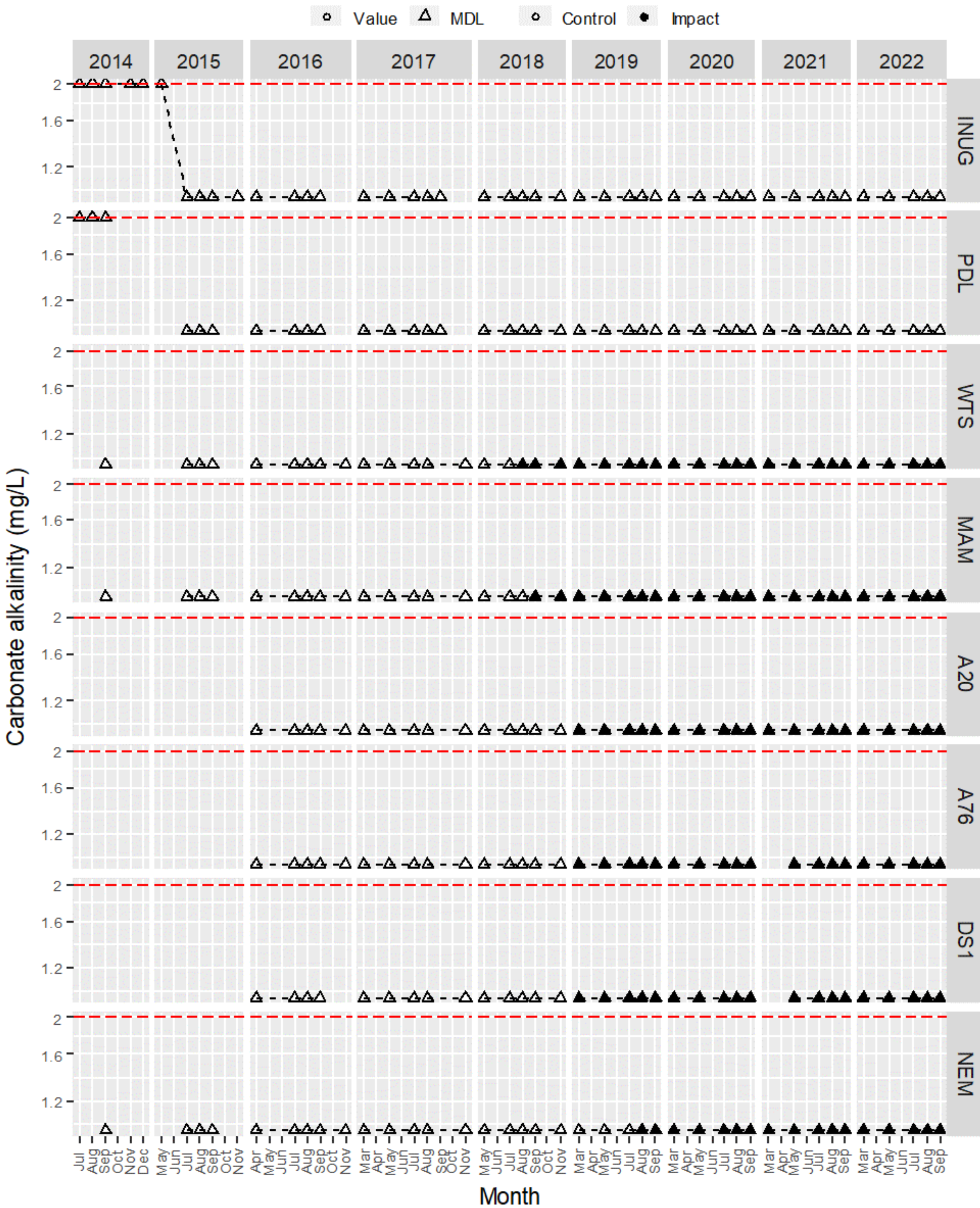


Figure B2-8. Bicarbonate alkalinity (mg/L).

Note: The red dashed line = trigger value. Bicarbonate alkalinity data from 2014 were removed due to data quality concerns. See Azimuth (2015c) for more details.

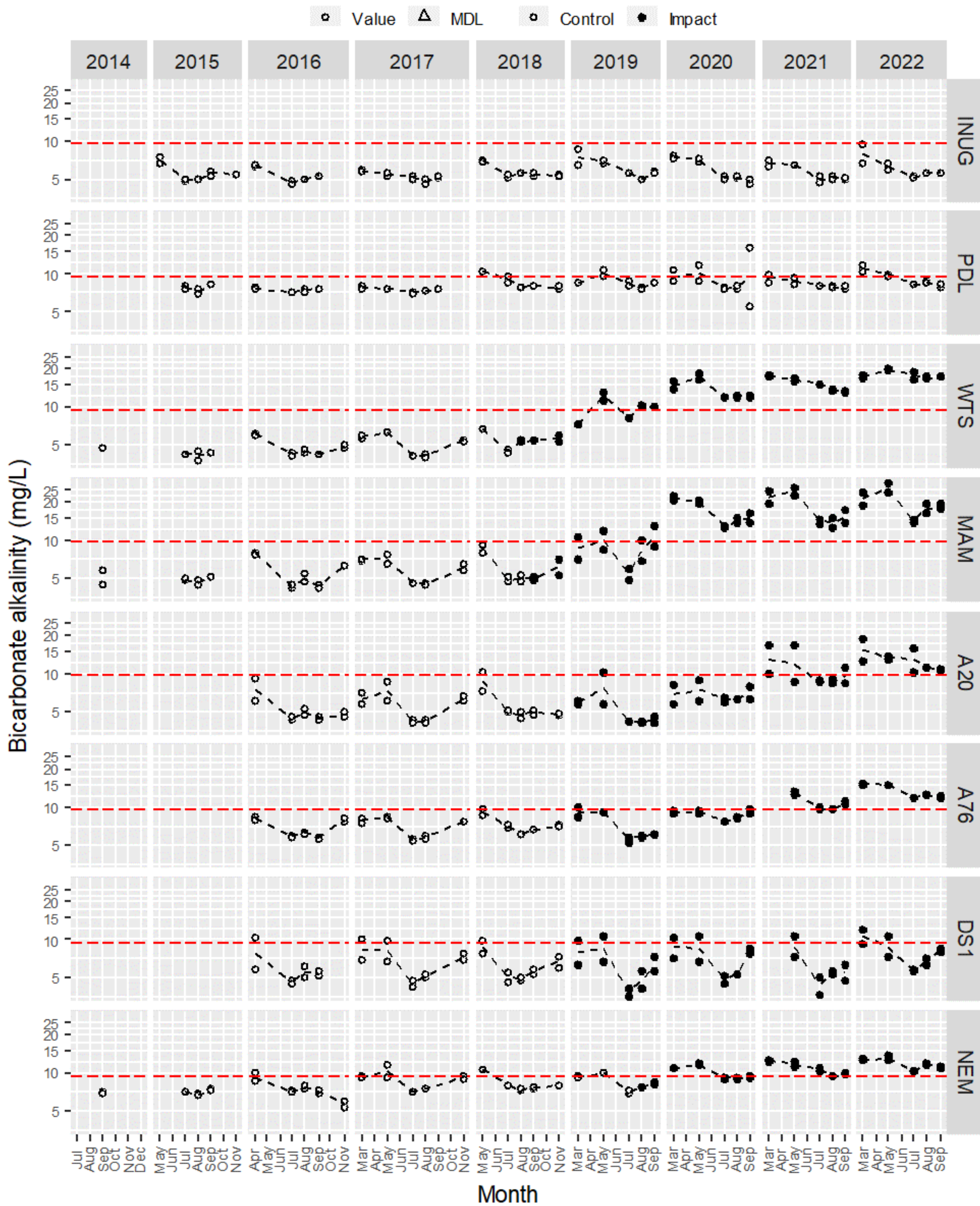


Figure B2-9. Total alkalinity (mg/L).

Note: The red dashed line = trigger value. The blue dashed line = FEIS screening prediction. Total alkalinity data from 2014 were removed due to data quality concerns. See Azimuth (2015c) for more details.

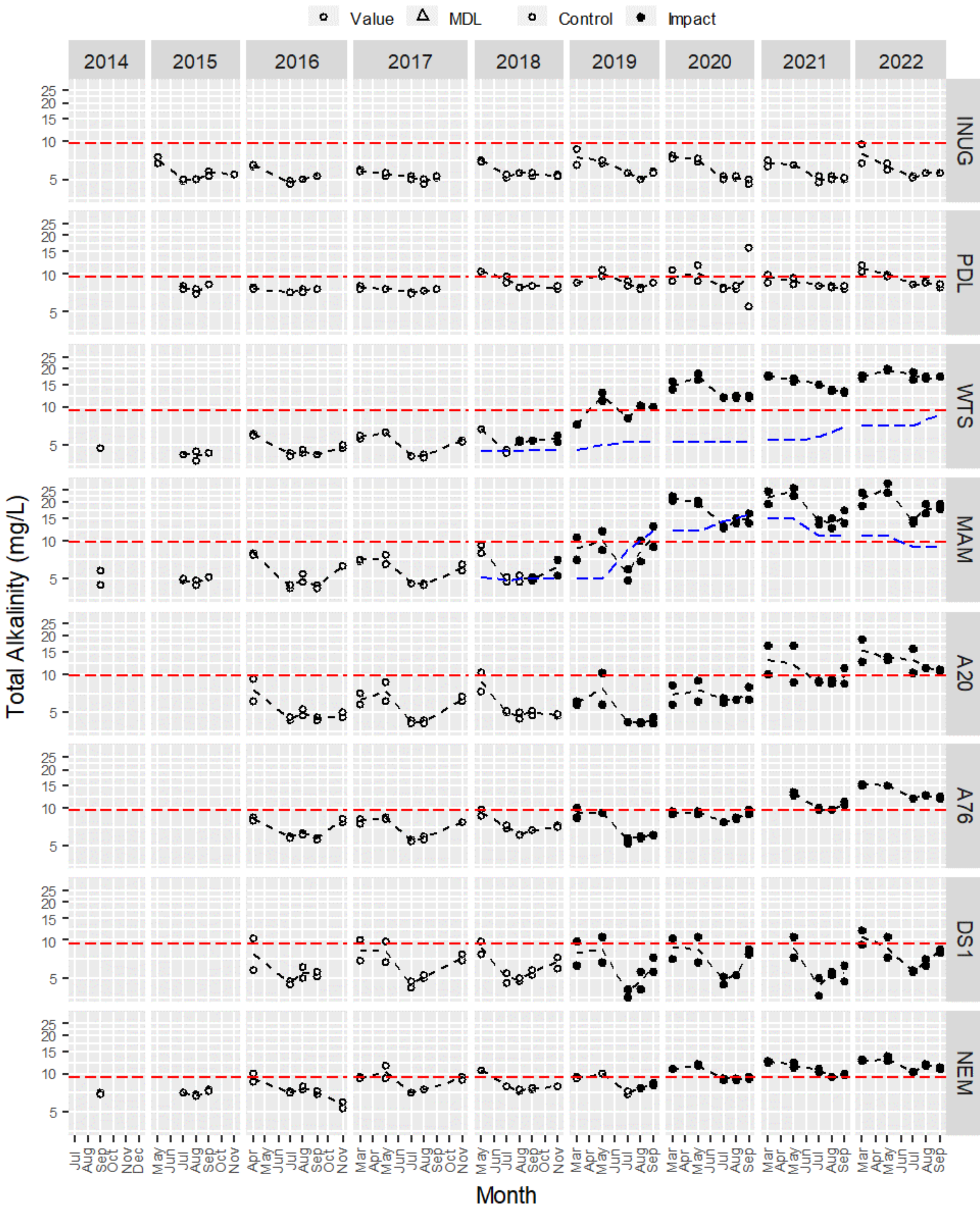


Figure B2-10. Ammonia-N (mg/L).

Note: The red dashed line = trigger value. The blue dashed line = FEIS screening prediction.

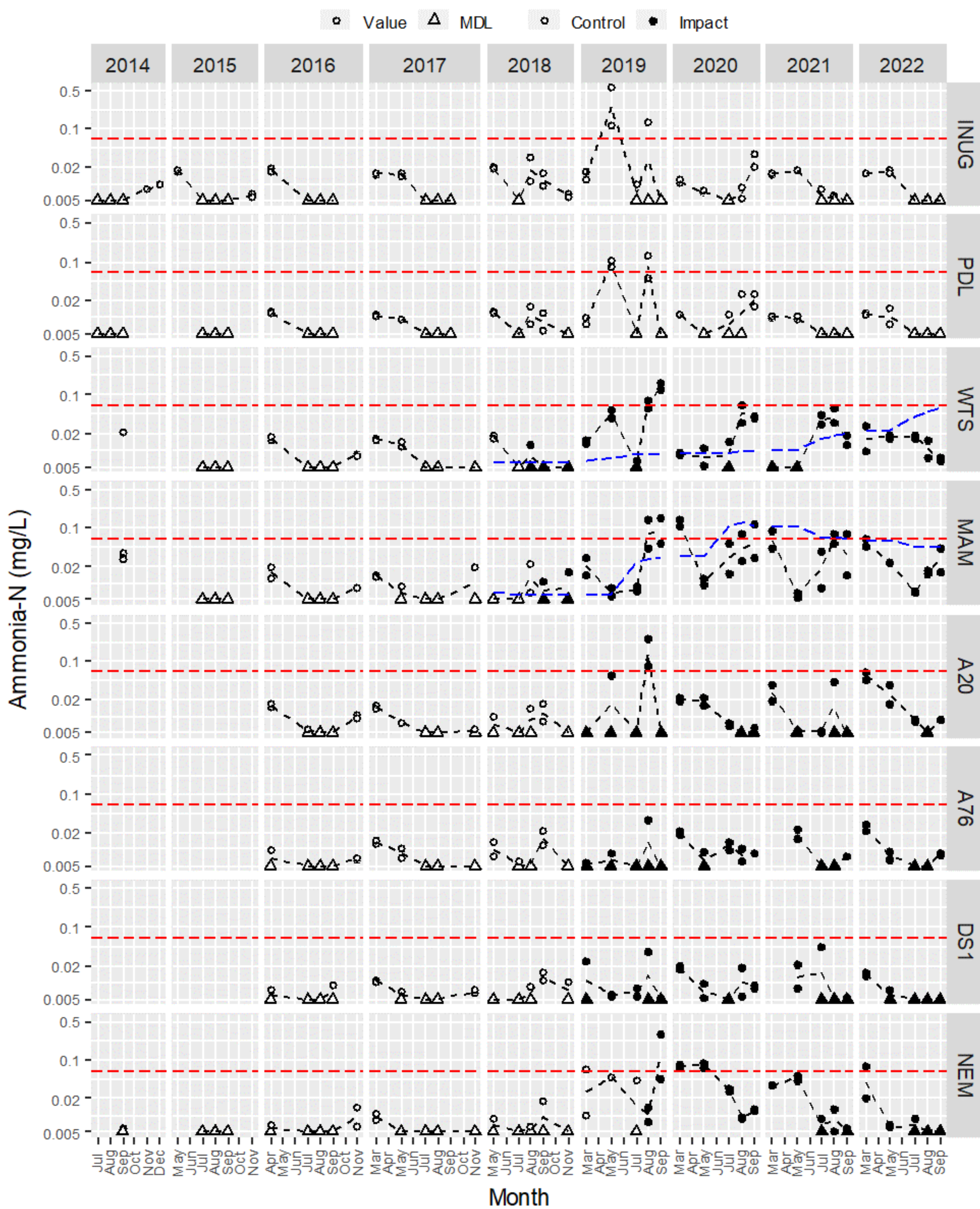


Figure B2-11. Chloride (mg/L).

Note: The red dashed line = trigger value. The blue dashed line = FEIS screening prediction.

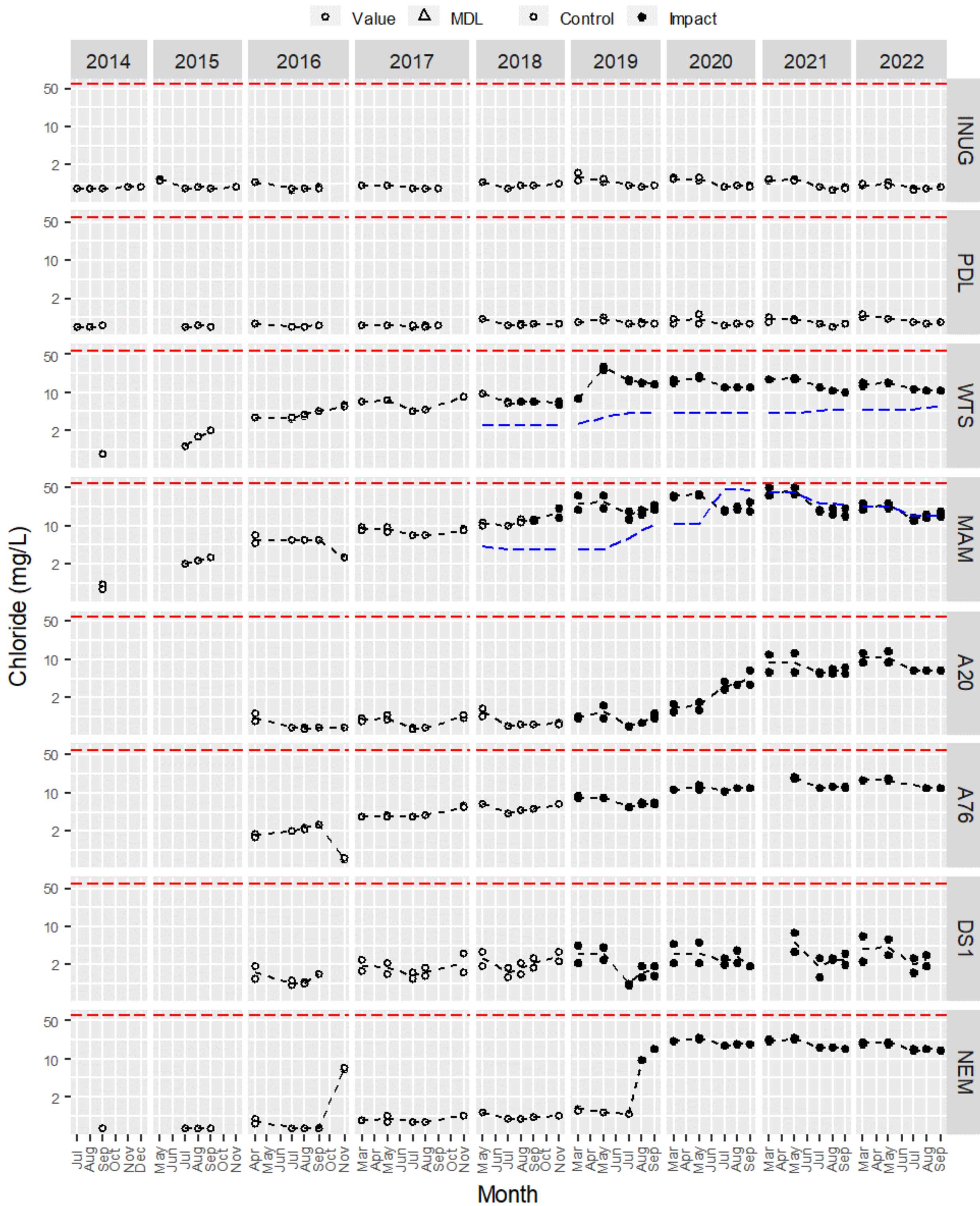


Figure B2-12. Fluoride (mg/L).

Note: The red dashed line = trigger value. The blue dashed line = FEIS screening prediction.

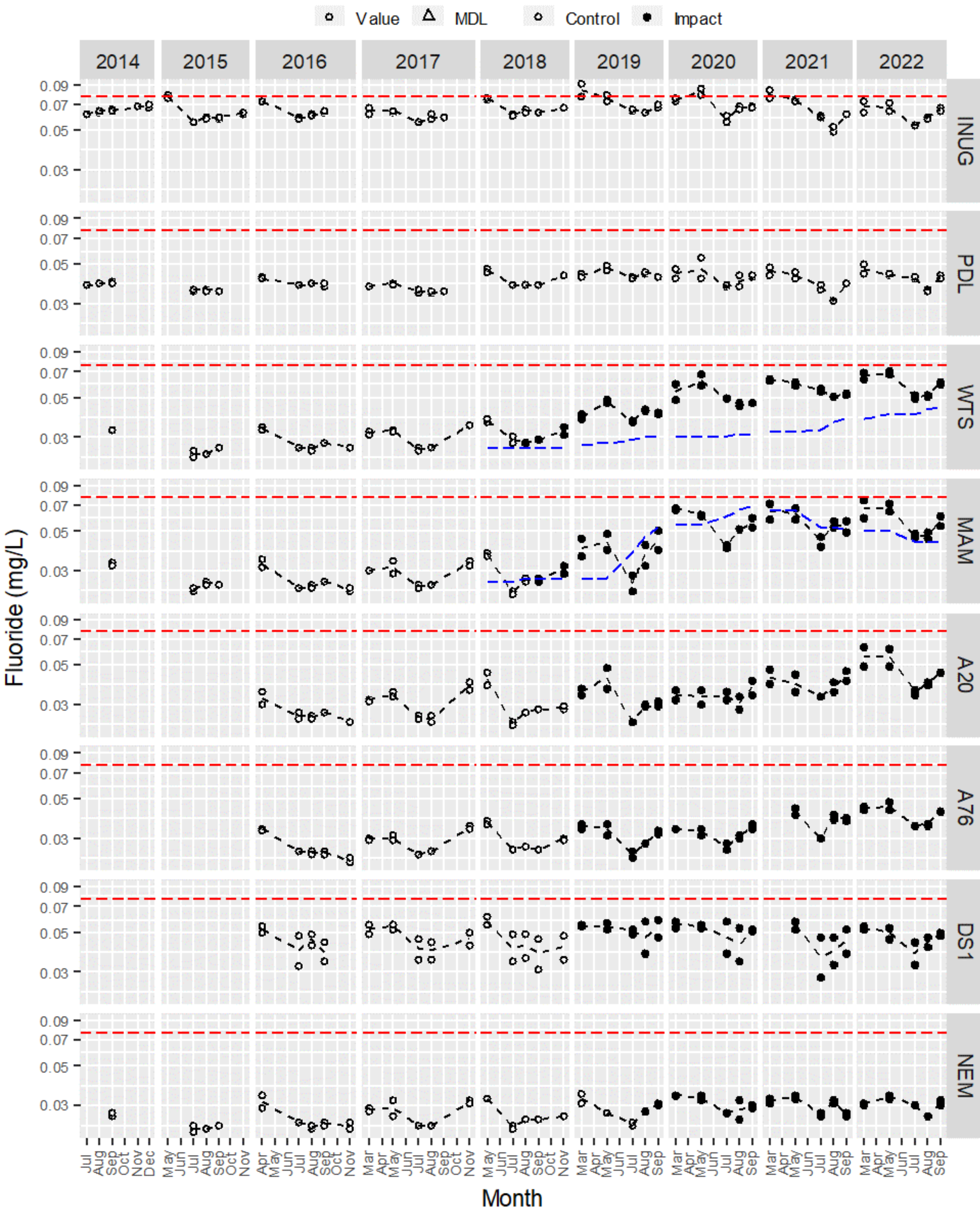


Figure B2-13. Nitrate-N (mg/L).

Note: The red dashed line = trigger value. The blue dashed line = FEIS screening prediction.

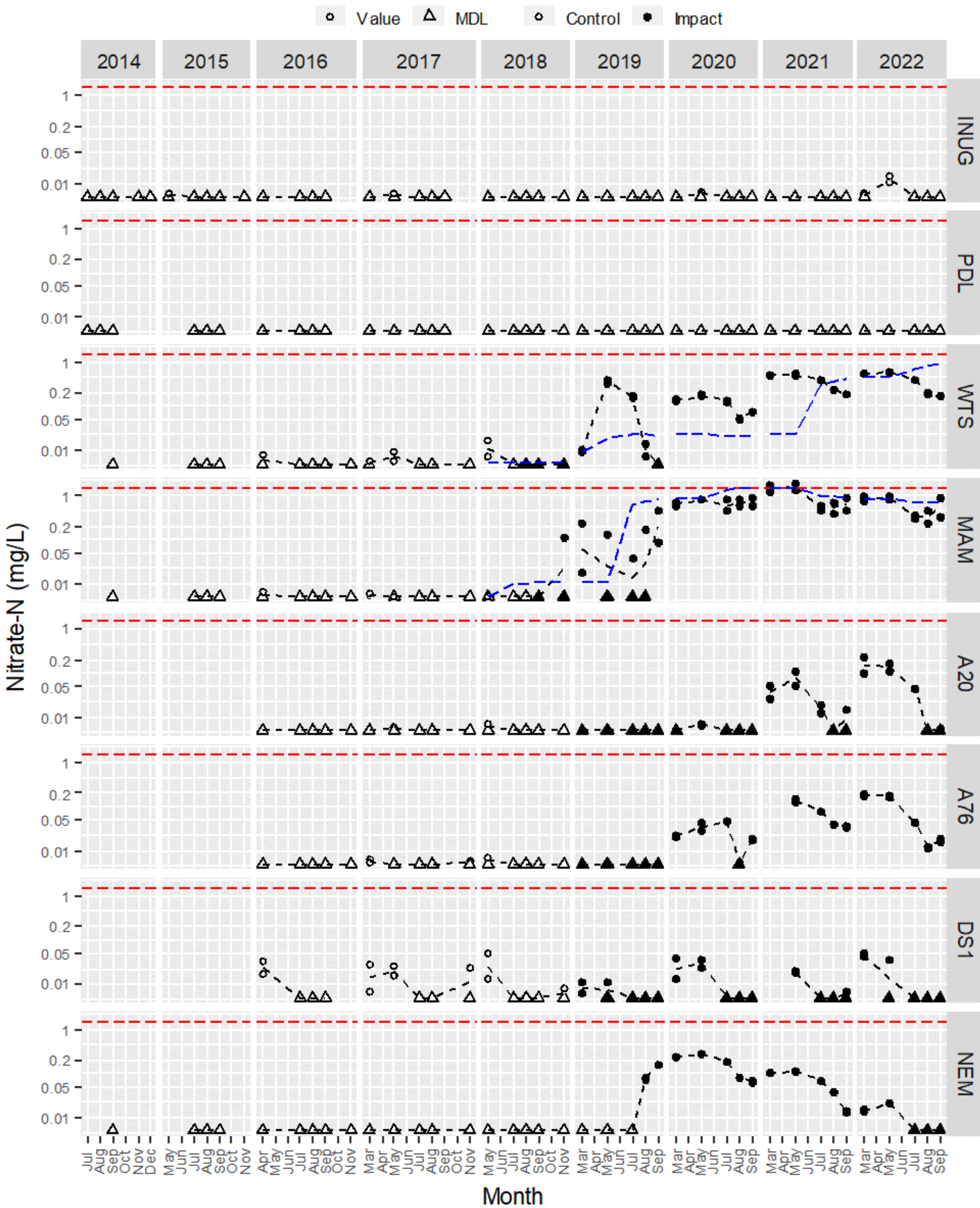


Figure B2-14. Nitrite-N (mg/L).

Note: The red dashed line = trigger value.