

DE BEERS GROUP

DE BEERS CANADA INC. VICTOR MINE

MERCURY PERFORMANCE MONITORING 2022 ANNUAL REPORT PER ENVIRONMENTAL COMPLIANCE APPROVAL #3960- 7Q4K2G CONDITIONS 7(5) AND 7(6)

Prepared for:

Ministry of the Environment, Conservation and Parks

June 2023
TC190502

DE BEERS

GROUP OF COMPANIES

June 30, 2023
TC190502

Mr. Greg Ault, District Manager
Ministry of the Environment, Conservation and Parks
Ontario Government Complex
Highway 101E
South Porcupine, Ontario, P0N 1H0

Chief Sylvia Koostachin-Metatawabin
Attawapiskat First Nation
First Nation Office
Box 248
Attawapiskat, Ontario, P0L 1A0

Dear Mr. Ault / Chief Koostachin-Metatawabin:

Re: Mercury Performance Monitoring 2022 Annual Report, Environmental Compliance Approval #3960-7Q4K2G, Conditions 7(5) and 7(6)

Please find enclosed the Annual Mercury Performance Monitoring Report for the De Beers Canada Inc. Victor Mine, for the 2022 reporting period. The report addresses Conditions 7(5) and 7(6) of Environmental Compliance Approval #3960-7Q4K2G, and summarizes monitoring data relating to peat pore water, surface water systems, groundwater (well field) discharge and fish.

Should you have any questions or concerns, please feel free to contact me by phone at (519)-872-3991 or by email at Braeden.Connor@debeersgroup.com.

Sincerely,
De Beers Canada Inc.



Braeden Connor
Environmental Superintendent, Victor Mine
De Beers Canada Inc.

cc: Pauline Tookate, Noel Tookate – Attawapiskat FN
Alyssa Dufresne - MECP
Sarah McLean– De Beers Canada

DE BEERS

GROUP OF COMPANIES

TABLE OF CONTENTS

	PAGE
1.0 INTRODUCTION.....	1
2.0 REQUIREMENTS	5
3.0 REPORTING – CONDITION 6(8) DATA	7
3.1 Condition 6(8) (a) – One Time Assessment of Peat Solids	7
3.2 Condition 6(8) (b) – Annual Analysis of Peat, Mineral Soil and Bedrock Pore Water	7
3.3 Condition 6(8) (c) – Analysis of Surface Water Systems.....	8
3.3.1 Passive Fen Treatment Systems.....	9
3.3.2 Ribbed Fen Systems	11
3.3.3 Granny Creek System	13
3.3.4 Nayshkootayaow and Attawapiskat Rivers.....	17
3.4 Condition 6(8) (d) – Annual Analysis of Well Field Discharge	18
3.5 Condition 6(8)(e) – Sport and Small Fish Mercury Body Burdens.....	18
3.5.1 Methods: Small Fish Mercury Body Burdens.....	19
3.5.2 Results: Small Fish Body Burdens (Granny Creek System).....	23
3.5.3 Results: Small Fish Body Burdens (Attawapiskat River)	25
3.5.4 Results: Small Fish Body Burdens (Nayshkootayaow River)	28
3.5.5 Methods: Sport Fish Mercury Body Burdens	30
3.5.6 Results: Sport Fish Mercury Body Burdens.....	32
4.0 REPORTING – CONDITION 6(9) DATA	36
4.1 Annual Analysis of Mineral Soil Pore Water	37
4.2 Annual Analysis of Surface Waters	37
4.3 Trend Analysis of Well Field Water Discharge	38
4.4 Annual Analysis of Fish Mercury Body Burdens.....	38
5.0 SULPHATE SOURCE INVESTIGATIONS AND CONTROL.....	42
6.0 CONCLUSIONS.....	44
6.1 Peat Pore Waters	44
6.2 Surface Waters.....	44
6.3 Fish Mercury Body Burdens	46
6.4 Consistency with the 2008 Trigger Values Document.....	47

DE BEERS

GROUP OF COMPANIES

7.0 REFERENCES.....49

LIST OF TABLES

	PAGE
Table 1a: Muskeg Monitoring Program - Annual Mercury Results for Clay and Bedrock; Total Mercury Filtered (2007 - 2020) (concentrations in ng/L)	53
Table 1b: Muskeg Monitoring Program - Annual Mercury Results for Clay and Bedrock; Methyl Mercury Filtered (2007 - 2020) (concentrations in ng/L).....	54
Table 2a: Muskeg Monitoring Program - Annual Mercury Results for Peat; Total Mercury Filtered (2007 - 2020) (concentrations in ng/L)	55
Table 2b: Muskeg Monitoring Program - Annual Mercury Results for Peat; Methyl Mercury Filtered (2007 - 2020) (concentrations in ng/L)	56
Table 2c: Muskeg Pore Water - Domed Bog 2007 - 2020 (Filtered) (concentrations in ng/L)	57
Table 2d: Muskeg Pore Water - Flat Bog 2007 - 2020 (Filtered) (concentrations in ng/L) ..	58
Table 2e: Muskeg Pore Water - Horizontal Fen 2007 - 2020 (Filtered) (concentrations in ng/L)	59
Table 2f: Muskeg Pore Water - Ribbed Fen 2007 - 2020 (Filtered) (concentrations in ng/L)	60
Table 2g: Mineral Horizon Pore Water - Shallow Bedrock 2007 - 2020 (Filtered) (concentrations in ng/L)	61
Table 2h: Mineral Horizon Pore Water - Deep Clay 2007 - 2020 (Filtered) (concentrations in ng/L)	62
Table 2i: Mineral Horizon Pore Water - Shallow Clay 2007 - 2020 (Filtered) (concentrations in ng/L)	63
Table 3: Total Mercury - Fens (Unfiltered) (concentrations in ng/L)	64
Table 4: Total Mercury - Fens (Filtered) (concentrations in ng/L)	65
Table 5: Methyl Mercury - Fens (Unfiltered) (concentrations in ng/L)	66
Table 6: Methyl Mercury - Fens (Filtered) (concentrations in ng/L)	67
Table 7: Fen Systems – Statistical Analysis – Total Mercury (concentrations in ng/L)	68
Table 8a: Total Mercury - Ribbed Fen Surface Waters (Unfiltered) (concentrations in ng/L)	69
Table 8b: Total Mercury - Ribbed Fen Surface Waters (Filtered) (concentrations in ng/L) .	70
Table 8c: Methyl Mercury - Ribbed Fen Surface Waters (Unfiltered) (concentrations in ng/L)	71
Table 8d: Methyl Mercury - Ribbed Fen Surface Waters (Filtered) (concentrations in ng/L)	72
Table 9: Muskeg System Ribbed Fen General Chemistry Results - All Years.....	73

DE BEERS

GROUP OF COMPANIES

Table 10a:	Total Mercury – North Granny Creek (Unfiltered) (concentrations in ng/L)	74
Table 10b:	Total Mercury - South Granny Creek (Unfiltered) (concentrations in ng/L)	75
Table 10c:	Total Mercury – Granny Creek Confluence (Unfiltered) (concentrations in ng/L)	76
Table 11a:	Total Mercury – North Granny Creek (Filtered) (concentrations in ng/L)	77
Table 11b:	Total Mercury – South Granny Creek (Filtered) (concentrations in ng/L)	78
Table 11c:	Total Mercury - Granny Creek Confluence (Filtered) (concentrations in ng/L)	79
Table 12a:	Methyl Mercury – North Granny Creek (Unfiltered) (concentrations in ng/L)	80
Table 12b:	Methyl Mercury – South Granny Creek (Unfiltered) (concentrations in ng/L)	81
Table 12c:	Methyl Mercury - Granny Creek Confluence (Unfiltered) (concentrations in ng/L)	82
Table 13a:	Methyl Mercury – North Granny Creek (Filtered) (concentrations in ng/L)	83
Table 13b:	Methyl Mercury – South Granny Creek (Filtered) (concentrations in ng/L)	84
Table 13c:	Methyl Mercury – Granny Creek Confluence (Filtered) (concentrations in ng/L)	85
Table 14:	North Granny Creek Summer Condition Methyl Mercury Concentrations (concentrations in ng/L)	86
Table 15a:	July / October Methyl Mercury Concentrations for Downstream Granny Creek Stations G4, G7 and G8 (Filtered) (concentrations in ng/L)	87
Table 15b:	July / October Methyl Mercury Concentrations for Downstream Granny Creek Stations G4, G7 and G8 (Unfiltered) (concentrations in ng/L)	88
Table 16a:	Total Mercury – Nayshkootayaow and Attawapiskat Rivers (Unfiltered) (concentrations in ng/L)	89
Table 16b:	Total Mercury – Nayshkootayaow and Attawapiskat Rivers (Filtered) (concentrations in ng/L)	90
Table 17a:	Methyl Mercury – Nayshkootayaow and Attawapiskat Rivers (Unfiltered) (concentrations in ng/L)	91
Table 17b:	Methyl Mercury – Nayshkootayaow and Attawapiskat Rivers (Filtered) (concentrations in ng/L)	92
Table 18:	Species-Specific Catch per Unit Effort for Seine Netting by Location	93
Table 19:	Species-Specific Catch per Unit Effort for Fyke Netting by Location	94
Table 20:	Species-Specific Catch per Unit Effort for Minnow Traps by Location	95
Table 21:	Species-Specific Catch per Unit Effort for Dip Netting by Location	96
Table 22:	Species-Specific Catch per Unit Effort for Electrofishing by Location	97
Table 23:	Species-Specific Catch per Unit Effort for Angling by Location	98
Table 24:	Species-Specific Catch per Unit Effort for Gillnetting by Location	99
Table 25:	Results of two-way and one-way ANOVA tests for Total Mercury in Northern Pearl Dace from the Granny Creek System and Tributary 5A	100
Table 26:	Results of ANCOVA for Total Mercury Adjusted for Total Length and Age in Northern Pearl Dace from the Granny Creek System and Tributary 5A	101

DE BEERS

GROUP OF COMPANIES

Table 27:	Before-After-Control-Impact (BACI) Design ANCOVA Results for 2009 Versus 2022 Control Versus Impact Sites for Northern Pearl Dace from the Granny Creek System and Tributary 5A	102
Table 28:	Results of two-way and one-way ANOVA tests for Total Mercury in Trout Perch from the Attawapiskat River	103
Table 29:	Results of ANCOVA for Total Mercury Adjusted for Total Length and Age in Trout Perch from the Attawapiskat River	104
Table 30:	Before-After-Control-Impact (BACI) Design ANCOVA Results for 2009 Versus 2022 Control Versus Impact Sites	105
Table 31:	Results of ANCOVA for Total Mercury Adjusted for Total Length and Age in Trout Perch from the Nayshkootayaow River	106
Table 32:	Before-After-Control-Impact (BACI) Design ANCOVA Results for 2012 Versus 2022 Control Versus Impact Sites for Trout Perch from the Nayshkootayaow River	107
Table 33:	Results of ANCOVA for Total Mercury Adjusted for Total Length and Age in Age 1+ Mottled Sculpin from the Attawapiskat River and Nayshkootayaow River ...	108
Table 34:	Results of ANCOVA for Total Mercury Adjusted for Total Length and Within and Between Year Statistical Comparisons for Northern Pike from the Attawapiskat River and Nayshkootayaow River	109
Table 35:	Results of ANCOVA for Total Mercury Adjusted for Total Length and Within and Between Year Statistical Comparisons for Walleye from the Attawapiskat River and Nayshkootayaow River	110
Table 36:	Results of ANCOVA for Total Mercury Adjusted for Total Length and Within and Between Year Statistical Comparisons for White Sucker from the Attawapiskat River and Nayshkootayaow River	111
Table 37a:	Muskeg Monitoring Program – Statistical Analysis of Cluster Peat Horizon Mercury Pore Waters Annual Sampling Program 2021 Results – Cluster S-1 Series	112
Table 37b:	Muskeg Monitoring Program – Statistical Analysis of Cluster Peat Horizon Mercury Pore Waters Annual Sampling Program 2021 Results – Cluster S-2 Series	113
Table 37c:	Muskeg Monitoring Program – Statistical Analysis of Cluster Peat Horizon Mercury Pore Waters Annual Sampling Program 2021 Results – Cluster S-7 Series	114
Table 37d:	Muskeg Monitoring Program – Statistical Analysis of Cluster Peat Horizon Mercury Pore Waters Annual Sampling Program 2021 Results – Cluster S-8 Series	115
Table 37e:	Muskeg Monitoring Program – Statistical Analysis of Cluster Peat Horizon Mercury Pore Waters Annual Sampling Program 2021 Results – Cluster S-(9)1 Series	116

DE BEERS

GROUP OF COMPANIES

Table 37f:	Muskeg Monitoring Program – Statistical Analysis of Cluster Peat Horizon Mercury Pore Waters Annual Sampling Program 2021 Results – Cluster S-(9)2 Series	117
Table 37g:	Muskeg Monitoring Program – Statistical Analysis of Cluster Peat Horizon Mercury Pore Waters Annual Sampling Program 2021 Results – Cluster S-V Series	118
Table 38a:	Muskeg Monitoring S-8 Long-term Analysis – Methyl Mercury	119
Table 38b:	Muskeg Monitoring S-8 Long-term Analysis - Methyl Mercury	120
Table 39a:	North Granny Creek Statistical Analysis - Mercury 2021 (Unfiltered).....	121
Table 39b:	North Granny Creek Statistical Analysis - Mercury 2021 (Filtered)	122
Table 39c:	South Granny Creek Statistical Analysis - Mercury 2021 (Unfiltered)	123
Table 39d:	South Granny Creek Statistical Analysis - Mercury 2021 (Filtered)	124
Table 39e:	Nayshkootayaow River Statistical Analysis - Mercury 2021 (Unfiltered)	125
Table 39f:	Nayshkootayaow River Statistical Analysis - Mercury 2021 (Filtered)	126
Table 39g:	Attawapiskat River Statistical Analysis - Mercury 2021 (Unfiltered)	127
Table 39h:	Attawapiskat River Statistical Analysis - Mercury 2021 (Filtered)	128
Table 40:	Granny Creek Confluence and Trib 5A - Statistical Analysis of Variance Tables (Filtered)	129
Table 41a:	Sulphate Trends Over Time (average values).....	130
Table 41b:	2022 Sulphate Investigation Results	131

DE BEERS

GROUP OF COMPANIES

LIST OF FIGURES

	PAGE
Figure 1: Muskeg Monitoring Locations.....	132
Figure 2: Surface Water Monitoring Stations.....	133
Figure 3: Interpreted Drawdown Contours in Upper Bedrock Aquifer (2021 Data)	134
Figure 4a: Ribbed Fen Average Methyl Mercury Concentration (Filtered) as a Function of DOC	135
Figure 4b: Ribbed Fen Average Methyl Mercury Concentration (Filtered) as a Function of pH	135
Figure 5a: Nayshkootayaow River Total and Methyl Mercury Trends (Filtered and Unfiltered)	136
Figure 5b: Attawapiskat River Total and Methyl Mercury Trends (Filtered and Unfiltered)	137
Figure 6: Fish Sampling Areas 2007 – 2021	138
Figure 7: Total Mercury for Northern Pearl Dace in the Granny Creek System and Tributary 5A in 2022	139
Figure 8: Histogram of Total Mercury Adjusted for Total Length in Northern Pearl Dace from the Granny Creek System and Tributary 5A.....	140
Figure 9: Plot of Total Mercury Concentrations Adjusted for Total Length in 2009 and 2022 Northern Pearl Dace from the Granny Creek System and Tributary 5A.....	141
Figure 10: Plot of Total Mercury Concentrations Adjusted for Total Length in 2021 and 2022 Northern Pearl Dace from the Granny Creek System and Tributary 5A.....	141
Figure 11: Total Mercury Additive Model for Northern Pearl Dace of Standard Size (60 mm) from 2008 to 2022 in the Granny Creek System and Tributary 5A.....	142
Figure 12: Total Mercury for Trout Perch from the Attawapiskat River in 2022.....	143
Figure 13: Histogram of Total Mercury Adjusted for Total Length in Trout Perch from the Attawapiskat River.....	144
Figure 14: Plot of Total Mercury Concentrations Adjusted for Total Length in 2009 and 2022 in Trout Perch from the Attawapiskat River.....	145
Figure 15: Plot of Total Mercury Concentrations Adjusted for Total Length in 2021 and 2022 in Trout Perch from the Attawapiskat River.....	145
Figure 16: Total Mercury Additive Model for Trout Perch of Standard Size (50 mm) from 2008 to 2022 in Attawapiskat River	146
Figure 17: Total Mercury for Age 1+ Trout Perch from the Nayshkootayaow River in 2022	147
Figure 18: Histogram of Total Mercury Adjusted for Total Length in Trout Perch from the Nayshkootayaow River.....	148
Figure 19: Plot of Total Mercury Concentrations Adjusted for Total Length in 2012 and 2022 in Trout Perch from the Nayshkootayaow River	149
Figure 20: Plot of Total Mercury Concentrations Adjusted for Total Length in 2021 and 2022 in Trout Perch from the Nayshkootayaow River	149

DE BEERS

GROUP OF COMPANIES

Figure 21:	Total Mercury Additive Model for Trout Perch of Standard Size (50 mm) from 2008 to 2022 in Nayshkootayaow River	150
Figure 22:	Total Mercury for Age 1+ Mottled Sculpin from the Attawapiskat River and Nayshkootayaow River in 2022	151
Figure 23:	Histogram of Total Mercury Adjusted for Total Length in Mottled Sculpin from the Attawapiskat River and Nayshkootayaow River	152
Figure 24:	Plot of Total Mercury Concentrations Adjusted for Total Length in 2015 and 2022 in Mottled Sculpin from the Attawapiskat River	153
Figure 25:	Plot of Total Mercury Concentrations Adjusted for Total Length in 2019 and 2022 in Mottled Sculpin from the Attawapiskat River	154
Figure 26:	Linear Regression of Total Mercury at Length in Northern Pike from the Attawapiskat River and Nayshkootayaow River	155
Figure 27:	Plot of Total Mercury Concentrations Adjusted for Total Length from 2007/08 to 2022 in Northern Pike from the Attawapiskat River	157
Figure 28:	Plot of Total Mercury Concentrations Adjusted for Total Length from 2007/08 to 2022 in Northern Pike from the Nayshkootayaow River	158
Figure 29:	Histogram of Total Mercury LS Means in Northern Pike from the Attawapiskat River and Nayshkootayaow River	159
Figure 30:	Total Mercury Additive Model for Northern Pike of Standard Size (650 mm) from 2008 to 2022 in Attawapiskat River	160
Figure 31:	Total Mercury Additive Model for Northern Pike of Standard Size (500 mm) from 2008 to 2022 in Nayshkootayaow River	161
Figure 32:	Linear Regression of Total Mercury at Length in Walleye from the Attawapiskat River and Nayshkootayaow River	162
Figure 33:	Plot of Total Mercury Concentrations Adjusted for Total Length from 2007/08 to 2022 in Walleye from the Attawapiskat River	163
Figure 34:	Plot of Total Mercury Concentrations Adjusted for Total Length from 2007/08 to 2022 in Walleye from the Nayshkootayaow River	164
Figure 35:	Histogram of Total Mercury LS Means in Walleye from the Attawapiskat River and Nayshkootayaow River	165
Figure 36:	Total Mercury Additive Model for Walleye of Standard Size (430 mm) from 2008 to 2022 in Attawapiskat River	166
Figure 37:	Total Mercury Additive Model for Walleye of Standard Size (430 mm) from 2008 to 2022 in Nayshkootayaow River	167
Figure 38:	Plot of Total Mercury Concentrations Adjusted for Total Length from 2007/08 to 2022 in White Sucker from the Attawapiskat River	168
Figure 39:	Plot of Total Mercury Concentrations Adjusted for Total Length from 2007/08 to 2022 in White Sucker from the Nayshkootayaow River	169
Figure 40:	Histogram of Total Mercury LS Means in White Sucker from the Attawapiskat River and Nayshkootayaow River	170
Figure 41:	Linear Regression of Total Mercury at Length in White Sucker from the Attawapiskat River and Nayshkootayaow River	171

DE BEERS

GROUP OF COMPANIES

Figure 42:	Total Mercury Additive Model for White Sucker of Standard Size (350 mm) from 2008 to 2022 in Attawapiskat River	172
Figure 43:	Total Mercury Additive Model for White Sucker of Standard Size (430 mm) from 2008 to 2022 in Nayshkootayaow River	173
Figure 44:	MS-8 Piezometer Locations	174
Figure 45a:	G3 / G4 Filtered Methyl Mercury Trend	175
Figure 45b:	G6 / G7 Filtered Methyl Mercury Trend	176
Figure 46:	Average Annual Sulphate Concentration at selected Monitoring Locations (2021 Data)	177

LIST OF APPENDICES

A	Supplemental Fish Tissue Analysis Data
---	--

DE BEERS

GROUP OF COMPANIES

LIST OF ABBREVIATIONS

ANCOVA	Analysis of Covariance
ANOVA	Analysis of Variance
ATT	Attawapiskat River
BACI	Before-After-Control-Impact
CEQG	Canadian Environmental Quality Guidelines
COM	Community
CONF	Confluence
CPUE	Catch Per Unit Effort
DS	Downstream
DSNAY	Downstream Nayshkootayaow
EEM	Environmental Effects Monitoring
F-Value	Analysis of Variance from Sample Statistics
FF	Far Field
GAM	Generalized Additive Model
Hg	Mercury
HgCON	Mercury Control Station / Northwest Control
LS	Least Mean
MC	Monument Channel
MDL	Method Detection Limit
MeHg	Methyl Mercury
NAY or NAYSH	Nayshkootayaow River
NAY-MOUTH	Mouth of Nayshkootayaow
NEF/F	Northeast Fen Final
NGC	North Granny Creek
ng/L	Nanograms Per Litre
NF	Near Field
PKC	Processed Kimberlite Containment
PPM	Parts Per Million
P-Value	Tabled Probability Threshold
SEF/F	Southeast Fen Final
RPD	Relative Percent Difference
SGC	South Granny Creek
SRB	Sulphate Reducing Bacteria
ST	Station
SWF/F	Southwest Fen Final
T	Tributary
µg/g	Micrograms Per Gram
THg	Total Mercury
US	Upstream
YOY	Young of Year

1.0 INTRODUCTION

This report was prepared by WSP E&I Canada Limited (WSP) (formerly Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited and formerly Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited) on behalf of De Beers Canada Inc. (De Beers), pursuant to the requirements of Conditions 7(5) and 7(6) of Environmental Compliance Approval (ECA) #3960-7Q4K2G. This report is the fifteenth in a series of annual mercury monitoring reports that have been prepared for the Victor Mine to date (AMEC Environment & Infrastructure 2009, 2010, 2011, 2012a, 2013a and 2014a; Amec Foster Wheeler 2015, 2016 and 2017; Wood 2018, 2019, 2020a, 2021, WSP 2022). This fifteenth annual report summarizes Victor Mine site mercury monitoring data collected for the 2022 calendar year related to this permit, and provides summaries of earlier data and trends where appropriate. For consistency and readability from year to year, this report maintains the same general format and much of the same wording as previous annual reports, with updates in data presentation and interpretation where warranted.

A broad-based, rigorous mercury monitoring program was established for the De Beers Victor Mine because of concerns raised during the Ministry of the Environment, Conservation and Parks (MECP) provincial permitting process, regarding the possible influences of mine dewatering activities on muskeg system hydrodynamics and associated mercury chemo-dynamics. In particular, concerns were expressed that should mine dewatering lead to extensive drying out of the local muskeg ecosystem, resultant decomposition of the desiccated peat could lead to increased mercury release to area receiving waters above levels that occur naturally. Mercury is present in area peatlands in the baseline condition as a result of the long-range aerial transport of emissions from natural and anthropogenic sources unrelated to Victor Mine activities. Volcanic activity is the primary natural source for the long-range transport of mercury. Coal-fired power plants in the United States and elsewhere are one of the primary anthropogenic sources for long-range mercury transport.

During the EA, evidence supporting the position that mine dewatering activities were not likely to result in a condition that would substantively increase mercury release rates to area receiving waters was provided; and that if evidence of such substantive release rates was to occur, mitigation measures would be implemented to prevent or reduce the impact to the receiving environment. The Victor Mine mercury monitoring program is designed to test the assumption that mine dewatering is not likely to substantively increase mercury release rates to area receiving waters.

In 2019, the Victor Mine ceased operations and began the decommissioning phase of the Project. Mining operations were terminated on March 6th, 2019 followed by the termination of processing operations on May 28th 2019. Open pit dewatering ceased progressively between February 18th and April 25th, 2019 and the pit has continued to flood since that date.

Data collected up to the end of 2022 continued to support the opinion that mine dewatering is unlikely to result in substantive increases in mercury release to area surface waters due to mine dewatering activities. Localized increases in methyl mercury concentrations have, however, been

noted over the past several years in downstream Granny Creek waters. This increase has been attributed to sulphate releases to the local muskeg environment from mine rock and ore material drainage, and is considered to be unrelated to mine dewatering effects on the muskeg environment.

Sulphate acts as an electron acceptor for sulphate reducing bacteria (SRB). SRB are the primary promoters of mercury methylation in wetland environments, and the stimulation of SRB growth leads to increased rates of methyl mercury production. This effect was first observed during the Victor Mine construction phase in 2006 and 2007, in connection with Central Quarry discharges to the Southwest Fen (AMEC 2009a). It continues to be observed in association with other localized muskeg drainages around the Victor Mine site, where sulphate concentrations are elevated above the background condition.

Laboratory services for the mercury water sampling program were provided by:

- Flett Research Ltd. in Winnipeg (to approximately the end of April 2009);
- Dr. Brian Branfireun's laboratory at the University of Toronto (from approximately May 2009 to September 2010); and
- Subsequently by the Biotron Analytical Services laboratory at the University of Western Ontario. Dr. Branfireun helped establish the Biotron Analytical Services laboratory, which is a CALA-accredited facility, using ISO 17025.

Fish tissue analyses were similarly conducted at Dr. Branfireun's laboratory at the University of Toronto, and subsequently at the Biotron Analytical Services laboratory since 2008. The above laboratories are recognized for their specialty of ultra-trace analyses for mercury.

Method detection limits (MDLs) for water quality analysis have changed over time according to the laboratory conducting the analysis and as a result of changes in detection limit methodology. In some instances, changes to the MDL over time has led to erroneous interpretation of water quality with respect to mercury concentrations. The Flett Research Ltd. Laboratory, used for mercury analysis in the earlier years of sampling and analysis, reported mercury concentration values that were below the subsequently used Biotron Analytical Services laboratory MDLs. To address changes to the MDLs over time and remove any false trends in the data, all historic water quality data presented in the annual mercury reports were adjusted for uniformity to reference detection limits of 0.02 ng/L for methyl mercury and 0.1 ng/L that had been used by the Biotron. However, in 2018 Biotron laboratory changed their methodology for calculating the MDL to comply with the definition and procedure for the *Determination of the Method Detection Limit, Revision 2* published by the United States Environmental Protection Agency (US EPA 2016). This changed the MDL for total mercury and methyl mercury to 0.215 ng/L and 0.023 ng/L. The MDL for total mercury was further changed in 2020 to 0.168 ng/L and changed for methyl mercury in 2022 to 0.029 ng/L. These MDL values have been included in all subsequent annual reports due to the small changes to the MDLs not resulting in erroneous trends.

For readers unfamiliar with these units of measurement:

ng/L represents nanograms per litre of water, which can also be expressed as parts per trillion (ppt) or 1 part of material in 1,000,000,000,000 parts of water.

ug/g represents micrograms per gram of solids (e.g., fish flesh), which can also be expressed as parts per million (ppm) or 1 part of material in 1,000,000 parts of solids.

Water quality results provided in this report are compared with the more stringent Canadian Environmental Quality Guidelines (CEQG) for the protection of aquatic life: set at 26 ng/L for total mercury and 4 ng/L for methyl mercury, both as unfiltered samples. Filtered samples are compared to CEQG in this report for information purposes only. The Provincial Water Quality Objective (PWQO) for the protection of aquatic life is 200 ng/L for total mercury. There is no PWQO for methyl mercury.

In the case of filtered methyl mercury concentrations in receiving waters, comparisons are also made with the bioaccumulation threshold of 0.05 ng/L, applicable to filtered samples, cited by the United States Environmental Protection Agency (US EPA 1997) for the protection of fish-eating wildlife species such as Bald Eagle (*Haliaeetus leucocephalus*) and River Otter (*Lontra canadensis*). This comparison is made for illustrative purposes only at the request of MECP in their comments on the 2016 Annual Mercury Report, as the US EPA value has no official standing in Ontario. The comment specifically asked that De Beers compare methyl mercury concentrations at the site with the US EPA “Mercury Study Report to Congress” (1997), but that the determination of significant impacts is to be defined statistically based upon the trigger values agreed upon by MECP and De Beers in 2007 (AMEC 2008). Fish tissue mercury concentrations for small bodied fish are also compared with the CEQG tissue residual guideline for methyl mercury of 0.033 mg/kg.

For completeness and in response to comments received from various stakeholders on the 2013 and 2014 annual reports (including from the Ministry of the Environment and Climate Change, Environment and Climate Change Canada, Neegan Naynowan Stantec LP on behalf of the Attawapiskat First Nation, and the Wildlands League), this report follows the format and information content of the 2015, 2016, 2017, 2018, 2019, 2020 and 2021 annual reports by:

- Providing more inclusive data sets on both unfiltered and filtered mercury samples for all sample locations, and particularly those of the Granny Creek system;
- Providing long-term summary statistics for peat pore water samples, as well as for samples collected from the Nayshkootayaow and Attawapiskat Rivers;
- Providing a correlation analysis of other factors such as pH, dissolved organic carbon, and iron that can also potentially affect mercury methylation (in ribbed fen systems);
- Determining the effects of flow supplementation from the Attawapiskat River on Granny Creek methyl mercury concentrations; and

- Providing updated information on the analysis of sulphate effects on localized mercury methylation, and measures being considered / developed to better control sulphate releases to the local muskeg environment.

However, flow supplementation for the Granny Creek system was not required in 2022 during the days that mercury sampling occurred on the creeks, so an analysis of flow supplementation effects was not performed.

A number of peer-reviewed scientific papers were published between 2012 and 2019, with respect to the operation and dewatering effects at the Victor Mine site. Papers published prior to issuance of the 2022 annual report are listed in earlier reports, and are not repeated here. With the end of mine operations in early 2019 and the Victor Mine entering into the decommissioning phase, research at the site has slowed and there were no additional publications in 2022.

2.0 REQUIREMENTS

Condition 7(5) of ECA #3960-7Q4K2G states the following:

The Owner shall report the results from the previous calendar year for the mercury monitoring program described [in] Condition 6(8), to the District Manager and the Chief of the Attawapiskat First Nation by June 30 of each year.

The referenced Condition 6(8) states:

The Owner shall carryout a mercury monitoring program that includes, but [is] not necessarily limited to the following:

- (a) A onetime assessment of peat solids to determine mercury content (completed in 2007);*
- (b) An analysis of peat, mineral soil, and bedrock pore water on an ongoing annual basis at the locations identified in Table 2;*
- (c) Monitoring of surface water systems on a monthly or quarterly basis depending on station at the locations identified in Table 3;*
- (d) Monitoring of the well field discharge on a monthly basis and quarterly basis and quarterly sampling of individual wells;*
- (e) Sampling of sportfish at three year intervals and small fish sampling on an annual basis at locations identified in Table 4.*

Condition 7(6) states the following:

The Owner shall report the results from the previous calendar year for the mercury assessments described [in] Condition 6(9), to the District Manager and the Chief of the Attawapiskat First Nation by June 30 of each year.

The referenced Condition 6(9) states:

In conjunction with the mercury management and monitoring program required in Section 6(8), the Owner shall also carryout data analyses, enhanced sampling programs, modelling, risk assessments, and implement effective mitigation measures, as and when required, all in accordance with the March 31, 2008 Report prepared by AMEC and submitted to the District Manager, entitled Trigger Values for Mercury Concentrations and/or Body Burdens in Fish, Condition 6(10) of Environmental Compliance Approval #8700-783LPK, De Beers Canada Inc., Victor Mine. This program may be amended from time to time when approved in writing by the District Manager. As well, water quality data collected as part of the groundwater well field recovery system shall be analyzed statistically to determine the variability and trending over time. Should significant variation occur over time within individual

wells or group of wells then a potential concern will be deemed to exist, requiring further investigation.

3.0 REPORTING – CONDITION 6(8) DATA

3.1 Condition 6(8) (a) – One Time Assessment of Peat Solids

Requirements of this condition were fulfilled in Section 3.1 of the first annual mercury report (2008 Annual Report) and are not repeated here.

3.2 Condition 6(8) (b) – Annual Analysis of Peat, Mineral Soil and Bedrock Pore Water

The reader is referred to earlier annual reports (most recently AMEC (2014b)), for a discussion of early phase sampling program nuances related to Condition 6(8)(b) of ECA #3960-7Q4K2G, and its predecessors. The ECA provides for the annual collection of peat pore water samples from muskeg monitoring program stations (listed in Table 2 of the ECA), as well as from associated mineral soil and bedrock monitoring wells / piezometers. Samples are to be analysed for total and methyl mercury on filtered samples, as per standard groundwater sampling protocols.

All of the observed values for total mercury and methyl mercury have thus far been well below their respective CEQG values of 26 ng/L for total mercury and 4 ng/L for methyl mercury (Tables 1a and 1b, Tables 2a to 2f). In making this comparison it is important to stress that the CEQG values of 26 ng/L for total mercury and 4 ng/L for methyl mercury apply to unfiltered samples for surface water and not to filtered samples from peat, mineral soil and bedrock pore water, which are collectively regarded as groundwater samples. It is standard practice to filter groundwater samples to exclude influences of sediment loading on analytical results, on the premise that sediment particles are not mobile during in-situ groundwater movement. Comparisons to the CEQG, in this case, are therefore for information purposes only.

In their review of the 2014 annual report, Malroz Engineering Incorporated (on behalf of Mushkegowuk Environmental Research Centre) questioned the appropriateness of filtered samples for analysing groundwater samples for mercury (comments from Malroz were received by De Beers in 2016). As per the above, peat pore water and other groundwater samples are considered to be groundwater samples and are sampled accordingly. The samples (total and methyl mercury) are forwarded to the Biotron Analytical Services laboratory for specialist ultra-trace analyses for mercury. This laboratory was set up under the direction of Dr. Brian Branfireun, a specialist in peatland mercury dynamics. Dr. Branfireun recommends sample filtration as a standard protocol because the physical installation and unusual hydraulic pressures in the field when sampling always mobilizes particles and colloids that would not move under natural hydraulic conditions. This is particularly true with peat, where it is impossible to get a clean sample from a peat well or piezometer that does not have some degree of particulate material, no matter how the well is developed. Results from unfiltered samples under such conditions would be highly variable since the peat particles would have relatively high solid phase total and methyl mercury relative to water, given the partition coefficients. Dr. Branfireun has routinely filtered mercury samples collected from peat piezometers, as reported in several peer-reviewed papers, and continues to recommend that filtered samples be collected for all such studies (Branfireun, personal communication April 3, 2017).

Also, the majority of muskeg drainage reports to area creek and river systems through ribbed fen systems. Surface flow through ribbed fens, associated with the muskeg system (MS station monitoring clusters) is analyzed for both unfiltered and filtered total and methyl mercury. The annual reports provide these additional data; and because surface flow through the ribbed fens is surface water, it is appropriate to analyze filtered and unfiltered data for these stations.

Muskeg monitoring program pore water sample results for total and methyl mercury (filtered samples) are provided in Tables 1a and 1b for bedrock and clay substrates, respectively, and in Tables 2a and 2b for peat substrates. Data are provided for the entire period of record from 2007 to 2021. Sampling station locations are shown in Figure 1.

Tables 2c to 2f provide graphical presentations of data from Tables 1a, 1b, 2a and 2b. Starting with the 2016 annual report, the axes on the graphs have been reversed from those used in earlier reports to make it easier for the reader to view overall temporal trends. This was a recommendation made by Malroz in their review of the 2014 annual report. In some instances, it may appear to the reader that not all data are being graphed in the tables, but this is a function of overlapping lines where the data from some of the stations are identical. It should also be noted that the vertical scales on these graphs vary depending on the range of results observed. Statistical analyses of the 2022 data are presented in Section 4.

With the exception of minor and possibly anomalous results for a few samples, total and methyl mercury concentrations observed in 2022 were generally within the range of values observed in previous years for all stations. Occasional spikes in data were observed for some of the stations for both total and methyl mercury in 2022, but there are no temporal patterns demonstrated by the data, with the exception of MS-8-BR(2) which has shown a slight increasing trend since 2013 for total mercury although values remain well under the CEQG for protection of aquatic life. The reason for the apparent increase in total mercury values at the MS-8-BR(2) station is unclear. The trend for MS-8-BR(2) appeared to stabilize in 2022. Where occasional minor increases in total or methyl mercury did occur in overburden and bedrock wells in 2022, compared with earlier values, these tended to occur for the most part in wells that were placed in areas that were influenced by mine activities, but otherwise there are no consistent trends to the data.

For wells (piezometers) developed in the peat (muskeg) horizon there were no evident trends evidenced by the data.

3.3 Condition 6(8) (c) – Analysis of Surface Water Systems

Surface water systems considered in this section include the following:

- Passive fen treatment systems;
- Ribbed fen systems;
- Granny Creek; and the
- Nayshkootayaow and Attawapiskat Rivers.

3.3.1 Passive Fen Treatment Systems

The Southwest Fen (SWF) was used as a passive wetland treatment system for the removal of residual total suspended solids and nutrients from the Central Quarry wastewater discharge during the early phase of mine development in 2006.

The Northeast Fen (NEF) currently provides, or previously provided, a similar function for effluents derived from the following sources:

- Plant site excavation area (completed 2006);
- Crusher excavation area (completed 2006 and 2007);
- Attawapiskat River intake excavation and construction (completed 2007).
- Open pit mine Phase 1 Mine Water Settling Pond (started 2007 and ceased in 2019 with the end of mine dewatering);
- Dry waste landfill runoff and leachate (started autumn of 2008 and ongoing);
- Fully treated sewage treatment plant effluent (started 2006 and completed August 2011); and
- Mine rock stockpile runoff (started in 2010 and continuing).

The Southeast Fen (SEF) and the Northwest Control Fen (HgCON) were set up as control fens (reference points) for the SWF and the NEF (Figure 2). The SEF previously received minor discharges from the shallow South Quarry during extremely brief periods in 2004 and 2005, but was not materially affected by these discharges. It is therefore regarded as non-impacted by mine site discharges or runoff. The HgCON fen has never received effluent discharge from any source.

Sampling from the SWF was discontinued in June 2009 as the C. of A. for this fen treatment system (C. of A. # 3374-6G7J2Y) was revoked on March 3, 2009. Much of the SWF has since been overlaid by stockpiles of mine waste (low grade kimberlite ore and processed kimberlite). There are consequently no data for the SWF beyond May 2009.

The Phase 1 Mine Water Settling Pond discharged surface runoff collected from the pit perimeter area to the NEF from 2008 to 2019, during non-frozen months of the year. The Phase 1 Mine Water Settling Pond also intermittently received well development water. The practice of discharging well development water to the Phase 1 Mine Water Settling Pond was discontinued in 2014.

Total mercury data (unfiltered and filtered) for the passive treatment and control fen systems are presented in Tables 3 and 4. Methyl mercury data (unfiltered and filtered) for these same systems are presented in Tables 5 and 6. All results are within applicable federal (and provincial)

guidelines (objectives) for the protection of aquatic life with the exception of unfiltered methyl mercury samples taken from the NEF in April / May 2009, January 2012, April / May 2013, April 2018, January / April 2019 and April 2020, and from the SWF in January and April of 2008. All filtered methyl mercury values have been below the federal guideline (CEQG) value of 4 ng/L except for a January 2012 and April 2018 value. Winter samples collected from under the ice can show concentrated ion strength due to ice crystallization effects. In very shallow stagnant water as the water freezes, ions tend to be extruded from the ice crystal matrix and concentrated in the remaining water below the ice. In extreme cases where the water freezes to near bottom, severe parameter concentration distortions can occur. All of the January, April and May anomalies referenced above are winter samples. All samples collected in 2022 were within the federal (and provincial) guidelines (objectives) for the protection of aquatic life.

Total mercury concentrations in the three fen systems (NEF, SEF and the HgCON) have been highly variable over the period of record, with the exception of a slight increase observed from 2017 to 2022 in the NEF. Total mercury values at the control site (HgCON) also showed an increase since 2018. If only the dates of common sampling are considered (i.e., May, July and October for 2013 through 2019, April and October for 2020, August in 2021 and July and October in 2022), total mercury concentrations between stations are statistically significant for filtered samples, with the NEF showing lower values (Table 7). This trend is also reflected in the longer-term averages between these three fen systems (Tables 3 and 4).

Results for methyl mercury in 2022 were similar to those of previous years (Tables 5 and 6). While continuing to meet the federal and provincial guidelines and objectives for the protection of aquatic life (with the exception of under-ice methyl mercury samples collected in April / May 2009, January 2012, April / May 2013, April 2018, Jan / April 2019, and April 2020 in the NEF), concentrations of methyl mercury, for both unfiltered and filtered samples, continued to be higher in the NEF compared with the two control fens. The data are sufficiently different that statistical analysis was not required to show that the differences are meaningful.

Methyl mercury concentrations in the NEF are postulated to be elevated as a result of increased sulphate levels, as described in previous annual reports. Sulphate reducing bacteria utilize sulphate as an electron acceptor, and hence higher sulphate levels tend to promote increased rates of conversion from pre-existing total mercury within the peat to methyl mercury (Ullrich et al. 2001; Jeremiason et al. 2006). Sulphate concentrations in the NEF final discharge point during 2022 averaged 89.5 mg/L. This value compares with average sulphate concentrations of 47.9, 32.2, 30.5, 60.0, 84.5, 74.5, 60.2, 72.6, 84.9, 71.9, 73.5, 70.3, 71.3 and 99.9 mg/L were noted in the NEF final discharge point for the years 2008 to 2021, respectively. The optimal sulphate range for mercury methylation is reported to be in the range of 20 to 50 mg/L (Ullrich et al. 2001).

Sulphate concentrations observed for the NEF from 2008 to 2022 indicate that sulphate containing waters are still draining to the NEF, primarily from the mine rock stockpile.

Samples from control fen sites typically contain <1 mg/L of sulphate. The increased mercury methylation rate observed for the NEF is therefore a localized phenomenon, and is not related to mine dewatering effects. As per Sections 5 and 7 of this report, De Beers has conducted further

investigation into methods to better control the release of sulphates to localized muskeg environments including to the NEF. As part of the decommissioning phase of the Project, the mine rock stockpile has been covered with a low permeability cover of overburden and muskeg to reduce the rate of infiltration into the stockpile and reduce sulphate loading into the surrounding environment. The ditch that runs along the southern and eastern borders of the mine rock stockpile will also be redirected away from the NEF to the pit lake as part of closure, which will reduce the sulphate loadings to the NEF. This is anticipated to reduce the methylation of mercury in the NEF.

In the 2014 annual report, it was speculated that a decline in filtered methyl mercury concentrations in the NEF could be a function of one or both of:

- The small stores of inorganic mercury originally present in the upper fen peat layer becoming depleted; or
- The continuous activity of sulphate reducing bacteria has progressed to a point where the associated build-up of sulphide (as opposed to sulphate) has reached a level that is beginning to inhibit mercury methylation.

Both of the above processes can occur simultaneously.

The average filtered methyl mercury concentrations in 2018 and 2019 were notably higher than the average concentration for all years (1.50 ng/L and 1.23 ng/L, respectively). The 2020, 2021 and 2022 concentrations (0.99, 0.55 and 0.85 ng/L respectively) represent a decrease in filtered methyl mercury concentrations as compared to 2018 and 2019 data, but are still elevated relative to earlier years, and the previously observed trend to lower filtered methyl mercury values in the NEF from 2012 to 2017 is no longer apparent.

It still appears, however, that stores of total mercury are being partially depleted in the NEF, as shown in Table 7, which shows a statistically significant trend of reduced total mercury concentrations, for filtered samples, in the NEF compared with the two control fens during the period of 2013 through 2022.

To assist with interpretations of mercury chemo dynamics within the NEF, the MECP (formally the MOECC) in its review of the 2013 annual report, requested that De Beers provide an estimate of flushing rates for this fen. In the 2015 annual report it was estimated that substantial flushing of the NEF would be expected to occur within a period of one calendar year, but in the 2016 annual report the estimated flushing time was more broadly defined as potentially extending from one to three calendar years. Additional details are provided in the earlier annual reports.

3.3.2 Ribbed Fen Systems

The water quality of general site area drainage is monitored on a quarterly basis at four ribbed fen stations located on or near to the Victor Mine site (Stations MS-V1-R, MS-V2-R, MS-V3-R and MS-8-R), as well as at several more remote sites beyond the zone of potential mine

dewatering effects (Figures 1 and 3). Ribbed fen sites were selected for surface water quarterly monitoring because ribbed fens, more than other muskeg types, tend to collect water from surrounding drainages and therefore provide the most representative data on overall site drainage.

Total and methyl mercury sample results for the ribbed fen stations, for the period of 2007 through 2022, are shown in Tables 8a to 8d. The data show concentrations of total and methyl mercury that were all well within applicable federal (and provincial) guidelines (objectives) for the protection of aquatic life, with no obvious increasing or decreasing trends except for a few results of unfiltered total mercury. The samples with elevated unfiltered total mercury include MS-9(2)-R of 100.6 ng/L on March 1, 2022, MS-V(1)-R of 19.63 ng/L on August 18, 2022 and MS-V(2)-R of 10.01 on August 20, 2022. The elevated concentration are attributed to the elevated total suspended solids collected within the samples. As shown in Table 8b, all filtered mercury results were well below the federal guidelines collected on the same date confirming that the unfiltered samples with elevated values are not representative of the mercury within the four ribbed fen stations.

Overall, no appreciable differences were noted between stations that are located within the mine dewatering 2 m drawdown contour (under drained sites) and those stations that are located outside of this contour (remote sites). For example, total mercury values for 2022, for unfiltered and filtered samples, averaged 6.06 and 2.10 ng/L, respectively, for under drained stations, and 6.73 and 2.20 ng/L for remote stations. Corresponding 2022 average values for methyl mercury were 0.25 and 0.07 ng/L for under drained stations, and 0.16 and 0.05 ng/L for remote stations. Some samples collected from under the ice showed relatively higher concentrations, such as for methyl mercury in January 2012 at the MS-8-R and MS-13-R stations. These results should be viewed with caution, as per discussions above regarding ice crystallization concentration effects (Section 3.3.1).

To assist with mercury data interpretation, De Beers also collects samples from these same ribbed fen stations for the analysis of chloride, conductivity, nitrate, dissolved organic carbon (DOC), pH, sulphate, total phosphorus, calcium, iron, magnesium and sodium (Table 9). Previous versions of this table in earlier annual reports included a mix of ribbed fen surface water and peat pore water samples due to confusion over sample labels. The 2017 version of this table, and all subsequent versions, have been amended to include only surface water samples, and has helped to improve data interpretations. This change resulted in the removal of data from 2007 and 2008, and substantial changes to data from the years of 2013 through 2016. As a result of this change, most of the previously identified higher values for chloride, sulphate and sodium, which turned out to be associated with peat pore water samples and not peat surface water samples, have been removed.

Of all the ribbed fen surface water systems assessed, the MS-8-R station exhibits the highest overall values for chloride and sodium (1.6 mg/L and 2.81 mg/L, respectively), but to a lesser extent than previously observed in past years with maximum values of chloride and sodium observed in 2012 (8.9 mg/L and 11.4 mg/L, respectively).

The MECP previously requested that De Beers should consider the potential relationships between key general chemistry parameters and methyl mercury concentrations for the ribbed fen systems, to determine if some of these general chemistry parameters were affecting methyl mercury concentrations. The key parameters of notable interest are pH, DOC, sulphate and iron. Regression analyses were performed on the data presented in Table 9, for the years 2010 through 2022, comparing these key parameters with average filtered methyl mercury concentrations. In performing this analysis, two abnormally elevated methyl mercury concentration values were excluded as outliers, namely the 0.28 ng/L MS-8R value for 2012 and the 0.29 ng/L MS-V(2)-R value in 2019.

The data set relationship of methyl mercury as a function of DOC continued, where a positive r^2 value of 0.18 was calculated, indicating that 18% of the variability in filtered methyl mercury concentrations could be explained by DOC concentrations (Figure 4a). There is support for this relationship in the literature, but the relationships are complicated and at times contradictory (Ullrich et al. 2001). A negative relationship was observed between filtered methyl mercury concentrations and pH (r^2 value of 0.12), where methyl mercury concentrations tended to increase with decreasing pH (Figure 4b). Negative correlations between methyl mercury and pH have been reported in the literature, where methyl mercury solubility has generally been observed to increase with decreasing pH (Ullrich et al. 2001). Decreasing pH would also increase the solubility of inorganic mercury, thereby increasing the supply of mercury available to microorganisms for methylation.

Analysis of potential relationships between filtered methyl mercury concentrations and iron and sulphate showed effectively no relationship, with r^2 values of 0.014 and 0.003, respectively (figures not shown). The lack of a relationship between sulphate and methyl mercury may appear somewhat surprising given the known effects of sulphate on methyl mercury concentrations. The reason for this condition is likely a function of the generally low sulphate values observed for the monitored ribbed fen systems, wherein the majority of sulphate values were <1 mg/L. These sulphate concentrations are generally below levels where enhanced mercury methylation would be expected to occur.

Other parameters were also assessed from Table 9, and of these only calcium showed any relationship with calcium showing an r^2 value of 0.04. The relationship between calcium and methyl mercury was negative and weak. The negative correlation of calcium with methyl mercury is essentially another measure of pH, wherein higher calcium concentrations translate to higher pH values. This reaffirms the inverse relationship between pH and methyl mercury discussed above. All other parameters (conductivity, chloride, total phosphorus and sodium) showed no relationship to filtered methyl mercury concentrations.

3.3.3 Granny Creek System

Total and methyl mercury data for upstream and downstream stations on the Granny Creek system are provided in Tables 10 to 13. Sampling locations are shown in Figure 2.

Data are provided for the five stations on North Granny Creek, three stations on South Granny Creek, the Granny Creek Confluence station, and for the Tributary 5A control station, as per the following:

- N. Granny Creek Upstream of Supplementation (NGC station code G-0);
- N. Granny Creek Upstream (NGC/UP/NWF –G-1);
- N. Granny Creek Downstream NWF (NGC/DN/NWF – G-2);
- N. Granny Creek Downstream NEF (NGC/DN/NEF – G-3);
- N. Granny Creek Downstream (NGC/DN G-4);
- S. Granny Creek Upstream (SGC/UP/SWF – G-5);
- S. Granny Creek Downstream SWF (SGC/DS/SWF – G-6);
- S. Granny Creek Downstream (SGC/DS G-7);
- Granny Creek Confluence (G-8); and
- Tributary 5A.

North Granny Creek stations G-0, G-1, G-2, G-3 and G-4 have been positioned progressively from upstream (G-0) to furthest downstream (G-4). The G-0 station is a new station established in May of 2017 on North Granny Creek upstream of the flow supplementation point (Figure 2). This station was established at the request of the MECF. The G-0 and G-1 stations are positioned upstream of any site mine drainage influences, but are necessarily still within the mine dewatering drawdown cone. The G-1 station is positioned approximately 600 m downstream of the North Granny Creek flow supplementation point. Station G-2 is located within the zone of drainage influence from the mine rock stockpile, and is downstream of the inflow point of intermittent seasonal discharge from the Fine PKC system (i.e., mine tailings), but is upstream of drainage influences from the NEF. Station G-3 is positioned just downstream of the NEF inflow point, and Station G-4 is positioned downstream of all mine related surface drainage influences.

South Granny Creek stations G-5, G-6 and G-7 have been similarly positioned progressively from upstream (G-5) to furthest downstream (G-7). The G-5 station is positioned upstream of any site drainage influences, including being upstream of the South Granny Creek flow supplementation point, but is also necessarily still within the mine dewatering drawdown cone shown in Figure 3. Station G-6 is within the zone of drainage influence from the coarse processed kimberlite and low grade kimberlite stockpiles; and within the zone of influence of drainage from the former SWF, which has been overprinted by Fine PKC system Cell 2 and by the coarse processed kimberlite and low grade kimberlite stockpiles. Station G-7 is positioned downstream of all mine related surface drainage influences.

The Granny Creek Confluence station (G-8) is positioned immediately downstream of the North and South Granny Creek confluence, and in terms of water quality, is expected to represent an average of station G-4 and G-7 effects. The Tributary 5A station is a control station located on a separate drainage system (Tributary 5 to the Nayshkootayaow River) outside of mine dewatering drawdown cone. Tributary 5A was selected as the closest station to the Granny Creek system, which has characteristics most similar to Granny Creek in terms of terrain and watershed area, to provide information on naturally occurring reference values and annual variability of mercury concentrations in the muskeg environment. North and South Granny Creeks each have

watershed areas of approximately 45 km². Tributary 5A has a watershed area of approximately 30 km².

Average total mercury concentrations for the nine Granny Creek stations for 2022 varied from 2.56 to 21.52 ng/L for unfiltered samples, and from 1.56 to 1.87 ng/L for filtered samples (Tables 10a to 10c and 11a to 11c). These values are well below the 26 ng/L federal guideline (CEQG) for the protection of aquatic life for unfiltered samples, except three samples collected at the upstream station on the SGC (G-5). The elevated concentrations are attributed to elevated total suspended solids collected within the samples during the winter months when there is limited water under ice. As shown in Table 11b, all filtered total mercury values are well below the federal guideline value of 26 ng/L, for samples collected on the same date confirming that the unfiltered values are not representative of the mercury within the South Granny Creek upstream location. Filtered sample results for total mercury averaged over all years show a slight decreasing trend in total mercury from upstream stations to downstream stations for both of North and South Granny Creeks (Tables 11a to 11c). The graphs attached to Tables 10 and 11 show that total mercury concentrations can vary substantively throughout the year due to seasonal and hydrological effects. However, there are no long-term trends evident in the data for either North or South Granny Creeks, for stations upstream or downstream of the developed areas of the Victor Mine. The Tributary 5A station has shown consistently lower total mercury concentrations for both unfiltered and filtered samples throughout the period of record dating back to 2009, compared with the Granny Creek system, with the exception of 2014 for stations G7 and G8. Generally lower total mercury concentrations for the Tributary 5A system compared with the Granny Creek system are therefore likely a background condition.

Methyl mercury concentrations for unfiltered and filtered samples, from upstream and downstream South and North Granny Creek stations, are shown in Tables 12a to 12c and 13a to 13c. The values are again variable, depending on seasonal and hydrologic influences. However, unlike total mercury, where there is no pronounced yearly trend between upstream and downstream stations, the trend to marked elevated downstream methyl mercury concentrations in North and South Granny Creeks has been observed since 2010 and continued into 2022 (Table series 12 and 13). In general, average filtered methyl mercury concentrations in the North Granny Creek downstream stations (G3 / G4) have increased from about 0.10 ng/L in 2009 to about 0.25 ng/L in 2022, with both stations showing comparable values. Filtered methyl mercury concentrations for the South Granny Creek downstream stations have increased from about 0.05 ng/L in 2009 to about 0.20 ng/L in 2022 for station G6, and from about 0.10 ng/L to about 0.29 ng/L for station G7, with station G7 showing consistently higher values. The highest values for methyl mercury concentrations generally occurred in the warmer months (June through September) for both North and South Granny Creek stations. Methyl mercury values typically tend to be elevated during the summer months because of increased methylating bacteria activity during these months (Ullrich et al. 2001).

In 2020, SGC/DS/SWF (G-6) and SGC/UP/CONF (G-7) showed the highest methyl mercury concentrations, compared with previous years, with average and maximum filtered methyl mercury values for the G6 station being 0.22 ng/L and 1.06 ng/L, respective; and with average and maximum filtered methyl mercury values for the G7 station being 0.55 ng/L and 2.31 ng/L,

respectively. Although these values are slightly higher from those observed in 2019, they still remain well below the federal guideline (CEQG) of 4 ng/L.

Overall, concentrations of total and methyl mercury, for both unfiltered and filtered samples, decreased across all downstream creek stations in both North and South Granny Creek in 2022 compared with 2021.

In the 2015 annual report, an analysis was undertaken for the NGC/DN/NEF (G3) station that showed that methyl mercury concentrations in the peak summer period were being partially masked by flow supplementation from the Attawapiskat River; and that higher peak summer methyl mercury concentrations were also associated with higher runoff conditions. Flow supplementation to the Granny Creek system is required in accordance with the expired MECP Permit to Take Water #2360-ABRHW7 (and its predecessors) in order to maintain fish habitat within the creek. De Beers is continuing to supplement flows in the Granny Creek system as part of a voluntary abatement now that Permit to Take Water #2360-ABRHW7 has expired. The addition of Attawapiskat River flow supplementation water has served to partially dilute NGC methyl mercury concentrations. If the effect of flows and loadings from the Attawapiskat River and the fine PKC facility are removed, expected concentrations of filtered methyl mercury in the summer months without these contributions can be calculated. However, flow supplementation for the Granny Creek system was not required in 2022 during the days that mercury sampling occurred, so an analysis of flow supplementation effects was not performed. Analysis of flow supplementation in previous years, is shown in Table 14, for further details the reader is referred to the earlier annual reports.

In 2015, data were presented that showed a noticeable decline in summer / fall (July / October) filtered methyl mercury concentrations between Granny Creek stations G-4 and G-7, and the downstream confluence station (G8). In particular, it was noted that since 2011, concentrations at the further downstream Granny Creek confluence station (G-8) had remained stable at substantively lower concentrations compared with further upstream stations G-4 and G-7. It was speculated in the 2015 annual report that mercury demethylation may be occurring between the G-4 / G-7 stations and the G-8 station. Data collected since 2015 have not supported the earlier observed trend, such that there is presently no longer any evidence to support a demethylation trend in downstream Granny Creek.

Further, while elevated methyl mercury concentrations are noted in downstream Granny Creek waters, averaging 3 and 2.5 times background over all years sampled for North Granny Creek (station G-4 compared with Station G-1), for filtered and unfiltered samples, respectively; and 6.6 and 5.5 times background over all years for South Granny Creek (station G-7 compared with Station G-5) for filtered and unfiltered samples, respectively. Overall, these values are still well below the federal guideline (CEQG) of 4 ng/L (Tables 12a, 12b, 13a and 13b).

That stated, methyl mercury concentrations for the Granny Creek system are consistently above the bioaccumulation threshold criterion of 0.05 ng/L for filtered methyl mercury samples put forward by the US EPA (1997) for the protection of fish-eating wildlife species such as Bald Eagle and River Otter. Most avian and mammalian predators in the region that feed on fish are larger

species, such as Bald Eagles, Osprey and River Otters. These predators would tend to seek larger fish types than those that are available in the Granny Creek system and are therefore more apt to feed on fish from the Nayshkootayaow and Attawapiskat Rivers, where changes to methyl mercury have not been observed. Smaller sized predators such as the Belted Kingfisher and Mink could reasonably be expected to feed on fish present in the Granny Creek system.

Downstream increases in Granny Creek methyl mercury appear to be related to sulphate drainages associated with the mine site area and are not considered to be linked to muskeg dewatering effects, as data shows that the peat horizons in the general mine site area continue to be saturated (Wood 2022a). Sulphate drainage effects continue to be localized.

3.3.4 Nayshkootayaow and Attawapiskat Rivers

Water quality results for the Nayshkootayaow and Attawapiskat Rivers are shown in Tables 16a and 16b for total mercury (unfiltered and filtered, respectively), and in Tables 17a and 17b for methyl mercury (unfiltered and filtered, respectively). Sample locations are shown in Figure 2. Graphical data are presented in Figure 5. All values are consistent across the stations, and well below federal guidelines (CEQG). Filtered results for all stations on the Nayshkootayaow and Attawapiskat Rivers were generally comparable and well within the range of historical data for the respective stations. A fifth station (A-5) was added to the Attawapiskat River sampling network in 2013 at a location 500 m downstream of the well field discharge. This addition was a response to commitments made to the MECP following review of the 2012 annual mercury performance report. Data collected for the 500 m downstream station showed total and methyl mercury values that were comparable to other Attawapiskat River stations for 2022 (Tables 16a, 16b, 17a and 17b).

In May of 2017, an additional station was also added on the Nayshkootayaow River downstream of the North Granny Creek and South Granny Creek Confluence. The total mercury and methyl mercury concentrations for the Nayshkootayaow River station located downstream of the Granny Creek inflow were comparable to both the upstream and downstream locations (stations N-2 and N-3, respectively).

In addition to being well below the CEQG of 4 ng/L for the protection of aquatic life, methyl mercury concentrations for all Attawapiskat River stations in 2022 were also at or below the bioaccumulation threshold of 0.05 ng/L for filtered methyl mercury, with the exception of one slightly elevated 0.06 ng/L value for the downstream A5 station in June 2022..

Average filtered methyl mercury values for the Nayshkootayaow River were at or below the US EPA bioaccumulation threshold of 0.05 ng/L during 2022 in all stations, with some values for individual months being slightly above the 0.05 ng/L criterion for the Nayshkootayaow River downstream of the confluence station. The highest average filtered methyl mercury value observed in 2022 was 0.07 ng/L for the Monument Channel control station.

Note, during 2022 N-3 had a few unfiltered total mercury and unfiltered methylmercury samples which were elevated above the range of previous samples collected. These samples also had

high total suspended solids, and as shown in Table 16b and 17b, all filtered mercury values were well below the federal guidelines collect on the same date confirming that these values are not representative of the mercury concentration within N-3.

For the Nayshkootayaow River, it is important to consider observed monitoring data in relation to predictions made during the permitting stage. In 2007, AMEC predicted a worst-case increase in methyl mercury concentrations during operations from a base case of 0.062 ng/L to a new value of 0.162 ng/L; and at closure after 25 years of possible peatland desiccation to as much as 0.65 ng/L. These calculations were based on very conservative assumptions, wherein it was assumed that up to 10% of the muskeg from a 75.6 km² under drained area (as a result of mine dewatering) could potentially decompose over a 25 year period, and release stored mercury; and that 17% of the total mercury released would occur as methyl mercury. The 17% value was based on observations from the SWF that were later determined to have been artificially elevated because of the sulphate release to the SWF associated with dewatering of the Central Quarry in 2006.

The 2007 calculations were updated in the 2008 amended permit application, following a further iteration of the hydrogeological model, during which the area of potential muskeg desiccation was substantively reduced, and the percent of total mercury occurring as methyl mercury was reduced to 2.2%. The resulting predicted changes to the methyl mercury concentration in the Nayshkootayaow River went from 0.062 ng/L to between 0.064 and 0.096 ng/L, depending on the extent of muskeg desiccation. It was considered that a change of this magnitude would be difficult to distinguish from the background condition. No predictions were made in 2008 relative to the mine closure phase.

Monitoring data has thus far shown that no meaningful desiccation of muskeg has occurred (or is expected to occur) within the area of the mine dewatering drawdown cone, and that methyl mercury concentrations in the Nayshkootayaow River have not changed appreciably from the background condition (Tables 16 and 17).

3.4 Condition 6(8) (d) – Annual Analysis of Well Field Discharge

Sampling of the Victor Mine well field discharge had been ongoing since November 2007 and ceased in April of 2019 when well dewatering ceased such that mercury loadings from the well field to the Attawapiskat River are no longer occurring (Wood 2020a). Historical data are presented in the earlier annual reports.

3.5 Condition 6(8)(e) – Sport and Small Fish Mercury Body Burdens

As per Condition 6(6), fish body burdens were investigated in both small-bodied and large-bodied fish (sport) in 2022. Small-bodied fish sampling occurs annually, with the most recent previous sampling period being in 2021 (Wood 2022b). Sportfish sampling occurs at a three-year interval, with the last sampling year being 2019 (Wood 2020a). Fish sampling in 2022 for small-bodied and sportfish occurred 13 to 29 August 2022 under Ministry of Natural Resources and Forestry (MNRF) Licence No.1101614. Species-specific catch data for each location are summarized in

Table 18 to Table 24 for the various sampling techniques used. Both sportfish and small-bodied fish comparisons include surveys of average body burden mercury analysis, comparing experimental locations with control locations.

3.5.1 Methods: Small Fish Mercury Body Burdens

Small-bodied fish were collected in 2022 from the following sampling locations (Figure 6):

- North Granny Creek at a reference location upstream of the flow supplementation discharge point on this creek (NGC-REF) and at a downstream location consistently sampled since 2008 within reaches of potential mine related influence (NGC-EXP);
- South Granny Creek at a reference location upstream of the flow supplementation discharge point on this creek (SGC-REF) and at a downstream location consistently sampled since 2008 within reaches of potential mine related influence (SGC-EXP);
- Tributary 5A (ST-5A), a reference location within a creek that discharges into the Nayshkootayaow River upstream of the Granny Creek confluence;
- Nayshkootayaow River downstream of the Granny Creek confluence (NAY-DS6) and upstream of Tributary 3 (NAY-US3); and from
- Four locations on the Attawapiskat River including; upstream of the mine site (ATT-US); approximately 500 m downstream of the well field discharge (ATT-NF); approximately 2 km downstream of the well field discharge point (ATT-FF); and the north shore of the river, parallel to the discharge location (ATT REF2).

The downstream North Granny Creek and South Granny Creek sampling locations are experimental locations, potentially influenced by the Victor Mine. The North Granny Creek and South Granny Creek reference sampling locations are situated upstream of expected mine influence and the flow supplementation. These two reference sampling locations were added in 2017 to provide a more direct habitat comparison to the Granny Creek exposure areas. Tributary 5A is a small creek similar in overall habitat to the Granny Creek system, which is located outside of the influence of mine related activities and has consistently served as a control site (reference location) for the Granny Creek system during all previous sampling years for the mercury monitoring program.

The Nayshkootayaow River downstream location (NAY-DS6) is situated directly downstream of the confluence with the Granny Creek system and the Nayshkootayaow River and is therefore considered to be within the zone of potential mine influence. The control location for this watercourse is located upstream of Tributary 3 (NAY-US3), which is outside the zone of influence of the mine and is also upstream of any potential confounding effects of the flow supplementation. Statistical comparisons between these locations was not possible in 2022 due to insufficient catch of Northern Pearl Dace (*Margariscus nachtriebi*). Sampling efforts in 2015 provided sufficient sample sizes; however, sampling in 2014 and 2016 through 2021 were also unsuccessful at collecting adequate numbers of Northern Pearl Dace for statistical analyses. The availability of Northern Pearl Dace in the Nayshkootayaow River has fluctuated between years, and thus Trout Perch (*Percopsis omiscomaycus*) have been sampled consistently across years as a substitute sentinel species within this system. Trout Perch were captured in abundance at each of the

Nayshkootayaow River sampling locations in 2022 and allowed for statistical comparisons to data collected in 2012 and 2016 through 2021 (years where Trout Perch were collected in sufficient numbers for statistical analysis). Mottled Sculpin (*Cottus bairdii*) were captured in relatively low abundance ($n < 15$) at the upstream and downstream sampling locations within the Nayshkootayaow River in 2022, yet still allowed for within-year comparative statistical analyses.

Sampling in the Attawapiskat River originally included three sampling locations (ATT-US, ATT-NF and ATT FF), until 2014 when a secondary control location (ATT-REF2) was added. This location was added as part of the 2014 Attawapiskat River Environmental Effects Monitoring (EEM) program to provide further indication of the natural variability inherent in the system (Amec Foster Wheeler 2015b). The ATT-REF2 sampling location is separated from the well field discharge location by an approximate 1,000 meters (m) cross-channel section of river and a chain of mid-channel islands, and is not influenced by the well field discharge (Figure 6). Mottled Sculpin (*Cottus bairdii*) were captured at two of the four Attawapiskat River sampling locations in 2022 (ATT-NF and ATT-REF2); allowing for statistical comparison between an experimental and control sampling location.

The availability of Mottled Sculpin in sufficient sample sizes within the Attawapiskat River has fluctuated but proven to be consistently low. Statistical analyses were successfully completed on this species in 2015 and 2019 with less than the target sample size; however, statistical power was very low. Thus, analyses involving Mottled Sculpin in 2022 were limited to within-year comparisons.

Small-bodied fish were collected from the above locations using boat electrofishing, minnow trapping, minnow fyke nets, seine nets and dip netting (where applicable; Tables 18 to 22). It should be noted that it was the intention to only use a single capture technique as applicable within each waterbody/creek system. This was possible for sampling in the Attawapiskat and Nayshkootayaow River systems (electrofishing). However, the capture of Northern Pearl Dace has consistently shown variable gear-specific catch results within the Granny Creek and Tributary 5A sampling locations. As such, multiple gear types are often needed in the creek systems to target both young-of-the-year (YOY) and older fish and to achieve higher capture success.

Small-bodied fish were analyzed at the Biotron Experimental Climate Change Research Centre laboratory (University of Western Ontario, London Ontario), a Canadian Association for Laboratory Accreditation (CALA) accredited facility. Fish tissue samples were analyzed by Flett Research Ltd. in Winnipeg prior to 2009. A comparative lab method study was conducted in 2013 between these laboratories and the Ministry of the Environment, Conservation and Parks (MECP) contaminants branch laboratory. Results of this inter-laboratory comparison indicated that most samples were analyzed as having similar (within 20%) concentrations for total mercury (AMEC 2014a); therefore, results from the time series were deemed adequate for comparative purposes.

Individual samples were thawed and sub sampled for dorsal muscle on which total mercury analysis was completed. A small sample mass was retained for oven-drying, and a minimum of two wet samples (< 0.5 grams (g) wet weight each) was used for analyses. Remaining tissue, if any, was kept frozen for replicate analyses if required. Samples were analyzed and reported as

wet weight, as per standard methods. Analysis was completed by thermal decomposition and atomic absorption detection using a Milestone DMA 80, as per the requirements of US EPA Method 7473. Calibration and instrument performance were verified through the analysis of fish tissue reference materials.

Statistical Analyses

Statistical analyses were performed using R statistical software version 4.2.3 (R Core Team, 2023). Prior to all analyses, each dataset was assessed for normality and homogeneity of variances using the Shapiro-Wilk and Bartlett tests, respectively, at an alpha equal to 0.05. Data that did not follow a normal distribution was transformed to meet the assumptions of the statistical test.

Length-frequency distributions for the sampling locations were compared using a two-sample Kolmogorov-Smirnov test. Fish descriptors (total length, weight and age) were investigated with separate one-way analysis of variance (ANOVA) tests using the sample locations as independent factors, or a Kruskal Wallis (WA) test if ANOVA test assumptions were violated after transformation. The ANOVA and Kruskal Wallis tests were followed by post-hoc between group tests (Tukey HSD or Dunn Test) to evaluate differences between the sampling locations.

Two-way ANOVA with replication was used to assess the interaction between sampling locations and age-class (YOY or age 1+). Age-class was determined from otolith aging structures. Two way ANOVA is used when there is one measurement variable (total mercury) and two nominal variables (location and age-class); and there is interest in the interaction between the two nominal variables (the effect of one variable may depend on the value of the other). If the interaction term was found to be statistically significant, separate one-way ANOVA tests for each age-class were used to determine differences in total mercury levels between sampling locations.

Analysis of covariance (ANCOVA) was used to test for differences in fish body burden mercury concentrations between sampling locations, while correcting for age and total length. Generalized linear models were used and included a response variable and an interaction term between the sampling locations, and either total length or age. The inclusion of a covariate accounts for greater variability in the model. If assumptions of ANCOVA test were not met (homogeneity of data and regression slopes), a non-parametric ANCOVA was used.

To compare total mercury body burden levels between site and year, a before-after-control-impact (BACI) design was used with an ANCOVA, incorporating total length as the covariate. Interactions between year and location were analyzed for significance to determine if an effect was evident. The 2008 data was not suitable as a baseline period for the BACI design as sample sizes were too small for SGC and NGC. Therefore, the sampling year of 2009 was used as a baseline and compared to the 2022 dataset to assess potential impacts of the Victor Mine on fish mercury concentrations. For the Nayshkootayaow River, 2012 was used to represent baseline conditions, as Trout Perch were consistently captured in sufficient abundance from 2012 to present. It should be noted that, for BACI analyses, all small-body datasets were not distributed normally and did

not have parallel slopes due to the inclusion of multiple years of data from both control and impact sites, and therefore did not meet all assumptions of ANCOVA.

Body burden mercury values from 2008 to 2022 were plotted to observe any trends between locations over time. A line graph of average ($\pm$ standard error (SE)) total mercury values was developed for Northern Pearl Dace, which included fish of all ages collected within each sampling year. Years prior to 2013 did not have known age data (otolith data were not collected). For these years, length-frequency histograms could not be generated for the historical Northern Pearl Dace data, to be able to classify fish as YOY or age 1+, because sample sizes were often too small at each sampling locations to develop a clear length cutoff between age-classes. For this reason, graphs generated for this species were inclusive of all fish captured regardless of age.

Line graphs were developed separately for YOY and age 1+ age classes of Trout Perch from the Attawapiskat River. Years 2011 and 2013 to 2022 were classified based on known ages from otolith aging structures. Fish from 2008 were classified based on the length-frequency distribution developed for this species as a part of the Attawapiskat River Environmental Effects Monitoring report (fish <45 millimetres (mm) classified as YOY) (AMEC 2009b). Fish from 2009, 2010 and 2012 were classified as YOY or age 1+ based on length frequency distributions generated in 2014 from historical total length data, as part of the 2014 Mercury Performance Monitoring Annual Report (Amec Foster Wheeler 2015a). These fish were <45 mm in 2009, <55 mm in 2010 and <50 mm in 2012.

Trends in mercury concentrations over time were assessed using a generalized additive model (GAM) for small-bodied fish to complement the above analyses. A cubic regression spline smoother (with three nodes) was applied to values of total mercury, sampling year and fish total length. A separate trend analysis was created for each species and each sampling location. Time series data are provided assuming a standardized size of fish (60 mm total length for Northern Pearl Dace, and 50 mm for Trout Perch) including 95% confidence intervals. The GAM trend lines represent mercury concentration for the standard size of fish for each species. The specific data points provided represent the raw mercury concentration distribution for a given year, uncorrected for size.

Total mercury concentrations in small-bodied fish were compared to the following guidelines or advisories (where applicable): Canadian Council of Ministers of the Environment (CCME) advisory for the protection of wildlife consumers of aquatic biota (0.033 mg/kg), and the MECP Standards Development Branch (SDB) working guideline for the protection of fish-eating wildlife (ENVIRON 2008; 0.2 mg/kg).

In sampling years 2017, 2018 and 2019, the 1+ age class in Trout Perch from the Attawapiskat River did not follow a normal distribution due to the distinct presence of two clear age cohorts (Age 1 and Age 2+), and thus did not meet the assumptions of ANOVA and ANCOVA (normality of data and homogeneity of variances; Wood 2018; 2019; 2020a). To meet assumptions of statistical tests, the age-classes assessed for Trout Perch in the Attawapiskat River from 2017 to 2019 were YOY and age 1. However, in sampling years 2020, 2021, and 2022, the data was

distributed normally among the age classes to allow for standard comparison of YOY and age 1+ age classes.

3.5.2 Results: Small Fish Body Burdens (Granny Creek System)

Northern Pearl Dace

Univariate statistics for the 2022 Northern Pearl Dace data from North Granny Creek, South Granny Creek and control Tributary 5A are summarized in Appendix A, Table A-1 and results of ANOVA and Kruskal-Wallis analysis for fish community descriptors are summarized in Appendix A, Table A 2. Results of ANOVA for total mercury, and ANCOVA for total mercury adjusted for total length and age are summarized in Tables 25 and 26.

Samples sizes of both YOY and age 1+ age-classes were sufficient to allow for statistical analyses within each age-class and between all sampling locations in 2022 (Appendix A, Table A-1).

Overall length frequency distributions for Northern Pearl Dace were significantly different between the exposed sampling locations SGC-EXP and NCG-EXP when compared to their reference sampling locations SGC-REF and NGC-REF and when compared to control Tributary ST-5A (Kolmogorov-Smirnov (KS), $p < 0.05$; Figure A-1).

The YOY Northern Pearl Dace from NGC-EXP were significantly larger (total length and weight) in 2022 when compared to NGC-REF and ST-5A (ANOVA, $p < 0.05$; Appendix A, Tables A-1 and A-2). Fish from SGC-EXP were also significantly larger than those collected from ST-5A. Similarly, age 1+ Northern Pearl Dace from both NGC EXP and SGC-EXP were larger (total length and weight) than those from ST-5A. Fish collected from NGC EXP were also larger than those from NGC-REF, whereas fish from SGC-REF were similar in overall size when compared to those collected from SGC-EXP (ANOVA, $p < 0.05$; Appendix A, Tables A-1 and A-2). Northern Pearl Dace age was generally similar across sampling locations in 2022, with the exception of fish from SGC EXP being older than those from ST-5A (KW, $p < 0.05$).

Two-way ANOVA indicated that there was an effect of sampling location and age-class (YOY versus age 1+) on mercury concentrations in Northern Pearl Dace (ANOVA, $p < 0.05$; Table 25). One-way ANOVA on YOY Northern Pearl Dace indicated a significant difference in total mercury concentrations between sampling location in 2022 (ANOVA, $p < 0.05$). Average total mercury for YOY Northern Pearl Dace was significantly higher at both exposure locations (NGC-EXP and SGC-REF) in comparison to control tributary 5A, and average total mercury at NGC-EXP was significantly higher than that from fish collected from its corresponding reference location (NGC-REF; Appendix A, Table A-1 and Figure 7). Similarly, one-way ANOVA on age 1+ Northern Pearl Dace indicated a significant difference in total mercury concentrations between sampling locations in 2022 (ANOVA, $p < 0.05$). Average total mercury for age 1+ Northern Pearl Dace was significantly higher at both exposure locations (NGC EXP and SGC-REF) in comparison to control tributary 5A. Both exposure locations, NGC-EXP and SGC-EXP, also had significantly higher total mercury concentrations in comparison to their corresponding reference locations, NGC REF and SGC-REF (Appendix A, Table A-1 and Figure 7).

Additionally, the LS means adjusted for total length in YOY and adjusted for total length and age in age 1+ Northern Pearl Dace indicated the exact same trends, with NGC-EXP and SGC-EXP having significantly higher total mercury concentrations when compared to their corresponding reference locations and control tributary 5A (ANCOVA, $p < 0.05$; Table 26 and Figure 8).

The BACI design using ANCOVA indicated a statistically significant interaction between sampling year and exposure sampling locations for total mercury concentrations in Northern Pearl Dace from the Granny Creek System from 2009 to 2023 (baseline to present) (Table 27 and Figure 9 and 10). Total mercury concentrations in Northern Pearl Dace increased between 2009 and 2022 for fish from NGC-EXP and SGC-EXP when corrected for total length, whereas total mercury concentrations at ST-5A remained relatively constant over time (Figure 9). As well, NGC-EXP and ST-5 total mercury concentrations in fish tissue in 2009 were statistically similar.

Post-hoc pairwise comparison showed a statistically significant increase between 2009 and 2022 for NGC-EXP and SGC-EXP but no significant increase for ST-5A (ANCOVA, $p < 0.05$; Table 27 and Figure 9). Mercury concentrations in fish tissue between 2021 and 2022 showed a slight increase at NGC-EXP yet showed a decrease at SGC-EXP (Figure 10). Mercury concentrations at NGC-REF and ST-5A remained relatively constant between 2021 and 2022, whereas mercury concentrations at SGC-REF decreased slightly.

A comparison of average mercury concentrations at NGC-EXP, SGC-EXP and ST-5A, uncorrected for age or length, showed variability between 2008 and 2022, with increases and decreases occurring year to year (Appendix A, Figure A-2). Regardless of the variability in mercury concentrations over time, the line plot shows an overall trend of increase from 2008 to 2022 at both exposure locations, with relative stability at ST-5A. The reference locations of SGC and NGC showed variability over time from 2017 to 2022, but no overall trend of increase is apparent.

This was further verified by the GAM model (standardized for total length, 60 mm Northern Pearl Dace), which was statistically significant when including both year and total length. When smoothed for total length and year, the trend analysis indicates an overall increase in total mercury concentrations over time at SGC-EXP and NGC-EXP and relative stability in concentrations at ST 5A, SGC-REF and NGC-REF (Figure 11).

Similar to previous years, all but six total mercury concentration values for YOY and age 1+ Northern Pearl Dace from the Granny Creek system and Tributary 5A were greater than the CCME advisory for the protection of wildlife consumers of aquatic biota of 0.033 mg/kg (CCME 2003) in 2022. All six of the fish with total mercury concentrations less than this advisory were collected from ST-5A and NGC-REF. Northern Pearl Dace total mercury concentrations were also compared to the MECP SDB working guideline for the protection of fish eating wildlife of 0.2 mg/kg (ENVIRON 2008). Mean total mercury concentrations in YOY Northern Pearl Dace exceeded this guideline at NGC-EXP and SGC-EXP. As in previous years, age 1+ Northern Pearl Dace mean total mercury concentrations were equal to or exceeded this guideline at all sample locations, except for ST-5A and SGC-REF.

The data for the Granny Creek system continue to show that mercury concentrations in fish tissue are elevated at both North Granny Creek and South Granny Creek exposure locations above that of the control tributary 5A and their corresponding creek reference locations. There is evident variability in mercury trends within sampling years and across years, yet the overall trend of increase overtime has remained the same. Total mercury concentrations adjusted for total length during 2009 are significantly less than those observed in 2022 at NGC EXP and SGC-EXP whereas concentrations at ST-5A have remained relatively consistent between baseline and present. Similarly, total mercury concentrations at NGC-REF and SGC-REF have been lower than NGC-EXP and SGC-EXP since sampling at these locations began in 2017.

3.5.3 Results: Small Fish Body Burdens (Attawapiskat River)

Trout Perch

Univariate statistics for the 2022 Trout Perch from the Attawapiskat River are summarized in Appendix A, Table A-3 and results of ANOVA and Kruskal-Wallis analysis for fish community descriptors are summarized in Appendix A, Table A 4. Results of ANOVA for total mercury, and ANCOVA for total mercury adjusted for total length and age are summarized in Tables 28 and 29.

Overall length-frequency distributions for Trout Perch were significantly different between ATT-US and ATT NF and ATT-FF (Kolmogorov-Smirnov (KS), $p < 0.05$); however, distributions between the secondary reference location and both exposure locations were similar (Kolmogorov-Smirnov (KS), $p < 0.05$; Appendix A, Figure A-3).

YOY Trout Perch collected from ATT-REF2 were larger (total length and weight), on average, than fish collected from all other sampling locations in 2022. Fish from ATT-FF were larger, on average, than those captured at ATT-US (ANOVA, $p < 0.05$; Appendix A, Tables A-3 and A-4). Similarly in age 1+ Trout Perch, those fish collected from ATT-REF2 were longer than those from ATT-FF and heavier than those from ATT-NF. Age 1+ Trout Perch did not differ significantly in age (KW, $p > 0.05$; Appendix A, Tables A-3 and A-4) between sampling locations in 2022.

Two-way ANOVA indicated that there was an effect of sampling location on mercury concentrations in Trout Perch from the Attawapiskat River sampling locations (ANOVA, $p < 0.05$; Table 28).

One-way ANOVA indicated significantly higher total mercury concentrations for YOY Trout Perch at ATT-REF2 when compared to ATT-NF, ATT-FF and ATT-US. Average mercury concentrations at ATT-US and ATT-NF were also significantly greater than that at ATT-FF in 2022 (ANOVA, $p < 0.05$; Table 28 and Figure 12; Appendix A, Table A-3). The same results for YOY Trout Perch were observed when comparing LS means (adjusted for total length) using ANCOVA; total mercury concentrations were greater at ATT-REF2 in comparison to the other three sampling locations (ANCOVA, $p < 0.05$; Table 29 and Figure 13). One-way ANOVA for age 1+ Trout Perch indicated significantly higher total mercury concentrations at ATT-REF2 when compared to ATT-FF and ATT US; total mercury concentrations were also significantly higher at ATT-NF when compared to the reference locations ATT-US (ANOVA, $p < 0.05$; Table 28 and Figure 12; Appendix

A, Table A-3). When adjusted for total length and age, the LS means of total mercury were also significantly greater at ATT-REF2 when compared to ATT-FF and ATT-US; the LS mean of total mercury was greater at ATT-NF in comparison to the reference location ATT-US only when adjusted for age (ANCOVA, $p > 0.05$; Table 29 and Figure 13).

The BACI design indicated a statistically significant interaction between year and sampling location for mercury concentrations in Trout Perch from the Attawapiskat River system from 2009 to 2022 (Table 30). There was a significant decrease in total mercury concentration in Trout Perch from ATT-NF from 2009 to 2022 (ANCOVA $p < 0.05$; Table 30 and Figure 14). There was also a slight decrease at ATT-FF and an increase at ATT-US from baseline to present, but these changes over time were not statistically significant. Slight increases in total mercury, adjusted for total length, were observed between sampling years 2021 and 2022 at sampling locations ATT-REF2, ATT-US and ATT-FF, yet a slight decrease at the near-field exposure location ATT-NF (Figure 15).

Total mercury concentrations in Trout Perch (uncorrected for length) from the Attawapiskat River showed variability from year to year within both age classes (Appendix A, Figure A-4); the increases and decreases in total mercury concentrations between years were typically displayed at all sampling locations in parallel among years, and thus appear to represent natural variability within the Attawapiskat River system.

Standardizing for a total length of 50 mm, the GAM model for Trout Perch from 2008 to 2022 shows relatively stable total mercury concentrations at ATT US and ATT-FF and a slight increase in concentrations at ATT-REF2 and ATT-NF (Figure 16). ATT-REF2 was not added as a sampling location until 2014; with less sampling years and data points, the degree of change is magnified in the GAM plot.

All total mercury concentrations in fish tissue from ATT-NF, ATT-FF, ATT-US and ATT-REF2 in 2022 were greater than the CCME advisory for the protection of wildlife consumers of aquatic biota of 0.033 mg/kg (CCME 2003). However, all fish captured in the Attawapiskat River had concentrations less than the MECP SDB working guideline for the protection of fish-eating wildlife of 0.2 mg/kg (ENVIRON 2008).

The Attawapiskat River data indicates a slight decrease in mercury bioaccumulation within the exposure locations since baseline, with the steepest decrease at the near-field exposure location. These results parallel those observed in 2021, where decreases in total mercury concentrations were also observed within the exposure locations. Results in 2020 indicated increased levels of mercury bioaccumulation within the exposure locations, more significantly at ATT-NF, yet results from 2019 showed all Attawapiskat River sampling locations had similar mercury concentrations. Overall, the alternating results between years demonstrate the variability of mercury concentrations within the Attawapiskat River system.

Mottled Sculpin

Sculpin are benthic foragers and therefore inhabit a lower level of the trophic system than Trout Perch. They exhibit an affinity for their localized habitat and therefore may be considered to provide a more suitable indication of localized effects than other fish species that are prone to greater movements diurnally and otherwise. However, the only sampling years where Mottled Sculpin were captured in sufficient numbers within the Attawapiskat River to be included as part of the mercury monitoring program were 2015 and 2019. The availability of fish at the Attawapiskat River sampling locations also varied between years, with captures in 2022 at ATT-REF2, ATT-NF and ATT-FF; although the sample size at ATT-FF was too small to be included in statistical analyses.

Univariate statistics for the 2022 Mottled Sculpin data from the Attawapiskat River sampling locations where sufficient samples were collected (ATT-NF and ATT-REF2) are summarized in Appendix A, Table A-6 and results of ANOVA and Kruskal-Wallis analysis for fish community descriptors are summarized in Appendix A, Table A-7. Results of ANOVA for total mercury, and ANCOVA for total mercury adjusted for total length and age are summarized in Appendix A, Table A-7 and Tables 33, respectively. YOY Mottled Sculpin were not collected in sufficient abundance to allow for statistical analysis in 2022.

Overall length-frequency distributions for Mottled Sculpin were significantly different between the exposed sampling location (ATT-NF) when compared to the reference sampling location (ATT-REF2; Kolmogorov Smirnov (KS), $p < 0.05$; Appendix A, Figure A-6). Age 1+ Mottled Sculpin at ATT-NF and ATT REF2 were similar in body size (total length and weight) and age (KW, $p > 0.05$) in 2022 (ANOVA, $p > 0.05$; Appendix A, Tables A-6 and A-7).

One-way ANOVA on age 1+ Mottled Sculpin indicated a significant difference in total mercury concentrations between sampling locations in 2022 (ANOVA, $p < 0.05$; Appendix A, Tables A-6 and A-7, Figure 22). Values of average total mercury were higher at ATT-REF2 when compared to ATT-NF. However, the LS means for total mercury indicated that, when adjusted for total length and age, total mercury values in age 1+ Mottled Sculpin were not significantly different between the two sampling locations (ANCOVA, $p > 0.05$; Table 33 and Figure 23). Similarly, results from 2019 also indicated that mercury concentrations were higher at ATT-REF2 when compared to the exposure locations (Wood 2020a).

All but one total mercury concentration for Mottled Sculpin from the Attawapiskat River sampling locations were greater than the CCME advisory for the protection of wildlife consumers of aquatic biota of 0.033 mg/kg (CCME 2003) in 2022. However, all total mercury concentrations in 2022 were less than the MECP SDB working guideline for the protection of fish-eating wildlife of 0.2 mg/kg (ENVIRON 2008).

Although data for Mottled Sculpin is limited, results from the available data within the Attawapiskat River does not indicate an impact of mercury bioaccumulation within the exposure locations. Results indicate relatively consistent mercury body burden levels in small-bodied fish and statistical results between years have not identified a consistent trend of increase at an exposure location over time.

3.5.4 Results: Small Fish Body Burdens (Nayshkootayaow River)

Trout Perch

YOY Trout Perch were not captured in sufficient numbers within the Nayshkootayaow River in 2022 to allow for statistical analysis. Univariate statistics for the 2022 age 1+ Trout Perch from the Nayshkootayaow River are summarized in Appendix A, Table A-3 and results of ANOVA and Kruskal-Wallis analysis for fish community descriptors and total mercury concentration are summarized in Appendix A, Table A 5. Results of ANCOVA for total mercury adjusted for total length and age are summarized in Table 31.

Overall length-frequency distributions were similar between NAY-US3 and NAY-DS6 for age 1+ Trout Perch from the Nayshkootayaow River in 2022 (Kolmogorov-Smirnov (KS), $p > 0.05$; Appendix A, Figure A-5).

Age 1+ Trout Perch at NAY-US3 were larger overall (total length and weight) and older when compared to those captured at NAY-DS6 (ANOVA, $p < 0.05$, Appendix A, Tables A-3 and A-5; KW, $p < 0.05$). Despite fish being larger at NAY-US3, total mercury concentrations were greater, on average, at NAY-DS6 in 2022 (ANOVA, $p < 0.05$, Appendix A, Tables A-3 and A-5, Figure 22). Similarly, the LS mean adjusted for total length and age indicated a statistically higher mercury concentration at NAY-DS6 (Table 31 and Figure 23).

The BACI design indicated a statistically significant interaction between year and sampling location for body burden concentrations in Trout Perch from the Nayshkootayaow River system from 2012 to 2021 (ANCOVA, $p < 0.05$, Table 32). Post-hoc comparisons showed significant increases in mercury concentrations at both sampling locations from 2012 to 2022, with a greater trajectory of increase at NAY-DS6 (ANCOVA, $p < 0.05$, Table 32 and Figure 19). There were also increases in total mercury, adjusted for total length, between sampling years 2021 and 2022, at both NAY-US3 and NAY-DS6 (Figure 20).

Average mercury concentrations (uncorrected for length) in Trout Perch at NAY-DS6 showed a decreasing trend from 2008 to 2012, followed by an overall increase from 2012 to 2022. Mercury concentrations in Trout Perch from NAY-US3 showed variability between years, yet an overall stability from baseline to present. (Appendix A, Figure A-4). Similar to the other species and sample locations in this study, there was quite a bit of variability observed from year to year.

The GAM for total mercury in Trout Perch sampled from NAY-DS6, standardizing for a total length of 50 mm, illustrates the increase in body burden levels for the species from 2012 to 2022 with levels prior to this remaining below values initially observed during baseline studies (2008 and 2009; Figure 21). The GAM for the NAY-US3, indicates a slight increase over time from 2016 to present (Figure 20).

All age 1+ Trout Perch total mercury values from both Nayshkootayaow River sampling locations were greater than the CCME advisory for the protection of wildlife consumers of aquatic biota of 0.033 mg/kg (CCME 2003) However, all mercury concentrations in 2022 were less than the MECP

SDB working guideline for the protection of fish-eating wildlife of 0.2 mg/kg (ENVIRON 2008), with the exception of one fish from NAY-DS6.

Mercury concentrations at sampling locations of the Nayshkootayaow River have increased over time at both the upstream and downstream locations of the river, but in 2022 the increase at NAY-DS6 was steeper than that at NAY-US3. In two successive sampling years (2016 and 2017), small-bodied fish showed a higher tissue mercury concentration at the downstream impact location compared to the upstream control location, yet in 2018 and 2019, mercury concentrations were similar between the two locations. In 2020 and 2021, total mercury concentrations were similar between sampling locations, yet in 2022, concentrations at NAY-DS6 were higher than NAY-US3. Therefore, trends of increase are apparent in both the upstream and downstream sampling locations; as well, the data shows variability among years and does not show a consistent pattern of increasing mercury concentrations in the downstream location temporally.

Mottled Sculpin

The YOY Mottled Sculpin were not captured in sufficient numbers within the Nayshkootayaow River in 2022 to allow for statistical analysis; age 1+ fish were captured, but in lower than desired numbers (n=10 and n=11 at NAY-DS6 and NAY-US3, respectively). Analyses were run for age 1+ Mottled Sculpin, although power of ANOVA tests were less than the desired level of 0.90 due to the reduced sample size. Mottled Sculpin have not been captured in the Nayshkootayaow River in the previous cycles of the mercury monitoring program, and thus between year analyses for this species within this waterbody could not be completed. Univariate statistics for the 2022 age 1+ Mottled Sculpin from the Nayshkootayaow River are summarized in Appendix A, Table A 6 and results of ANOVA and Kruskal-Wallis analysis for fish community descriptors and total mercury concentration are summarized in Appendix A, Table A 7. Results of ANCOVA for total mercury adjusted for total length and age are summarized in Table 33.

Overall length-frequency distributions for Mottled Sculpin were significantly different between the sampling locations NAY-DS6 and NAY-US3 (Kolmogorov-Smirnov (KS), $p < 0.05$; Appendix A, Figure A-6). Age 1+ Mottled Sculpin were similar in body size (total length and weight) and age (KW, $p > 0.05$) in 2022 (ANOVA, $p > 0.05$; Appendix A, Tables A-6 and A-7).

One-way ANOVA on age 1+ Mottled Sculpin indicated a significant difference in total mercury concentrations between sampling locations in 2022 (ANOVA, $p < 0.05$; Appendix A, Tables A-6 and A-7, Figure 22). Values of average total mercury were higher at NAY-DS6 when compared to NAY-US3. Similarly, the LS means for total mercury adjusted for total length and age indicated that total mercury concentrations in age 1+ Mottled Sculpin were significantly greater at NAY-DS6 when compared to NAY-US3 (ANCOVA, $p > 0.05$; Table 33 and Figure 23).

All but one total mercury concentration for Mottled Sculpin from the Nayshkootayaow River sampling locations were greater than the CCME advisory for the protection of wildlife consumers of aquatic biota of 0.033 mg/kg (CCME 2003) in 2022. However, all total mercury concentrations in 2022 were less than the MECP SDB working guideline for the protection of fish-eating wildlife of 0.2 mg/kg (ENVIRON 2008).

Although data for Mottled Sculpin is limited, especially within the Nayshkootayow River, values of total mercury were greater at the downstream sampling location in comparison to the upstream sampling location. Mottled Sculpin data within this waterbody will need to be collected, as available, in future cycles within this waterbody to continue to monitor for trends.

3.5.5 Methods: Sport Fish Mercury Body Burdens

Sport fish were collected from five sampling locations in 2022 (Figure 6):

- Three locations on the Attawapiskat River (a reference location located approximately 9 km upstream of the mine site, ATT-US; a near-field receiving water location located with 500 m downstream of the Victor Mine well-field discharge, ATT-NF); and a far-field receiving water location located downstream of the mouth of the Nayshkootayaow River (ATT-DSNAY), which was added as an additional sport fish sampling location in 2022.
- The main-stem of the Nayshkootayaow (NAY-MS); and
- Monument Channel (MC), a control location for the Nayshkootayaow River.

Fish were successfully collected from the above locations using boat electrofishing, angling and gill netting (Tables 22, 23 and 24, respectively). The C of A requires that a minimum of 30 fish of each the following species be captured from each sampling location, but despite strong effort, sample sizes of Northern Pike (*Esox lucius*) ranged from 6 to 24, Walleye (*Sander vitreus*) ranged from 13 to 32 and White Sucker (*Catostomus commersonii*) ranged from 8 to 32 samples per location. Although capture numbers at some sampling locations did not meet the target, sample sizes of Northern Pike, Walleye and White Sucker allowed for comparisons between all five sampling locations.

Large-bodied fish tissue fillets and plugs were analyzed at the Biotron laboratory, a CALA accredited facility. Total mercury was analyzed on a Milestone Direct Mercury Analyzer (DMA-80). The DMA-80 instrument used thermal decomposition, catalytic conversion, gold amalgamation, and atomic absorption spectrophotometry following US EPA 7473 and required no sample pre-treatment. This protocol is consistent with the analysis conducted by this laboratory on large-bodied fish species collected as part of this program since 2010.

During the 2022 sport fish survey, tissue plugs were collected to allow for non-lethal sampling and a reduced environmental impact as per previous program; however, dorsal epaxial muscle fillets were removed from incidental mortalities. The methods of tissue plug extraction was validated in a comparative lab method study that included the MECP and Flett Laboratories, completed as part of the 2013 Mercury Performance Monitoring Report (AMEC 2014b), which indicated tissue plugs and epaxial muscle fillets provided comparable estimates of mercury concentrations.

Statistical Analyses

Statistical analyses were performed using R statistical software version 4.2.3 (R Core Team, 2023). Prior to all analyses, each dataset was assessed for normality and homogeneity of variances using the Shapiro-Wilk and Bartlett test, respectively, at an alpha equal to 0.05. Data

that did not follow a normal distribution was transformed to meet the assumptions of the statistical test.

To compare total mercury body burden levels between site and year, a BACI design was used with an ANCOVA, incorporating total length as a covariate. The inclusion of a covariate accounts for greater amounts of variability in the model. Interactions between year and location were analyzed for significance to determine if an effect was evident. The period of 2007/08 (baseline condition) was compared to the present dataset (2022) to assess potential impacts of the Victor Mine on fish mercury concentrations. This analysis was repeated to compare 2019 and 2022 data, as they were successive cycles of sport fish collection. Body burden mercury values from 2007/08 to 2022 were plotted to observe any trends between locations over time, and least square adjusted means (total mercury adjusted for total length) were plotted for all sites for 2022.

Total mercury concentrations in large-bodied fish were compared to the following guidelines/advisories (where applicable): Canadian Council of Ministers of the Environment (CCME) advisory for the protection of wildlife consumers of aquatic biota (0.033 mg/kg), MECP Standards Development Branch (SDB) working guideline for the protection of fish-eating wildlife (0.2 mg/kg). Tissue mercury concentrations were also compared to the MECP consumption advisories. For women of childbearing age and children under 15 the advisory changes from 32 to 16 meals per month at a mercury concentration of 0.06 mg/kg with total restriction (no meals) recommended at mercury concentration greater than 0.5 mg/kg. Advisory for the general population changes from 32 to 16 meals per month at a mercury concentration of 0.15 mg/kg with complete restriction recommended at levels greater than 1.8 mg/kg (MECP). It should be noted that a meal is considered 227 grams (g; 8 ounces) of fish. For example, two meals of 227 g of 30 cm Brook Trout are equivalent to approximately 6 fillets.

Trends in total mercury levels over time were assessed using a GAM to compliment the above analyses. A GAM is a useful approach that can deal with non-linear data and provide statistical tests to determine if change over time has occurred. In this case, a cubic regression spline smoother (with three nodes) was applied to values of total mercury and year of collection. Due to the tendency of body burden mercury concentrations to increase in parallel with fish size, and the difficulty in obtaining similar length fish across all years, fish length was also added to the model. A separate trend analysis was created for each site for Northern Pike, Walleye, and White Sucker. Time series data are provided assuming a standardized size of fish (including 95% confidence intervals); Northern Pike were standardized at 650 mm in the Attawapiskat River and 500 mm in the Nayshkootayaow River, Walleye were standardized at 430 mm in the Attawapiskat and Nayshkootayaow Rivers, and White Sucker were standardized at 350 mm in the Attawapiskat and Nayshkootayaow Rivers. These standard sizes were chosen based on the average size of fish across the years of sampling from baseline to present (± 10 mm). GAM trend lines represent mercury concentration for the standard size of fish for each species. The specific data points provided represent the raw mercury concentration distribution for a given year, not corrected for size.

3.5.6 Results: Sport Fish Mercury Body Burdens

Northern Pike

Univariate statistics for the 2022 Northern Pike data from the Attawapiskat River sampling locations, the Nayshkootayaow River and Monument Channel are summarized in Appendix A, Table A-8. Results of the BACI design with LS means are displayed in Table 34 and Figures 27 to 29.

Overall length-frequency distributions for Northern Pike were significantly different between the sampling locations in the Attawapiskat River, and the sampling locations in the Nayshkootayaow River (Kolmogorov Smirnov (KS), $p < 0.05$; Appendix A, Figure A-7).

The BACI design indicated a significant interaction between year and sampling locations for total mercury concentration (adjusted for total length) in Northern Pike from the Attawapiskat River from 2007/08 to 2022 (baseline to present); a significant overall increase in total mercury concentration was observed between 2007/08 and 2022 at ATT-NF, but no significant change in concentration was present at ATT-US over time. The LS mean of total mercury at ATT-DSNAY was greater than that at ATT-US (0.343 mg/kg versus 0.228 mg/kg) but was less than that at ATT-NF (0.445 mg/kg; Table 34 and Figure 29). The LS mean of total mercury increased in parallel at both ATT-NF and ATT-US from 2007/08 to 2019, followed by a decrease at both sampling locations from 2019 to 2022; the decrease in concentrations from 2019 to 2022 was significant only at ATT-US (ANCOVA, $p < 0.05$; Table 34, Figure 27).

Northern Pike from the Nayshkootayaow River (NAY) had significantly higher total mercury concentrations than those from the Monument Channel (MC; ANCOVA, $p < 0.05$; Table 34, Figure 28). Overall, there was a trend of increasing total mercury concentrations from baseline to 2022 at both sampling locations; with a statistically significant increase at NAY (ANCOVA, $p < 0.05$; Table 34, Figure 28). Concentrations of total mercury increased from the previous sampling year (2019) to present at the NAY sampling location but decreased slightly at the reference location (MC).

A comparison of mean total mercury concentrations in the Attawapiskat River, not adjusted for age or length, stayed relatively constant at both sampling locations from 2007/08 to 2022, yet displayed variability year to year (Appendix A, Figure A-8). Monument Channel and the Nayshkootayaow River sampling locations displayed higher variability in mercury body burdens, yet a more apparent trend of increase overall at both sampling locations from 2008 to 2022 (Appendix A, Figure A-8). The GAM model, correcting for size, displayed the same trends, indicating a slight increase in total mercury over time at ATT-NF and both NAY and MC (Figures 30 and 31).

Northern Pike total mercury concentrations in fish tissue for 2022 were less than the general population complete consumption restriction value of 1.8 mg/kg in the Attawapiskat River, Nayshkootayaow River and Monument Channel (MECP 2019; Appendix A, Table A-8; Figure 26).

In both the Attawapiskat River control and impact sampling locations, some total mercury concentrations were greater than the complete restriction value for women of childbearing age and children under 15 (n=2 at ATT-DSNAY, n=3 at ATT-US and n=5 at ATT-NF) (0.5 mg/kg; MECP 2019; Figure 26). Two concentrations of total mercury from the Monument Channel, and four concentrations from within the Nayshkootayaow River were greater than this restriction value (Figure 26). In 2022, all but one Northern Pike from NAY and MC and 69% of individuals captured within the Attawapiskat River approached or exceeded the general population advisory (0.15 mg/kg) and working tissue residue guideline of the MECP SDB (0.2 mg/kg; Figure 26) (MECP 2023; (MECP/Todd Kondrat 2017). At the consumption advisory for the general population (0.15 mg/kg), it is recommended that meals (227 g of fillet) be reduced from 32 to 16 in a month.

Walleye

Univariate statistics for 2022 Walleye data from the Attawapiskat River sampling locations, the Nayshkootayaow River and Monument Channel are summarized in Appendix A, Table A-8. Results of the BACI design with LS means are displayed in Table 35 and Figures 33 to 35.

Overall length frequency distributions for Walleye were significantly different between the ATT-DSNAY and ATT-NF when compared to ATT-US (Kolmogorov-Smirnov (KS), $p < 0.05$; Appendix A, Figure A-9). Length frequency distributions were also significantly different between NAY and MC in 2022.

The BACI design did not indicate a significant interaction between year and sampling location for total mercury concentration (adjusted for total length) in Walleye from the Attawapiskat River from 2007/08 to 2022 (baseline to present); there were slight increases from baseline to present at both sampling locations in the Attawapiskat River, but these increases from 2007/08 to present and 2019 to present were not significant (Table 35 and Figure 33). The LS mean of total mercury at ATT-DSNAY was greater than that at ATT-US (0.696 mg/kg versus 0.568 mg/kg) and greater than at ATT-NF (0.618 mg/kg; Table 35 and Figure 35), but these differences were not statistically significant (ANCOVA, $p < 0.05$; Table 35 and Figure 35).

Walleye from the Nayshkootayaow River (NAY) had significantly higher total mercury concentrations than those from the Monument Channel in 2022 (MC; ANCOVA, $p < 0.05$; Table 35, Figures 34 and 35). Overall, there was a trend of increasing total mercury concentrations from baseline to 2019, followed by a decrease from 2019 to 2022 at both sampling locations; these differences between sampling years were indicative of an overall significant increase from baseline to present (ANCOVA, $p < 0.05$; Table 35, Figure 34).

A comparison of mean total mercury concentrations in the Attawapiskat River, not adjusted for age or length, showed an overall increase in mean values from 2007/08 to 2022, yet displayed variability year to year (Appendix A, Figure A-10). Monument Channel and the Nayshkootayaow River sampling locations displayed an overall consistency in mean mercury concentrations over time, with year-to-year variability.

The GAM model, correcting for size, displayed the same trends, indicating a slight increase in total mercury over time at ATT-NF and NAY with ATT-US and MC showing more stability in total mercury concentrations over time (Figures 36 and 37).

Walleye total mercury concentrations in fish tissue for 2022 were less than the general population complete restriction value of 1.8 mg/kg in the Attawapiskat River, Nayshkootayaow River and Monument Channel (MECP 2023; Appendix A, Table A-8; Figure 26), with the exception of one Walleye from ATT-NF with a mercury tissue concentration of 1.8 mg/kg.

In both the Attawapiskat River control and impact sampling locations, some total mercury concentrations were elevated above the complete restriction value for women of childbearing age and children under 15 ($n=14$ at ATT-DSNAY, $n=15$ at ATT-US and $n=19$ at ATT-NF) (0.5 mg/kg; MECP 2023; Figure 32). Two concentrations of total mercury from the Monument Channel, and 11 concentrations from within the Nayshkootayaow River greater than this restriction value (Figure 32). In 2022, all Walleye from NAY and MC and all but one individual captured within the Attawapiskat River approached or exceeded the general population advisory (0.15 mg/kg) and working tissue residue guideline of the MECP SDB (0.2 mg/kg; Figure 32) (MECP 2023; (MECP/Todd Kondrat 2017). At the consumption advisory for the general population (0.15 mg/kg), it is recommended that meals (227 g of fillet) be reduced from 32 to 16 in a month.

White Sucker

Univariate statistics for 2022 White Sucker data from the Attawapiskat River sampling locations, the Nayshkootayaow River and Monument Channel are summarized in Appendix A, Table A-8. Results of the BACI design with LS means are displayed in Table 36 and Figures 38 to 40.

Overall length-frequency distributions for White Sucker were significantly different between the ATT-DSNAY and ATT-NF when compared to ATT-US (Kolmogorov-Smirnov (KS), $p<0.05$; Appendix A, Figure A-9), although sample sizes for comparisons were significantly lower at ATT-NF ($n=9$) and ATT-US ($n=8$) in comparison to ATT-DSNAY ($n=18$). Length-frequency distributions were also significantly different between NAY and MC in 2022.

The BACI design did not indicate a significant interaction between year and sampling location for total mercury concentration (adjusted for total length) in White Sucker from the Attawapiskat River from 2007/08 to 2022 (baseline to present). Overall, there was a slight increase from baseline to present at ATT-NF, with a steeper increase from baseline to 2019, followed by slight decline from 2019 to 2022; White Sucker were not collected at ATT-US in 2008/07, but a decline was observed from 2019 to 2022 (Figure 38). Although there were overall trends of decline from baseline to present within both Attawapiskat River sampling locations, LS means of total mercury adjusted for total length were not significantly different between sampling years (baseline, 2019 and 2022) and total mercury concentrations in 2022 were similar between ATT-NF (0.126 mg/kg) and ATT-US (0.099 mg/kg; ANCOVA, $p>0.05$, Table 35 and Figure 40).

White Sucker from the Nayshkootayaow River (0.199 mg/kg) had significantly higher total mercury concentrations than those from the Monument Channel (0.156 mg/kg) in 2022 (ANCOVA, $p<0.05$;

Table 35, Figure 40). Mercury concentrations decreased from baseline to 2019 at both NAY and MC sampling locations; concentrations within the MC remained relatively consistent from 2019 to 2022, whereas concentrations within the NAY increased (Figure 39). Overall, there was a trend of increase from baseline to present in the Nayshkootayaow River and a trend of decrease from baseline to present in the Monument Channel, although these changes over time were not statistically significant (ANCOVA, $p > 0.05$; Table 35, Figure 39).

A comparison of mean total mercury concentrations in the Attawapiskat River (ATT-NF and ATT-US), not adjusted for age or length, showed a slight overall increase in mean values from 2007/08 to 2022, yet displayed variability year to year (Appendix A, Figure A-12). Mean values of total mercury within the Monument Channel showed an overall trend of decline from baseline to present, whereas within the Nayshkootayaow River there was an overall trend of increase.

The GAM model, correcting for size, displayed the similar trends, indicating relative stability in total mercury over time at ATT-NF, ATT-US and MC, whereas NAY displayed an increase in total mercury concentrations over time (Figures 42 and 43).

White Sucker total mercury concentrations in fish tissue for 2022 were less than the general population complete restriction value of 1.8 mg/kg in the Attawapiskat River, Nayshkootayaow River and Monument Channel (MECP 2023; Appendix A, Table A-8; Figure 41).

All total mercury concentrations in White Sucker collected from ATT-NF, ATT-US, NAY and MC sampling locations in 2022 were less than the MECP complete restriction value for women of childbearing age and children under 15 (0.5 mg/kg; MECP 2023; Figure 41), with the exception of one White Sucker captured at NAY (0.509 mg/kg). In 2022, 23% of White Sucker captured within the Attawapiskat River had tissue concentrations of total mercury exceeding the general population advisory (0.15 mg/kg) and working tissue residue guideline of the MECP SDB (0.2 mg/kg; Figure 41); exceedances were observed amongst both reference and exposure sampling locations (MECP 2023; (MECP/Todd Kondrat 2017). Within the Nayshkootayaow River and Monument Channel, 60% of White Sucker captures had tissue concentrations of total mercury exceeding these guidelines, among both sampling locations. At the consumption advisory for the general population (0.15 mg/kg), it is recommended that meals (227 g of fillet) be reduced from 32 to 16 in a month.

4.0 REPORTING – CONDITION 6(9) DATA

Annual Analysis of Peat Pore Water as described in Section 3.2, concentrations of total and methyl mercury in the 2022 peat horizon water samples were, in general, not markedly higher or lower than the range of data for previous years.

Statistical analyses of total and methyl mercury peat pore water concentrations are presented in Table 37 for: the S-1 stations (Table 37a), the S-2 stations (Table 37b), the S-7 stations (Table 37c), the S-8 stations (Table 37d), the S-9(1) stations (Table 37e), the S-9(2) stations (Table 37f), and the S-V stations (Table 37g). Analysis could not be completed for the S-1, S-2 and S-V stations due to missing data. None of the remaining station clusters showed a statistically significant location effect compared with the S-13 / S-15 background control stations baseline using Two-Way Analysis of Variance at $\alpha = 0.05$.

The S-8 station is of interest because of its proximity to the mine site and because a statistically significant difference has been observed for methyl mercury for the S-8 station in 2018, where a high methyl mercury concentration was observed for the S-8 station compared with that of the S-13 / S-15 control stations. This was not the case in 2019, 2020, 2021 or 2022 with statistical analysis indicating that there was no significant difference between the two station clusters. Table 3a shows annual average methyl mercury values for the S-8 and S-13 / S-15 control stations, averaged across all muskeg types, for all years from 2008 to 2022. Averaged over all years, the average methyl mercury concentration for the S-8 station of 0.099 ng/L was only slightly greater than the corresponding value of 0.070 ng/L for the S-13 / S-15 control stations. The S-8 versus S-13 / S-15 comparison was not statistically significant.

As per Section 1, it had been speculated by some reviewers during the provincial permitting process that mine dewatering might cause extensive drying out of the muskeg environment surrounding the Victor Mine, and that such drying out could release additional mercury to the environment.

As per follow-up monitoring measures stipulated in the Federal EA and the VDM Follow-up Program Agreement, De Beers is required to carry out periodic satellite imagery assessments at 5-year intervals to assess the effects of mine dewatering on the areal extent of muskeg ponds over time. Satellite imagery was compared for the years 2006 (predevelopment), 2012, 2017 and 2022. The imagery from 2022 indicates that there was a general reduction in pond surface area expression between 2006, 2012, 2017 and 2022 with greater reductions occurring closer to the mine. For the near-field zone, defined as the 2012 interpolated 2 m mine dewatering drawdown contour, pond area was reduced by 37.2% from 2006 to 2022 compared to the reduction of 14.6% from 2006 to 2012. For the mid-field zone, defined as the area between the near-field zone and the predicted drawdown extent from the 2008 model, pond area was reduced by 27.2% from 2006 to 2017 compared to the reduction of 7.5% from 2006 to 2012. These results are consistent with EA predictions, wherein some localized reduction in muskeg pond expression was expected to occur as a result of mine dewatering, specifically in areas of very thin marine sediment thickness (i.e., bioherms and bedrock subcrop zones). However, localized dewatering has not had a measurable effect on the total or methyl mercury concentration in the peat pore water samples.

Groundwater level data recorded from the muskeg piezometers within the zone of well field dewatering influence shows that the muskeg environment associated with the peat piezometers has remained saturated despite depressurization of the underlying bedrock and marine sediment horizons, such for the MS-8 series of piezometers (Figure 44). However, in some years, groundwater level data for the MS-8 series of piezometers do show increased levels of seasonal variation within the four muskeg terrain types. This variation shows up as a gradual decline in water levels over the winter months followed by a rebound during the spring with water levels maintained over the remainder of the open water period. Muskeg systems are therefore still effectively saturated, and there is no evidence of muskeg drying out.

4.1 Annual Analysis of Mineral Soil Pore Water

Total and methyl mercury results from shallow and deep clay pore water samples, and from bedrock samples, have continued to show generally low values, with no defining trends for any of the stations (Tables 1a and 1b). There have been anomalous results in methyl mercury concentrations over the life of mine, which are not considered a result of mine related activities as they were just as likely to occur outside the drawdown zone of influence.

4.2 Annual Analysis of Surface Waters

Statistical analyses of total and methyl mercury concentrations in surface water samples are presented in Table 39. Monthly samples from all Granny Creek stations allowed for a more complete statistical analysis of the data, compared with analyses carried out prior to 2016 when monthly samples were not available for some stations.

Stations (G-0 through G-8) are included in the analysis for Granny Creek, with the analysis including data for total and methyl mercury, for unfiltered and filtered samples. The G-0 station was included in the analysis for the first time in 2018.

Consistent with earlier results, differences in total mercury concentrations were not statistically significant between the stations on North and South Granny Creek, at the 0.05 probability level, for unfiltered and filtered samples in 2022 (Tables 39a, 39b, 39c and 39d)

Also, consistent with earlier results, analysis of methyl mercury samples showed statistically significant differences between locations on both North and South Granny Creek filtered samples. This significant increase in downstream methyl mercury is attributed to slow conversion of total to methyl mercury in downstream portions of the Granny Creek watershed as a result of sulphate drainage.

Unlike in previous years, in 2022 Table 39c shows unfiltered samples for methyl mercury being not statistically significant, this is mainly due to the elevated mercury results, attributed to the elevated TSS, within the winter months at the G-5 station.

Table 40 provides a statistical analysis of average annual Granny Creek Confluence (G-8) total mercury values with those of Tributary 5A, over the period of common record from 2009 through

2022. Statistically significant differences were noted for unfiltered and filtered total mercury values. For both filtered and unfiltered total mercury samples, G-8 has shown consistently higher concentrations: 80% higher in the case of unfiltered samples and 59% higher in the case of filtered samples. These differences may be inherent in the two systems as a natural condition, as the slight upward trend in the data over all years occurred at both the G-8 and Tributary 5A stations, suggesting that mine development has not resulted in an increase in total mercury concentrations in the Granny Creek system.

Statistical analyses were not run for methyl mercury for the G-8 and Tributary 5A stations as concentration differences are sufficiently pronounced that statistical analyses are not needed to show that methyl mercury concentrations are materially elevated in the Granny Creek system compared with those of Tributary 5A.

As per Section 3.3, it is likely that methyl mercury dynamics in peatlands around the mine site are being influenced by elevated sulphate levels, and not by mine dewatering. However, while methyl mercury values were elevated from baseline in downstream portions of the Granny Creek system, all values were well below the CEQG value of 4 mg/L.

Data for the Nayshkootayaow and Attawapiskat Rivers show no overall upstream or downstream trends with no statistically significant differences (Tables 39e through 39h). Except for unfiltered methyl mercury in the Attawapiskat River with the A-2 station having higher results.

4.3 Trend Analysis of Well Field Water Discharge

As per Section 3.4, wellfield dewatering ceased in the first quarter of 2019 with the end of mine operations, such that mercury loadings from the well field to the Attawapiskat River are no longer occurring. For a discussion of statistical comparisons up to 2018 the reader is referred to the 2018 annual mercury report.

4.4 Annual Analysis of Fish Mercury Body Burdens

Small-bodied Fish Species

Overall total mercury levels in Northern Pearl Dace continued to be higher in the exposure locations of North Granny Creek and South Granny Creek, when compared to the reference locations, as added in 2017, and control Tributary 5A.

For Northern Pearl Dace in 2022, the LS mean mercury concentrations, corrected for size, were higher in the exposure location of NGC when compared to SGC, a trend also displayed in 2021, 2020 and 2018. However, in 2019, Northern Pearl Dace captured from SGC-EXP had higher mercury concentrations as compared to NGC-EXP.

Over the course of the study period (2008/09 to 2022) Northern Pearl Dace mercury body burden concentrations have fluctuated in the Granny Creek System, but concentrations in the North and South Granny Creek exposure locations have consistently been higher than that in Northern Pearl

Dace from control Tributary 5A since 2014 (Appendix A, Figures A-2) and there is a clear increasing trend in the LS means of total mercury adjusted for total length from baseline to present at the exposure locations.

In 2022, 99% of Northern Pearl Dace (YOY and age 1+) captured from NGC-EXP and 75% captured from SGC EXP had mercury tissue concentrations greater than the MECP SDB working guideline of 0.2 mg/kg (ENVIRON 2008).

Data collected thus far for Trout Perch from the Attawapiskat River when viewed in their entirety show a lack of consistent trends in results between years. Results from 2014 show body size (length and weight) was similar between all sampling locations, and mercury concentrations adjusted for total length were also relatively similar between all sampling locations, with the far-field exposure location (ATT-FF) having the lowest concentrations. Contrary to this, in 2015 fish from ATT-FF were larger (length and weight), older, and had the higher tissue mercury concentrations than the other sampling locations. Although the far field exposure location had mercury concentrations higher than that of both reference locations, concentrations in the near field exposure location remained low and at levels similar to the reference locations. In 2016 Trout Perch aged 1+ displayed no difference in mean mercury concentration between sampling locations, further indicating a lack of an observed mine-related effect. Contrary to the 2016 data, the data from 2017 and 2018 show significantly higher mercury concentrations in YOY and Age 1 Trout Perch from ATT-NF when compared all other Attawapiskat River sampling locations. In 2019, total mercury body burden concentrations for Trout Perch were generally higher at ATT-REF2 when compared to all other sampling locations and unadjusted total mercury concentrations were higher at ATT-NF than ATT-US. In 2020, the exposure locations displayed a significant increase in mercury concentrations at the exposure locations when compared to the reference locations. In 2021, mean mercury concentrations, both unadjusted and adjusted for total length were higher at ATT-NF and ATT-REF2 in YOY Trout Perch, but concentrations in age 1+ fish were similar between all sampling locations. In, 2022 mean total mercury concentrations at ATT-REF2 continued to be greater than ATT-FF in age 1+ Trout Perch, and above all other sampling locations in YOY.

The current trend in LS means from baseline to present shows decreasing total mercury concentrations at ATT NF and ATT-FF, yet increasing total mercury at ATT-US, from 2009 to 2022; however, from 2021 to 2022 total mercury increased at ATT-US, ATT-REF2 and ATT-FF, yet decreased at ATT-NF.

Overall, the Attawapiskat River data does not indicate an impact of mercury bioaccumulation within the exposure locations from baseline to present. Considering the findings of the most recent years studies, results still indicate relatively consistent mercury body burden levels in small-bodied fish in the near-field exposure location and statistical results between years have not identified a consistent trend of increase over time.

There is a lack of long-term species-specific data for the Nayshkootayaow River, as the sentinel species for this system has alternated between Trout Perch and Northern Pearl Dace based on year-to-year catchability and environmental conditions. In years prior to 2016, where Northern

Pearl Dace were captured in sufficient abundance to complete statistical analyses (2009, 2010 and 2012), no differences were found in tissue mercury concentrations between the downstream and upstream sampling locations.

For Trout Perch collected in the Nayshkootayaow River in 2016 and 2017, mean tissue mercury concentrations at NAY-DS6 were significantly higher compared to NAY-US3. However, in 2018 and 2019, mercury concentrations were similar between locations. In 2020 and 2021, average tissue concentrations were greater than at NAY-DS6 in YOY, but age 1+ Trout Perch showed differing trends; In 2020, mercury concentrations in age 1+ Trout Perch were higher at NAY-US3 and in 2021, concentrations were higher at NAY-DS6. In 2022, YOY Trout Perch were not captured in sufficient abundance, but age 1+ fish results were consistent with those observed in 2021, with higher total mercury concentrations at NAY-DS6.

All mercury concentrations were less than the MECP SDB working guideline for the protection of fish-eating wildlife in 2022. Overall, the Nayshkootayaow River data does not indicate mine induced increases in mercury concentrations within the downstream impact location from 2012 to 2022. Although concentrations have increased over time at the exposure location, they have also simultaneously increased at the control location. In two successive sampling years (2016 and 2017) small-bodied fish showed a higher tissue mercury concentration at the downstream impact location when compared to the upstream control location, but this was not observed in 2018 or 2019. Although concentrations at the downstream impact location have continued to be higher from 2020 to 2022, this trend has not proven to be consistent across sampling years; further monitoring will verify if this trend is consistent over the next sampling cycles.

Capture success for Mottled Sculpin in the Attawapiskat River remains inconsistent between years, with the last successful capture years being 2019. Mottled Sculpin have not been analysed within the Nayshkootayaow River in previous monitoring cycles. In 2022, age 1+ Mottled Sculpin were captured within both rivers systems. Total mercury concentrations were similar between ATT-NF and ATT-REF2 in 2022 and remained consistent over time from 2015 to present. Within the Nayshkootayaow River, total mercury concentrations were higher at the downstream exposure location in 2022; however, data from previous years is not available to determine trends over time for this species.

Large-bodied Fish Species

Total mercury concentrations in Northern Pike in the Attawapiskat River show a significant interaction between year (baseline to present) and location (impact vs. control); with total mercury concentrations being higher at ATT-NF in comparison to ATT-US, and at ATT-NF from baseline to present. However, despite the overall increase in the exposure location from baseline to 2022, there was a decrease in total mercury concentration from 2019 to 2022, at both sampling locations.

Northern Pike from the Nayshkootayaow River had higher mercury concentrations than those from Monument Channel in 2022; there was also a significant trend of increasing total mercury from baseline to present within the NAY sampling location. However, although not statistically

significant, total mercury concentrations also increased over time from baseline to 2022 within the Monument Channel. Previous study periods have indicated varying results within the Nayshkootyow River Northern Pike, with results from 2013 showing higher mercury in the Monument Channel and results from 2016 and 2019 showing higher mercury in the Nayshkootayaow River. These varying results between years suggest natural variability within this system.

Walleye mercury body burden levels for the Attawapiskat River exposure locations were similar to those identified for the reference location in 2022. These results were also observed in 2019. For Walleye within the Nayshkootayaow River, concentrations of total mercury were higher at NAY when compared to MC in 2022, but both sample locations had declines in concentrations from 2019 to 2022, and there was no significant increase from baseline to present at the exposure location. Thus, this predatory piscivorous species does not appear to indicate a potential effect from the mine with respect to mercury bioaccumulation.

The same trend was observed for White Sucker, with sampling locations within the Attawapiskat River having similar total mercury concentrations in 2022 and no trends of increase from baseline to present. The Nayshkootayaow River fish tissue total mercury concentrations were greater than those from the Monument Channel in 2022, but there was no significant increase from baseline to present at either sampling location.

In 2022, generally Northern Pike greater than 380 mm from the Attawapiskat River and 350 mm from the Nayshkootayaow River approached or exceeded the starting advisory for the general public (0.15 mg/kg), as well as the working tissue residue guideline of the MECP SDB (0.2 mg/kg). The starting advisory recommends that meals should be reduced from 32 to 16 meals per month with a meal consisting of 227 grams of fish. It should also be noted that a portion of the fish population above this size also had mercury concentrations that exceeded 0.5 mg/kg, which is identified by MECP as the level at which complete restriction (no meals) should occur for women of childbearing age and children under 15 years of age.

Walleye captured in both the reference and impact locations of the Attawapiskat River, the Nayshkootayaow River and the Monument Channel over the length of 200 mm exceeded the complete restriction value for women of childbearing age and children under 15 (0.5 mg/kg) and the start of advisory threshold for the general human population and the working tissue residue guideline for fish eating wildlife (0.2 mg/kg).

5.0 SULPHATE SOURCE INVESTIGATIONS AND CONTROL

Sulphate data for the period of 2010 through 2022 are provided in Tables 41a with 2022 sampling details shown in Table 41b. Sampling locations are shown in Figure 46. The 2015 to 2022 data include a greater number of stations, particularly in association with the waste rock stockpile, including sampling from three wells installed within the stockpile by a drilling program conducted in mid-2015 (WR-North, WR-Centre, WR-East). One similar monitoring well (LG-South) was installed within the Low-Grade Kimberlite stockpile. The data show the following aspects:

- Sulphate concentrations associated with the NEF, as well as with Phase 1 (Mine Water Pond) Ditch and the Landfill area (LF3), have been variably stable since about 2011, with the exception of the proximal NEF sample (NEF-M) where concentrations increased through 2015 and 2016, and have remained relatively stable since 2016.
- Sulphate concentrations for the NEF were highest in the proximal end of the fen (i.e., NEF-M where the fen borders the east side of the Attawapiskat River Road) in all years from 2011 onward, with the average annual value for 2022 being 203.4 mg/L, declining to 93.3 mg/L at the mid fen station (NEF-M2). These data suggest that sulphate is being consumed by microorganisms within the fen, with some possible dilution effects from the surrounding landscape.
- Highest average sulphate concentrations occur in association with the mine rock stockpile with sulphate concentrations averaging in the 300 to 400 mg/L range for the majority of stations (WR-Centre – 365.3 mg/L); at the eastern, central edge of the mine rock stockpile (WR-East – 374.6 mg/L); and just east of the eastern, central edge of the mine rock stockpile (WR-B – 325.3 mg/L, WR-C – 318.2 mg/L). These stations all fall along the line of the original fen track through this area, and may therefore represent the dominant subsurface seepage flow path for the mine rock stockpile, connecting with the proximal end of the NEF. Overall, average sulphate values associated with the mine rock stockpile have been comparatively stable from 2015 through 2022, with respective averages of 382 mg/L (WR-Centre), 380.8 mg/L (WR-East), 393.7 mg/L (WR-B) and 314.7 mg/L (WR-C) for the eight consecutive years (2015 to 2022).
- Average sulphate concentrations associated with the WR-North well site (87.0 mg/L) were the lowest observed. WR-North continues to show some potential for seepage from the northern portion of the mine rock stockpile to enter North Granny Creek along a broad front in this area.
- Sulphate concentrations associated with LG Pond 2 bordering the south side of the low grade ore stockpile averaged 107.2 mg/L, showing that sulphates are also draining to muskeg zones that report to South Granny Creek. Other ponds bordering the perimeter of the low grade ore stockpile that were sampled in 2014 and 2015 have been overprinted by the expanding stockpile.

- The LG-South well developed within the southeast perimeter of the low grade ore stockpile (Figure 45), had shown a steady reduction in sulphate values since 2015, with the lowest value observed in 2017 of 11.6 mg/L. However, concentrations have increased since 2018, with average sulphate concentrations of 116.3 mg/L, 234.5 mg/L, 311.5 mg/L, 242.5 mg/L, and 317.1 in 2018, 2019, 2020, 2021 and 2022, respectively (Table 41a).

The primary source of sulphate to the NEF, and to muskeg areas bordering the north side of the mine rock stockpile that may also drain to North Granny Creek, is the mine rock stockpile. The low-grade ore stockpile / coarse PK stockpile are the primary sources of sulphate loading to muskeg zones that drain to South Granny Creek.

As part of closure planning, De Beers has undertaken investigations for the purpose of reducing and/or mitigating contaminant loadings (including sulphate) on site. As part of the investigative process, De Beers engaged Hatch (2019) and Golder (2020) to model the mine site and receiving water quality at post-closure, in order to inform the closure water management strategy. These water quality models looked at different scenarios of post-closure water management from the stockpiles, including the use of directing drainage to the open pit and passive drainage to the muskeg. The results of the modeling showed that the scenario assessed in the Federal Environmental Assessment of passive drainage to the muskeg is still a viable option with the implementation of low permeability covers on stockpiles to limit infiltration. In addition, De Beers will also be directing runoff from the southern and eastern portions of the mine rock stockpile to the pit lake in closure. This is expected to reduce the sulphate loading to the muskeg from this pile and reduce methyl mercury production in the NEF. As of the end of 2022, the majority of the mineral stockpile covers had been completed.

6.0 CONCLUSIONS

6.1 Peat Pore Waters

- Filtered total and methyl mercury concentrations in peat pore waters remained considerably lower than the respective CEQG values of 26 ng/L for total mercury and 4 ng/L for methyl mercury, recognizing that CEQG criteria do not apply to ground water or to filtered samples; and there are no evident trends in the data.
- Statistical analysis of peat pore waters, including for 2022 results, showed no statistically significant differences for total or methyl mercury, between peat complexes located near to and at mid-distances from the mine site, compared with more remote control stations.

6.2 Surface Waters

- Filtered total mercury concentrations measured in proximal area fen systems (NEF, SEF and HgCON) were well below the CEQG value of 26 ng/L. An analysis of quarterly data for the past nine years for the open water period (May, July and October) has shown that filtered and unfiltered total mercury values for the NEF have been generally lower than for either of the two control fens (SEF and HgCON), and that these differences are statistically significant (Table 7). It is speculated that the small stores of total mercury in the NEF, that occur naturally, may be becoming partially depleted through the conversion to methyl mercury as a result of the action of SRB (Section 3.3.1).
- Methyl mercury concentrations in the NEF, which receives (or received) various site effluents, continued to show elevated methyl mercury concentrations in 2022 compared with the control fens (SEF and HgCON). Elevated methyl mercury concentrations in the NEF are considered to be the result of sulphate-rich effluent waters which stimulate the mercury methylation process, and are not a function of well field dewatering effects. De Beers has continued to collect additional sulphate data from the general Victor Mine site, and particularly in reference to NEF drainages. Actions have been taken to reduce sulphate loadings to the NEF during closure. Previous reports have suggested that mercury methylation rates within the NEF may have peaked in 2012 attributed to the depletion of total mercury stores within the muskeg (Table 6). Although the depletion of mercury stores within the NEF is likely a factor contributing to decreasing methyl mercury in the NEF over time, the 2018, 2019, 2020, 2021 and 2022 data suggest that there are still mercury stores in the fen available for methylation.
- With the possible exception of station MS-V(2)-R, analysis of total and methyl mercury concentrations for area ribbed fen systems shows no obvious increasing or decreasing trends; and no appreciable differences between stations that are located within the mine dewatering 2 m drawdown contour (under drained sites) and those stations that are located outside of this contour (remote sites).

- Analysis of other parameters measured for ribbed fen systems (pH, DOC, sulphate, chloride, conductivity, calcium, magnesium, iron, total phosphorus and sodium) showed a positive correlation between filtered methyl mercury and DOC ($r^2 = 0.18$), and a negative correlation between filtered methyl mercury and pH ($r^2 = 0.12$), although the strength of these correlations was less than observed in previous years. A correlation was also noted with calcium that reflects the pH function. No correlation was demonstrated for any of the other parameters including sulphate. The lack of a correlation between methyl mercury and sulphate in area fen systems is likely a function of sulphate concentrations being generally too low to trigger mercury methylation.
- With the exception of a few methyl mercury values taken from the Granny Creek system, total and methyl mercury concentrations measured in area surface waters (Granny Creek, the Nayshkootayaow River and the Attawapiskat River) have shown mercury concentrations below the applicable CEQG values of 26 ng/L and 4 ng/L, respectively. Filtered methyl mercury values for the downstream Granny Creek stations are, however, above the US EPA bioaccumulation threshold criterion of 0.05 ng/L set for the protection of fish-eating wildlife species such as Bald Eagle and River Otter, but this is not a regulatory limit and does not constitute a nonconformance. There were also a few individual samples taken from both the Nayshkootayaow River and Attawapiskat River, as well as from Monument Channel as control site, that were above the US EPA bioaccumulation threshold, but there were no clear upward trends in methyl mercury concentrations in these rivers.
- Generally, the Nayshkootayaow and Attawapiskat River have continued to show essentially background concentrations for total and methyl mercury, both upstream and downstream of the Victor Mine, with no evident trends to the data.
- North and South Granny Creek continue to show trends of elevated methyl mercury concentrations in downstream waters, compared with the upstream stations for these two creeks, and compared with the Tributary 5A control site, with downstream North Granny Creek showing average concentrations in 2022 of about 0.27 ng/L for the G3 station and 0.24 ng/L for the G4 station, and downstream South Granny Creek showing 2022 concentrations of about 0.20 ng/L for the G6 station, and 0.29 ng/L for the G7 station (Figure 45a and 45b). Average downstream filtered methyl mercury concentrations for both North and South Granny Creek represented improvements over conditions observed in the previous three years. Observed downstream increases in methyl mercury for the Granny Creek system are attributed to sulphate-rich drainage waters, which stimulate the mercury methylation process within the anoxic muskeg (peat) environment, and not a function of well field dewatering effects. Filtered methyl mercury concentration differences between upstream and downstream stations were statistically significant for North and South Granny Creeks in 2022. That stated, all values in the Granny Creek system for methyl mercury were below the federal guideline (CEQG) of 4 ng/L, with the highest observed unfiltered and filtered values in 2022 being 3.78 ng/L and 0.97 ng/L, respectively.

- A comparison of filtered and unfiltered methyl mercury concentrations for the Granny Creek confluence station (G-8), with values for the furthest downstream North and South Granny Creek stations (G-4 and G-7), for the summer / fall (July / October) period, showed that elevated methyl mercury values from North and South Granny Creeks declined somewhat at the Granny Creek confluence station for the years 2011 through 2017; but this trend was not evident in 2018 through 2022, where G-8 and G-4 / G-7 values were similar.

6.3 Fish Mercury Body Burdens

- Majority of small-bodied fish from all locations (control and exposed) remained greater than the CEQG tissue residue guideline for the protection of wildlife consumers of aquatic biota (0.033mg/kg) in 2022.
- Most concentrations of total mercury for small-bodied fish from the Granny Creek system (NGC and SGC) were greater than the MECP SDB guideline (0.2 mg/kg) for fish eating wildlife in 2021.
- Overall, there has been an increase in total mercury concentrations in Northern Pearl Dace within the Granny Creek system relative to baseline conditions.
- The data collected thus far for Trout Perch from the Attawapiskat River show that there has not been a consistent effect over time on small-bodied fish mercury concentrations within the Attawapiskat River.
- Trout Perch from the downstream impact location of the Nayshkootayaow River had elevated mercury concentrations in comparison to the upstream control location in 2016 and 2017. However, in 2018 and 2019 mercury concentrations were statistically similar between the control and impact locations. In 2020 to 2022, mercury concentrations were again higher in at the downstream exposure location. The upstream and downstream locations of the river show an increase in mercury concentrations from baseline to 2022, with a steeper increase at NAY-DS6.
- The data collected for Northern Pike show an overall increase at ATT-NF from baseline to 2022, but a decrease from 2019 to 2022, and higher mercury concentration at NAY in 2022 and also from baseline to 2022. However, the increase over time at NAY was paralleled by an overall increase at MC.
- The data collected for Walleye within the Attawapiskat River indicate similar total mercury concentrations between reference and exposure locations and no trends of increase over time. Data collected within the Nayshkootayaow show higher concentrations at NAY when compared to MC but decreases in concentration at this sampling location from 2019 to 2022.

- The data collected for White Sucker within the Attawapiskat River indicate similar total mercury concentrations between reference and exposure locations and no trends of increase over time. Data collected within the Nayshkootayaow show higher concentrations at NAY when compared to MC, but no overall trend of increase from baseline to present.

6.4 Consistency with the 2008 Trigger Values Document

The AMEC 2008 trigger values document stipulated the following general responses to observed increases mercury concentrations in water or in fish:

- Level 1 response: if a statistically significant difference is observed between experimental and control station results, at an alpha 0.05 level, then a potential concern will be deemed to exist, requiring further investigation, principally through increased sampling effort to confirm the result. It should be noted that the sampling program was already very extensive from the outset, and that the program was proactively increased beyond ECA requirements. Also, independent research by a consortium of local universities was proactively initiated.
- Level 2 response: if increased sampling (or further investigation) confirms that a concern continues to exist then a root cause analysis of the condition is to be undertaken, and if appropriate, following consultation with the MECP and the Attawapiskat First Nation (AttFN), predictive modelling studies are to be undertaken to determine expected longer-term performance of the system.
- Level 3 response: if increased mercury concentrations are likely to result in an Attawapiskat River mercury concentration increase of greater than 10%, or an increase in the concentration of mercury in fish tissue by greater than 10% over background conditions, then a comprehensive risk assessment is to be undertaken.
- Level 4 response: if the risk assessment carried out as per Level 3 indicates that there is likely to be a meaningful adverse effect on aquatic life, a mitigation strategy is to be developed to reduce the level of risk.

Statistically significant differences in surface water methyl mercury concentrations, compared with control stations, have been determined for Granny Creek water quality, and for total mercury body burden levels in Granny Creek small-bodied fish. Additional sampling has been carried out in response to this condition, including the institution of additional sampling areas for small-bodied fish in each of North and South Granny Creeks since 2017. A root cause analysis has been undertaken, which has identified sulphate release to local muskeg environments as the most probable root cause of increased mercury methylation in the system. Further investigations were undertaken to better understand the mechanisms of sulphate release, and measures are being developed to better manage this release including the covering of the onsite stockpiles with a low permeability cover.

Thus far there has been no demonstrable increase in the concentrations of total or methyl mercury (unfiltered or filtered) in the Attawapiskat River, with all values remaining essentially at background. The data collected thus far for small-body fish (Trout Perch) from the Attawapiskat

River have not provided a consistent confirmed effect on total mercury body burden levels from baseline to present. As such, a further response is not warranted.

The 2016 Nayshkootayaow River Trout Perch body burden mercury data, when assessed against the 2008 trigger document, indicated the need for further study of the potential sources of mercury loading to aquatic biota in this system, in accordance with Section 4.5 of the trigger document. In response, surface water mercury concentrations (total and methyl) were investigated at the downstream Nayshkootayaow River sampling location (just downstream of the Granny Creek confluence) starting in 2017, and increased efforts to collect the same sentinel species (Trout Perch) at both control and exposure stations in this river were also undertaken. The goal was to provide related information to confirm whether the observed effect, or trend, for small-bodied fish species in the Nashkootayaow River was consistent over greater than one year of study. The results of the 2016 and 2017 small-bodied fish study confirmed a trend of increased total mercury body burden in fish (Trout Perch) at the downstream Nayshkootayaow River impact area in comparison to the upstream control area. However, in 2018 and 2019 this trend was not repeated, and thus was no longer considered a level 2 response. Methyl mercury concentrations in the Nayshkootayaow River surface water from the same sample area collected in 2017, 2018 and 2019 were not demonstratively different from those collected from controls for similar periods. The basis for the observed differences in Trout Perch mercury concentrations in previous years is therefore unclear and has not been confirmed by further data collected in 2018 or 2019.

However, similar to 2016 and 2017, results from 2020 through 2022 indicate higher mercury concentrations in fish tissue in the downstream area. This result was present in YOY fish only in 2020, in both age classes in 2021, and in age 1+ fish only in 2022 (YOY Trout Perch were not captured during this sampling year). Field studies in 2023 will again include assessment of small-bodied fish within the Nayshkootayaow River. Extensive sampling efforts will target YOY and age 1+ Trout Perch to provide sufficient sample sizes for analyses of both age classes; 2023 sampling will provide further data to define trends in Trout Perch among both age classes within this system.

Based on the factors discussed above, the MECP's review of the 2020 Mercury Performance Monitoring Report recommended that monitoring continue in the adjacent fens, Granny Creek, Nayshkootayaow River, Attawapiskat River and applicable reference locations for water, forage fish, and large-bodied fish. MECP further recommended that all other monitoring program components (i.e., effluent from well field dewatering; peat, mineral soil, and bedrock porewater; and ribbed fens) can be discontinued from 2021 onwards, with the exception of the MS-8 series of peat piezometers where monitoring of peat pore water would continue, at least during the near-term.

7.0 REFERENCES

- AMEC Earth & Environmental. 2004. Victor Diamond Project. Environmental Baseline Study.
- AMEC Environment & Infrastructure. 2008. Trigger Values for Mercury Concentrations and/or Body Burdens in Fish as Per Condition 6(10) of Certificate of Approval # 8700-783LPK.
- AMEC Environment & Infrastructure. 2009a. De Beers Canada Inc. Victor Mine Mercury Performance Monitoring 2008 Annual Report, as Per Conditions 7(5) and 7(6) of Certificate of Approval #3960-7Q4K2G.
- AMEC Environment & Infrastructure. 2009b. De Beers Canada Inc. 2008 Aquatic Environmental Effects Monitoring Study – Attawapiskat River Receiving Waters. June 2009.
- AMEC Environment & Infrastructure. 2010. De Beers Canada Inc. Victor Mine Mercury Performance Monitoring 2009 Annual Report, as Per Conditions 7(5) and 7(6) of Certificate of Approval #3960-7Q4K2G.
- AMEC Environment & Infrastructure. 2011. De Beers Canada Inc. Victor Mine Mercury Performance Monitoring 2010 Annual Report, as Per Conditions 7(5) and 7(6) of Certificate of Approval #3960-7Q4K2G.
- AMEC Environment & Infrastructure. 2012a. De Beers Canada Inc. Victor Mine Mercury Performance Monitoring 2012 [2011] Annual Report, as Per Conditions 7(5) and 7(6) of Certificate of Approval #3960-7Q4K2G.
- AMEC Earth & Environmental. 2012b. De Beers Canada Inc. Victor Mine Landfill Leachate Mercury and Cadmium Bioaccumulation Study – Fish Tissue and Sediment Quality Components. February 2012.
- AMEC Earth & Environmental. 2013a. De Beers Canada Inc. Victor Mine Mercury Performance Monitoring 2012 Annual Report as per Conditions 7(5) and 7(6) of Certificate of Approval #3960-7Q4K2G.
- AMEC Environment & Infrastructure. 2013b. De Beers Canada Inc. Victor Mine Landfill Leachate Mercury and Cadmium Bioaccumulation Study – Fish Tissue and Sediment Quality Components. February 2013.
- AMEC Environment & Infrastructure. 2014a. De Beers Canada Inc. Victor Mine Mercury Performance Monitoring 2013 Annual Report, as Per Conditions 7(5) and 7(6) of Certificate of Approval #3960-7Q4K2G. June 2014.
- AMEC Environment & Infrastructure. 2014b. Victor Mine Closure Plan Amendment 3.

- Amec Foster Wheeler. 2015a. De Beers Canada Inc. Victor Mine Mercury Performance Monitoring 2014 Annual Report as per Conditions 7(5) and 7(6) of Certificate of Approval #3960-7Q4K2G.
- Amec Foster Wheeler. 2015b. De Beers Canada Inc. 2014 Aquatic Environmental Effects Monitoring Study Attawapiskat River Receiving Waters. June 2015
- Amec Foster Wheeler. 2016. De Beers Canada Inc. Victor Mercury Performance Monitoring 2015 Annual Report as per Conditions 7(5) and 7(6) of Certificate of Approval #3960-7Q4K2G.
- Amec Foster Wheeler. 2017. De Beers Canada Inc. Victor Mercury Performance Monitoring 2016 Annual Report as per Conditions 7(5) and 7(6) of Certificate of Approval #3960-7Q4K2G.
- Barak, N.A.E., and Mason, C.F. 1990a. Mercury, cadmium and lead in eels and roach: the effects of size, season and locality on metal concentrations in flesh and liver. *Sci. Total Environ.* 106: 249–256.
- Barak, N.A.E., and Mason, C.F. 1990b. Mercury, cadmium and lead concentrations in five species of freshwater fish from eastern England. *Sci. Total Environ.* 106: 257–263.
- Benoit, J.M., C.C. Gilmour, R.P. Mason and A. Heyes. 1999. Sulphide Controls on Mercury Speciation and Bioavailability to Methylating Bacteria in Sediment Pore Waters. *Environmental Science & Technology.* 33: 951-957.
- Canadian Council of Ministers of the Environment. 2003. Canadian water quality guidelines for the protection of aquatic life: Inorganic mercury and methyl mercury. In: Canadian environmental quality guidelines, 1999. Canadian Council of Ministers of the Environment, Winnipeg.
- ENVIRON International Corporation. 2008. Environmental Risk Assessment for Peninsula Harbour Area of Concern. September 2008.
- Federal Authorities. 2005. Victor Diamond Project Comprehensive Study Report (CSR), June 2005 (draft prepared by AMEC Earth & Environmental Limited).
- Golder Associated. 2020. Mine Site Water Quality Predictive Model, Victor Mine Closure Evaluation.
- Goldstein, R.M., Brigham, M.E., and Stauffer, J.C. 1996. Comparison of mercury concentrations in liver, muscle, whole bodies, and composites of fish from the Red River of the North. *Can. J. Fish. Aquat. Sci.* 53: 244–252.
- Hatch. 2019. De Beers Canada Victor Mine: Post-Closure Water Quality Model Report.
- Itasca Denver Inc. 2015. Dewatering of Victor Diamond Mine: July 2015 Update of the Victor Integrated Groundwater Flow Model. Prepared for De Beers Canada.

Jeremiason, J.D, D.R. Engstrom, E.B. Swain, E.A. Nater, B.M. Johnson, J.E. Alemendinger, B.A. Monson and R.K. Kolka. 2006. Sulfate Addition Increases Methylmercury Production in and Experimental Wetland. *Environ. Sci. Technol.* 40(12): 3800 – 3806.

Krabbenhoft, D.P., B.A. Branfireun and A. Heyes. 2005. Chapter 8: Biogeochemical Cycles Affecting the Speciation, Fate and Transport of Mercury in the Environment. Mineralogical Association of Canada Short Course 34, Halifax, Nova Scotia. P. 139-156. Ministry of the Environment and Climate Change (MOECC) Guide of Eating Ontario Sport Fish 2015-2016. 2015.

R Studio Team (2018). RStudio: Integrated Development for R. RStudio, Inc., Boston MA URL <http://rstudio.com/>.

Segade, S.R., T. Dias and E. Ramalhosa. 2010. Mercury Methylation versus Demethylation: Main Processes Involved. In: A.P. Clampt eds., *Methylmercury: Formation, Sources and Health Effects*. ISBN: 978-1-61761-838-3. Nova Science Publishers, Inc.

Ullrich, S.M., T.W. Tanton and S.A. Abdrashitova. 2001. Mercury in the Aquatic Environment: A Review of Factors Affecting Methylation. *Critical Reviews in Environmental Science and Technology* 31(3): 241-293.

US EPA Method 7473 Mercury in Solids and Solutions by Thermal Decomposition Amalgamation, and Atomic Absorption Spectrophotometry. Revision 0, February 2007.

US EPA. 1997. Mercury Study Report to Congress. Volume 6: An Ecological Assessment for Anthropogenic Mercury Emissions in the United States

US EPA. 2006. Definition and Procedure for the Determination of the Method Detection Limit, Revision 2.

Wood Environment and Infrastructure Solutions. 2018. De Beers Canada Inc. Victor Mercury Performance Monitoring 2017 Annual Report as Per Conditions 7(5) and 7(6) of Certificate of Approval #3960-7Q4K2G.

Wood Environment and Infrastructure Solutions. 2019. De Beers Canada Inc. Victor Mercury Performance Monitoring 2018 Annual Report as Per Conditions 7(5) and 7(6) of Certificate of Approval #3960-7Q4K2G.

Wood Environment and Infrastructure Solutions. 2020a. De Beers Canada Inc. Victor Mercury Performance Monitoring 2019 Annual Report as Per Conditions 7(5) and 7(6) of Certificate of Approval #3960-7Q4K2G.

Wood Environment and Infrastructure Solutions. 2020b. De Beers Canada Inc. Victor Mine Annual Groundwater, Subsidence and Sinkhole Report for 2019 as per Conditions 4.2.4 and 4.2.6 of Permit to Take Water #1201-9HHJ5G.

Wood Environment and Infrastructure Solutions. 2021. De Beers Canada Inc. Victor Mercury Performance Monitoring 2020 Annual Report as Per Conditions 7(5) and 7(6) of Certificate of Approval #3960-7Q4K2G.

Wood Environment and Infrastructure Solutions. 2022a. De Beers Canada Inc. Victor Mine Annual Groundwater, and Sinkhole Report for 2021 as per De Beers Voluntary Monitoring Program, Victor Diamond Mine

Wood Environment and Infrastructure Solutions. 2022b. De Beers Canada Inc. Victor Mercury Performance Monitoring 2021 Annual Report as Per Conditions 7(5) and 7(6) of Certificate of Approval #3960-7Q4K2G.



Table 1a: Muskeg Monitoring Program - Annual Mercury Results for Clay and Bedrock; Total Mercury Filtered (2007-2022) (concentrations in ng/L)

Cluster Location	Substrate / Condition	Well Name	GPS Code	Sample Code	Total Mercury (Filtered)																Average	Standard Deviation	
					2007	2008	2009	2010	2011 (Aug)	2011 (Sep / Nov)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021			2022
MS-1	Bedrock (Bioherm)	MS-1-BR	ES1-BR	ES1BDR	1.30	-	0.27	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.24	<0.10	<0.10	0.26	<0.17	0.77	<0.166	<0.26	<0.34
	Clay - Deep	MS-1-CL(1)	ES1-BR	ES1CLD	1.47	-	0.18	<0.10	<0.10	<0.10	0.19	<0.10	0.10	0.12	<0.10	<0.10	<0.10	<0.22	<0.17	<0.17	0.30	<0.23	<0.35
	Clay - Shallow	MS-1-CL(2)	ES1-BR	ES1CLS	0.27	-	0.16	<0.10	<0.10	<0.10	0.16	<0.10	0.15	0.19	0.16	0.48	<0.10	<0.22	<0.17	0.25	<0.166	<0.18	<0.10
MS-2	Bedrock (Bioherm)	DAS-1	EDAS-1	EDAS-1	0.23	-	0.24	0.45	<0.10	-	<0.10	<0.10	<0.10	<0.10	0.14	<0.10	<0.10	<0.22	<0.17	-	<0.166	<0.17	<0.10
		MS-2-BR	ES2-BR	ES2BR	0.68	-	-	0.38	<0.10	-	0.21	0.17	D	D	0.67	0.11	<0.10	<0.22	<0.17	-	<0.20	<0.27	<0.22
	Clay - Deep	MS-2-CL(1)	ES2-BR	ES2CLD	-	-	0.36	<0.10	<0.10	<0.10	0.18	D	0.31	<0.10	0.43	D	<0.10	0.60	0.68	-	1.50	<0.38	<0.21
MS-7	Clay - Shallow	MS-2-CL(2)	ES2-BR	ES2CLS	0.98	-	0.17	<0.10	3.01	<0.10	<0.10	<0.10	0.95	0.32	0.47	0.23	<0.10	0.30	<0.17	0.56	0.18	<0.49	<0.75
	BR Shallow		NS7-BR	NS7BRS	1.02	-	0.53	0.34	0.35	0.52	0.54	0.67	0.43	0.45	0.58	0.30	0.34	0.37	0.31	0.58	0.41	0.48	0.19
	BR Intermediate		NS7-BR	NS7BRI	1.93	-	0.23	<0.10	<0.10	-	0.23	0.53	0.29	0.75	0.84	2.11	0.50	0.60	3.64	2.83	4.55	<1.28	<1.12
MS-8	BR Deep		NS7-BR	NS7BRD	2.34	-	0.12	0.39	<0.10	<0.10	1.62	0.30	0.19	0.35	0.32	0.16	0.13	<0.22	<0.17	0.96	<0.166	<0.50	<0.65
	Clay - Deep	MS-7-CL(1)	NS7-CL	NS7-CLD	0.59	-	0.25	<0.10	<0.10	<0.10	<0.10	0.22	1.46	<0.10	0.48	<0.10	<0.10	<0.22	0.25	<0.17	<0.166	<0.29	<0.36
	Clay - Intermediate		NS7-CL	NS7-CLI	0.41	-	0.13	<0.10	<0.10	<0.10	0.25	0.19	0.57	0.12	0.20	<0.10	<0.10	<0.22	0.27	0.27	0.22	<0.21	<0.13
MS-9(1)	Clay - Shallow	MS-7-CL(2)	NS7-CL	NS7-CLS	0.70	-	0.10	<0.10	0.96	<0.10	<0.10	0.18	0.29	0.11	0.34	<0.10	0.13	<0.22	<0.17	<0.17	0.77	<0.28	<0.25
	Bedrock (Bioherm)	MS-8-BR(1)	NS8BR1	NS8B1S	7.46	-	1.56	7.14	1.37	-	0.79	0.54	0.27	0.71	1.12	0.11	<0.10	0.63	-	2.22	2.78	<1.91	<2.49
	Bedrock (Bioherm)	MS-8-BR(2)	NS8BR1	NS8B2S	4.36	-	-	0.33	-	0.35	0.36	0.66	0.81	1.45	1.66	3.95	1.51	6.06	6.58	18.34	16.60	<4.50	<4.95
MS-9(2)			NS8BR1	NS8B1D	1.83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Clay - Deep	MS-8-CL(1)	NS8CL1	NS8C1D	0.31	-	0.24	<0.10	-	-	-	D	D	D	D	D	D	D	0.30	0.43	0.87	<0.38	<0.12
	Clay - Middle	MS-8-CL(2)	NS8CL1	NS8C1I	-	-	0.26	-	0.32	0.47	0.21	1.05	0.80	0.42	1.00	0.94	D	1.10	0.69	0.94	0.39	<0.66	<0.33
MS-9(2)	Clay - Shallow	MS-8-CL(3)	NS8CL1	NS8C1S	0.89	-	0.28	0.50	<0.10	<0.10	-	1.13	D	0.32	1.62	0.40	D	0.76	0.18	0.95	0.17	<0.57	<0.47
	Clay - Deep	MS-8-CL(4)	NS8CL2	NS8C2D	0.14	-	0.16	<0.10	<0.10	-	<0.10	1.37	0.16	<0.10	0.11	<0.10	<0.10	<0.22	0.19	0.20	-	<0.22	<0.33
	Clay - Middle	MS-8-CL(5)	NS8CL2	NS8C2MD	0.49	-	-	-	-	-	<0.10	0.20	<0.10	<0.10	0.18	<0.10	D	0.29	<0.17	0.25	<0.166	<0.20	<0.12
MS-9(1)	Clay - Shallow	MS-8-CL(6)	NS8CL2	NS8C2S	0.33	-	0.59	<0.10	<0.10	0.17	<0.10	0.17	0.13	0.38	0.99	0.20	<0.10	0.33	<0.17	0.44	0.23	<0.28	<0.24
	Bedrock (Bioherm) *	MS-9(1)-BR			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Clay - Deep	MS-9(1)-CL(1)	SS9CL1	SS9C1D	0.66	-	<0.10	0.52	<0.10	<0.10	<0.10	0.32	0.29	0.23	0.41	<0.10	<0.10	<0.22	0.21	0.49	0.20	<0.26	<0.18
MS-9(2)	Clay - Shallow	MS-9(1)-CL(2)	SS9CL1	SS9C1S	1.03	-	0.10	0.43	<0.10	<0.10	0.24	0.26	4.94	<0.10	0.23	<0.10	<0.10	<0.22	0.23	0.47	<0.166	<0.58	<1.23
	Bedrock (Bioherm) *	MS-9(2)-BR			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Clay - Deep	MS-9(2)-CL(1)	SS9CL2	SS9C2D	1.09	-	0.30	0.38	<0.10	<0.10	<0.10	0.25	0.69	<0.10	0.12	<0.10	<0.10	<0.22	<0.17	<0.17	<0.166	<0.27	<0.28
MS-13	Clay - Shallow	MS-9(2)-CL(2)	SS9CL2	SS9C2S	0.44	-	0.13	<0.10	<0.10	<0.10	0.51	0.17	0.80	<0.10	0.17	<0.10	<0.10	<0.22	1.39	<0.17	<0.166	<0.31	<0.36
	Bedrock (Bioherm)	MS-13-BR	WS13BR	WS13BS	2.57	-	0.72	0.87	-	-	0.56	0.92	0.75	1.29	0.63	0.71	0.76	1.10	1.17	0.91	1.11	<1.00	<0.52
			WS13BR	WS13BD	1.19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MS-15	Clay - Deep	MS-13-CL(1)	WS13CL	WS13CD	0.42	-	<0.10	<0.10	<0.10	<0.10	-	<0.10	0.41	<0.10	0.13	0.29	<0.10	<0.22	0.18	0.52	0.21	<0.20	<0.15
			WS13CL	WS13CI	1.48	-	0.18	-	<0.10	<0.10	-	0.20	0.38	-	0.20	0.11	<0.10	<0.22	<0.17	0.18	0.19	<0.28	<0.38
	Clay - Shallow	MS-13-CL(2)	WS13CL	WS13CS	0.50	-	<0.10	0.36	<0.10	-	-	0.60	0.71	0.43	0.72	D	D	D	-	-	-	<0.44	<0.24
MS-15	Bedrock (Bioherm)	MS-15-BR	WS15BR	WS15BS	2.00	-	2.34	2.74	2.46	-	2.02	0.88	12.19	2.44	1.25	2.96	0.81	2.94	2.62	1.60	3.05	<2.82	<2.79
			WS15BR	WS15BD	0.58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Clay - Deep	MS-15-CL(1)	WS15CL	WS15CD	-	-	-	0.59	-	-	-	-	-	-	0.11	1.16	D	<0.10	0.53	0.22	-	0.53	<0.41
MS-15			WS15CL	WS15CI	1.70	-	-	-	-	-	-	-	-	-	-	0.75	0.45	<0.22	0.24	3.21	<0.166	<1.09	<1.17
	Clay - Shallow	MS-15-CL(2)	WS15CL	WS15CS	0.69	-	<0.10	<0.10	0.33	<0.10	-	0.14	D	0.32	0.25	-	-	-	-	-	-	<0.25	<0.20

Near-field sites: MS-2; MS-8
Mid-field sites: MS-1; MS-7; MS-9(1); MS-9(2)
Far-field sites: MS-13; MS-15
*Bedrock samples for stations MS-9(1) and MS-9(2) are collected at the overburden / bedrock interface and are reported as deep clay samples.
MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample

Table 1b: Muskeg Monitoring Program - Annual Mercury Results for Clay and Bedrock; Meythyl Mercury Filtered (2008-2022) (concentrations in ng/L)

Cluster Location	Substrate / Condition	Well Name	GPS Code	Sample Code	Methyl Mercury (Filtered)																	Average	Standard Deviation
					2007	2008	2009	2010	2011 (Aug)	2011 (Sep / Nov)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022		
MS-1	Bedrock (Bioherm)	MS-1-BR	ES1-BR	ES1BDR	<0.02	-	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.029	<0.02	<0.01
	Clay - Deep	MS-1-CL(1)	ES1-BR	ES1CLD	-	-	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.029	<0.02	<0.00
	Clay - Shallow	MS-1-CL(2)	ES1-BR	ES1CLS	<0.02	-	0.03	0.04	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.029	<0.02	<0.01
MS-2	Bedrock (Bioherm)	DAS-1	EDAS-1	EDAS-1	<0.02	-	0.05	0.02	0.07	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	<0.029	<0.03	<0.01
		MS-2-BR	ES2-BR	ES2BR	<0.02	-	-	0.14	0.04	-	0.03	0.07	D	D	<0.02	0.04	0.03	0.07	0.05	-	0.05	<0.05	<0.04
	Clay - Deep	MS-2-CL(1)	ES2-BR	ES2CLD	-	-	0.13	0.03	0.03	<0.02	<0.02	D	0.03	<0.02	<0.02	D	0.03	0.11	0.03	-	0.18	<0.05	<0.04
MS-7	Clay - Shallow	MS-2-CL(2)	ES2-BR	ES2CLS	<0.02	-	0.04	<0.02	<0.02	<0.02	0.02	0.06	0.25	0.05	0.05	<0.02	0.14	0.14	0.02	0.05	<0.029	<0.06	<0.07
	BR Shallow		NS7-BR	NS7BRS	0.09	-	0.05	0.05	0.05	0.12	0.03	<0.02	0.05	0.08	0.02	0.06	0.10	0.09	0.09	0.09	0.15	0.07	0.03
	BR Intermediate		NS7-BR	NS7BRI	0.04	-	<0.02	0.05	<0.02	-	<0.02	0.06	0.04	0.04	0.03	0.03	0.19	0.31	<0.02	0.31	<0.029	<0.08	<0.10
	BR Deep		NS7-BR	NS7BRD	0.03	-	0.03	0.03	0.03	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.029	<0.02	<0.01
	Clay - Deep	MS-7-CL(1)	NS7-CL	NS7-CLD	<0.02	-	0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.14	<0.02	<0.029	<0.03	<0.03
	Clay - Intermediate		NS7-CL	NS7-CLI	0.02	-	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	0.03	0.05	0.05	<0.02	0.04	0.06	<0.029	<0.03	<0.01
	Clay - Shallow	MS-7-CL(2)	NS7-CL	NS7-CLS	<0.02	-	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.029	<0.02	<0.00
MS-8	Bedrock (Bioherm)	MS-8-BR(1)	NS8BR1	NS8B1S	0.03	-	0.03	0.13	0.04	-	0.03	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	-	<0.02	<0.029	<0.03	<0.03
	Bedrock (Bioherm)	MS-8-BR(2)	NS8BR1	NS8B2S	<0.02	-	-	0.0515	-	0.165	0.176	0.42	0.032	0.213	0.11	0.12	0.21	0.21	0.16	0.32	0.26	<0.18	<0.11
			NS8BR1	NS8B1D	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Clay - Deep	MS-8-CL(1)	NS8CL1	NS8C1D	<0.02	-	<0.02	<0.02	-	-	-	D	D	D	D	D	D	D	0.03	0.03	0.04	<0.03	<0.01
	Clay - Middle	MS-8-CL(2)	NS8CL1	NS8C1I	-	-	0.04	-	0.10	0.06	0.02	<0.02	<0.02	0.03	<0.02	0.03	D	<0.02	0.03	<0.02	0.11	<0.04	<0.02
	Clay - Shallow	MS-8-CL(3)	NS8CL1	NS8C1S	0.03	-	<0.02	0.06	0.08	0.03	-	0.63	D	0.12	0.07	0.26	D	0.07	0.02	<0.02	<0.029	<0.12	<0.17
	Clay - Deep	MS-8-CL(4)	NS8CL2	NS8C2D	<0.02	-	<0.02	<0.02	<0.02	-	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	-	<0.02	<0.00
MS-9(1)	Clay - Middle	MS-8-CL(5)	NS8CL2	NS8C2MD	<0.02	-	-	-	-	-	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	D	0.03	<0.02	<0.02	-	<0.02	<0.01
	Clay - Shallow	MS-8-CL(6)	NS8CL2	NS8C2S	0.08	-	<0.02	0.03	0.04	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	0.04	0.04	<0.03	<0.02
	Bedrock (Bioherm) *	MS-9(1)-BR			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Clay - Deep	MS-9(1)-CL(1)	SS9CL1	SS9C1D	<0.02	-	<0.02	<0.02	0.029	<0.02	0.037	0.04	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.029	<0.02	<0.01
	Clay - Shallow	MS-9(1)-CL(2)	SS9CL1	SS9C1S	<0.02	-	0.07	0.02	0.03	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.05	<0.03	<0.02
	Bedrock (Bioherm) *	MS-9(2)-BR			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Clay - Deep	MS-9(2)-CL(1)	SS9CL2	SS9C2D	<0.02	-	0.04	0.02	0.03	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	< 0.02	< 0.02	<0.029	<0.02	<0.01
MS-9(2)	Clay - Shallow	MS-9(2)-CL(2)	SS9CL2	SS9C2S	<0.02	-	0.02	<0.02	<0.02	<0.02	<0.02	0.04	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	0.022	<0.029	<0.02	<0.01
	Bedrock (Bioherm)	MS-13-BR	WS13BR	WS13BS	<0.02	-	<0.02	<0.02	-	-	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	< 0.02	< 0.02	<0.029	<0.02	<0.01
			WS13BR	WS13BD	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Clay - Deep	MS-13-CL(1)	WS13CL	WS13CD	0.03	-	<0.02	0.02	<0.02	<0.02	-	0.03	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.02	<0.02	0.04	<0.02	<0.00
			WS13CL	WS13CI	0.04	-	0.04	-	<0.02	<0.02	-	<0.02	0.05	-	<0.02	0.03	<0.02	<0.02	0.02	<0.02	<0.029	<0.03	<0.01
MS-13	Clay - Shallow	MS-13-CL(2)	WS13CL	WS13CS	0.02	-	-	<0.02	<0.02	-	-	0.03	0.04	0.02	0.03	D	D	D	-	-	-	<0.02	<0.01
	Bedrock (Bioherm)	MS-15-BR	WS15BR	WS15BS	<0.02	-	0.37	0.03	<0.02	-	<0.02	0.61	0.04	<0.02	0.07	<0.02	<0.02	<0.02	0.03	0.03	<0.029	<0.09	<0.17
			WS15BR	WS15BD	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Clay - Deep	MS-15-CL(1)	WS15CL	WS15CD	<0.02	-	-	0.04	-	-	-	-	-	0.02	<0.02	D	0.09	0.13	0.10	-	0.10	<0.06	<0.05
			WS15CL	WS15CI	<0.02	-	-	-	-	-	-	-	-	-	-	<0.02	0.07	<0.02	0.03	<0.02	0.04	<0.03	<0.02
MS-15	Clay - Shallow	MS-15-CL(2)	WS15CL	WS15CS	<0.02	-	<0.02	<0.02	<0.02	0.04	-	<0.02	D	<0.02	<0.02	-	-	-	-	-	-	<0.02	<0.01

Near-field sites: MS-2; MS-8
Mid-field sites: MS-1; MS-7; MS-9(1); MS-9(2)
Far-field sites: MS-13; MS-15
*Bedrock samples for stations MS-9(1) and MS-9(2) are collected at the overburden / bedrock interface and are reported as deep clay samples.
MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury), as per Section 1.
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample

Table 2a: Muskeg Monitoring Program - Annual Mercury Results for Peat; Total Mercury Filtered (2009-2022) (concentrations in ng/L)

Cluster Location	Substrate / Condition	Well Name	GPS Code	Sample Code	Total Mercury (Filtered)																Average	Standard Deviation
					2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022		
MS-1	Peat - Domed Bog	MS-1-D	ES1D	ES1D	2.22	1.93	0.40	0.79	0.37	0.72	0.28	1.03	0.82	0.75	0.33	0.57	0.52	0.69	0.64	0.54	0.79	0.54
	Peat - Flat Bog	MS-1-F	ES1F	ES1F	2.73	3.04	0.83	1.47	1.18	1.31	0.79	2.30	2.04	1.50	0.99	1.61	2.25	1.76	2.04	1.70	1.72	0.65
	Peat - Horizontal Fen	MS-1-H	ES1H	ES1H	-	1.77	0.36	0.53	0.30	0.48	0.28	1.18	0.39	0.33	0.24	<0.10	0.64	0.37	0.60	0.63	<0.55	<0.42
	Peat - Ribbed Fen	MS-1-R	ES1R	ES1R	1.81	2.27	0.49	1.24	0.91	1.06	<0.10	1.84	1.73	0.79	0.44	0.61	1.72	2.75	2.39	-	<1.34	<0.80
MS-2	Peat - Domed Bog	MS-2-D	ES2D	ES2D	1.98	2.15	0.51	1.25	4.69	1.02	1.21	1.82	1.40	0.94	1.54	1.34	2.79	1.39	1.12	2.27	1.71	0.98
	Peat - Flat Bog	MS-2-F	ES2F	ES2F	3.12	3.05	2.35	2.74	5.79	1.53	2.48	5.17	5.10	1.84	1.30	3.95	5.94	5.81	-	-	3.58	1.68
	Peat - Ribbed Fen	MS-2-R ¹	ES2R	ES2R	1.56	2.02	0.38	1.43	4.60	0.67	0.30	2.06	1.46	0.42	0.68	0.83	1.28	1.40	1.36	1.18	1.35	1.02
	Peat - Domed Bog	MS-7-D	NS-7D	NS-7D	0.72	1.04	0.29	0.62	0.74	0.58	0.72	0.95	0.58	0.57	0.58	0.68	0.49	0.88	1.01	0.68	0.70	0.20
MS-7	Peat - Flat Bog	MS-7-F	NS-7F	NS-7F	1.23	1.61	0.27	0.85	1.09	0.86	1.32	2.36	1.12	0.73	0.69	1.01	0.88	1.18	0.96	1.33	1.09	0.46
	Peat - Horizontal Fen	MS-7-H	NS-7H	NS-7H	1.24	2.18	0.68	1.35	0.61	0.74	1.01	2.06	3.23	0.70	1.32	1.52	1.79	1.93	3.75	2.09	1.64	0.90
	Peat - Ribbed Fen	MS-7-R	NS-7R	NS-7R	0.62	0.52	0.12	0.44	0.36	0.25	<0.10	1.94	0.11	<0.10	0.56	0.20	0.23	0.23	0.38	0.47	<0.41	<0.44
	Peat - Domed Bog	MS-8-D	NS8-1D	NS8-1D	1.13	1.49	0.38	1.66	1.20	1.33	1.72	4.18	1.51	1.10	0.93	1.64	1.26	1.73	2.26	1.67	1.57	0.81
MS-8	Peat - Flat Bog	MS-8-F	NS8-1F	NS8-1F	1.91	2.85	1.46	2.76	4.34	3.08	3.31	5.44	5.73	2.38	3.96	3.91	6.09	6.00	0.61	3.58	3.59	1.64
	Peat - Horizontal Fen	MS-8-H	NS8-1H	NS8-1H	0.56	0.55	0.18	<0.10	<0.10	0.14	0.44	3.28	0.29	0.37	0.26	0.57	0.28	0.37	0.43	0.29	<0.51	<0.75
	Peat - Ribbed Fen	MS-8-R	NS8-1R	NS8-1R	1.00	0.98	0.27	1.60	1.18	0.55	0.30	1.15	1.34	1.27	0.77	1.37	1.17	2.15	1.56	1.39	1.13	0.49
	Peat - Domed Bog	MS-9(1)-D	SS9-1D	SS9-1D	0.77	0.77	0.27	0.58	<0.10	0.59	0.52	3.26	0.68	0.61	0.23	0.59	1.06	0.43	0.48	1.22	<0.76	<0.72
MS-9(1)	Peat - Flat Bog	MS-9(1)-F	SS9-1F	SS9-1F	2.53	1.74	0.37	1.36	0.69	1.08	1.27	1.44	1.50	1.18	0.84	1.75	1.20	1.01	1.08	1.34	1.27	0.49
	Peat - Horizontal Fen	MS-9(1)-H	SS9-1H	SS9-1H	2.65	2.06	0.45	1.01	0.71	0.68	0.48	0.70	0.50	1.47	0.62	0.92	1.18	1.92	1.74	3.40	1.28	0.86
	Peat - Ribbed Fen	MS-9(1)-R	SS9-1R	SS9-1R	0.72	1.26	0.22	0.47	0.42	0.32	0.25	0.71	0.51	0.20	0.17	0.27	0.27	0.36	0.40	0.73	0.46	0.28
	Peat - Domed Bog	MS-9(2)-D	SS9-2D	SS9-2D	1.72	1.89	0.42	1.04	0.93	0.63	1.38	1.17	1.14	1.35	0.89	1.33	1.58	1.04	1.25	1.80	1.22	0.41
MS-9(2)	Peat - Flat Bog	MS-9(2)-F	SS9-2F	SS9-2F	1.10	1.27	0.57	1.21	0.98	1.25	1.02	2.44	1.15	1.02	1.05	1.59	1.78	2.02	2.27	2.56	1.46	0.59
	Peat - Horizontal Fen	MS-9(2)-H	SS9-2H	SS9-2H	0.80	0.59	0.30	<0.10	<0.10	0.11	1.37	1.51	<0.10	<0.10	<0.10	<0.10	<0.22	<0.17	<0.19	<0.166	<0.38	<0.46
	Peat - Ribbed Fen	MS-9(2)-R	SS9-2R	SS9-2R	1.29	0.90	0.33	0.72	5.16	0.34	<0.10	1.75	0.24	0.16	0.21	<0.10	0.17	0.33	0.24	0.36	<0.77	<1.26
	Peat - Domed Bog	MS-13-D	WS13-D	WS13-D	2.81	2.68	1.26	1.45	7.02	1.23	1.25	1.68	2.41	1.86	1.32	1.72	1.91	3.76	4.09	3.55	2.50	1.53
MS-13	Peat - Flat Bog	MS-13-F	WS13-F	WS13-F	1.60	2.79	0.92	1.30	1.83	1.22	1.23	1.69	1.56	1.40	0.96	1.87	1.26	1.54	1.89	2.37	1.59	0.49
	Peat - Horizontal Fen	MS-13-H	WS13-H	WS13-H	-	0.57	0.35	0.42	0.31	<0.10	0.11	3.12	0.18	0.23	0.15	0.21	<0.22	<0.28	0.32	0.47	<0.47	<0.75
	Peat - Ribbed Fen	MS-13-R	WS13-R	WS13-R	0.40	0.95	0.25	<0.10	<0.10	0.13	<0.10	0.26	0.11	0.24	<0.10	0.33	0.49	0.63	0.71	0.58	<0.34	<0.26
	Peat - Domed Bog	MS-15-D	WS15-D	WS15-D	1.35	1.89	0.93	<0.10	<0.10	0.17	0.23	0.41	0.18	0.45	0.10	0.54	0.70	0.34	0.34	0.51	<0.52	<0.50
MS-15	Peat - Flat Bog	MS-15-F	WS15-F	WS15-F	2.66	2.55	0.30	0.35	1.92	<0.10	0.63	1.99	0.48	0.73	0.64	1.54	2.23	1.71	0.43	2.13	<1.27	<0.90
	Peat - Horizontal Fen	MS-15-H	WS15-H	WS15-H	0.99	0.90	0.22	<0.10	<0.10	0.10	0.13	0.37	<0.10	0.20	0.19	0.18	<0.22	<0.17	0.32	0.17	<0.28	<0.27
	Peat - Ribbed Fen	MS-15-R	WS15-R	WS15-R	0.43	0.92	0.15	<0.10	<0.10	0.10	0.20	0.22	<0.10	0.46	<0.10	0.15	<0.22	0.18	0.17	0.27	<0.24	<0.21
	Peat - Domed Bog	MS-V(1)-D		NS-V(1)-D	1.96	0.60	0.18	0.53	0.49	0.14	0.17	0.43	0.29	0.25	0.23	0.28	<0.22	0.27	7.90	-	0.93	1.98
MS-V(1)	Peat - Ribbed Fen	MS-V(1)-R ¹		NS-V(1)-R	1.56	2.02	0.38	1.43	4.60	0.67	0.30	2.06	1.46	0.42	0.68	0.83	1.28	1.40	1.36	-	1.36	1.06
	Peat - Domed Bog	MS-V(2)-D		SS-V(2)-D	1.97	1.16	0.24	0.45	0.52	1.19	0.55	D	1.23	0.37	0.55	0.73	1.13	1.20	0.60	1.13	0.87	0.46
MS-V(2)	Peat - Ribbed Fen	MS-V(2)-R		SS-V(2)-R	0.59	0.60	0.13	0.85	<0.10	0.33	0.61	1.13	0.89	0.85	0.86	1.01	1.34	1.61	1.26	1.41	<0.85	<0.44
	Peat - Domed Bog	MS-V(3)-D		SS-V(3)-D	0.72	0.61	0.49	0.60	5.20	0.47	0.64	1.06	1.39	0.79	0.44	1.23	1.45	1.13	0.58	1.69	1.16	1.15
MS-V(3)	Peat - Ribbed Fen	MS-V(3)-R		SS-V(3)-R	1.08	1.69	0.47	0.76	0.89	0.64	0.76	0.61	0.58	2.22	0.35	0.90	0.80	0.99	0.57	0.73	0.88	0.47

MDLs have been adjusted for uniformity (0.1 ng/L for total mercury), as per Section 1.

¹MS-2-R and MS-V(1)-R are the same station

Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.

Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.

D: Dry

F: Frozen

US: Unsafe to sample



Table 2b: Muskeg Monitoring Program - Annual Mercury Results for Peat; Meythyl Mercury Filtered (2010-2022) (concentrations in ng/L)

Cluster Location	Substrate / Condition	Well Name	GPS Code	Sample Code	Methyl Mercury (Filtered)																Average	Standard Deviation
					2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022		
MS-1	Peat - Domed Bog	MS-1-D	ES1D	ES1D	0.02	0.07	0.10	0.06	0.08	0.03	0.10	0.05	0.05	0.03	0.03	0.02	0.03	0.04	0.03	<0.03	0.05	0.03
	Peat - Flat Bog	MS-1-F	ES1F	ES1F	<0.02	0.18	0.19	0.14	<0.02	0.06	0.10	0.09	0.04	0.04	0.06	0.06	0.04	0.10	0.06	0.05	<0.08	<0.05
	Peat - Horizontal Fen	MS-1-H	ES1H	ES1H	-	-	0.10	0.04	<0.02	0.10	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.03	0.02	< 0.02	<0.03	<0.04	<0.03
	Peat - Ribbed Fen	MS-1-R	ES1R	ES1R	0.02	0.07	0.06	0.06	0.05	<0.02	0.05	0.02	0.06	<0.02	0.03	0.02	0.02	<0.06	0.06	-	<0.04	<0.02
MS-2	Peat - Domed Bog	MS-2-D	ES2D	ES2D	<0.02	0.02	0.04	0.05	<0.02	0.07	0.14	0.04	0.02	<0.02	<0.02	0.03	0.07	0.06	0.03	0.09	<0.05	<0.03
	Peat - Flat Bog	MS-2-F	ES2F	ES2F	<0.02	0.10	0.07	0.11	0.10	0.09	0.20	0.08	0.05	0.02	0.07	0.11	0.41	0.14	-	-	<0.11	<0.10
	Peat - Ribbed Fen	MS-2-R ¹	ES2R	ES2R	<0.02	0.04	0.09	0.08	0.06	0.29	0.11	0.10	0.06	0.03	0.07	0.05	0.04	0.03	0.04	0.06	<0.07	<0.06
	Peat - Domed Bog	MS-7-D	NS-7D	NS-7D	<0.02	<0.02	0.04	0.02	0.04	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.02	<0.02	<0.03	<0.02	<0.01
MS-7	Peat - Flat Bog	MS-7-F	NS-7F	NS-7F	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.02	<0.02	<0.02	<0.03	<0.02	<0.01
	Peat - Horizontal Fen	MS-7-H	NS-7H	NS-7H	0.02	0.06	0.10	0.04	0.03	0.46	0.04	0.03	0.09	<0.02	0.03	0.02	0.05	0.02	0.06	0.05	<0.07	<0.11
	Peat - Ribbed Fen	MS-7-R	NS-7R	NS-7R	<0.02	<0.02	0.03	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	< 0.02	<0.02	<0.03	<0.02	<0.00
	Peat - Domed Bog	MS-8-D	NS8-1D	NS8-1D	<0.02	<0.02	0.06	0.29	0.11	0.07	0.23	0.11	0.06	0.05	0.06	0.09	0.04	0.05	0.05	0.06	<0.09	<0.07
MS-8	Peat - Flat Bog	MS-8-F	NS8-1F	NS8-1F	<0.02	0.08	0.31	0.14	0.16	0.12	0.11	0.13	0.14	0.07	0.19	0.27	0.15	0.18	0.20	0.14	<0.15	<0.07
	Peat - Horizontal Fen	MS-8-H	NS8-1H	NS8-1H	<0.02	<0.02	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.03	0.05	0.07	0.09	0.05	0.05	0.08	<0.04	<0.02
	Peat - Ribbed Fen	MS-8-R	NS8-1R	NS8-1R	<0.02	<0.02	0.09	<0.02	0.02	<0.02	0.07	0.06	0.10	0.19	0.08	0.10	0.30	0.27	0.21	0.13	<0.10	<0.09
	Peat - Ribbed Fen	MS-9(1)-R	SS9-1R	SS9-1R	0.02	0.03	0.04	<0.02	0.02	<0.02	<0.02	<0.02	0.09	<0.02	0.02	<0.02	<0.02	0.03	0.02	<0.03	<0.03	<0.02
MS-9(1)	Peat - Domed Bog	MS-9(1)-D	SS9-1D	SS9-1D	<0.02	<0.02	0.17	<0.02	<0.02	0.04	<0.02	<0.02	0.05	0.04	<0.02	<0.02	<0.02	0.10	< 0.02	< 0.07	<0.04	<0.04
	Peat - Flat Bog	MS-9(1)-F	SS9-1F	SS9-1F	<0.02	0.04	0.05	0.05	<0.02	0.05	<0.02	0.04	0.29	0.08	0.06	0.07	0.03	0.02	0.09	0.09	<0.06	<0.06
	Peat - Horizontal Fen	MS-9(1)-H	SS9-1H	SS9-1H	0.02	0.05	0.11	0.03	0.04	0.02	<0.02	<0.02	<0.02	0.02	0.02	<0.02	<0.03	< 0.02	< 0.02	< 0.03	<0.03	<0.02
	Peat - Ribbed Fen	MS-9(1)-R	SS9-1R	SS9-1R	0.02	0.03	0.04	<0.02	0.02	<0.02	<0.02	<0.02	0.09	<0.02	0.02	<0.02	<0.02	0.03	0.02	<0.03	<0.03	<0.02
MS-9(2)	Peat - Domed Bog	MS-9(2)-D	SS9-2D	SS9-2D	<0.02	0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.02	<0.02	<0.03	0.03	0.03	0.04	<0.02	<0.01
	Peat - Flat Bog	MS-9(2)-F	SS9-2F	SS9-2F	<0.02	0.06	0.12	0.03	0.05	0.04	<0.02	0.07	0.04	0.04	0.04	0.07	0.09	0.06	0.06	0.06	<0.05	<0.03
	Peat - Horizontal Fen	MS-9(2)-H	SS9-2H	SS9-2H	<0.02	<0.02	0.08	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	< 0.02	< 0.02	< 0.02	<0.03	<0.03	<0.02
	Peat - Ribbed Fen	MS-9(2)-R	SS9-2R	SS9-2R	<0.02	0.06	0.17	0.05	0.18	0.06	0.02	<0.02	<0.02	<0.02	<0.02	0.03	0.02	0.02	< 0.02	<0.03	<0.05	<0.05
MS-13	Peat - Domed Bog	MS-13-D	WS13-D	WS13-D	0.03	0.12	0.24	0.11	0.08	0.06	0.06	0.11	0.11	0.06	0.07	0.05	0.04	0.11	0.09	0.07	0.09	0.05
	Peat - Flat Bog	MS-13-F	WS13-F	WS13-F	0.07	0.24	0.45	0.15	0.19	0.28	0.18	0.29	0.12	0.10	0.12	0.15	0.12	0.14	0.07	0.08	0.17	0.10
	Peat - Horizontal Fen	MS-13-H	WS13-H	WS13-H	0.02	<0.02	0.29	<0.02	0.02	<0.02	0.04	0.02	<0.02	<0.02	0.04	0.03	0.02	0.02	< 0.02	< 0.07	<0.04	<0.07
	Peat - Ribbed Fen	MS-13-R	WS13-R	WS13-R	0.13	<0.02	0.05	<0.02	0.03	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	< 0.02	< 0.02	<0.03	<0.03	<0.03
MS-15	Peat - Domed Bog	MS-15-D	WS15-D	WS15-D	<0.02	0.04	0.78	<0.02	0.05	<0.02	0.13	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	< 0.02	< 0.02	<0.03	<0.08	<0.19
	Peat - Flat Bog	MS-15-F	WS15-F	WS15-F	<0.02	0.07	0.17	<0.02	0.16	<0.02	0.04	0.07	0.03	0.04	0.08	0.12	0.12	0.05	< 0.02	< 0.06	<0.07	<0.05
	Peat - Horizontal Fen	MS-15-H	WS15-H	WS15-H	-	<0.02	0.10	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	< 0.02	< 0.02	<0.03	<0.03	<0.02	<0.02
	Peat - Ribbed Fen	MS-15-R	WS15-R	WS15-R	0.02	0.02	<0.02	<0.02	<0.02	<0.02	0.03	0.02	<0.02	<0.02	<0.02	0.03	0.02	< 0.02	< 0.02	< 0.03	<0.02	<0.00
MS-V(1)	Peat - Domed Bog	MS-V(1)-D		NS-V(1)-D	-	<0.02	0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	< 0.02	< 0.02	-	<0.02	<0.00
	Peat - Ribbed Fen	MS-V(1)-R ¹		NS-V(1)-R	<0.02	0.04	0.09	0.08	0.06	0.29	0.11	0.10	0.06	0.03	0.07	0.05	0.04	0.03	0.04	-	<0.07	<0.07
MS-V(2)	Peat - Domed Bog	MS-V(2)-D		SS-V(2)-D	-	<0.02	<0.02	0.05	0.07	0.03	0.05	D	0.10	0.05	0.04	0.06	0.05	0.04	0.04	0.08	<0.05	<0.02
	Peat - Ribbed Fen	MS-V(2)-R		SS-V(2)-R	-	<0.02	0.03	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.03	0.04	0.06	0.11	0.07	<0.04	<0.03
MS-V(3)	Peat - Domed Bog	MS-V(3)-D		SS-V(3)-D	-	0.10	0.03	<0.02	0.07	<0.02	<0.02	0.03	<0.02	0.02	<0.02	0.04	0.04	0.05	0.03	<0.03	<0.04	<0.02
	Peat - Ribbed Fen	MS-V(3)-R		SS-V(3)-R	-	0.02	0.04	<0.02	0.03	<0.02	0.05	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	0.11	< 0.02	<0.03	<0.03	<0.02

MDLs have been adjusted for uniformity (0.02 ng/L for methyl mercury), as per Section 1.

¹MS-2-R and MS-V(1)-R are the same stations

Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.

Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.

D: Dry

F: Frozen

US: Unsafe to sample

Table 2c: Muskeg Pore Water - Domed Bog 2007-2022 (Filtered) (concentrations in ng/L)

Cluster Location	Total Mercury																Methyl Mercury																
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
MS-1	2.22	1.93	0.40	0.79	0.37	0.72	0.28	1.03	0.82	0.75	0.33	0.57	0.52	0.69	0.64	0.54	0.02	0.07	0.10	0.06	0.08	0.03	0.10	0.05	0.05	0.03	0.03	0.02	0.03	0.04	0.03	<0.03	
MS-2	1.98	2.15	0.51	1.25	4.69	1.02	1.21	1.82	1.40	0.94	1.54	1.34	2.79	1.39	1.12	2.27	<0.02	0.02	0.04	0.05	<0.02	0.07	0.14	0.04	0.02	<0.02	<0.02	0.03	0.07	0.06	0.03	0.09	
MS-7	0.72	1.04	0.29	0.62	0.74	0.58	0.72	0.95	0.58	0.57	0.58	0.68	0.49	0.88	1.01	0.68	<0.02	<0.02	0.04	0.02	0.04	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.03	
MS-8	1.13	1.49	0.38	1.66	1.20	1.33	1.72	4.18	1.51	1.10	0.93	1.64	1.26	1.73	2.26	1.67	<0.02	<0.02	0.06	0.29	0.11	0.07	0.23	0.11	0.06	0.05	0.06	0.09	0.04	0.05	0.05	0.06	
MS-9(1)	0.77	0.77	0.27	0.58	<0.10	0.59	0.52	3.26	0.68	0.61	0.23	0.59	1.06	0.43	0.48	1.22	<0.02	<0.02	0.17	<0.02	<0.02	0.04	<0.02	<0.02	0.05	0.04	<0.02	<0.02	<0.02	0.10	<0.02	0.07	
MS-9(2)	1.72	1.89	0.42	1.04	0.93	0.63	1.38	1.17	1.14	1.35	0.89	1.33	1.58	1.04	1.25	1.80	<0.02	0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.02	<0.02	<0.03	0.03	0.03	0.04	
MS-13	2.81	2.68	1.26	1.45	7.02	1.23	1.25	1.68	2.41	1.86	1.32	1.72	1.91	3.76	4.09	3.55	0.03	0.12	0.24	0.11	0.08	0.06	0.06	0.11	0.11	0.06	0.07	0.05	0.04	0.11	0.09	0.09	
MS-15	1.35	1.89	0.93	<0.10	0.34	0.17	0.23	0.41	0.18	0.45	0.10	0.54	0.70	0.34	0.34	0.51	<0.02	0.04	0.78	0.02	0.05	<0.02	0.13	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.03
MS-V(1)	1.96	0.6	0.18	0.53	0.49	0.14	0.17	0.43	0.29	0.25	0.23	0.28	0.22	0.27	7.90	-	<0.02	<0.02	0.02	0.02	0.03	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	
MS-V(2)	1.97	1.16	0.24	0.45	0.52	1.19	0.55	D	1.23	0.37	0.55	0.73	1.13	1.20	0.60	1.13	<0.02	<0.02	0.05	0.07	0.03	0.05	D	0.10	0.05	0.04	0.06	0.05	0.04	0.04	0.08		
MS-V(3)	0.72	0.61	0.49	0.60	5.20	0.47	0.64	1.06	1.39	0.79	0.44	1.23	1.45	1.13	0.58	1.69	0.10	0.03	<0.02	0.07	<0.02	<0.02	0.03	<0.02	0.02	<0.02	0.04	0.04	0.05	0.03	<0.03		

MDLs have been adjusted for uniformity (0.1 ng/L for total mercury and 0.02 ng/L for methyl mercury), as per Section 1.

Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.

Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.

D: Dry

F: Frozen

US: Unable to sample

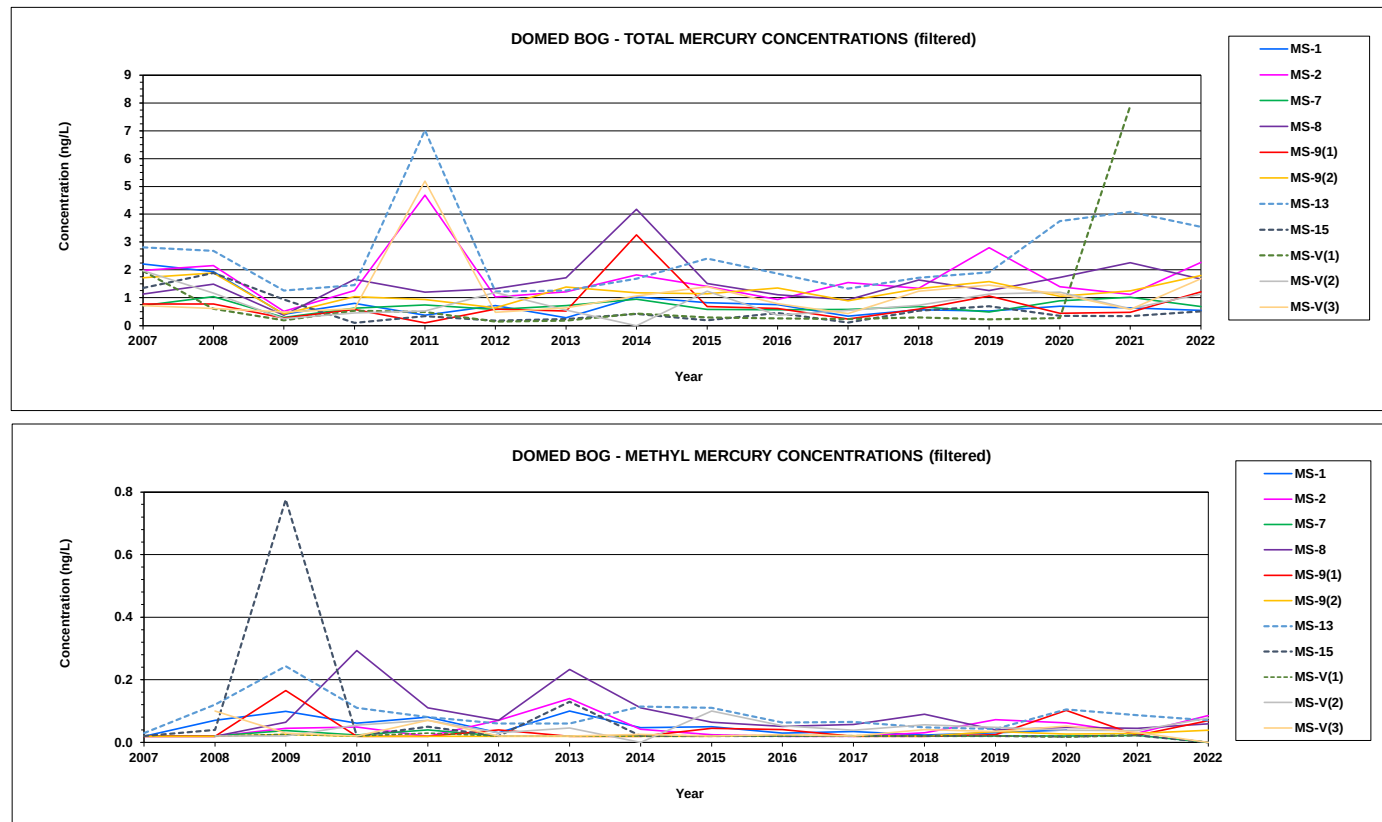


Table 2d: Muskeg Pore Water - Flat Bog 2007-2022 (Filtered) (concentrations in ng/L)

Cluster Location	Total Mercury																Methyl Mercury															
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
MS-1	2.73	3.04	0.83	1.47	1.18	1.31	0.79	2.3	2.04	1.50	0.99	1.61	2.25	1.76	2.04	1.70	<0.02	0.18	0.19	0.14	<0.02	0.06	0.10	0.09	0.04	0.04	0.06	0.06	0.04	0.10	0.06	0.05
MS-2	3.12	3.05	2.35	2.74	5.79	1.53	2.48	5.17	5.10	1.84	1.30	3.95	5.94	5.81	-	-	<0.02	0.10	0.07	0.11	0.10	0.09	0.20	0.08	0.05	0.02	0.07	0.11	0.41	0.14	-	-
MS-7	1.23	1.61	0.27	0.85	1.09	0.86	1.32	2.36	1.12	0.73	0.69	1.01	0.88	1.18	0.96	1.33	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.02	<0.02	<0.03
MS-8	1.91	2.85	1.46	2.76	4.34	3.08	3.31	5.44	5.73	2.38	3.96	3.91	6.09	6.00	0.61	3.58	<0.02	0.08	0.31	0.14	0.16	0.12	0.11	0.13	0.14	0.07	0.19	0.27	0.15	0.18	0.20	0.14
MS-9(1)	2.53	1.74	0.37	1.36	0.69	1.08	1.27	1.44	1.50	1.18	0.84	1.75	1.20	1.01	1.08	1.34	<0.02	0.04	0.05	0.05	<0.02	0.05	<0.02	0.04	0.29	0.08	0.06	0.07	0.03	0.02	0.09	0.09
MS-9(2)	1.10	1.27	0.57	1.21	0.98	1.25	1.02	2.44	1.15	1.02	1.05	1.59	1.78	2.02	2.27	2.56	<0.02	0.06	0.12	0.03	0.05	0.04	<0.02	0.07	0.04	0.04	0.04	0.07	0.09	0.06	0.06	0.06
MS-13	1.60	2.79	0.92	1.30	1.83	1.22	1.23	1.69	1.56	1.40	0.96	1.87	1.26	1.54	1.89	2.37	0.07	0.24	0.45	0.15	0.19	0.28	0.18	0.29	0.12	0.10	0.12	0.15	0.12	0.14	0.07	0.08
MS-15	2.66	2.56	0.30	0.35	1.92	<0.10	0.63	1.99	0.48	0.73	0.64	1.54	2.23	1.71	0.43	2.13	<0.02	0.07	0.17	<0.02	0.16	<0.02	0.04	0.07	0.03	0.04	0.08	0.12	0.12	0.05	<0.02	0.06

MDLs have been adjusted for uniformity (0.1 ng/L for total mercury and 0.02 ng/L for methyl mercury), as per Section 1.
 Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.

Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.

D: Dry

F: Frozen

US: Unsafe to sample

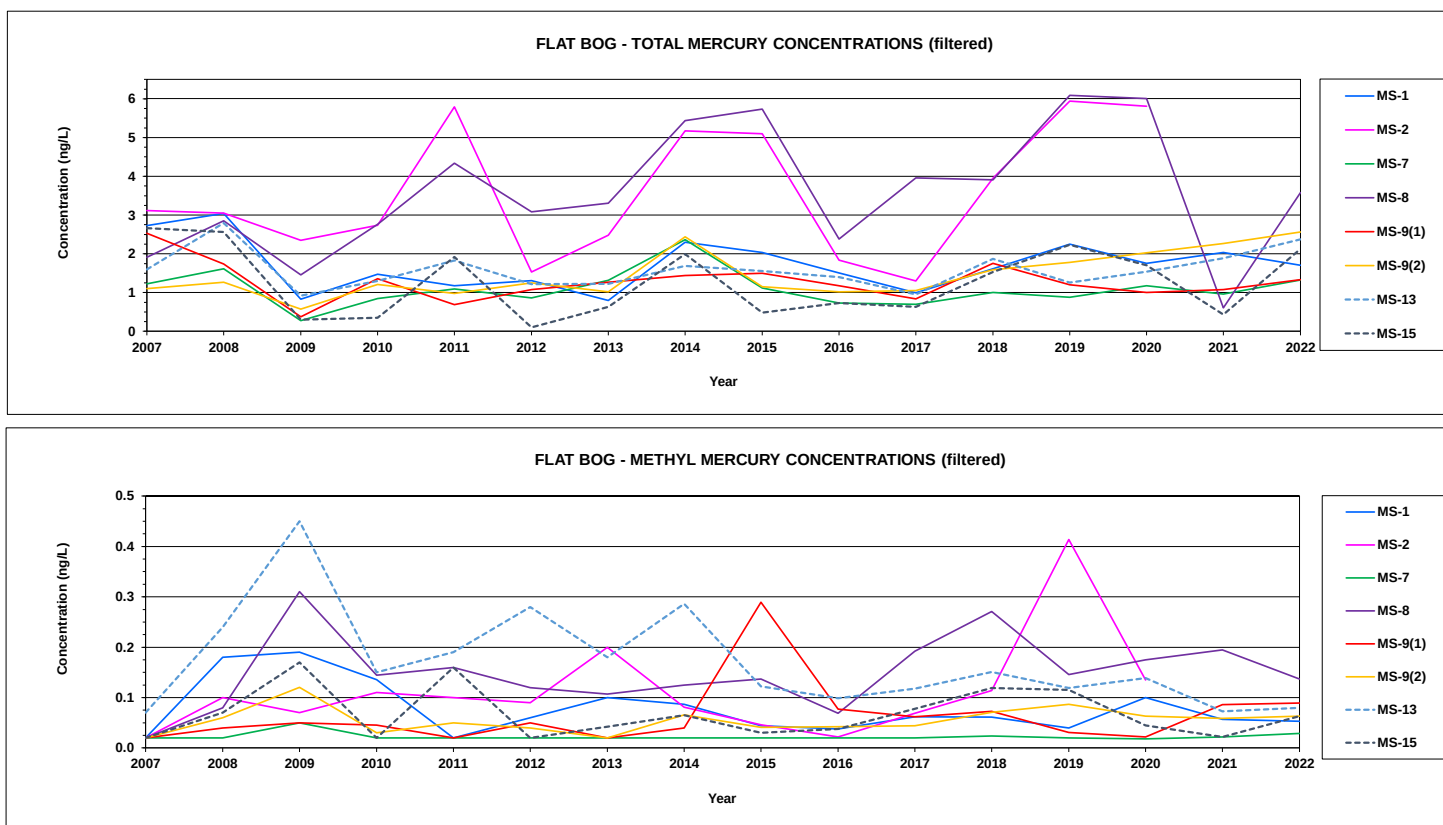


Table 2e: Muskeg Pore Water - Horizontal Fen 2007-2022 (Filtered) (concentrations in ng/L)

Cluster Location	Total Mercury																Methyl Mercury																
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
MS-1		1.77	0.36	0.53	0.3	0.48	0.28	1.18	0.39	0.33	0.24	<0.10	<0.64	0.37	0.60	0.63		0.02	0.06	0.10	0.04	<0.02	0.10	0.04	0.02	<0.02	<0.02	<0.02	<0.02	<0.03	0.02	<0.02	<0.03
MS-7	1.24	2.18	0.68	1.35	0.61	0.74	1.01	2.06	3.23	0.70	1.32	1.52	1.79	1.93	3.75	2.09		0.02	0.06	0.10	0.04	0.03	0.46	0.04	0.03	<0.09	<0.02	0.03	0.02	0.05	0.02	0.06	0.05
MS-8	0.56	0.55	0.18	<0.10	<0.10	0.14	0.44	3.28	0.29	0.37	0.26	0.57	0.28	0.37	0.43	0.29		<0.02	<0.02	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	0.03	0.05	0.07	0.09	0.05	0.05	0.08
MS-9(1)	2.65	2.06	0.45	1.01	0.71	0.68	0.48	0.7	0.50	1.47	0.62	0.92	1.18	1.92	1.74	3.40		<0.02	0.05	0.11	0.03	0.04	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.03	<0.03	<0.02	<0.03	<0.03
MS-9(2)	0.80	0.59	0.30	<0.10	<0.10	0.11	1.37	1.51	<0.10	<0.10	<0.10	<0.10	<0.22	<0.17	0.19	0.17		<0.02	<0.02	0.08	0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	0.03	0.02	<0.02	<0.02	<0.03	
MS-13	0.57	0.35	0.42	0.31	<0.10	0.11	3.12	0.18	0.23	0.15	0.21	<0.22	<0.28	0.32	0.47		0.02	<0.02	0.28	<0.02	0.02	<0.02	0.04	0.02	<0.02	<0.02	0.04	0.03	0.02	<0.02	<0.03	<0.03	
MS-15	0.99	0.90	0.22	<0.10	<0.10	0.10	0.13	0.37	<0.10	0.20	0.19	0.18	<0.22	<0.17	0.32	0.17		<0.02	<0.02	0.10	<0.02	0.02	<0.02	<0.02	0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.03	

MDLs have been adjusted for uniformity (0.1 ng/L for total mercury and 0.02 ng/L for methyl mercury), as per Section 1.
 Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
 Where cells are blank or contain "-"; this indicates that the sample was not required to be collected or data was unavailable.
 D: Dry
 F: Frozen
 US: Unsafe to sample

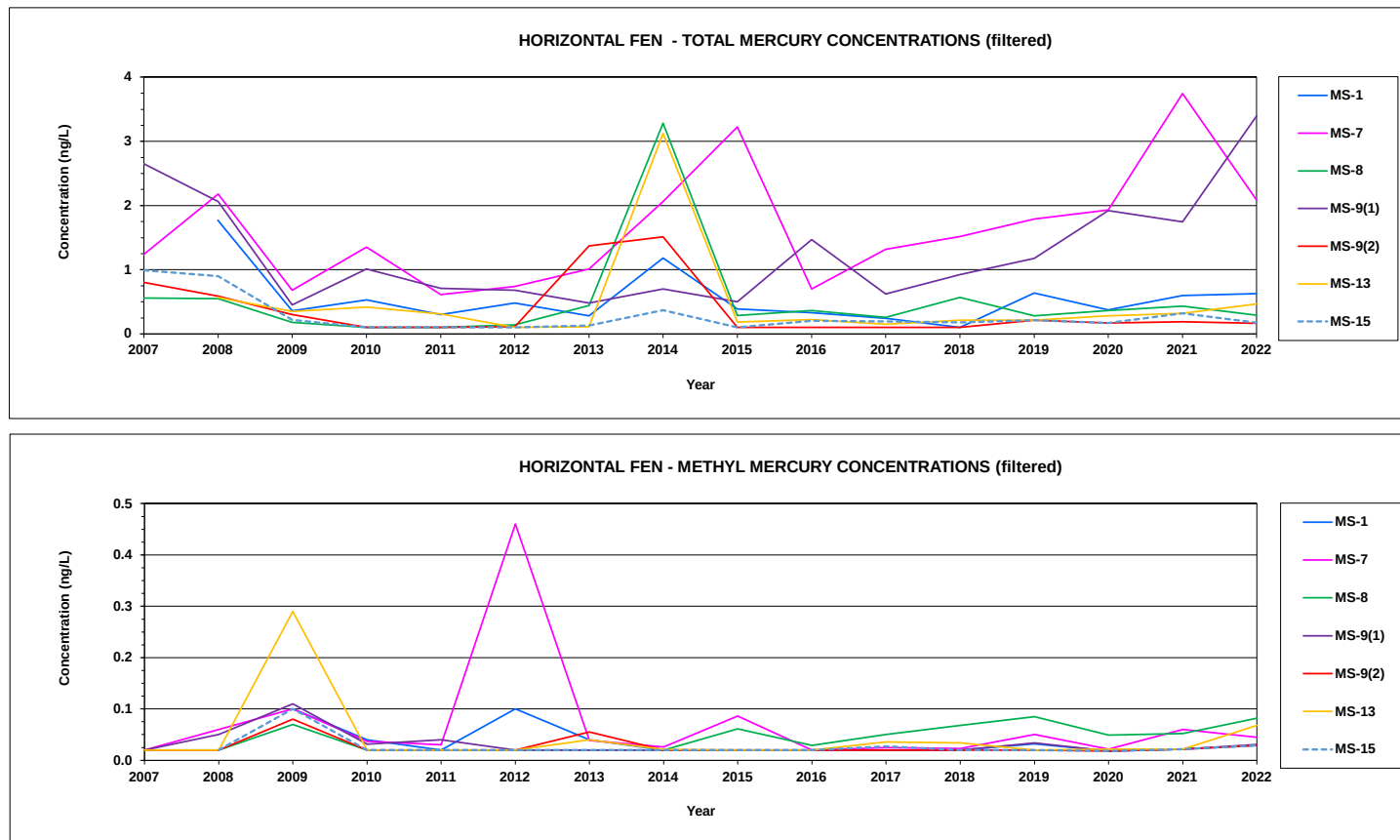


Table 2f: Muskeg Pore Water - Ribbed Fen 2007-2022 (Filtered) (concentrations in ng/L)

Cluster Location	Total Mercury																Methyl Mercury															
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
MS-1	1.81	2.27	0.49	1.24	0.91	1.06	<0.10	1.84	1.73	0.79	0.44	0.61	1.72	2.75	2.39		0.02	0.07	0.06	0.06	0.05	<0.02	0.05	0.02	0.06	<0.02	0.03	0.02	<0.02	<0.06	0.06	
MS-2 ¹	1.56	2.02	0.38	1.43	4.6	0.67	0.3	2.06	1.46	0.42	0.68	0.83	1.28	1.40	1.36	1.18	<0.02	0.04	0.09	0.08	0.06	0.29	0.11	0.10	0.06	0.03	0.07	0.05	0.04	0.03	0.04	0.06
MS-7	0.62	0.52	0.12	0.44	0.36	0.25	<0.10	1.94	0.11	<0.10	0.56	0.20	0.23	0.23	0.38	0.47	<0.02	<0.02	0.03	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.03	
MS-8	1.00	0.98	0.27	1.60	1.18	0.55	0.30	1.15	1.34	1.27	0.77	1.37	1.17	2.15	1.56	1.39	<0.02	<0.02	0.09	<0.02	0.02	<0.02	0.07	0.06	0.10	<0.02	0.08	0.10	0.30	0.27	0.21	0.13
MS-9(1)	0.72	1.26	0.22	0.47	0.42	0.32	0.25	0.71	0.51	0.20	0.17	0.27	0.27	0.36	0.40	0.73	0.02	0.03	0.04	<0.02	0.02	<0.02	<0.02	0.09	<0.02	0.02	<0.02	0.03	<0.02	<0.03		
MS-9(2)	1.29	0.90	0.33	0.72	5.16	0.34	<0.10	1.75	0.24	0.16	0.21	<0.10	<0.17	0.33	0.24	0.36	<0.02	0.06	0.17	0.05	0.18	0.06	0.02	0.02	<0.02	<0.02	0.03	<0.02	0.02	<0.02	<0.03	
MS-13	0.40	0.95	0.25	<0.10	<0.10	0.13	<0.10	0.26	0.11	0.24	<0.10	0.33	0.49	0.63	0.71	0.58	0.13	<0.02	0.05	<0.02	0.03	<0.02	0.03	0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.03		
MS-15	0.43	0.92	0.15	<0.10	<0.10	<0.10	0.20	0.22	<0.10	0.46	<0.10	0.15	0.22	0.18	0.17	0.27	0.02	0.02	<0.02	0.02	<0.02	<0.02	0.03	0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.03		
MS-V(1) ¹	1.56	2.02	0.38	1.43	4.60	0.67	0.30	2.06	1.46	0.42	0.68	0.83	1.28	-	1.36	1.18	<0.02	0.04	0.09	0.08	0.06	0.29	0.11	0.10	0.06	0.03	0.07	0.05	0.04	-	0.04	0.06
MS-V(2)	0.59	0.60	0.13	0.85	<0.10	0.33	0.61	1.13	0.89	0.85	0.86	1.01	1.34	1.61	1.26	1.41	<0.02	<0.02	0.03	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	0.04	0.06	0.11	0.07		
MS-V(3)	1.08	1.69	0.47	0.76	0.89	0.64	0.76	0.61	0.58	2.22	0.35	0.90	0.80	0.99	0.57	0.73		0.02	0.04	<0.02	<0.02	<0.02	0.05	0.02	<0.02	<0.02	0.02	<0.02	0.11	<0.02	<0.03	

MS-15 have been adjusted for uniformity (0.12 ng/L for total mercury and 0.02 ng/L for methyl mercury), as per Section 1.

¹ - MS-2 and MS-V(1) are the same station.

Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.

Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.

D: Dry

F: Frozen

US: Unsafe to sample

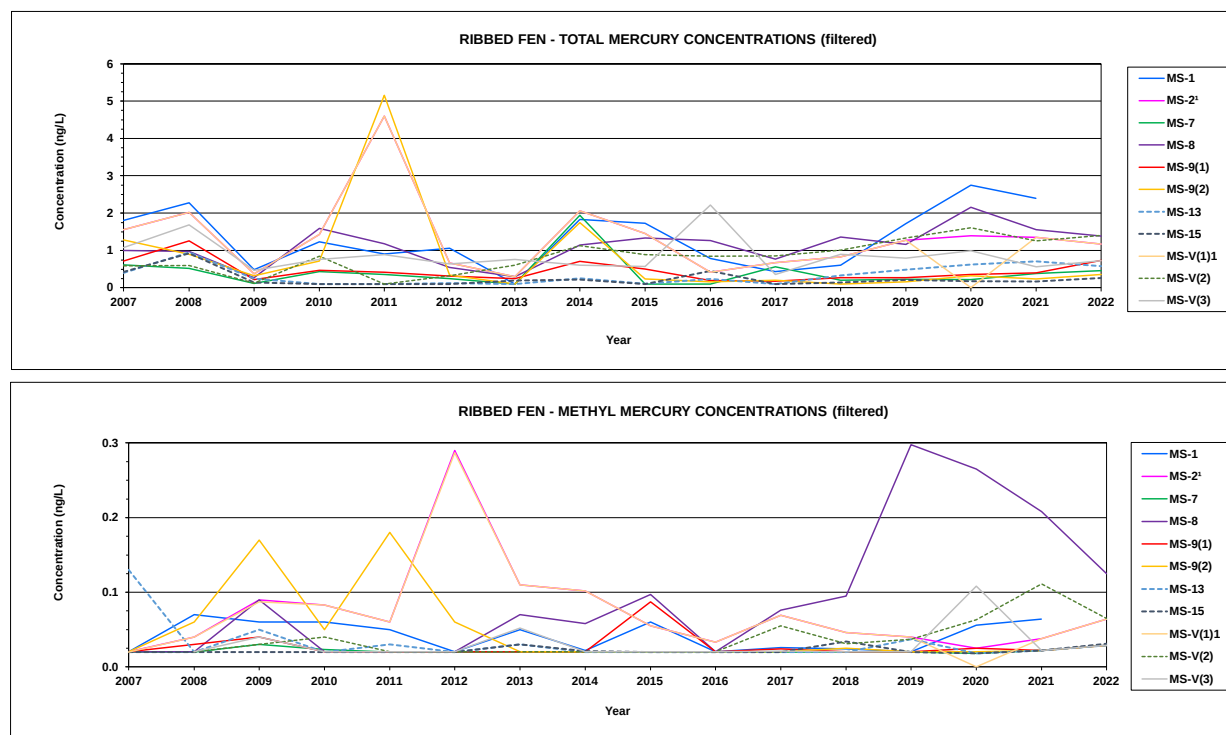


Table 3: Total Mercury - Fens (Unfiltered) (concentrations in ng/L

Date	Southwest Fen (SWF/F) S-1	Northeast Fen (NEF/F) S-2	Southeast Fen (SEF/F) S-3	Northwest Control (HgCON) S-4
	CEQG for Protection of Aquatic Life: 26 ng/L			
May-06	0.77	0.62		
Jun-06	2.44	1.72		
Jul-06	2.49	1.26	2.51	2.64
Aug-06	1.86	0.83		
Sep-06	1.29	1.25		
Oct-06	1.59	0.53	1.09	1.70
Dec-06	4.65	1.08		
Jan-07	3.01	0.86	1.51	2.77
Feb-07	2.84	0.99		
Mar-07	F	3.14		
Apr-07	F	2.34		
May-07	2.07	1.31	1.43	1.25
Jun-07	1.96	1.21		
Jul-07	2.40	0.87	1.57	2.87
Aug-07	3.85	1.30		
Sep-07	2.28	1.32		
Oct-07	3.74	1.12	3.57	4.51
Nov-07	2.86	0.68		
Dec-07	3.42	1.41		
Jan-08	6.55	3.33	13.30	4.36
Feb-08	5.70	3.52		
Mar-08	9.79	4.64		
Apr-08	16.30	5.67	F	2.80
May-08	1.78	1.33		
Jun-08	2.37	1.11		
Jul-08	3.19	1.54	2.42	3.47
Aug-08	2.98	2.51		
Sep-08	2.76	2.22		
Oct-08	1.84	1.02	1.44	1.60
Nov-08	1.80	0.76		
Dec-08	2.19	0.92		
Jan-09	F	3.43	1.83	2.66
Feb-09	8.61	5.14		
Mar-09				
Apr-09	4.89	7.35		
May-09	1.44	2.92	2.60	2.91
Jun-09	ND	1.25		
Jul-09	ND	1.46	2.12	2.97
Aug-09	ND	1.11		
Sep-09	ND	1.42		
Oct-09	ND	1.41	0.94	1.15
Nov-09	ND	0.38		
Dec-09	ND	0.19		
Jan-10	ND	3.21	3.16	2.93
Feb-10	ND			
Mar-10	ND			
Apr-10	ND	1.03	0.55	
May-10	ND	0.70		
Jun-10	ND	0.74		
Jul-10	ND	1.34	1.21	1.21
Aug-10	ND	1.76		
Sep-10	ND	1.15		
Oct-10	ND	0.78	1.29	1.86
Nov-10	ND	0.56		
Dec-10	ND	0.98		
Jan-11	ND	1.26	1.61	1.87
Feb-11	ND	F		
Mar-11	ND	F		
Apr-11	ND	2.81	3.74	2.05
May-11	ND	1.23		
Jun-11	ND	1.05		
Jul-11	ND	3.18	1.41	1.99
Aug-11	ND	3.29		
Sep-11**	ND	-		
Oct-11	ND	1.68	2.78	3.97
Nov-11	ND	1.23		
Dec-11	ND	1.17		
Jan-12	ND	5.31	7.75	5.49
Feb-12	ND	-		
Mar-12	ND	1.88		
Apr-12	ND	2.06	3.32	0.72
May-12	ND	0.68		
Jun-12	ND	1.16		
Jul-12	ND	3.59	1.36	1.90
Aug-12	ND	4.93		
Sep-12	ND	3.79		
Oct-12	ND	0.60	1.33	1.33
Nov-12	ND	2.70		
Dec-12	ND	2.37		
Jan-13	ND	3.30	F	4.59
Feb-13	ND			
Mar-13	ND			
Apr-13	ND	7.39		
May-13	ND	0.64	2.55	3.36
Jun-13	ND	0.26		
Jul-13	ND	1.52	1.11	1.67
Aug-13	ND	2.29		
Sep-13	ND	3.06		
Oct-13	ND	1.34	4.52	1.86
Nov-13	ND			
Dec-13	ND	1.72		
Jan-14	ND	1.40	F	8.49
Feb-14	ND			
Mar-14	ND			
Apr-14	ND	3.17		
May-14	ND	2.92	6.13	3.17
Jun-14	ND	1.88		
Jul-14	ND	3.27	2.62	3.25
Aug-14	ND	4.09		

Table 3: Total Mercury - Fens (Unfiltered) (concentrations in ng/L

Date	Southwest Fen (SWF/F) S-1	Northeast Fen (NEF/F) S-2	Southeast Fen (SEF/F) S-3	Northwest Control (HgCON) S-4
	CEQG for Protection of Aquatic Life: 26 ng/L			
Sep-14	ND	2.28		
Oct-14	ND	1.59	1.69	3.03
Nov-14	ND	1.44		
Dec-14	ND	0.91		
Jan-15	ND	2.77	F	5.49
Feb-15	ND			
Mar-15	ND			
Apr-15	ND	4.28		
May-15	ND	0.44	1.22	2.84
Jun-15	ND	0.90		
Jul-15	ND	1.75	2.89	4.11
Aug-15	ND	2.19		
Sep-15	ND	1.92		
Oct-15	ND	1.54	2.64	5.13
Nov-15	ND	3.53		
Dec-15	ND	0.98		
Jan-16	ND	2.84	4.38	4.79
Feb-16	ND			
Mar-16	ND			
Apr-16	ND	3.93		
May-16	ND	1.77	1.50	1.53
Jun-16	ND	1.00		
Jul-16	ND	3.17	1.81	2.00
Aug-16	ND	3.81		
Sep-16	ND	5.33		
Oct-16	ND	2.93	1.52	1.96
Nov-16	ND	1.08		
Dec-16	ND	0.56		
Jan-17	ND	0.76	2.34	5.65
Feb-17	ND			
Mar-17	ND			
Apr-17	ND	5.62		
May-17	ND	0.87	2.77	1.89
Jun-17	ND	1.08		
Jul-17	ND	3.26	1.52	2.73
Aug-17	ND	2.80		
Sep-17	ND	2.46		
Oct-17	ND	0.49	0.84	1.96
Nov-17	ND	1.86		
Dec-17	ND	0.57		
Jan-18	ND	2.81		
Feb-18	ND			
Mar-18	ND		F	F
Apr-18	ND	10.67		
May-18	ND	2.11	2.36	1.12
Jun-18	ND	<0.69		
Jul-18	ND	1.66	1.98	2.46
Aug-18	ND	2.95		
Sep-18	ND	3.08		
Oct-18	ND	0.44	1.66	3.71
Nov-18	ND	0.58		
Dec-18	ND	5.69		
Jan-19	ND	6.41	US	US
Feb-19	ND			
Mar-19	ND			
Apr-19	ND	11.12		
May-19	ND	2.12	2.74	3.74
Jun-19	ND	1.24		
Jul-19	ND	2.51	2.85	3.99
Aug-19	ND	7.07		
Sep-19	ND	3.44		
Oct-19	ND	1.36	1.28	2.14
Nov-19	ND	1.86		
Dec-19	ND	4.15		
Jan-20	ND			4.03
Feb-20	ND			
Mar-20	ND			
Apr-20	ND	8.26	1.87	3.25
May-20	ND	4.33		
Jun-20	ND	2.14	1.53	
Jul-20	ND	4.82	2.21	
Aug-20	ND	4.61		2.84
Sep-20	ND	1.30		
Oct-20	ND	1.42	2.99	3.95
Nov-20	ND	2.69		
Dec-20	ND	1.07		
Jan-21	ND	3.25		
Feb-21	ND			
Mar-21	ND			5.01
Apr-21	ND	7.75		
May-21	ND	0.72	1.55	
Jun-21	ND	1.13		4.22
Jul-21	ND	2.51		
Aug-21	ND	3.62	1.98	3.05
Sep-21	ND	1.74		
Oct-21	ND	1.25	3.61	5.49
Nov-21	ND	0.94		
Dec-21	ND	1.24		
Jan-22	ND	4.62		
Feb-22	ND			
Mar-22	ND			
Apr-22	ND	10.95		
May-22	ND	2.96		
Jun-22	ND	3.04	2.70	4.07
Jul-22	ND	2.73	3.09	4.25
Aug-22	ND	4.46		
Sep-22	ND	3.77		
Oct-22	ND	2.33	1.27	2.64
Nov-22	ND	5.41		

Table 3: Total Mercury - Fens (Unfiltered) (concentrations in ng/L

Date	Southwest Fen (SWF/F) S-1	Northeast Fen (NEF/F) S-2	Southeast Fen (SEF/F) S-3	Northwest Control (HgCON) S-4
	CEQG for Protection of Aquatic Life: 26 ng/L			
Dec-22	ND	5.32		
*Average 2009	5.03	2.31	1.87	2.42
*Average 2010		1.59	1.55	2.00
*Average 2011		2.23	2.39	2.47
*Average 2012		2.89	3.44	2.36
*Average 2013		1.70	2.73	2.87
*Average 2014		2.30	3.48	4.49
*Average 2015		1.63	2.25	4.39
*Average 2016		2.68	2.30	2.57
*Average 2017		1.34	1.87	3.06
*Average 2018		1.75	2.00	2.43
*Average 2019		3.10	2.29	3.29
*Average 2020		4.76	2.15	3.52
*Average 2021		2.31	2.38	4.44
*Average 2022		2.70	2.35	3.65
Average All Years	3.62	2.16	2.52	2.93
	CEQG for Protection of Aquatic Life: 26 ng/L			

Southwest Fen - Receives effluent from central quarry (2006 only)
Northeast Fen - Receives effluent from plant site excavation, sewage treatment plant, landfill and pit sump
Southeast Fen - Control site
Northwest Control - Control site
*Annual averages are calculated using months that correspond to the Northwest Control Site (S-4) for comparative purposes
** Samples discarded due to lab miscommunication
MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.
NEF/F not sampled in February and March as per permit amendment
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample
ND: not determined (C. of A. #3374-6G7J2Y was revoked)

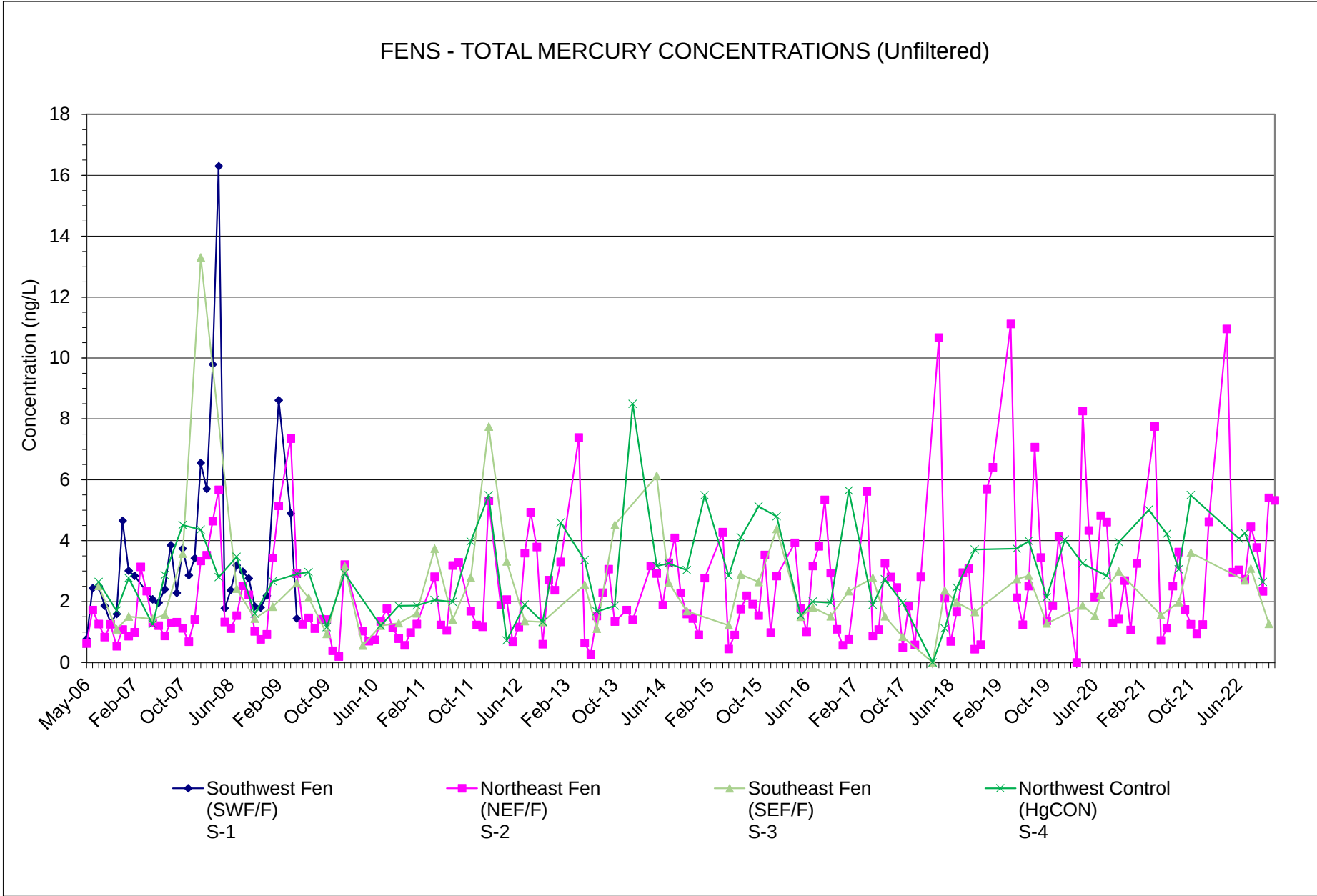


Table 4: Total Mercury - Fens (Filtered) (concentrations in ng/L)

Date	Southwest Fen (SWF/F) S-1	Northeast Fen (NEF/F) S-2	Southeast Fen (SEF/F) S-3	Northwest Control (HgCON) S-4
May-06	0.64	0.48		
Jun-06	2.32			
Jul-06	1.96	0.86	1.38	1.82
Aug-06	1.34	0.72		
Sep-06	1.11	0.61		
Oct-06	0.85	0.44	0.94	1.19
Dec-06	3.05	0.59		
Jan-07	1.86	0.47	1.01	1.73
Feb-07	1.90	0.48		
Mar-07	F	3.03		
Apr-07	F	1.69		
May-07	1.31	1.41	0.89	1.03
Jun-07	1.24	1.05		
Jul-07	1.74	0.70	1.48	1.70
Aug-07	2.45	0.98		
Sep-07	1.87	0.69		
Oct-07	2.89	1.04	3.11	3.92
Nov-07	2.66	0.60		
Dec-07	3.22	1.00		
Jan-08	4.86	2.10	2.21	3.07
Feb-08	5.40	2.32		
Mar-08	3.79	3.41		
Apr-08	6.72	2.41	F	2.41
May-08	1.22	1.01		
Jun-08	1.63	1.11		
Jul-08	2.87	1.38	2.02	2.88
Aug-08	2.55	1.81		
Sep-08	2.07	1.90		
Oct-08	1.71	1.04	1.12	1.33
Nov-08	1.77	0.66		
Dec-08	2.02	0.86		
Jan-09	F	2.86	1.61	2.00
Feb-09	7.42	3.62		
Mar-09				
Apr-09	3.89	5.09		
May-09	1.44	1.55	2.25	1.85
Jun-09	ND	1.20		
Jul-09	ND	1.12	1.49	2.09
Aug-09	ND	0.79		
Sep-09	ND	1.15		
Oct-09	ND	1.46	0.92	1.02
Nov-09	ND	0.21		
Dec-09	ND	<0.10		
Jan-10	ND	1.40	1.93	2.21
Feb-10	ND			
Mar-10	ND			
Apr-10	ND	0.65		<0.10
May-10	ND	0.50	0.76	
Jun-10	ND	0.59		
Jul-10	ND	1.00	0.80	0.95
Aug-10	ND	1.25		
Sep-10	ND	0.89		
Oct-10	ND	0.37	1.35	0.64
Nov-10	ND	0.55		
Dec-10	ND	0.45		
Jan-11	ND	0.81	0.95	1.37
Feb-11	ND	F		
Mar-11	ND	F		
Apr-11	ND	1.65	0.79	0.53
May-11	ND	0.60		
Jun-11	ND	0.91		
Jul-11	ND	2.00	1.16	1.57
Aug-11	ND	2.20		
Sep-11**	ND			
Oct-11	ND	0.96	1.59	2.89
Nov-11	ND	0.48		
Dec-11	ND	0.66		
Jan-12	ND	3.32	2.00	4.73
Feb-12	ND			
Mar-12	ND	0.69		
Apr-12	ND	0.98	2.06	0.25
May-12	ND	0.41		
Jun-12	ND	0.68		
Jul-12	ND	2.09	1.11	1.56
Aug-12	ND	3.01		
Sep-12	ND	2.86		
Oct-12	ND	0.43	0.85	0.96
Nov-12	ND	1.07		
Dec-12	ND	0.89		
Jan-13	ND	2.33	F	2.19
Feb-13	ND			
Mar-13	ND			
Apr-13	ND	3.25		
May-13	ND	0.37	1.83	2.32
Jun-13	ND	0.17		
Jul-13	ND	0.69	0.70	1.00
Aug-13	ND	1.06		
Sep-13	ND	1.83		
Oct-13	ND	0.82	1.44	1.27
Nov-13	ND			
Dec-13	ND	1.60		
Jan-14	ND	0.86	F	2.08
Feb-14	ND			
Mar-14	ND			
Apr-14	ND	1.32		
May-14	ND	0.72	4.18	1.70
Jun-14	ND	1.19		
Jul-14	ND	2.10	1.69	2.13
Aug-14	ND	2.13		
Sep-14	ND	1.36		
Oct-14	ND	<0.10	1.34	2.79
Nov-14	ND	0.91		
Dec-14	ND	0.42		

Table 4: Total Mercury - Fens (Filtered) (concentrations in ng/L)

Date	Southwest Fen (SWF/F) S-1	Northeast Fen (NEF/F) S-2	Southeast Fen (SEF/F) S-3	Northwest Control (HgCON) S-4
Jan-15	ND	1.72	F	2.48
Feb-15	ND			
Mar-15	ND			
Apr-15	ND	3.00		
May-15	ND	0.29	6.37	2.07
Jun-15	ND	0.68		
Jul-15	ND	1.41	1.71	2.51
Aug-15	ND	1.85		
Sep-15	ND	1.21		
Oct-15	ND	1.02	1.89	2.63
Nov-15	ND	0.79		
Dec-15	ND	0.68		
Jan-16	ND	1.18	2.56	3.18
Feb-16	ND			
Mar-16	ND			
Apr-16	ND	0.88		
May-16	ND	0.73	0.80	0.54
Jun-16	ND	0.77		
Jul-16	ND	1.44	1.70	1.96
Aug-16	ND	1.77		
Sep-16	ND	2.65		
Oct-16	ND	1.25	1.31	1.56
Nov-16	ND	0.29		
Dec-16	ND	0.25		
Jan-17	ND	0.43	1.73	1.72
Feb-17	ND			
Mar-17	ND			
Apr-17	ND	2.33		
May-17	ND	0.54	1.70	0.52
Jun-17	ND	0.74		
Jul-17	ND	1.42	1.36	2.53
Aug-17	ND	1.52		
Sep-17	ND	1.42		
Oct-17	ND	0.37	0.77	1.13
Nov-17	ND	1.01		
Dec-17	ND	0.20		
Jan-18	ND	1.78		
Feb-18	ND			
Mar-18	ND		F	F
Apr-18	ND	4.06		
May-18	ND	1.13	1.58	<0.69
Jun-18	ND	<0.69		
Jul-18	ND	1.06	1.49	1.33
Aug-18	ND	2.39		
Sep-18	ND	2.12		
Oct-18	ND	<0.40	1.14	2.36
Nov-18	ND	0.39		
Dec-18	ND	3.10		
Jan-19	ND	3.53	US	US
Feb-19	ND			
Mar-19	ND			
Apr-19	ND	3.72		
May-19	ND	0.83	1.48	1.94
Jun-19	ND	0.88		
Jul-19	ND	1.70	1.42	2.27
Aug-19	ND	2.17		
Sep-19	ND	2.21		
Oct-19	ND	0.45	1.09	1.65
Nov-19	ND	1.15		
Dec-19	ND	2.17		
Jan-20	ND			3.47
Feb-20	ND			
Mar-20	ND			
Apr-20	ND	1.65	1.31	0.86
May-20	ND	1.55		
Jun-20	ND	1.21	1.17	
Jul-20	ND	3.23	1.75	
Aug-20	ND	2.63		1.68
Sep-20	ND	0.91		
Oct-20	ND	0.80	1.92	2.55
Nov-20	ND	1.69		
Dec-20	ND	0.77		
Jan-21	ND	1.49		
Feb-21	ND			
Mar-21	ND			1.12
Apr-21	ND	1.04		
May-21	ND	0.59	1.13	
Jun-21	ND	1.04		4.00
Jul-21	ND	1.95		
Aug-21	ND	2.52	1.72	2.42
Sep-21	ND	1.14		
Oct-21	ND	0.92	2.86	4.13
Nov-21	ND	0.43		
Dec-21	ND	0.78		
Jan-22	ND	2.56		
Feb-22	ND			
Mar-22	ND			
Apr-22	ND	0.73		
May-22	ND	1.21		
Jun-22	ND	1.79	2.17	3.03
Jul-22	ND	2.09	2.80	3.77
Aug-22	ND	3.40		
Sep-22	ND	2.00		
Oct-22	ND	1.14	1.12	1.64
Nov-22	ND	0.45		
Dec-22	ND	3.81		

Table 4: Total Mercury - Fens (Filtered) (concentrations in ng/L)

Date	Southwest Fen (SWF/F) S-1	Northeast Fen (NEF/F) S-2	Southeast Fen (SEF/F) S-3	Northwest Control (HgCON) S-4
*Average 2009	4.43	<1.75	1.57	1.74
*Average 2010		0.86	1.21	<0.98
*Average 2011		1.36	1.12	1.59
*Average 2012		1.71	1.51	1.88
*Average 2013		1.05	1.32	1.70
*Average 2014		<0.95	2.40	2.18
*Average 2015		1.11	3.32	2.42
*Average 2016		1.15	1.59	1.81
*Average 2017		0.69	1.39	1.47
*Average 2018		1.09	1.40	1.46
*Average 2019		1.63	1.33	1.95
*Average 2020		1.69	1.54	2.14
*Average 2021		1.50	1.91	2.92
*Average 2022		1.67	2.03	2.81
Average All Years	2.56	<1.27	<1.64	<1.95

Southwest Fen - Receives effluent from central quarry (2006 only)
Northeast Fen - Receives effluent from plant site excavation, sewage treatment plant, landfill and pit sump
Southeast Fen - Control site
Northwest Control - Control site
*Annual averages are calculated using months that correspond to the Northwest Control Site (S-4) for comparative purposes
** Samples discarded due to lab miscommunication
MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.
NEF/F not sampled in February and March as per permit amendment
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample
ND: not determined (C. of A. #3374-6G7J2Y was revoked)

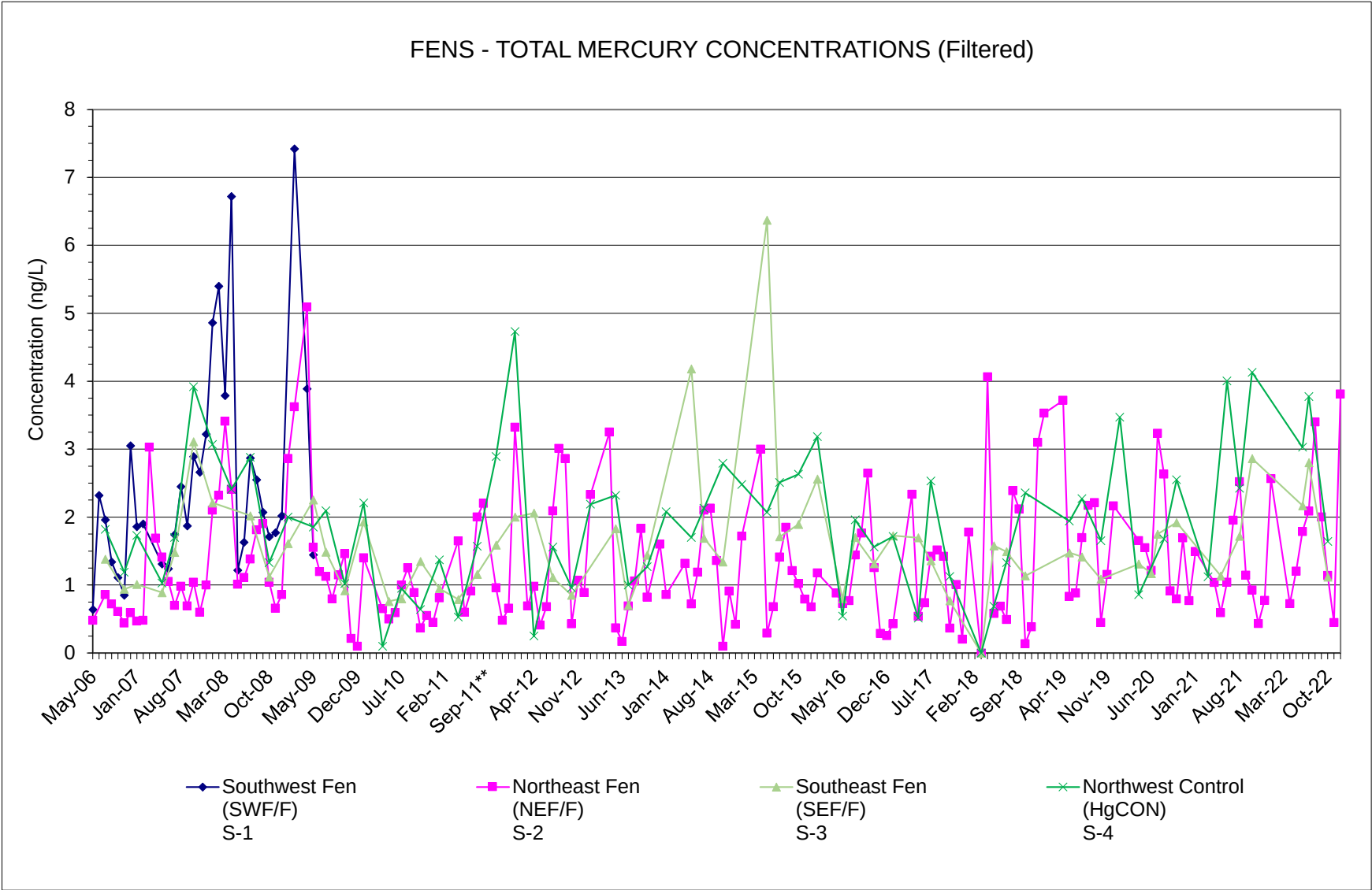


Table 5: Methyl Mercury - Fens (Unfiltered) (concentrations in ng/L)

Date	Southwest Fen (SWF/F) S-1	Northeast Fen (NEF/F) S-2	Southeast Fen (SEF/F) S-3	Northwest Control (HgCON) S-4
	CEQG for Protection of Aquatic Life: 4 ng/L			
Jul-06	0.16	0.10	0.03	0.06
Oct-06	0.20	0.02	0.02	0.05
Jan-07	0.97	0.07	0.07	0.16
May-07	0.14	0.07	<0.02	0.04
Jul-07	0.68	0.10	0.02	0.05
Oct-07	0.81	0.15	0.08	0.09
Jan-08	5.58	1.72	1.07	0.34
Mar-08	F	2.07	F	F
Apr-08	8.37	2.90	0.07	0.65
Jul-08	0.69	0.40	0.11	0.12
Oct-08	0.27	0.50	0.05	0.04
Jan-09	4.59	1.99	0.12	0.19
Apr/May-09	2.79	5.08	0.05	0.04
Jul-09	ND	0.34	<0.02	0.03
Oct-09	ND	0.12	0.03	0.04
Jan-10	ND	2.38	0.06	0.18
Apr-10	ND	0.21	0.04	0.06
Jul-10	ND	1.10	0.03	0.08
Oct-10	ND	0.24	0.03	0.07
Jan-11	ND	0.65	0.08	0.06
Apr-11	ND	0.13	0.18	0.18
Jul-11	ND	1.03	0.03	0.04
Oct-11	ND	0.23	0.07	0.07
Jan-12	ND	8.09	0.94	0.47
Apr-12	ND	0.49	0.10	0.05
Jul-12	ND	1.74	0.03	0.07
Oct-12	ND	0.15	0.02	0.03
Jan-13	ND	1.18	F	0.19
Apr/May-13	ND	6.05	0.08	0.04
Jul-13	ND	0.68	0.07	0.11
Oct-13	ND	0.48	<0.02	0.03
Jan-14	ND	0.49	F	0.50
Apr/May-14	ND	1.55	0.04	0.06
Jul-14	ND	1.56	0.05	0.19
Oct-14	ND	0.17	0.08	0.09
Jan-15	ND	1.16	F	0.98
May-15	ND	0.10	0.09	0.06
Jul-15	ND	1.02	0.07	0.14
Oct-15	ND	0.60	0.06	0.20
Jan-16	ND	1.66	0.15	0.26
Apr-16	ND	1.86		
May-16	ND	0.36	0.02	0.03
Jul-16	ND	1.54	0.05	0.09
Oct-16	ND	0.94	0.04	0.05
Nov-16	ND	0.15		
Jan-17	ND	0.32	0.06	0.13
Apr-17	ND	2.83		
May-17	ND	0.18	0.05	0.05
Jul-17	ND	1.78	0.05	0.11
Oct-17	ND	0.21	0.03	0.06
Nov-17	ND	1.54		
Jan-18	ND	1.71		
Mar-18	ND		F	F
Apr-18	ND	8.16		
May-18	ND	0.46	0.05	0.04
Jun-18	ND	0.21		
Jul-18	ND	0.60	0.05	0.06
Aug-18	ND	1.36		
Sep-18	ND	1.79		
Oct-18	ND	0.29	0.06	0.10
Nov-18	ND	0.21		
Dec-18	ND	4.74		
Jan-19	ND	4.96	US	US
Feb-19	ND			
Mar-19	ND			
Apr-19	ND	4.94		
May-19	ND	0.27	0.03	0.06
Jun-19	ND	0.54		
Jul-19	ND	1.33	0.41	0.09
Aug-19	ND	3.46		
Sep-19	ND	1.33		
Oct-19	ND	0.37	0.12	0.06
Nov-19	ND	1.18		
Dec-19	ND	2.51		
Jan-20	ND			0.11
Feb-20	ND			
Mar-20	ND			
Apr-20	ND	4.56	0.339	0.48
May-20	ND	0.79		
Jun-20	ND	0.82	0.077	
Jul-20	ND	2.75	0.216	
Aug-20	ND	2.41		0.08
Sep-20	ND	0.46		
Oct-20	ND	0.53	0.271	0.22
Nov-20	ND	1.52		
Dec-20	ND	0.57		
Jan-21	ND	1.99		
Feb-21	ND			
Mar-21	ND			0.33
Apr-21	ND	1.83		
May-21	ND	0.16	0.10	
Jun-21	ND	0.33		0.11
Jul-21	ND	1.34		
Aug-21	ND	1.59	0.04	0.06
Sep-21	ND	0.56		
Oct-21	ND	0.59	0.46	0.18
Nov-21	ND	0.27		
Dec-21	ND	0.69		
Jan-22	ND	3.37		
Feb-22	ND			

Table 5: Methyl Mercury - Fens (Unfiltered) (concentrations in ng/L)

Date	Southwest Fen (SWF/F) S-1	Northeast Fen (NEF/F) S-2	Southeast Fen (SEF/F) S-3	Northwest Control (HgCON) S-4
	CEQG for Protection of Aquatic Life: 4 ng/L			
Mar-22	ND			
Apr-22	ND	1.68		
May-22	ND	0.46		
Jun-22	ND	1.07	0.20	0.18
Jul-22	ND	1.67	0.09	0.09
Aug-22	ND	2.63		
Sep-22	ND	1.37		
Oct-22	ND	0.86	0.03	0.08
Nov-22	ND	1.13		
Dec-22	ND	3.77		
Average 2009	3.69	1.88	<0.05	0.07
Average 2010		0.98	0.04	0.10
Average 2011		0.51	0.09	0.09
Average 2012		2.62	0.27	0.16
Average 2013		2.10	<0.06	0.09
Average 2014		0.94	0.06	0.21
Average 2015		0.72	0.07	0.35
Average 2016*		1.13	0.07	0.11
Average 2017*		0.62	0.05	0.09
Average 2018*		2.69	0.06	0.06
Average 2019*		1.73	0.18	0.07
Average 2020*		2.50	0.23	0.22
Average 2021*		0.84	0.20	0.17
Average 2022*		1.20	0.11	0.12
Average all Data	2.10	1.21	<0.12	0.14
CEQG for Protection of Aquatic Life: 4 ng/L				

Southwest Fen - Receives effluent from central quarry (2006 only)
Northeast Fen - Receives effluent from plant site excavation, sewage treatment plant, landfill and pit sump
Southeast Fen - Control site
Northwest Control - Control site
Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G
*Annual averages are calculated using months that correspond to the Northwest Control Site (S-4) for comparative purposes
MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury), as per Section 1.
NEF/F: MeHg was not requested for June, August, September, December 2017
NEF/F not sampled in February and March as per permit amendment
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample
ND: not determined (C. of A. #3374-6G7J2Y was revoked)

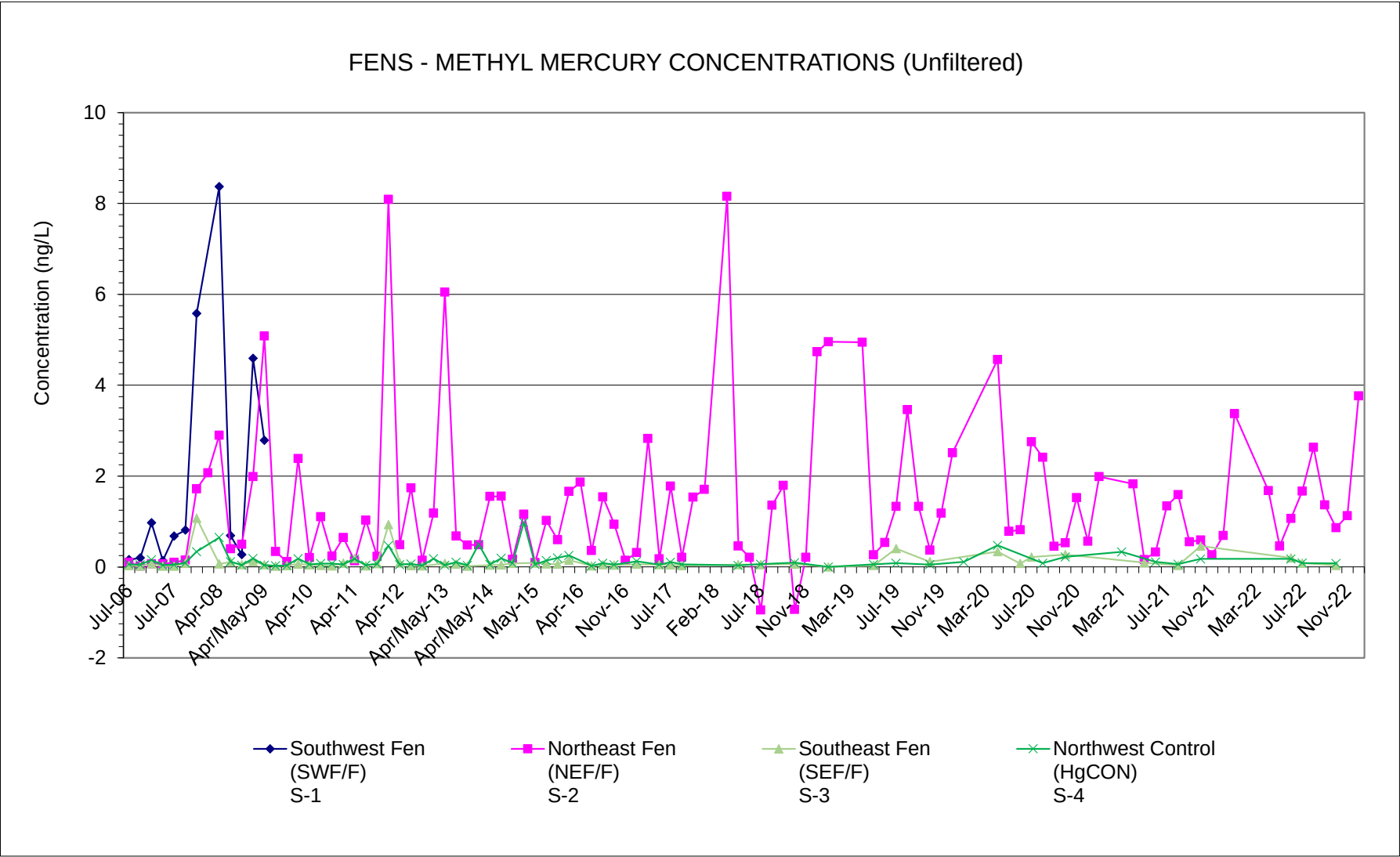


Table 6: Methyl Mercury - Fens (Filtered) (concentrations in ng/L)

Date	Southwest Fen (SWF/F) S-1	Northeast Fen (NEF/F) S-2	Southeast Fen (SEF/F) S-3	Northwest Control (HgCON) S-4
	Draft USEPA Criteria: 0.05 ng/L			
Jul-06	0.13	0.08	0.02	<0.02
Oct-06	0.15	0.02	<0.02	0.02
Jan-07	0.68	0.04	0.06	0.10
May-07	0.08	0.06	0.02	0.04
Jul-07	0.30	0.10	0.02	0.04
Oct-07	0.63	0.12	0.04	0.09
Jan-08	3.48	1.29	0.39	0.17
Mar-08	F	1.34	F	F
Apr-08	3.42	1.73	0.03	0.37
Jul-08	0.58	0.41	0.08	0.07
Oct-08	0.29	0.39	0.02	0.04
Jan-09	3.03	0.89	0.09	0.14
Apr/May-09	1.85	3.32	0.05	0.05
Jul-09	ND	0.16	0.07	0.08
Oct-09	ND	0.13	0.05	0.06
Jan-10	ND	0.76	0.11	0.07
Apr-10	ND	0.12	0.03	0.05
Jul-10	ND	0.59	0.02	0.04
Oct-10	ND	0.23	0.03	0.06
Jan-11	ND	0.40	0.03	0.03
Apr-11	ND	<0.02	0.04	0.06
Jul-11	ND	0.88	0.02	0.04
Oct-11	ND	0.04	0.03	<0.02
Jan-12	ND	4.09	0.17	0.20
Apr-12	ND	0.27	0.07	<0.02
Jul-12	ND	1.18	0.02	0.04
Oct-12	ND	0.11	<0.02	0.03
Jan-13	ND	0.97	F	0.24
Apr/May-13	ND	2.85	<0.02	0.04
Jul-13	ND	0.45	0.06	0.09
Oct-13	ND	0.18	<0.02	<0.02
Jan-14	ND	0.31	F	0.07
Apr/May-14	ND	1.09	0.04	0.04
Jul-14	ND	0.68	0.03	0.19
Oct-14	ND	0.11	0.03	0.05
Jan-15	ND	0.46	F	0.68
May-15	ND	0.08	0.09	0.05
Jul-15	ND	0.76	<0.02	0.02
Oct-15	ND	0.23	0.05	0.17
Jan-16	ND	0.84	0.11	0.15
Apr-16	ND	0.60		
May-16	ND	0.18	0.02	<0.02
Jul-16	ND	0.76	0.02	0.06
Aug-16	ND	1.21		
Oct-16	ND	0.49	0.03	0.03
Nov-16	ND	0.11		
Jan-17	ND	0.19	0.02	0.06
Apr-17	ND	1.60		
May-17	ND	0.13	0.03	<0.02
Jul-17	ND	0.70	0.03	0.07
Aug-17	ND	1.03		
Oct-17	ND	0.13	<0.02	0.02
Nov-17	ND	0.86		
Jan-18	ND	1.17		
Mar-18	ND		F	F
Apr-18	ND	4.09		
May-18	ND	0.24	0.04	0.02
Jun-18	ND	0.12		
Jul-18	ND	0.53	0.03	0.04
Aug-18	ND	1.27		
Sep-18	ND	1.00		
Oct-18	ND	0.20	0.04	0.05
Nov-18	ND	0.10		
Dec-18	ND	2.82		
Jan-19	ND	3.69	US	US
Feb-19	ND			
Mar-19	ND			
Apr-19	ND	2.37		
May-19	ND	0.17	<0.02	<0.02
Jun-19	ND	0.37		
Jul-19	ND	0.89	0.18	0.07
Aug-19	ND	1.05		
Sep-19	ND	0.95		
Oct-19	ND	0.16	0.10	0.05
Nov-19	ND	0.72		
Dec-19	ND	1.49		
Jan-20	ND			0.12
Feb-20	ND			
Mar-20	ND			
Apr-20	ND	1.39	0.39	0.32
May-20	ND	0.40		
Jun-20	ND	0.64	0.07	
Jul-20	ND	2.22	0.20	
Aug-20	ND	1.22		0.05
Sep-20	ND	0.39		
Oct-20	ND	0.36	0.22	0.07
Nov-20	ND	1.00		
Dec-20	ND	0.42		
Jan-21	ND	1.36		
Feb-21	ND			
Mar-21	ND			0.23
Apr-21	ND	1.04		
May-21	ND	0.17	0.04	
Jun-21	ND	0.25		0.11
Jul-21	ND	0.84		
Aug-21	ND	0.95	0.03	0.05
Sep-21	ND	0.44		
Oct-21	ND	0.45	0.27	0.09
Nov-21	ND	0.14		

Table 6: Methyl Mercury - Fens (Filtered) (concentrations in ng/L)

Date	Southwest Fen (SWF/F) S-1	Northeast Fen (NEF/F) S-2	Southeast Fen (SEF/F) S-3	Northwest Control (HgCON) S-4
	Draft USEPA Criteria: 0.05 ng/L			
Dec-21	ND	0.48		
Jan-22	ND	2.14		
Feb-22	ND			
Mar-22	ND			
Apr-22	ND	0.28		
May-22	ND	0.23		
Jun-22	ND	0.82	0.13	0.07
Jul-22	ND	1.22	0.08	0.06
Aug-22	ND	1.78		
Sep-22	ND	1.17		
Oct-22	ND	0.50	0.03	0.04
Nov-22	ND	0.21		
Dec-22	ND	2.67		
Average 2009	2.44	1.12	0.07	0.08
Average 2010		0.43	0.05	0.06
Average 2011		<0.33	0.03	<0.04
Average 2012		1.41	<0.07	<0.07
Average 2013		1.11	<0.03	<0.10
Average 2014		0.55	0.03	0.09
Average 2015		0.38	<0.05	0.23
Average 2016*		0.57	0.05	0.07
Average 2017*		0.29	<0.02	<0.04
Average 2018*		1.50	0.04	0.04
Average 2019*		1.23	0.10	0.05
Average 2020*		0.99	0.22	0.14
Average 2021*		0.55	0.12	0.06
Average 2022*		0.85	0.08	0.12
Average All Data	1.22	<0.76	<0.07	<0.09
Draft USEPA Criteria: 0.05 ng/L				

Southwest Fen - Receives effluent from central quarry (2006 only)
Northeast Fen - Receives effluent from plant site excavation, sewage treatment plant, landfill and pit sump
Southeast Fen - Control site
Northwest Control - Control site
Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G
*Annual averages are calculated using months that correspond to the Northwest Control Site (S-4) for comparative purposes
MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury), as per Section 1.
NEF/F: MeHg was not requested for June, August, September, December 2017
NEF/F not sampled in February and March as per permit amendment
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample
ND: not determined (C. of A. #3374-6G7J2Y was revoked)

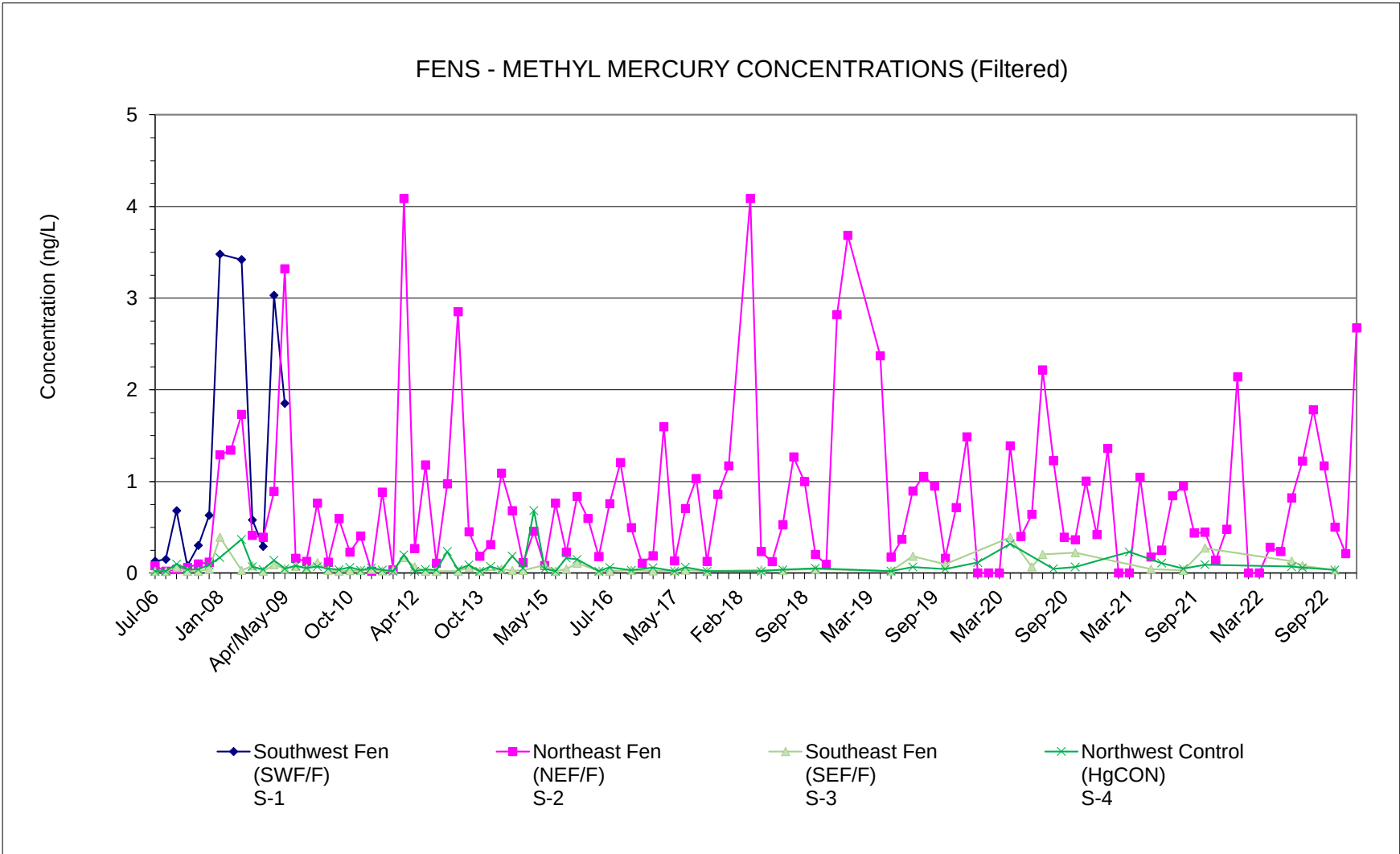


Table 7: Fen Systems - Statistical Analysis - Total Mercury (concentrations in ng/L)

UNFILTERED DATA - TWO-WAY ANALYSIS OF VARIANCE TABLES

Month / Year	Northeast Fen (NEF/F) MS-2	Southeast Fen (SEF/F) MS-3	Northwest Control Fen (HgCON) MS-4	Sum r.
May-13	0.64	2.55	3.36	6.55
Jul-13	1.52	1.11	1.67	4.30
Oct-13	1.34	4.52	1.86	7.72
May-14	2.92	6.13	3.17	12.22
Jul-14	3.27	2.62	3.25	9.14
Oct-14	1.59	1.69	3.03	6.31
May-15	0.44	1.22	2.84	4.50
Jul-15	1.75	2.89	4.11	8.75
Oct-15	1.54	2.64	5.13	9.31
May-16	1.77	1.50	1.53	4.81
Jul-16	3.17	1.81	2.00	6.97
Oct-16	2.93	1.52	1.96	6.41
May-17	0.87	2.77	1.89	5.53
Jul-17	3.26	1.52	2.73	7.50
Oct-17	0.49	0.84	1.96	3.29
May-18	2.11	2.36	1.12	5.59
Jul-18	1.66	1.98	2.46	6.10
Oct-18	0.44	1.66	3.71	5.80
May-19	2.12	2.74	3.74	8.60
Jul-19	2.51	2.85	3.99	9.35
Oct-19	1.36	1.28	2.14	4.78
Apr-20	8.26	1.87	3.25	13.38
Oct-20	1.42	2.99	3.95	8.36
Aug-21	3.62	1.98	3.05	8.65
Oct-21	1.25	3.61	5.49	10.35
Jul-22	2.73	2.70	4.25	9.68
Oct-22	2.33	1.27	2.64	6.24
Sum c.	57.32	62.59	80.28	200.19

Total SS	136.737
Treat SS	10.712
Block SS	51.039
Error SS	74.986

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	80	136.737	-		
Treatment	2	10.712	5.356	3.71	3.18
Block	26	51.039	1.963	1.36	1.71
Error	52	74.986	1.442		

Treatment Effect (i.e., difference between fen systems)
Significant

FILTERED DATA - TWO-WAY ANALYSIS OF VARIANCE TABLES

Month / Year	Northeast Fen (NEF/F) MS-2	Southeast Fen (SEF/F) MS-3	Northwest Control Fen (HgCON) MS-4	Sum r.
May-13	0.37	1.83	2.32	4.52
Jul-13	0.69	0.7	1	2.39
Oct-13	0.82	1.44	1.27	3.53
May-14	0.72	4.18	1.7	6.60
Jul-14	2.1	1.69	2.13	5.92
Oct-14	0.1	1.34	2.79	4.23
May-15	0.29	6.37	2.07	8.73
Jul-15	1.41	1.71	2.51	5.63
Oct-15	1.02	1.89	2.63	5.54
May-16	0.73	0.80	0.54	2.07
Jul-16	1.44	1.70	1.96	5.10
Oct-16	1.25	1.31	1.56	4.13
May-17	0.54	1.70	0.52	2.75
Jul-17	1.42	1.36	2.53	5.31
Oct-17	0.37	0.77	1.13	2.26
May-18	1.13	1.58	<0.69	<3.40
Jul-18	1.06	1.49	1.33	3.88
Oct-18	<0.40	1.14	2.36	3.89
May-19	0.83	1.48	1.94	4.25
Jul-19	1.70	1.42	2.27	5.39
Oct-19	0.45	1.09	1.65	3.19
Apr-20	1.65	1.31	0.86	3.82
Oct-20	0.80	1.92	2.55	5.27
Aug-21	2.52	1.72	2.42	6.66
Oct-21	0.92	2.86	4.13	7.92
Jul-22	2.09	2.80	3.77	8.66
Oct-22	1.14	1.12	1.64	3.90
Sum c.	27.96	48.71	52.27	128.95

Total SS	77.759
Treat SS	12.766
Block SS	28.287
Error SS	36.706

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	80	77.759	-		
Treatment	2	12.766	6.383	9.04	3.18
Block	26	28.287	1.088	1.54	1.71
Error	52	36.706	0.706		

Treatment Effect (i.e., difference between fen systems)
Significant

r. - rows; c. - columns
CEQG for Protection of Aquatic Life: 26ng/L

Table 8a: Total Mercury - Ribbed Fen Surface Waters (Unfiltered) (concentrations in ng/L)

Date	MS-1-R (ES1R-S)	MS-2-R (ES2R-S)	MS-7-R (NS-7R-S)	MS-8-R (NS8-1R-S)	MS-9(1)-R (SS9-1R-S)	MS-9(2)-R (SS9-2R-S)	MS-13-R (WS13-R-S)	MS-15-R (WS15-R-S)	MS-V(1)-R (ES2R-S)	MS-V(2)-R (SSV2-R)	MS-V(3)-R (SSV3-R)
	CEQG for Protection of Aquatic Life: 26 ng/L										
Aug / Sep-07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nov-07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
May-08	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aug-08	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oct-08	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Jan-09	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
May-09	3.29	2.65	3.50	3.38	5.26	1.85	3.85	1.95	2.65	2.05	2.98
Aug-09	1.50	1.47	1.29	1.74	4.13	0.90	2.84	0.96	1.47	2.10	1.88
Oct-09	1.29	1.64	1.40	1.56	1.42	1.51	2.47	0.73	1.64	2.18	1.94
Jan-10	1.46	1.34	0.97	4.94	1.64	0.92	0.79	0.71	1.34	1.29	
May-10	1.88	1.48	0.61	1.48	1.22	0.71	2.19	0.58	1.48	0.68	2.17
Jul/Aug-10	2.46	2.42	4.24	1.92	1.48	2.24	2.61	0.98	2.42	1.81	1.98
Oct-10	1.32	1.52	0.93	2.04	2.47	1.32	3.11	0.62	1.52	1.31	1.77
Jan/Feb-11		12.98	5.22	2.61	1.13	1.98	3.03	13.34	12.98		
Apr-11	2.41	1.32	1.78	2.30	1.12	1.89	8.96	1.32	1.32	3.25	1.24
Jul-11	2.88	14.02	1.69	2.41	1.89	1.50	3.36	0.66	14.02	2.64	1.74
Oct-11	3.09	2.80	6.02	4.07	2.22	2.43	4.40	1.25	2.80	2.66	5.75
Jan-12	5.10		12.32	4.52	2.76	2.48	5.64	1.26		5.74	9.23
May-12	2.29	4.01	1.41	1.48	1.55	1.64	2.49	0.77	4.01	1.06	1.21
Aug/Sep-12	2.16	2.56	1.81	1.68	2.00	2.37	3.75	0.85	2.56	1.67	3.88
Oct-12	2.35	2.33	3.93	2.15	1.57	1.04	3.54	0.78	2.33	1.19	3.73
Jan/Feb-13	F	F	F	F	2.91	4.25	F	7.24	F	F	F
May-13	2.96	2.91	2.55	1.95	1.96	2.27	3.19	1.44	2.91	3.50	3.45
Jul-13	1.38	1.29	0.67	1.21	0.63	0.64	2.05	0.52	1.29	0.86	1.33
Oct-13	2.37	1.87	0.77	2.15	1.62	2.67	3.88	0.66	1.87	0.95	1.51
Mar-14	F	F	F	F	8.80	F	F	11.00	F	F	F
May/Jun-14	3.23	3.13	6.51	2.50	1.85	2.12	3.05	1.25	3.13	4.20	4.02
Aug/Sep-14	9.14	2.30	1.29	1.71	7.46	1.77	3.71	1.17	2.30	1.38	1.25
Oct-14	3.72	3.72	2.67	4.02	6.22	2.77	5.04	1.61	3.72	2.73	3.28
Jan/Mar-15		F	F	F	F	F	F	F	F	F	F
Jun-15	3.41	2.77	4.75	3.74	2.27	2.58	3.50	1.40	2.77	4.69	3.57
Jul-15	2.98	2.58	4.88	5.56	1.59	2.10	4.38	1.38	2.58	2.42	3.86
Oct-15	2.40	1.14	3.36	3.04	2.10	4.91	4.93	0.81	1.14	2.96	2.48
Jan-16	F	F	F	F	3.17	3.11	F	0.99	F	F	F
Apr/May-16	3.00	2.12	4.00	1.87	1.72	1.73	3.16	2.07	2.12	3.14	2.45
Jul-16	2.25	2.45	3.56	2.59	1.36	1.52	3.48	1.12	2.45	1.67	5.05
Oct/Nov-16	2.58	1.88	2.83	2.27	1.74	1.71	3.32	0.69	1.88	4.10	1.64
Jan/Mar-17	2.52	2.93	5.57	F	1.62	1.79	F	7.21	2.93	F	3.32
Jun-17	2.74	2.29	3.81	5.42	2.35	2.99	3.23	1.27	2.29	4.74	3.94
Jul-17	2.74	2.37	2.22	2.44	1.52	1.62	3.56	0.97	2.37	2.97	3.81
Oct/Nov-17	4.18	2.24	4.17	1.35	1.76	1.43	2.63	0.96	2.24	0.99	F
Mar-18	F	F	F	F	F	F	F	F	F	F	F
May-18	5.23	3.79	5.01	2.08	3.15	2.16	4.73	1.28	3.79	4.55	4.34
Jul/Aug/Sep-18	2.89	1.41	3.43	1.86	1.61	1.25	3.65	1.01	1.41	1.69	2.80
Nov/Dec-18	F	F	1.59	F	F	1.28	F	0.58	F	F	F
Jan/Mar-19	F	F	1.87	1.73	F	F	F	F	F	F	F
May-19	5.59	3.87	5.73	3.32	2.93	3.51	4.63	2.01	3.87	4.35	2.39
Jul/Aug-19	2.44	2.83	5.49	4.96	2.91	1.74	3.54	1.02	2.83	3.38	4.93
Oct-19	2.40	1.32	3.19	1.91	2.04	2.24	3.78	0.65	1.32	3.40	3.23
Mar-20	F	F	F	8.98	2.49	9.75	F	2.52	F	F	15.93
May/Jun-20	5.77	4.34	5.45	2.64	2.78	2.93	6.21	1.42	0.10	1.58	2.83
Jul/Aug-20	4.54	7.40	12.57	2.55	2.21	2.24	4.64	1.22	0.23	4.17	3.88
Oct-20	3.54	3.35	6.10	3.69	3.07	2.71	4.81	1.09	0.07	3.24	4.85
Feb/Mar-21	F	F	F	5.93	2.07	2.27	F	2.00	F	F	F
May/Jun-21	3.68	2.80	4.89	2.84	2.37	2.58	4.29	1.15	2.80	2.90	3.66
Jul/Aug-21	3.27	2.10	3.01	2.61	1.70	4.31	4.07	1.21	2.10	2.00	3.80
Oct/Nov-21	2.82	2.78	3.97	2.71	3.11	3.51	4.08	1.09	2.78	3.95	4.07
Feb/Mar-22	F	F	F	F	F	100.60	F	F	F	F	F
May/Jun-22	3.16	3.23	4.06	3.01	3.25	2.84	4.08	1.82	3.23	3.55	4.20
Jul/Aug-22	2.97	19.63	2.31	2.18	2.98	2.44	NA	NA	19.63	10.01	8.38
Oct/Nov-22	2.24	1.28	2.65	1.87	1.76	1.65	3.38	0.80	1.28	3.19	6.27
2009 Average	2.03	1.92	2.06	2.23	3.60	1.42	3.05	1.21	1.92	2.11	2.27
2010 Average	1.78	1.69	1.69	2.60	1.70	1.30	2.18	0.72	1.69	1.27	1.97
2011 Average	2.79	7.78	3.68	2.85	1.59	1.95	4.94	4.14	7.78	2.85	2.91
2012 Average	2.98	2.97	4.87	2.46	1.97	1.88	3.86	0.92	2.97	2.42	4.51
2013 Average	2.24	2.02	1.33	1.77	1.78	2.46	3.04	2.47	2.02	1.77	2.10
2014 Average	5.36	3.05	3.49	2.74	6.08	2.22	3.93	3.76	3.05	2.77	2.85
2015 Average	2.93	2.16	4.33	4.11	1.99	3.20	4.27	1.20	2.16	3.36	3.30
2016 Average	2.61	2.15	3.46	2.24	2.00	2.02	3.32	1.22	2.15	2.97	3.05
2017 Average	3.05	2.46	3.94	3.07	1.81	1.96	3.14	2.60	2.46	2.90	3.69
2018 Average	4.06	2.60	3.34	1.97	2.38	1.70	4.19	0.96	2.60	3.12	3.57
2019 Average	3.48	2.67	4.07	2.98	2.63	2.49	3.98	1.22	2.67	3.71	3.51
2020 Average	4.62	5.03	8.04	4.47	2.64	4.41	5.22	1.56	0.13	3.00	6.87
2021 Average	3.26	2.56	3.96	3.52	2.31	3.17	4.15	1.36	2.56	2.95	3.84
2022 Average	2.79	8.04	3.01	2.35	2.66	26.88	3.73	1.31	8.04	5.58	6.29
Average All Years	3.08	3.42	3.66	2.87	2.50	4.25	3.77	1.83	3.09	2.86	3.72
	CEQG for Protection of Aquatic Life: 26 ng/L										

MS-2-R and MS-V(1)-R are the same stations

	Stations located at or inside the Upper Bedrock 2 m drawdown contour
	Stations located outside the Upper Bedrock 2 m drawdown contour

Amended C. of A. #3960-7Q4K2G provides for annual sampling of peat pore water and quarterly sampling of ribbed fen surface water (the previous C. of A. #4111-7DXKQW provided for the same sampling frequency).

MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.

Data prior to May 2009 refers to groundwater concentrations.

Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.

Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.

D: Dry

F: Frozen

US: Unsafe to sample

NA

Table 8b: Total Mercury - Ribbed Fen Surface Waters (Filtered) (concentrations in ng/L)

Date	MS-1-R (ES1R-S)	MS-2-R (ES2R-S)	MS-7-R (NS-7R-S)	MS-8-R (NS8-1R-S)	MS-9(1)-R (SS9-1R-S)	MS-9(2)-R (SS9-2R-S)	MS-13-R (WS13-R-S)	MS-15-R (WS15-R-S)	MS-V(1)-R (ES2R-S)	MS-V(2)-R (SSV2-R)	MS-V(3)-R (SSV3-R)
Aug / Sep-07	1.81	1.56	0.62	1.00	0.72	1.29	0.40	0.43	1.56	<0.10	<0.10
Nov-07	1.67	2.30	0.82	1.36	1.11	1.01	1.70	1.11	2.30	<0.10	<0.10
May-08	2.86	5.56	F	0.91	0.53	F	0.42	0.38	5.56	F	F
Aug-08	2.27	2.02	0.52	0.98	1.26	0.90	0.95	0.92	2.02	0.60	1.69
Oct-08	1.52	1.07	0.72	1.26	1.26	0.70	1.22	0.37	1.07	0.41	1.33
Jan-09	F	F	F	F	F	F	F	F	F	F	F
May-09	2.90	1.98	1.92	3.25	2.10	2.40	4.08	2.19	1.98	2.38	3.19
Aug-09	1.00	0.95	0.95	1.38	1.01	1.44	2.54	0.86	0.95	0.94	1.78
Oct-09	1.19	1.01	1.15	1.19	1.18	1.24	2.54	0.75	1.01	0.86	2.01
Jan-10	0.65	<0.10	<0.10	2.45	1.17	<0.10	1.21	<0.10	<0.10	<0.10	F
May-10	1.86	1.75	0.74	1.32	1.40	0.93	2.68	1.05	1.75	0.83	2.06
Aug-10	1.24	1.43	0.44	1.60	0.47	0.72	<0.10	<0.10	1.43	0.85	0.76
Oct-10	1.11	1.24	0.81	1.79	1.25	1.05	3.03	0.68	1.24	1.03	1.67
Jan / Feb-11	F	0.60	0.41	1.42	0.94	0.54	1.92	0.49	0.60	F	F
Apr-11	1.07	0.83	0.84	1.35	0.92	0.84	2.63	0.63	0.83	0.47	1.01
Jul-11	2.10	1.23	1.20	1.52	1.52	1.04	3.06	0.51	1.23	1.36	1.38
Oct-11	2.52	2.07	4.43	2.73	2.00	2.01	3.43	1.02	2.07	1.45	3.92
Jan-12	1.68	F	0.84	4.44	1.98	0.94	4.84	0.73	F	1.70	1.95
Apr-12	2.00	2.28	1.03	0.87	1.21	1.37	2.09	0.69	2.28	0.49	0.71
Jul-12	1.70	0.66	0.76	1.18	1.23	1.70	2.97	0.62	0.66	1.24	2.87
Oct-12	2.05	1.76	2.89	1.87	1.34	0.71	3.25	0.67	1.76	0.76	2.61
Jan / Feb-13	F	F	F	F	2.09	1.58	F	0.66	F	F	F
Apr / May-13	2.43	1.56	1.92	1.12	1.66	1.35	2.59	1.23	1.56	3.14	2.76
Jul-13	1.00	1.00	0.50	1.00	0.40	0.40	1.70	0.40	1.00	0.60	0.80
Oct-13	1.64	1.01	0.52	1.12	1.20	0.85	3.31	0.48	1.01	0.84	0.91
Mar-14	F	F	F	F	1.93	F	F	0.78	F	F	F
May / Jun-14	3.00	2.14	5.18	2.19	1.82	1.77	2.92	1.15	2.14	3.83	3.82
Aug-14	2.70	2.27	1.07	1.63	1.34	1.36	2.35	1.51	2.27	1.31	0.88
Oct-14	3.69	2.07	2.71	2.87	2.41	2.42	3.51	1.02	2.07	1.81	2.17
Jan/Mar-15		F	F	F	F	F	F	F	F	F	F
Jun-15	2.66	2.33	4.35	3.09	1.99	2.29	3.39	1.27	2.33	4.30	3.23
Jul-15	2.28	1.53	4.02	5.26	1.48	1.79	4.17	1.29	1.53	1.79	3.32
Oct-15	2.34	0.60	1.20	2.17	1.75	1.13	2.69	0.55	0.60	2.50	1.72
Jan-16	F	F	F	F	2.16	1.27	F	0.64	F	F	F
Apr/May-16	2.45	1.11	3.06	1.33	1.57	1.24	2.75	0.13	1.11	2.36	1.84
Jul-16	2.19	1.50	2.88	2.25	0.90	1.08	3.08	0.75	1.50	1.38	3.83
Oct/Nov-16	2.52	1.75	1.94	1.92	1.71	1.63	3.28	0.52	1.75	3.31	1.54
Jan-17	0.49	1.32	0.69	F	0.73	0.30	F	0.29	1.32	F	2.54
Apr/May-17	2.36	1.60	2.72	4.08	1.94	2.29	2.87	1.13	1.60	3.74	3.30
Jul-17	2.19	1.47	1.79	1.96	1.35	1.39	3.38	0.73	1.47	2.29	2.82
Oct/Nov-17	1.30	0.26	2.83	1.18	0.79	1.04	2.59	0.54	0.26	0.99	F
Mar-18	F	F	F	F	F	F	F	F	F	F	F
May-18	5.09	2.98	3.98	1.19	1.63	1.55	3.92	0.84	2.98	3.24	2.86
Jul/Aug/Sep -18	2.75	1.00	3.05	1.58	1.50	1.03	3.83	0.92	1.00	1.64	2.77
Nov/Dec-18	F	F	1.13	F	F	0.40	F	0.32	F	F	F
Jan/Mar-19	F	F	0.75	0.58	F	F	F	F	F	F	F
May-19	4.60	2.09	4.32	1.96	2.13	2.70	4.11	1.60	2.09	3.49	1.33
Jul/Aug-19	1.97	1.98	3.90	2.58	2.20	1.33	3.56	0.85	1.98	2.04	3.81
Oct-19	2.17	0.79	2.34	1.53	1.90	1.90	3.57	0.57	0.79	2.37	3.12
Mar-20	F	F	F	1.01	0.99	1.18	F	0.38	F	F	2.43
May/Jun-20	2.52	2.32	3.31	1.66	2.09	2.12	5.00	1.26	2.32	0.96	1.80
Jul/Aug-20	3.50	2.31	2.93	1.97	1.71	1.73	3.71	1.10	2.31	2.71	4.29
Oct-20	2.46	1.90	2.23	2.77	2.52	2.19	4.12	0.93	1.90	2.14	4.52
Feb/Mar-21	F	F	F	1.54	1.01	0.55	F	0.48	F	F	F
May/Jun-21	3.30	2.44	4.50	2.48	2.33	2.55	4.00	1.38	2.44	2.26	3.31
Jul/Aug-21	2.92	1.60	1.77	1.95	1.52	1.68	3.80	0.90	1.60	1.72	3.18
Oct/Nov-21	2.32	1.50	2.66	2.01	2.57	2.19	3.14	0.97	1.50	2.89	3.45
Feb/Mar-22	F	F	F	F	F	1.19	F	F	F	F	F
May/Jun-22	3.03	1.96	3.25	2.31	2.35	2.22	3.35	1.57	1.96	2.55	3.56
Jul/Aug-22	2.88	1.16	1.77	2.06	1.82	1.79	4.17	1.03	1.16	1.66	5.01
Oct/Nov-22	1.85	0.91	1.57	1.57	1.72	1.51	3.21	0.93	0.91	1.53	3.16
2009 Average	1.70	1.31	1.34	1.94	1.43	1.69	3.05	1.27	1.31	1.39	2.32
2010 Average	1.22	<1.13	<0.52	1.79	1.07	<0.70	<1.76	<0.48	<1.13	<0.70	1.50
2011 Average	1.90	1.18	1.72	1.76	1.35	1.11	2.76	0.66	1.18	1.09	2.10
2012 Average	1.86	1.57	1.38	2.09	1.44	1.18	3.29	0.68	1.57	1.05	2.04
2013 Average	1.69	1.19	0.98	1.08	1.34	1.05	2.53	0.69	1.19	1.53	1.49
2014 Average	3.13	2.16	2.99	2.23	1.88	1.85	2.93	1.12	2.16	2.32	2.29
2015 Average	2.43	1.49	3.19	3.51	1.74	1.74	3.42	1.04	1.49	2.86	2.76
2016 Average	2.38	1.45	2.63	1.83	1.58	1.30	3.04	0.51	1.45	2.35	2.40
2017 Average	1.58	1.16	2.01	2.41	1.20	1.26	2.95	0.67	1.16	2.34	2.88
2018 Average	3.92	1.99	2.72	1.38	1.56	0.99	3.87	0.69	1.99	2.44	2.82
2019 Average	2.91	1.62	2.83	1.66	2.08	1.98	3.75	1.01	1.62	2.63	2.75
2020 Average	2.83	2.18	2.82	1.85	1.83	1.80	4.28	0.92	2.18	1.94	3.26
2021 Average	2.85	1.85	2.98	1.99	1.86	1.74	3.65	0.93	1.85	2.29	3.31
2022 Average	2.59	1.34	2.20	1.98	1.96	1.68	3.58	1.17	1.34	1.91	3.91
Average All Years	2.24	1.61	2.00	1.88	1.52	1.38	2.92	0.81	1.61	1.72	2.41

MS-2-R and MS-V(1)-R are the same stations

	Stations located at or inside the Upper Bedrock 2 m drawdown contour
	Stations located outside the Upper Bedrock 2 m drawdown contour

Amended C. of A. #3960-7Q4K2G provides for annual sampling of peat pore water and quarterly sampling of ribbed fen surface water (the previous C. of A. #4111-7DXKQW provided for the same sampling frequency).

MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.

Data prior to May 2009 refers to groundwater concentrations.

Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.

Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.

D: Dry

F: Frozen

US: Unsafe to sample

Table 8c: Methyl Mercury - Ribbed Fen Surface Waters (Unfiltered)

Date	MS-1-R (ES1R-S)	MS-2-R (ES2R-S)	MS-7-R (NS-7R-S)	MS-8-R (NS8-1R-S)	MS-9(1)-R (SS9-1R-S)	MS-9(2)-R (SS9-2R-S)	MS-13-R (WS13-R-S)	MS-15-R (WS15-R-S)	MS-V(1)-R (ES2R-S)	MS-V(2)-R (SSV2-R)	MS-V(3)-R (SSV3-R)
CEQG for Protection of Aquatic Life: 4 ng/L											
Aug / Sep-07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nov-07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
May-08	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Aug-08	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Oct-08	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Jan-09	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
May-09	0.02	0.07	<0.02	0.09	<0.02	<0.02	0.09	<0.02	0.07	0.04	0.04
Aug-09	<0.02	0.11	0.08	0.04	0.07	0.06	0.02	0.12	0.11	0.03	0.14
Oct-09	0.09	0.04	0.04	<0.02	<0.02	0.02	0.05	<0.02	0.04	0.17	0.03
Jan-10	0.13	0.08	0.03	0.14	0.14	0.25	0.08	0.07	0.08	0.08	
May-10	<0.02	0.05	<0.02	0.05	0.03	0.04	0.04	<0.02	0.05	0.02	0.08
Jul/Aug-10	0.05	0.07	0.09	0.05	0.03	0.08	0.19	0.03	0.07	0.10	0.14
Oct-10	0.05	0.05	0.02	0.10	0.08	0.03	0.13	<0.02	0.05	0.02	0.09
Jan/Feb-11		0.54	0.08	0.16	0.04	0.11	0.30	0.12	0.54		
Apr-11	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Jul-11	0.10	0.40	0.05	0.11	0.05	0.04	0.17	<0.02	0.40	0.06	0.04
Oct-11	0.06	0.08	0.09	0.16	0.02	0.04	0.20	0.03	0.08	0.05	0.34
Jan-12	1.49		0.04	3.08	0.32	0.43	1.42	0.12		0.95	1.22
May-12	0.07	0.10	0.04	0.08	0.05	0.06	0.11	0.03	0.10	0.04	0.05
Aug/Sep-12	0.08	0.13	0.04	0.31	0.04	0.06	0.25	0.11	0.13	0.03	0.13
Oct-12	0.05	0.05	0.03	0.03	0.03	0.03	0.07	<0.02	0.05	0.04	0.12
Jan/Feb-13	F	F	F	F	0.09	0.07	F	0.12	F	F	F
May-13	0.05	0.07	0.02	0.08	0.07	0.06	0.10	0.04	0.07	0.11	0.08
Jul-13	0.13	0.08	0.05	0.09	0.04	0.06	0.25	0.03	0.08	0.04	0.07
Oct-13	0.02	0.03	<0.02	0.02	0.02	0.04	0.10	<0.02	0.03	<0.02	<0.02
Mar-14	F	F	F	F	1.83	F	F	0.06	F	F	F
May/Jun-14	0.08	0.08	0.13	0.07	0.05	0.07	0.13	0.03	0.08	0.16	0.13
Aug/Sep-14	0.06	0.04	0.03	0.05	0.05	0.04	0.33	0.03	0.04	0.04	0.03
Oct-14	0.05	0.04	0.04	0.04	0.04	0.05	0.11	<0.02	0.04	0.11	0.05
Jan/Mar-15		F	F	F	F	F	F	F	F	F	F
Jun-15	0.08	0.06	0.05	0.09	0.02	0.03	0.10	0.02	0.06	0.12	0.07
Jul-15	0.07	0.04	0.10	0.15	0.03	0.06	0.18	0.02	0.04	0.06	0.18
Oct-15	<0.02	0.03	0.06	0.04	0.02	0.06	0.15	<0.02	0.03	0.10	0.07
Jan-16	F	F	F	F	0.09	0.13	F	0.02	F	F	F
Apr/May-16	0.10	0.10	0.10	0.05	0.03	0.04	0.09	0.13	0.10	0.13	0.04
Jul-16	0.06	0.11	0.09	0.05	<0.02	0.02	0.09	<0.02	0.11	0.05	0.09
Oct/Nov-16	0.04	0.05	0.07	0.03	0.03	0.03	0.09	<0.02	0.05	0.13	0.04
Jan-17	0.05	0.07	0.38	F	0.08	0.11	F	0.09	0.07	F	0.09
Apr/May-17	0.07	0.12	0.09	0.07	0.04	0.06	0.17	<0.02	0.12	0.13	0.12
Jul-17	0.08	0.11	0.06	0.06	0.04	0.06	0.19	0.03	0.11	0.11	0.21
Oct/Nov-17	0.14	0.07	0.08	0.03	0.07	0.04	0.14	<0.02	0.07	0.02	F
Mar-18	F	F	F	F	F	F	F	F	F	F	F
May-18	0.06	0.05	0.11	0.03	0.04	0.05	0.12	<0.02	0.05	0.10	0.08
Jul/Aug/Sep -18	0.13	0.08	0.12	0.04	0.05	0.04	0.25	0.03	0.08	0.04	0.15
Nov/Dec-18	F	F	0.04	F	F	0.06	F	<0.02	F	F	F
Jan/Mar-19	F	F	0.04	<0.02	F	F	F	F	F	F	F
May-19	0.03	0.04	0.04	0.05	0.03	0.03	0.08		0.04	0.05	<0.02
Jul/Aug-19	0.07	0.17	0.13	0.10	0.08	0.03	0.25	<0.02	0.17	0.62	0.14
Oct-19	0.03	<0.02	0.07	0.03	0.03	0.03	0.10	<0.02	<0.02	0.09	0.09
Mar-20	F	F	F	0.47	0.17	0.17	F	0.08	F	F	0.38
May/Jun-20	0.15	0.10	0.07	0.05	0.05	0.04	0.25	0.02	0.10	0.06	0.04
Jul/Aug-20	0.11	0.23	0.30	0.07	0.04	0.06	0.21	0.02	0.23	1.64	0.16
Oct-20	0.06	0.07	0.09	0.05	0.04	0.07	0.09	<0.02	0.07	0.09	0.12
Feb/Mar-21	F	F	F	0.29	0.10	0.11	F	0.07	F	F	F
May/Jun-21	0.10	0.14	0.12	0.09	0.08	0.09	0.23	0.07	0.14	0.19	0.15
Jul/Aug-21	0.05	0.03	0.04	0.03	0.04	0.09	0.20	<0.02	0.03	0.07	0.13
Oct/Nov-21	0.05	0.06	0.07	0.04	0.03	0.09	0.11	<0.02	0.06	0.07	0.13
Feb/Mar-22	F	F	F	F	F	2.07	F	F	F	F	F
May/Jun-22	0.09	0.09	0.09	0.09	0.06	0.06	0.18	<0.03	0.09	0.34	0.09
Jul/Aug-22	0.11	0.87	0.06	0.09	0.07	0.06	NA	NA	0.87	0.55	0.30
Oct/Nov-22	0.06	0.03	0.04	0.04	0.10	0.03	0.14	<0.03	0.03	0.14	0.14
2009 Average	<0.04	0.07	<0.05	<0.05	<0.04	<0.04	0.05	<0.05	0.07	0.08	0.07
2010 Average	<0.06	0.06	<0.04	0.09	0.07	0.10	0.11	<0.03	0.06	0.07	0.10
2011 Average	<0.06	<0.26	<0.06	<0.11	<0.03	<0.05	<0.17	<0.05	<0.26	<0.04	<0.13
2012 Average	0.42	0.09	0.04	0.87	0.11	0.15	0.46	<0.07	0.09	0.26	0.38
2013 Average	0.06	0.06	<0.03	0.06	0.05	0.06	0.15	<0.05	0.06	<0.06	<0.06
2014 Average	0.06	0.05	0.06	0.05	0.49	0.05	0.19	<0.03	0.05	0.10	0.07
2015 Average	<0.06	0.04	0.07	0.09	0.02	0.05	0.14	<0.02	0.04	0.09	0.11
2016 Average	0.07	0.09	0.09	0.04	0.04	0.06	0.09	<0.05	0.09	0.10	0.06
2017 Average	0.09	0.09	0.15	0.05	0.06	0.07	0.17	0.04	0.09	0.09	0.14
2018 Average	0.09	0.07	0.09	0.04	0.04	0.05	0.18	<0.02	0.07	0.07	0.11
2019 Average	0.04	0.08	0.07	0.05	0.05	0.03	0.14	<0.02	0.08	0.25	0.08
2020 Average	0.11	0.13	0.15	0.16	0.07	0.08	0.18	<0.02	0.13	0.60	0.17
2021 Average	0.07	0.07	0.08	0.11	0.06	0.10	0.18	<0.02	0.07	0.11	0.14
2022 Average	0.09	0.33	0.07	0.07	0.07	0.56	0.16	<0.02	0.33	0.34	0.18
Average All Years	<0.10	<0.11	<0.07	<0.15	<0.09	<0.11	<0.18	<0.04	<0.11	<0.17	<0.13
CEQG for Protection of Aquatic Life: 4 ng/L											

MS-2-R and MS-V(1)-R are the same stations

	Stations located at or inside the Upper Bedrock 2 m drawdown contour
	Stations located outside the Upper Bedrock 2 m drawdown contour

Amended C. of A. #3960-7Q4K2G provides for annual sampling of peat pore water and quarterly sampling of ribbed fen surface water (the previous C. of A. #4111-7DXKQW provided for the same sampling frequency).

MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury), as per Section 1.

Data prior to May 2009 refers to groundwater concentrations.

Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.

Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.

D: Dry

F: Frozen

US: Unsafe to sample

NA

Table 8d: Methyl Mercury - Ribbed Fen Surface Waters (Filtered) (concentrations in ng/L)

Date	MS-1-R (ES1R-S)	MS-2-R (ES2R-S)	MS-7-R (NS-7R-S)	MS-8-R (NS8-1R-S)	MS-9(1)-R (SS9-1R-S)	MS-9(2)-R (SS9-2R-S)	MS-13-R (WS13-R-S)	MS-15-R (WS15-R-S)	MS-V(1)-R (ES2R-S)	MS-V(2)-R (SSV-2R-S)	MS-V(3)-R (SSV-3R-S)
Draft USEPA Criteria: 0.05 ng/L											
Aug / Sep-07	0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.13	0.02	<0.02	<0.02	<0.02
Nov-07	0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
May-08	0.11	0.07	F	<0.02	<0.02	F	<0.02	0.02	0.07	F	F
Aug-08	0.07	0.04	<0.02	<0.02	0.03	0.06	<0.02	0.02	0.04	<0.02	0.02
Oct-08	0.02	<0.02	<0.02	<0.02	0.02	0.04	<0.02	0.02	<0.02	<0.02	<0.02
Jan-09	F	F	F	F	F	F	F	F	F	F	F
May / June-09	0.07	0.05	<0.02	0.08	0.02	<0.02	0.08	<0.02	0.05	0.04	0.04
Aug-09	0.03	0.05	0.03	0.09	<0.02	0.04	0.04	0.11	0.05	0.04	<0.02
Oct-09	0.05	0.03	0.05	0.06	0.04	0.04	0.09	0.02	0.03	0.05	0.14
Jan-10	0.07	<0.02	<0.02	0.10	<0.02	<0.02	0.05	0.02	<0.02	<0.02	F
May-10	0.04	0.04	0.03	0.03	0.04	0.03	0.07	0.02	0.04	0.03	0.06
Aug-10	0.06	0.08	0.02	<0.02	<0.02	0.05	<0.02	<0.02	0.08	0.04	<0.02
Oct-10	0.03	0.04	<0.02	0.08	0.03	<0.02	0.12	<0.02	0.04	<0.02	0.07
Jan / Feb-11	F	0.03	<0.02	0.03	0.09	<0.02	0.04	<0.02	0.03	F	F
Apr-11	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Jul-11	0.05	0.07	0.03	0.05	0.03	<0.02	0.16	<0.02	0.07	0.03	0.03
Oct-11	0.07	0.06	0.08	0.14	0.03	0.04	0.15	<0.02	0.06	0.05	0.23
Jan-12	0.29	F	0.03	0.95	0.02	0.13	0.63	0.07	F	0.18	0.10
Apr-12	0.06	0.06	0.03	0.05	0.04	0.06	0.10	0.02	0.06	<0.02	0.03
Jul-12	0.04	0.05	<0.02	0.11	<0.02	0.05	0.20	<0.02	0.05	0.03	<0.02
Oct-12	0.04	0.02	0.02	0.03	<0.02	0.02	0.06	<0.02	0.02	<0.02	0.10
Jan / Feb-13	F	F	F	F	0.05	0.09	F	0.04	F	F	F
Apr / May-13	<0.02	<0.02	<0.02	0.05	0.03	0.03	<0.02	0.03	<0.02	0.06	0.04
Jul-13	0.12	0.05	0.03	0.09	0.04	0.03	0.21	<0.02	0.05	<0.02	0.05
Oct-13	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	0.09	<0.02	<0.02	<0.02	<0.02
Mar-14	F	F	F	F	0.20	F	F	0.03	F	F	F
May-14	0.07	0.06	0.07	0.06	0.03	0.04	0.12	<0.02	0.06	0.12	0.07
Aug-14	0.03	0.02	0.02	0.03	0.02	0.02	0.14	<0.02	0.02	<0.02	0.02
Oct-14	0.03	0.03	0.02	0.04	0.04	0.03	0.09	<0.02	0.03	0.06	0.04
Jan/Mar-15		F	F	F	F	F	F	F	F	F	F
Jun-15	0.05	0.05	0.04	0.08	0.03	0.03	0.11	ND	0.05	0.12	0.10
Jul-15	<0.02	0.03	0.07	<0.02	<0.02	<0.02	0.08	<0.02	0.03	<0.02	0.04
Oct-15	0.04	0.03	0.04	0.03	0.03	0.03	0.13	ND	0.03	0.12	0.08
Jan-16	F	F	F	F	0.08	0.07	F	<0.02	F	F	F
Apr/May-16	0.08	0.06	0.07	0.03	0.02	0.02	0.07	<0.02	0.06	0.09	0.05
Jul-16	0.06	0.06	0.06	0.04	<0.02	0.02	0.15	<0.02	0.06	<0.02	0.09
Oct/Nov-16	0.03	0.04	0.03	0.03	0.03	0.02	0.08	<0.02	0.04	0.12	0.04
Jan-17	0.02	0.05	0.14	F	0.05	0.05	F	<0.02	0.05	F	0.07
Apr/May-17	0.06	0.08	0.07	0.07	0.03	0.05	0.16	<0.02	0.08	0.11	0.10
Jul-17	0.06	0.07	0.05	0.04	0.03	0.05	0.17	<0.02	0.07	0.08	0.17
Oct/Nov-17	0.05	<0.02	0.04	0.03	0.06	0.02	0.12	<0.02	<0.02	<0.02	F
Mar-18	F	F	F	F	F	F	F	F	F	F	F
May-18	0.05	0.05	0.07	0.03	<0.02	0.03	0.10	<0.02	0.05	0.10	0.06
Jul/Aug/Sep -18	0.10	0.05	0.10	0.04	0.04	0.04	0.22	<0.02	0.05	0.04	0.12
Nov/Dec-18	F	F	0.02	F	F	0.03	F	<0.02	F	F	F
Jan/Mar-19	F	F	<0.02	<0.02	F	F	F	F	F	F	F
May-19	0.03	0.03	<0.02	<0.02	<0.02	0.03	0.07	<0.02	0.03	0.04	<0.02
Jul/Aug-19	0.05	0.06	0.08	0.07	0.06	0.02	0.22	<0.02	0.06	0.53	0.11
Oct-19	0.04	<0.02	0.06	<0.02	0.03	0.03	0.10	<0.02	<0.02	0.05	0.08
Mar-20	F	F	F	0.09	0.09	0.05	F	0.02	F	F	0.13
May/Jun-20	0.05	0.06	0.04	0.04	0.05	0.02	0.22	<0.02	0.06	0.06	0.03
Jul/Aug-20	0.08	0.06	0.08	0.04	0.04	0.03	0.15	<0.02	0.06	0.96	0.16
Oct-20	0.04	0.02	0.04	0.06	0.04	0.05	0.09	<0.02	0.02	0.07	0.10
Feb/Mar-21	F	F	F	F	F	0.03	F	F	F	F	F
May/Jun-21	0.05	0.03	0.05	0.05	0.05	0.05	0.12	<0.03	0.03	0.28	0.08
Jul/Aug-21	0.07	0.07	0.05	0.05	0.05	0.03	0.16	<0.03	0.07	0.06	0.11
Oct/Nov-21	<0.03	<0.03	<0.03	0.04	<0.03	<0.03	0.11	<0.03	<0.03	0.04	0.08
2009 Average	0.05	0.04	<0.03	0.08	<0.03	<0.03	0.07	<0.05	0.04	0.04	<0.07
2010 Average	0.05	<0.05	<0.02	<0.06	<0.03	<0.03	<0.07	<0.02	<0.05	<0.03	<0.05
2011 Average	<0.05	<0.04	<0.04	<0.06	<0.04	<0.03	<0.09	<0.02	<0.05	<0.03	<0.09
2012 Average	0.11	0.04	<0.02	0.28	<0.02	0.06	0.25	<0.03	0.04	<0.06	<0.06
2013 Average	<0.05	<0.03	<0.02	<0.05	<0.04	0.05	<0.11	<0.03	<0.03	<0.03	<0.04
2014 Average	0.05	0.04	0.04	0.04	0.07	0.03	0.11	<0.02	0.04	<0.07	0.04
2015 Average	<0.04	0.04	0.05	<0.04	<0.02	<0.03	0.11	<0.02	0.04	<0.09	0.07
2016 Average	0.05	0.05	0.05	0.03	0.04	0.03	0.10	<0.02	0.05	0.08	0.06
2017 Average	0.05	0.06	0.07	0.04	0.04	0.04	0.15	<0.02	0.06	0.07	0.11
2018 Average	0.07	0.05	0.06	0.03	<0.02	0.03	0.16	<0.02	0.05	0.07	0.09
2019 Average	0.04	<0.03	<0.05	<0.03	<0.04	0.03	0.13	<0.02	<0.03	0.21	<0.07
2020 Average	0.06	0.05	0.04	0.05	0.04	0.04	0.13	<0.03	0.04	0.13	0.09
2021 Average	0.06	0.05	0.05	0.05	0.05	0.04	0.15	<0.02	0.05	0.37	0.11
2022 Average	0.05	0.04	0.04	0.05	0.04	0.04	0.13	0.03	0.04	0.13	0.09
Average All Years	0.05	0.04	0.04	0.07	0.04	0.04	0.12	0.02	0.04	0.09	0.07
Draft USEPA Criteria: 0.05 ng/L											

MS-2-R and MS-V(1)-R are the same stations

	Stations located at or inside the Upper Bedrock 2 m drawdown contour
	Stations located outside the Upper Bedrock 2 m drawdown contour

Amended C. of A. #3960-7Q4K2G provides for annual sampling of peat pore water and quarterly sampling of ribbed fen surface water (the previous C. of A. #4111-7DXKQW provided for the same sampling frequency). MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury), as per Section 1.

Data prior to May 2009 refers to groundwater concentrations.

Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.

Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.

D: Dry

F: Frozen

US: Unsafe to sample

ND

Table 9: Muskeg System Ribbed Fen General Chemistry Results (Surface Water) - All Years

Station	Year	Number of Samples	Parameter												
			Cl (mg/L)	Cond (µs/cm)	Nitrate (mg/L)	DOC (mg/L)	pH (units)	SO ₄ (mg/L)	TP (mg/L)	Ca-D (mg/L)	Fe-D (mg/L)	Mg-D (mg/L)	Na-D (mg/L)	Average Methyl Mercury (unfiltered) (ng/L)	Average Methyl Mercury (filtered) (ng/L)
MS-V(1)-R (ES2R-S)	2007														
	2008														
	2009	3	0.4	18.7	<0.1	16.4	6.43	<0.1	<0.01	3.4	0.320	0.4	<0.4		
	2010	4	0.6	27.4	<0.1	22.2	5.84	<1.0	0.01	3.7	0.860	0.3	0.4	0.06	<0.04
	2011	4	5.7	60.4	<0.1	23.7	6.41	2.6	0.03	5.0	1.292	0.8	3.2	<0.25	<0.04
	2012	3	0.5	25.7	<0.1	36.0	6.09	<1.0	0.01	3.2	1.064	0.4	0.4	0.09	0.04
	2013	3	<1.2	22.2	<0.1	26.6	5.62	<1.5	0.02	3.0	0.483	0.4	0.6	0.06	<0.03
	2014	3	0.6	21.2	<0.1	22.5	5.01	<1.0	0.01	2.9	0.813	0.3	0.4	0.05	0.04
	2015	3	0.5	12.9	<0.1	27.3	5.71	<1.0	<0.01	4.4	0.651	0.3	1.1	0.04	0.04
	2016	3	1.3	16.1	<0.1	19.0	5.34	<1.0	<0.006	2.7	0.783	0.3	0.3	0.09	0.03
	2017	4	<1.3	26.1	<0.8	26.1	5.64	<1.0	0.017	4.5	2.548	0.4	0.5	0.09	0.06
	2018	2	0.6	19.9	<0.1	18.6	5.76	<1.0	0.040	2.6	0.641	0.3	0.4	0.07	0.05
	2019	3	0.5	18.7	<0.1	19.0	5.69	<1.0	0.011	2.7	0.864	0.4	0.4	<0.08	<0.03
	2020	3	<0.3	18.3	<0.05	23.5	5.79	<0.5	0.032	3.18	0.78	0.33	0.25	0.13	<0.05
2021	3	<0.3	20.7	<0.05	21.4	6.20	<0.5	0.012	3.32	0.65	0.38	0.29	0.07	<0.03	
2022	3	<0.2	25.5	<0.05	25.4	5.67	<0.5	0.029	2.70	1.49	0.29	0.24	0.33	0.04	
MS-V(2)-R (SSV-2R-S)	2007														
	2008														
	2009	3	0.4	18.7	<0.1	14.8	6.52	<0.1	<0.01	18.9	0.107	2.8	7.1		
	2010	4	0.5	70.3	<0.1	18.7	6.93	<1.0	0.02	12.4	0.568	0.7	0.5	<0.05	<0.08
	2011	3	2.1	84.4	<0.1	18.9	7.53	<1.0	0.08	11.8	0.077	0.9	0.7	<0.04	<0.03
	2012	4	2.5	193.9	<0.1	38.3	7.28	<1.0	0.05	32.8	0.950	3.1	1.8	0.26	<0.06
	2013	3	0.7	62.3	<0.1	24.8	6.70	<1.0	0.01	10.3	0.061	1.0	0.7	<0.06	<0.03
	2014	3	0.6	69.4	<0.1	25.6	6.43	<1.0	0.04	10.6	0.112	1.2	0.7	0.10	<0.07
	2015	3	0.7	38.3	<0.1	29.8	6.46	<1.0	0.01	8.7	0.116	1.1	0.6	0.09	<0.09
	2016	3	<1	45.5	<0.1	20.3	6.89	<1.0	0.01	9.6	0.118	1.2	0.4	0.10	0.08
	2017	3	1.3	68.4	<0.1	25.4	7.15	<1.0	0.01	12.4	0.121	1.7	0.4	0.09	0.07
	2018	2	1.1	116.2	<0.1	26.9	7.41	<1.0	0.02	18.6	0.097	2.6	0.6	0.07	0.07
	2019	3	0.8	77.7	<0.1	22.8	6.75	<1.0	0.02	11.0	0.162	2.1	1.5	0.25	0.29
	2020	3	0.7	101.7	<0.1	19.4	7.45	<0.6	0.03	14.0	0.144	2.0	1.8	0.60	0.37
2021	3	0.3	52.7	<0.1	20.1	6.72	<0.5	0.02	8.8	0.148	1.5	0.9	0.11	0.09	
2022	3	<0.3	108.0	<0.05	21.5	7.09	<0.5	0.065	11.95	0.15	1.91	0.76	0.34	0.13	
MS-V(3)-R (SSV-3R-S)	2007														
	2008														
	2009	3	0.3	18.0	<0.1	20.8	5.34	<0.1	<0.01	1.0	0.100	0.1	<0.5		
	2010	3	0.3	20.0	<0.1	23.6	5.08	<1.0	0.01	1.8	0.161	0.1	0.2	0.10	0.08
	2011	4	0.5	36.5	<0.1	22.9	6.07	<1.0	0.01	3.6	0.079	0.5	0.4	<0.13	<0.09
	2012	4	2.3	75.1	<0.1	38.0	6.48	<1.0	0.04	11.1	0.318	1.4	0.7	0.38	<0.06
	2013	3	<0.4	39.1	<0.1	17.2	6.11	<1.0	0.03	5.6	0.059	0.6	0.4	<0.06	<0.04
	2014	3	<0.6	40.7	<0.1	21.7	5.60	<1.0	0.01	5.2	0.086	0.7	0.4	0.07	0.04
	2015	3	<0.5	21.3	<0.1	26	4.85	<1.0	<0.003	2.3	0.191	0.3	0.3	0.11	0.07
	2016	3	<1.0	25.4	<0.1	20.6	6.06	<1.0	<0.01	4.4	0.090	0.5	0.3	0.06	0.06
	2017	3	1.7	41.5	<0.1	32.0	5.35	<1.0	0.02	6.4	0.181	0.8	0.5	0.14	0.11
	2018	2	0.5	19.1	<0.1	22.2	4.86	<1.0	0.01	1.5	0.090	0.3	0.2	0.11	0.09
	2019	3	<0.3	22.0	<0.1	25.9	4.77	<1.0	0.01	1.9	0.193	0.4	0.2	<0.08	<0.07
	2020	4	<0.7	18.6	<0.1	33.6	5.50	<1.3	0.02	8.1	0.326	1.2	0.4	<0.17	<0.11
2021	3	<0.2	21.0	<0.1	31.2	4.93	<0.5	0.01	2.3	0.191	0.4	0.2	<0.12	<0.12	
2022	3	<0.3	29.1	<0.05	32.9	4.77	<0.5	0.035	2.03	0.21	0.35	0.19	0.18	0.09	
MS-1-R (ES1R-S)	2007														
	2008														
	2009	3	0.5	26.0	<0.1	18.9	6.47	<0.1	<0.01	3.4	0.136	0.3	<0.6		
	2010	4	0.4	34.5	<0.1	22.6	6.22	<1.0	0.01	5.6	0.499	0.4	0.8	<0.06	0.05
	2011	4	0.7	42.6	<0.1	24.8	6.77	<1.0	0.01	5.7	0.317	0.5	1.1	<0.05	<0.04
	2012	4	2.3	81.8	<0.1	44.7	6.66	<1.0	0.01	13.1	2.578	1.3	2.1	0.42	0.11
	2013	3	2.6	35.3	<0.1	29.8	6.23	<2.8	0.01	5.4	0.180	0.5	2.1	0.06	<0.05
	2014	3	1.0	31.2	<0.1	25.2	5.53	<1.0	0.02	4.7	0.280	0.4	1.4	0.06	0.05
	2015	3	<1.3	21.1	<0.1	23.6	6.11	<1.0	0.005	5.7	0.191	0.4	1.3	<0.06	<0.04
	2016	3	<1.3	26.9	<0.1	21.8	6.26	<1.0	<0.01	5.2	0.218	0.4	1.0	0.07	0.05
	2017	4	<2.7	60.8	<0.1	35.1	6.19	<1.0	<0.026	12.2	1.128	0.8	2.5	0.09	0.05
	2018	2	0.7	34.5	<0.1	25.2	6.53	<1.0	0.010	5.7	0.225	0.4	1.5	0.09	0.07
	2019	3	<0.7	29.7	<0.1	23.3	6.58	<1.0	0.013	4.2	0.209	0.4	0.9	0.04	0.04
	2020	3	<0.4	24.6	<0.1	26.8	6.10	<0.5	0.049	4.7	0.273	0.4</			

Table 9: Muskeg System Ribbed Fen General Chemistry Results (Surface Water) - All Years

Station	Year	Number of Samples	Parameter												
			Cl (mg/L)	Cond (µs/cm)	Nitrate (mg/L)	DOC (mg/L)	pH (units)	SO ₄ (mg/L)	TP (mg/L)	Ca-D (mg/L)	Fe-D (mg/L)	Mg-D (mg/L)	Na-D (mg/L)	Average Methyl Mercury (unfiltered) (ng/L)	Average Methyl Mercury (filtered) (ng/L)
	2018	2	2.8	43.3	<0.1	17.95	6.80	<1.1	<0.01	3.1	0.169	0.5	3.8	0.04	0.03
	2019	3	1.0	25.3	<0.1	19.13	6.30	<1.0	<0.01	2.5	0.219	0.7	1.9	0.05	<0.05
	2020	4	4.6	124.7	<0.1	47.9	6.52	<0.5	0.03	12.2	5.110	2.2	7.0	0.16	0.05
	2021	4	3.6	86.5	<0.1	41.0	6.49	<0.5	0.02	10.5	5.096	1.8	4.9	0.12	0.07
	2022	4	<1.6	38.2	<0.05	19.4	6.78	<0.6	0.012	2.74	0.17	0.52	2.81	0.07	0.05
MS-9(1)-R (SS9-1R-S)	2007														
	2008														
	2009	3	0.3	21.7	<0.1	14.6	6.56	<0.1	<0.02	2.5	0.067	0.2	<0.5		
	2010	4	0.3	31.7	<0.1	19.4	6.14	<1.0	<0.01	5.5	0.238	0.4	0.4	0.07	0.02
	2011	4	0.4	32.5	<0.1	18.0	6.73	<1.0	<0.01	5.0	0.114	0.4	0.5	<0.03	<0.04
	2012	4	1.5	36.6	<0.1	20.9	6.57	<1.0	<0.01	5.8	0.392	0.5	0.5	0.11	<0.02
	2013	4	0.7	35.7	<0.1	31.6	6.20	<1.0	0.02	6.2	0.431	0.6	0.6	0.05	<0.04
	2014	4	1.1	84.4	<0.1	43.5	6.07	<1.0	0.06	15.3	1.108	1.1	1.0	0.49	0.07
	2015	3	<0.5	20.2	<0.1	19.7	6.04	<1.0	<0.01	4.5	0.118	0.3	0.4	0.02	<0.02
	2016	4	<1.4	30.3	<0.2	19.7	6.12	<1.3	<0.01	5.5	0.337	0.4	0.4	0.04	0.04
	2017	4	<1.4	31.6	<0.1	22.3	6.16	<1.0	<0.01	6.0	0.416	0.4	0.4	0.06	0.04
	2018	2	0.3	23.2	<0.1	14.5	6.30	<1.0	0.02	3.8	0.081	0.3	0.3	0.04	0.03
	2019	3	<0.3	20.0	<0.1	19.0	5.78	<1.0	0.01	2.8	0.145	0.2	0.3	0.06	<0.04
	2020	4	0.6	21.3	<0.1	25.8	6.17	<0.5	0.19	6.0	0.560	0.5	0.4	0.07	0.05
	2021	4	0.5	30.8	<0.1	23.9	6.30	<0.5	0.01	5.7	0.402	0.4	0.4	0.07	0.08
	2022	4	<0.2	23.2	<0.05	18.3	6.39	<0.5	0.01	3.3	0.13	0.2	0.3	0.07	0.04
MS-9(2)-R (SS9-2R)	2007														
	2008														
	2009	3	0.5	30.0	<0.1	13.0	6.98	<0.1	<0.02	3.6	0.087	0.4	<0.5		
	2010	4	0.7	57.9	<0.1	19.2	6.66	<1.0	0.03	10.1	0.881	1.1	0.7	0.10	<0.02
	2011	4	0.7	70.5	<0.1	18.3	7.12	<1.0	<0.01	10.5	1.618	1.0	1.1	<0.05	<0.02
	2012	4	0.8	60.1	<0.1	19.1	7.02	<1.0	<0.01	8.9	1.278	1.2	1.3	0.15	0.06
	2013	4	1.0	49.3	<0.1	13.5	6.37	<1.0	0.02	8.4	0.904	1.3	1.6	0.06	0.05
	2014	3	0.6	46.8	<0.1	18.5	6.25	<1.0	0.01	6.2	0.207	0.9	1.0	0.05	0.03
	2015	3	<0.5	37.5	<0.1	21.2	6.42	<1.0	<0.01	8.0	0.138	0.8	0.7	0.05	<0.03
	2016	4	<1.6	58.0	<0.1	17.1	6.76	<1.3	0.02	10.0	1.507	1.0	0.8	0.06	0.03
	2017	4	<1.4	64.4	<0.1	19.8	6.72	<1.0	<0.01	11.3	1.655	1.1	1.0	0.07	0.04
	2018	2	0.7	48.6	<0.1	15.1	6.62	<0.8	<0.01	6.6	0.407	0.7	0.8	0.05	0.03
	2019	3	<0.5	38.7	<0.1	16.8	6.65	<0.5	<0.01	5.8	0.148	0.7	0.6	0.03	0.03
	2020	4	1.1	38.1	<0.05	25.8	6.48	<0.5	0.02	12.5	1.55	1.5	1.4	0.08	0.04
	2021	4	0.5	58.0	<0.05	20.4	6.78	<0.5	0.02	9.5	0.85	1.3	0.9	0.10	0.08
	2022	4	<0.9	47.0	<0.05	25.7	6.91	<0.5	0.14	14.245	2.12	1.4	1.3	0.56	0.04
MS-13-R (WS13-R-S)	2007														
	2008														
	2009	3	<0.3	21.7	<0.1	22.9	4.54	<0.1	<0.01	<0.6	0.067	0.1	<0.5		
	2010	3	0.9	30.5	<0.1	26.0	4.34	<1.0	<0.01	0.9	0.090	0.1	0.3	0.11	0.09
	2011	4	2.6	51.6	<0.1	50.9	4.30	<1.1	0.02	2.5	0.351	0.4	0.4	<0.17	<0.09
	2012	4	1.4	42.0	<0.1	66.2	4.75	<1.0	<0.01	2.4	0.458	0.3	0.4	0.46	0.25
	2013	3	0.3	33.6	<0.1	44.5	4.03	<1.0	0.01	0.9	0.098	0.2	0.3	0.15	<0.11
	2014	3	0.4	37.6	<0.1	31.8	4.04	<1.0	0.01	0.8	0.138	0.2	0.3	0.19	0.11
	2015	3	<1.0	30.5	<0.1	33.1	3.97	<1.7	<0.01	0.8	0.092	0.1	0.2	0.14	0.11
	2016	3	<1.7	27.4	<0.1	27.0	4.11	<3.4	<0.01	0.6	0.100	0.1	<0.2	0.09	0.10
	2017	3	1.7	31.9	<0.8	29.4	3.91	<1.0	<0.01	0.8	0.133	0.2	0.2	0.17	0.15
	2018	2	0.3	38.8	<0.1	21.7	5.54	<1.0	0.01	0.8	0.075	0.1	0.2	0.18	0.16
	2019	3	<0.3	32.7	<0.1	29.4	4.03	<1.0	0.01	0.8	0.144	0.2	0.2	0.14	0.13
	2020	3	<0.2	32.8	<0.1	32.3	4.11	<0.5	0.01	0.9	0.15	0.2	<0.1	0.18	0.15
	2021	3	<0.2	37.7	<0.1	35.2	4.21	<0.5	0.01	1.0	0.15	0.2	<0.2	0.18	0.16
	2022	3	<0.2	38.0	<0.05	31.6	4.20	<0.5	0.01	0.8	0.13	0.2	0.2	0.16	0.13
MS-15-R (WS15-R-S)	2007														
	2008														
	2009	3	0.4	50.0	<0.1	9.8	7.27	<0.1	<0.01	6.8	0.019	0.5	<0.5		
	2010	4	0.6	86.0	<0.1	12.7	7.12	<1.0	<0.01	15.7	<0.182	1.3	0.6	<0.03	<0.02
	2011	4	0.5	86.3	<0.1	10.2	7.49	<1.0	0.01	12.9	<0.259	1.0	0.7	<0.04	<0.02
	2012	4	0.7	97.8	<0.1	13.4	7.30	<1.0	<0.01	15.5	<0.263	1.3	0.9	<0.07	<0.03
	2013	4	<0.8	109.6	<0.1	11.8	6.68	<1.0	0.02	17.6	<0.978	1.6	0.9	<0.05	<0.03
	2014	4	<0.9	131.2	<0.1	15.2	6.60	<1.0	<0.02	23.1	0.636	1.7	1.0	<0.03	<0.02
	2015	3	<0.5	63.6	<0.1	14.2	6.74	<1.0	<0.03	13.1	<0.027	0.9	0.5	<0.02	<0.02
	2016	4	<1.0	88.4	<0.1	11.2	6.89	<1.0	<0.03	14.8	<0.084	1.0	0.52	<0.04	<0.02
	2017	4	<1.2	93.9	<0.1	10.9	7.15	<1.0	<0.01	16.2	0.201	1.1	0.64	0.03	<0.02
	2018	2	0.4	66.6	<0.1	14.6	5.83	<0.8	0.01	10.8	0.087	0.7	0.47	<0.02	<0.02
	2019	3	<0.5	72.0	<0.1	10.1	7.32	<1.0	0.01	11.1	0.095	0.9	0.53	<0.02	<0.02
	2020	4	<0.5	69.9	<0.05	12.2	7.28	<0.5	0.01	16.6	0.575	1.4	0.67	<0.02	<0.02
	2021	4	<0.5	92	<0.05	11.7	7.16	<0.5	0.01	17.8	0.350	1.2	0.63	<0.05	<0.02
	2022	4	<0.4	62.3	<0.05	11.2	7.60	<0.5	0.01	10.9	0.07	0.8	0.5	0.03	0.03

MS-8-R This station stands out as being influenced by natural groundwater upwellings, as evidenced by elevated Cl and Na
Beyond zone of dewatering influence

MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury), as per Section 1.
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample

Table 10a: Total Mercury - North Granny Creek (Unfiltered)
(concentrations in ng/L)

Date	N. Granny Creek Upstream of Supplementation G-0	N. Granny Creek Upstream (NGC/UP/NWF) G-1	N. Granny Creek Downstream (NGC/DN/NWF) G-2	N. Granny Creek Downstream (NGC/DN/NEF) G-3	N. Granny Creek Upstream of Confluence (NGC/UP/CONF) G-4	Tributary-5A
	CEQG for Protection of Aquatic Life: 26 ng/L					
May-06			1.18	1.66		
Jun-06			3.20			
Jul-06			2.92	2.80		
Aug-06			4.21	3.77		
Sep-06			2.37	2.26		
Oct-06				1.61		
Dec-06			2.53	4.58		
Jan-07		2.02	2.74	2.35		
Feb-07			5.07	2.02		
Mar-07		7.17	8.73	F		
Apr-07		8.82	8.82	5.87		
May-07		3.01	3.01	3.02		
Jun-07		3.34	3.26	2.99		
Jul-07		3.16	3.24	2.23		
Aug-07		3.10	1.98	1.94		
Sep-07		1.96	2.05	2.04		4.42
Oct-07		5.91		5.67		
Nov-07		3.19	3.26	3.00		2.12
Dec-07		2.42	2.72	2.60	2.55	
Jan-08		2.95	2.43	2.42	2.72	
Feb-08		2.19	2.50	2.29		0.98
Mar-08		0.46	2.72	2.66		
Apr-08		11.90	5.58	F	4.23	
May-08		3.54	3.72	3.73		2.53
Jun-08		3.06	3.00	3.08		
Jul-08		3.28	3.22	1.61	4.85	2.20
Aug-08		2.71	2.73	2.69		
Sep-08		1.76	1.60	2.32		
Oct-08		1.37	2.44	1.57	1.73	1.48
Nov-08		3.20	1.95	2.39		
Dec-08		1.82	1.43	1.83		
Jan-09		1.41	1.14	1.54	1.48	0.84
Feb-09		1.18	1.29	1.34		
Mar-09		1.48	1.21	2.26		
Apr-09		3.19	3.15	1.41		0.70
May-09		5.18	3.08	3.81		
Jun-09		2.95	3.93	2.72		
Jul-09		3.62	2.12	3.48	3.58	1.93
Aug-09		2.07	2.48	2.08		
Sep-09		1.45	1.59	1.82		
Oct-09		1.47	1.74	1.38	1.57	0.89
Nov-09		1.70	1.11	1.79		
Dec-09		1.11	1.00	1.02		
Jan-10		1.46	1.33	1.03	1.56	0.67
Feb-10		1.49	1.73	1.36		
Mar-10		1.64	1.82	1.78		
Apr-10		1.56	1.92	2.05		1.57
May-10		1.99	1.12	1.80	2.15	
Jun-10		0.93	0.99	0.97		
Jul-10		0.92	3.67	1.04	<0.10	0.83
Aug-10		3.90	2.66	3.15		
Sep-10		2.44	1.74	2.71		
Oct-10		1.46	2.01	1.81	1.79	0.98
Nov-10		1.94	2.14	2.10		
Dec-10		1.50	1.41	1.62		
Jan-11		1.31	1.45	1.24	1.25	0.72
Feb-11		1.77	1.04	1.64		
Mar-11		1.56	1.23	1.36		
Apr-11		0.92	3.74	1.04	0.93	0.64
May-11		3.58	2.74	3.75		
Jun-11		2.99		2.65		
Jul-11		1.51	2.08	2.03	2.47	1.28
Aug-11		1.81	1.86	1.92		
**Sep-11						
Oct-11		4.36	4.59	4.11	4.12	2.72
Nov-11		3.12	3.37	3.45		
Dec-11		1.82	1.84	2.05		
Jan-12			1.23		1.64	1.18
Feb-12		0.78	0.68	0.81		
Mar-12		0.78	0.83	1.15		
Apr-12			2.45		3.00	1.96
May-12		2.08	1.98	2.23		
Jun-12		3.96	3.84	4.06		
Jul-12		1.94	2.30	2.29	2.42	1.22
Aug-12		1.48	1.76	1.75		
Sep-12		1.71	2.10	2.15		
Oct-12			2.81		2.46	1.55
Nov-12			3.97	5.12		
Dec-12		3.76	3.62	3.31		-
Jan-13		F	2.30	F	2.49	1.13
Feb-13		1.72	3.93	1.69		
Mar-13		1.39	1.31	1.31		
Apr-13		1.27	1.43	1.24	1.00	0.52
May-13		3.68	3.89	3.60		
Jun-13		3.48	3.59	3.53		
Jul-13		1.30	1.56	1.55	1.03	0.88
Aug-13		1.49	1.70	1.54		
Sep-13		1.75	2.33	2.25		
Oct-13		2.04	1.44	0.99	1.08	1.06
Nov-13		1.09	1.25	1.29		
Dec-13		1.12	0.50	1.19		
Jan-14		1.36	1.70	1.16	1.29	0.55
Feb-14		1.84	1.39	1.20		
Mar-14		1.42	1.52	0.79		
Apr-14		2.25	0.95	2.69	8.19	

Table 10a: Total Mercury - North Granny Creek (Unfiltered)
(concentrations in ng/L)

Date	N. Granny Creek Upstream of Supplementation G-0	N. Granny Creek Upstream (NGC/UP/NWF) G-1	N. Granny Creek Downstream (NGC/DN/NWF) G-2	N. Granny Creek Downstream (NGC/DN/NEF) G-3	N. Granny Creek Upstream of Confluence (NGC/UP/CONF) G-4	Tributary-5A
	CEQG for Protection of Aquatic Life: 26 ng/L					
May-14		2.26	5.19	3.37		4.16
Jun-14		4.25	4.42	3.85		
Jul-14		3.41	3.09	3.03	2.32	1.31
Aug-14		3.09	2.03	1.91		
Sep-14		2.96	15.10	6.33		1.17
Oct-14		4.76	4.83	3.34	5.24	1.65
Nov-14		3.62	3.57	3.48		2.34
Dec-14		US	2.37	4.91		
Jan-15			1.44	1.53	1.55	0.58
Feb-15		1.55	1.35	1.40		
Mar-15		2.74	2.23	6.85		
Apr-15		2.89	1.47	1.48	1.14	0.63
May-15		3.41	2.90	3.25		
Jun-15		3.60	3.35	3.44		
Jul-15		4.19	4.07	6.85	4.71	1.70
Aug-15		4.29	4.42	4.84		
Sep-15		6.94	4.55	4.65		
Oct-15		2.63	2.20	2.97	2.82	1.61
Nov-15		2.47	2.29	2.40	2.60	
Dec-15		1.31	1.36	1.59	1.56	
Jan-16		2.44	2.50	2.87	2.22	2.99
Feb-16		1.97	1.97	1.93	1.91	
Mar-16		1.46	1.34	1.21	5.40	
Apr-16		1.59	1.69	1.72	1.96	
May-16		2.33	2.39	2.43	4.03	2.91
Jun-16		3.51	3.07	2.92	3.75	
Jul-16		2.86	2.56	2.50	2.65	1.46
Aug-16		2.88	2.18	2.14	3.45	1.47
Sep-16		3.21	2.47	2.24	3.04	1.24
Oct-16		3.56	3.77	3.26	3.13	1.43
Nov-16		3.60	3.38	3.12	3.47	1.51
Dec-16		2.53	2.47	2.21	2.62	1.10
Jan-17		1.65	1.67	1.62	2.55	1.71
Feb-17		1.37	1.40	1.27	1.74	0.89
Mar-17		1.63	1.61	1.45	1.26	0.57
Apr-17		1.72	1.87	1.44	1.35	1.54
May-17	3.15	2.57	2.51	2.38	3.54	2.42
Jun-17	3.24	4.19	4.10	3.55	3.70	1.35
Jul-17	3.86	2.98	2.77	2.94	3.93	1.53
Aug-17	2.57	1.59	1.61	1.45	1.83	0.99
Sep-17	2.72	1.38	1.71	1.47	1.07	0.69
Oct-17	1.87	1.67	2.22	1.58	1.63	1.12
Nov-17	1.59	3.19	1.48	1.18	1.25	0.64
Dec-17	2.82	1.18	1.15	1.15	1.01	0.66
Jan-18	2.62	1.17	1.28	0.95	1.52	10.87
Feb-18	3.23	0.96	0.94	1.10	0.84	F
Mar-18	3.20	1.18	1.15	1.14	0.88	F
Apr-18	2.56	1.00	1.23	1.00	0.75	F
May-18	3.43	4.62	4.49	5.20	3.74	3.46
Jun-18	3.03	3.18	3.02	2.84	2.36	1.48
Jul-18	2.40	2.77	2.31	1.95	2.16	1.22
Aug-18	3.48	4.10	3.54	3.46	1.91	1.02
Sep-18	3.08	1.69	1.64	2.17	2.11	1.79
Oct-18	5.31	4.19	4.33	4.11	4.35	2.09
Nov-18	3.27	3.30	3.18	2.97	2.93	1.67
Dec-18	1.95	2.02	2.07	2.01	1.90	0.83
Jan-19	2.20	2.05	2.11	1.82	1.89	0.79
Feb-19	2.11	2.15	1.90	5.09	1.73	0.72
Mar-19	2.46	2.11	1.90	1.92	1.62	0.69
Apr-19	2.88	1.72	1.78	2.21	1.59	0.93
May-19	4.26	3.83	4.08	4.07	4.22	2.62
Jun-19	4.74	4.02	4.12	3.88	2.92	2.15
Jul-19	3.36	3.83	3.42	3.45	4.17	1.70
Aug-19	4.39	4.29	4.22	4.66	4.08	2.06
Sep-19	2.28	3.01	3.11	3.49	2.21	1.51
Oct-19	3.02	2.73	2.72	2.61	2.99	1.70
Nov-19	3.54	3.25	3.12	2.92	2.82	1.36
Dec-19	2.14	1.85	1.88	1.80	1.89	0.86
Jan-20		1.88	1.88	1.86	1.75	0.74
Feb-20	2.12	1.81	1.88	1.74	1.42	0.83
Mar-20	2.07	1.83	1.91	1.63	1.48	
Apr-20	2.15	1.61	1.62	1.40	1.40	
May-20	1.99	3.17	5.47	2.94	3.48	2.31
Jun-20	4.65	3.86	3.77	3.45	3.95	1.98
Jul-20	4.45	3.17	3.54	4.55	4.68	1.65
Aug-20	3.35	2.92	2.53	3.01	3.42	1.60
Sep-20	3.84	4.30	3.98	3.95	3.21	2.29
Oct-20	3.92	4.32	4.27	3.57	4.68	2.65
Nov-20	3.16	3.29	3.40	3.29	2.78	1.34
Dec-20	2.48	2.61	2.70	2.36	2.50	1.24
Jan-21	2.54	2.44	2.10	2.06	2.17	0.95
Feb-21	2.46	1.91	1.94	2.72	1.99	0.99
Mar-21	2.98	1.91	1.94	2.72	4.05	1.32
Apr-21	2.89	1.71	4.70	2.75	2.41	3.75
May-21	3.30	3.31	3.29	3.06	2.41	2.00
Jun-21	4.34	1.71	4.70	2.75	4.27	1.77
Jul-21	3.65	3.51	3.43	3.91	2.93	1.50
Aug-21	3.21	2.43	2.10	3.64	3.57	1.58
Sep-21	4.76	6.54	6.86	6.05	4.57	2.19
Oct-21	4.51	5.47	4.66	4.90	5.03	2.45
Nov-21	7.91	3.99	3.84	3.67	3.41	2.49
Dec-21	3.34	2.66	2.66	2.38	3.51	1.43
Jan-22	3.42	3.61	2.80	2.40	2.45	1.13
Feb-22	4.37	1.86	1.91	1.99	1.96	2.87
Mar-22	4.65	1.78	1.67	1.71	1.55	1.59

Table 10a: Total Mercury - North Granny Creek (Unfiltered)
(concentrations in ng/L)

Date	N. Granny Creek Upstream of Supplementation G-0	N. Granny Creek Upstream (NGC/UP/NWF) G-1	N. Granny Creek Downstream (NGC/DN/NWF) G-2	N. Granny Creek Downstream (NGC/DN/NEF) G-3	N. Granny Creek Upstream of Confluence (NGC/UP/CONF) G-4	Tributary-5A
	CEQG for Protection of Aquatic Life: 26 ng/L					
Apr-22	4.80	1.85	1.70	1.54	1.47	1.93
May-22	4.36	6.65	5.27	6.31	5.02	2.27
Jun-22	3.61	4.67	4.86	4.63	4.05	2.20
Jul-22	4.94	2.99	3.18	6.32	3.63	1.97
Aug-22	4.06	3.61	3.21	3.89	3.73	1.37
Sep-22	1.97	1.65	2.57	1.96	1.98	1.10
Oct-22	1.98	1.70	2.30	2.03	2.30	1.07
Nov-22	3.22	4.80	3.20	4.30	3.11	1.80
Dec-22	2.54	2.40	2.73	2.91	2.01	1.07
Average 2009		2.23	1.99	2.06	2.21	1.09
Average 2010		1.77	1.88	1.79	1.40	1.01
Average 2011		2.25	2.39	2.29	2.19	1.34
Average 2012		2.06	2.30	2.54	2.38	1.48
Average 2013		1.85	2.10	1.83	1.40	0.90
Average 2014		2.84	3.85	3.01	4.26	1.86
Average 2015		3.27	2.64	3.44	2.40	1.13
Average 2016		2.66	2.48	2.38	3.14	1.76
Average 2017	2.73	2.09	2.01	1.79	2.07	1.18
Average 2018	3.13	2.51	2.43	2.41	2.12	2.71
Average 2019	3.12	2.90	2.86	3.16	2.68	1.42
Average 2020	3.11	2.90	3.08	2.81	2.89	1.66
Average 2021	3.82	3.13	3.52	3.38	3.36	1.87
Average 2022	3.66	3.13	2.95	3.33	2.77	1.70
Average All Data	3.29	2.68	2.71	2.62	2.64	1.64
CEQG for Protection of Aquatic Life: 26 ng/L						

** Samples discarded due to lab miscommunication
MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1
North Granny Creek receives effluent from the PKC facility
Station G-4 was changed from quarterly to monthly sampling in October 2015
Tributary-5A was changed from quarterly to monthly sampling in July 2016
Sampling at Station G-0 was initiated in May 2017
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample

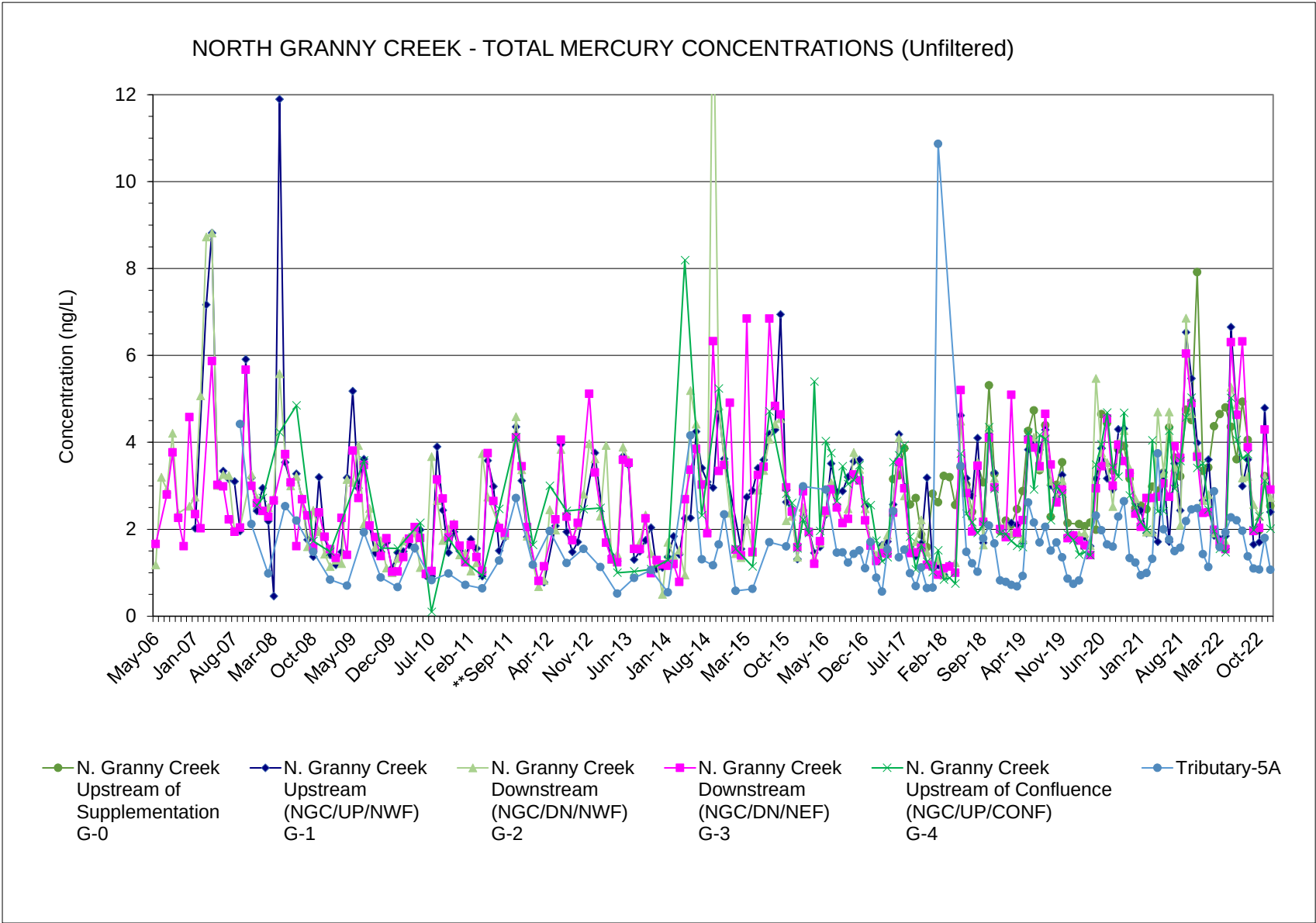


Table 10b: Total Mercury - South Granny Creek (Unfiltered)
(concentrations in ng/L)

Date	S. Granny Creek Upstream (SGC/UP/SWF) G-5	S. Granny Creek Downstream (SGC/DS/SWF) G-6	S. Granny Creek Upstream of Confluence (SGC/UP/CONF) G-7	Tributary-5A
	CEQG for Protection of Aquatic Life: 26 ng/L			
May-06	0.86	1.26		
Jun-06	3.37	3.16		
Jul-06	2.72	3.08		
Aug-06	2.57	2.60		
Sep-06	2.28	2.74		
Oct-06	1.34	1.30		
Dec-06	2.23	2.08		
Jan-07	16.20	4.52		
Feb-07	3.57	3.16		
Mar-07	F	7.43		
Apr-07	3.72	3.76		
May-07	2.46	2.08		
Jun-07	2.49	3.04		
Jul-07	2.73	2.03		
Aug-07		2.17		
Sep-07	4.41	1.61		4.42
Oct-07	5.16	3.79		
Nov-07	2.74	2.49		2.12
Dec-07	2.67	2.61	2.61	
Jan-08	2.97	2.94	3.41	
Feb-08	3.76	2.91		0.98
Mar-08	3.06	3.35		
Apr-08	2.19	2.91	1.50	
May-08	3.37	3.42		2.53
Jun-08	2.55	2.81		
Jul-08	3.60	2.68	2.84	2.20
Aug-08	2.63	2.38		
Sep-08	1.94	2.78		
Oct-08	2.14	1.83	1.47	1.48
Nov-08		1.81		
Dec-08	1.84	1.88		
Jan-09	4.42	1.64	1.66	0.84
Feb-09	2.22	1.52		
Mar-09	2.56	1.45		
Apr-09	2.19	2.98	1.59	0.70
May-09	3.31	3.82		
Jun-09	2.65	2.76		
Jul-09	2.70	2.69	2.92	1.93
Aug-09	2.06	2.05		
Sep-09	1.47	1.39		
Oct-09	1.40	1.05	1.29	0.89
Nov-09	3.65	0.98		
Dec-09	1.08	0.96		
Jan-10	0.94	1.89	2.45	0.67
Feb-10	1.89	2.03		
Mar-10	2.14	1.84		
Apr-10	1.68	1.90		1.57
May-10	1.90	2.13	2.25	
Jun-10	0.83	0.78		
Jul-10	0.70	1.28	0.09	0.83
Aug-10	3.06	3.37		
Sep-10	2.21	2.00		
Oct-10	1.59	1.55	1.63	0.98
Nov-10	1.82	1.86		
Dec-10	1.59	1.67		
Jan-11	1.50	1.46	1.54	0.72
Feb-11	1.70	1.42		
Mar-11	2.55	1.11		
Apr-11	2.40	1.38	1.18	0.64
May-11	2.98	3.53		
Jun-11	2.34	2.36		
Jul-11	2.08	2.00	2.30	1.28
Aug-11	2.42	2.28		
**Sep-11				
Oct-11	3.67	3.57	4.14	2.72
Nov-11	3.00	2.72		
Dec-11	2.32	1.97		
Jan-12	2.33	1.56	1.15	1.18
Feb-12	2.06	0.95		
Mar-12	29.4*	0.82		
Apr-12	2.72	2.41	2.66	1.96
May-12	2.13	2.42		
Jun-12	3.36	2.95		
Jul-12	2.42	2.68	2.68	1.22
Aug-12	2.28	1.74		
Sep-12	2.77	2.61		
Oct-12	2.63	2.34	2.38	1.55
Nov-12	2.33	3.53		
Dec-12	3.26	3.31		
Jan-13	2.49	2.10	3.03	1.13
Feb-13	2.53	2.14		
Mar-13	2.14	1.32		
Apr-13	2.35	1.64	1.00	0.52
May-13	3.33	3.16		
Jun-13	2.84	2.68		
Jul-13	1.58	1.88	1.39	0.88
Aug-13	2.95	2.43		
Sep-13	2.16	1.71		
Oct-13	1.41	0.86	1.27	1.06
Nov-13	1.96	2.51		
Dec-13	1.87	0.95		
Jan-14	0.88	0.79	1.35	0.55
Feb-14	1.51	1.39		
Mar-14	2.40	1.20		
Apr-14	3.19	0.98	2.13	
May-14	4.25	4.43		4.16
Jun-14	2.67	3.38		

Table 10b: Total Mercury - South Granny Creek (Unfiltered)
(concentrations in ng/L)

Date	S. Granny Creek Upstream (SGC/UP/SWF) G-5	S. Granny Creek Downstream (SGC/DS/SWF) G-6	S. Granny Creek Upstream of Confluence (SGC/UP/CONF) G-7	Tributary-5A
	CEQG for Protection of Aquatic Life: 26 ng/L			
Jul-14	2.48	2.85	3.94	1.31
Aug-14	2.22	1.96		
Sep-14	2.16	4.96		1.17
Oct-14	3.52	3.59	4.17	1.65
Nov-14	3.36	5.30		2.34
Dec-14	NA	NA		
Jan-15	1.91	1.94	1.31	0.58
Feb-15	2.34	1.65		
Mar-15	3.98	2.42		
Apr-15	2.69	1.29	1.55	0.63
May-15	3.01	3.28		
Jun-15	2.64	3.08		
Jul-15	2.27	2.26	3.79	1.70
Aug-15	3.41	3.69		
Sep-15	4.81	5.30		
Oct-15	2.92	2.86	2.33	1.61
Nov-15	4.96	2.48	2.31	
Dec-15	2.35	1.85	2.48	
Jan-16	2.78	2.45	2.82	2.99
Feb-16	2.88	2.24	6.17	
Mar-16	1.40	2.80	1.18	
Apr-16	9.52	8.79	4.26	
May-16	2.83	3.33	3.34	2.91
Jun-16	3.14	3.19	3.12	
Jul-16	1.97	2.47	3.01	1.46
Aug-16	2.75	2.78	2.60	1.47
Sep-16	2.71	2.27	2.29	1.24
Oct-16	2.18	2.15	2.19	1.43
Nov-16	3.53	2.70	2.08	1.51
Dec-16	2.72	2.69	2.59	1.10
Jan-17	2.14	1.97	2.39	1.71
Feb-17	1.75	1.62	1.68	0.89
Mar-17	1.78	1.62	1.46	0.57
Apr-17	3.13	2.03	1.60	1.54
May-17	2.60	2.28	2.51	2.42
Jun-17	3.45	2.94	2.87	1.35
Jul-17	3.12	3.25	4.03	1.53
Aug-17	2.73	3.26	2.15	0.99
Sep-17	1.43	1.28	1.43	0.69
Oct-17	1.59	1.26	1.11	1.12
Nov-17	1.45	1.02	1.98	0.64
Dec-17	2.15	1.31	3.21	0.66
Jan-18	1.76	0.98	1.26	10.87
Feb-18	5.11	1.02	1.71	F
Mar-18	3.14	0.95	1.47	F
Apr-18	2.65	1.47	1.13	F
May-18	3.93	2.83	3.50	3.46
Jun-18	2.62	2.37	2.33	1.48
Jul-18	2.38	2.03	2.04	1.22
Aug-18	2.09	2.58	1.24	1.02
Sep-18	1.27	0.87	1.23	1.79
Oct-18	3.92	3.28	3.22	2.09
Nov-18	2.55	3.02	2.58	1.67
Dec-18	2.29	2.26	1.91	0.83
Jan-19	2.23	2.08	1.97	0.79
Feb-19	2.44	1.98	1.85	0.72
Mar-19	2.96	1.84	1.79	0.69
Apr-19	2.91	2.07	1.63	0.93
May-19	4.30	4.27	3.34	2.62
Jun-19	4.25	3.83	3.01	2.15
Jul-19	3.20	4.00	6.92	1.70
Aug-19	3.36	5.31	4.83	2.06
Sep-19	2.30	3.31	2.38	1.51
Oct-19	2.65	2.51	2.64	1.70
Nov-19	2.55	2.33	2.63	1.36
Dec-19	2.14	2.05	2.05	0.86
Jan-20	2.38	1.84		0.74
Feb-20	2.34	1.96	1.59	0.83
Mar-20	12.23	1.93	2.27	
Apr-20	3.10	1.50	3.71	
May-20	3.60	2.41	3.36	2.31
Jun-20	4.12	2.51	2.61	1.98
Jul-20	3.31	5.04	5.64	1.65
Aug-20	2.48	3.41	3.89	1.60
Sep-20	2.99	2.65	3.04	2.29
Oct-20	3.31	2.84	2.73	2.65
Nov-20	2.92	2.31	2.21	1.34
Dec-20	2.25	2.05	2.02	1.24
Jan-21	2.14	1.92	1.83	0.95
Feb-21	2.14	1.84	2.14	0.99
Mar-21	2.91	2.40	2.10	1.32
Apr-21	4.02	3.58	3.70	3.75
May-21	3.30	3.94	3.70	2.00
Jun-21	3.71	4.82	3.81	1.77
Jul-21	3.67	3.04	3.10	1.50
Aug-21	2.80	2.80	3.56	1.58
Sep-21	6.39	4.80	4.03	2.19
Oct-21	4.26	4.61	3.97	2.45
Nov-21	2.93	3.34	3.12	2.49
Dec-21	3.00	3.12	2.81	1.43
Jan-22	21.94	2.23	2.54	1.13
Feb-22	47.29	2.34	1.83	2.87
Mar-22	132.20	2.15	1.84	1.59
Apr-22	32.98	2.28	2.56	1.93
May-22	4.80	4.19	3.44	2.27
Jun-22	3.30	2.75	3.44	2.20
Jul-22	2.88	3.38	3.09	1.97
Aug-22	2.88	3.29	3.47	1.37
Sep-22	2.16	1.92	2.15	1.10
Oct-22	2.70	2.70	1.79	1.07
Nov-22	2.52	3.67	2.42	1.80
Dec-22	2.52	2.49	2.14	1.07
Average 2009	2.48	1.94	1.87	1.09
Average 2010	1.70	1.86	1.61	1.01
Average 2011	2.45	2.16	2.29	1.34

Table 10b: Total Mercury - South Granny Creek (Unfiltered)
(concentrations in ng/L)

Date	S. Granny Creek Upstream (SGC/UP/SWF) G-5	S. Granny Creek Downstream (SGC/DS/SWF) G-6	S. Granny Creek Upstream of Confluence (SGC/UP/CONF) G-7	Tributary-5A
	CEQG for Protection of Aquatic Life: 26 ng/L			
Average 2012	2.57	2.28	2.22	1.48
Average 2013	2.30	1.95	1.67	0.90
Average 2014	2.60	2.80	2.90	1.86
Average 2015	3.11	2.68	2.30	1.13
Average 2016	3.20	3.16	2.97	1.76
Average 2017	2.28	1.99	2.20	1.18
Average 2018	2.81	1.97	1.97	2.71
Average 2019	2.94	2.96	2.92	1.42
Average 2020	3.75	2.54	3.01	1.66
Average 2021	3.44	3.35	3.16	1.87
Average 2022	21.52	2.78	2.56	1.70
Average All Data	3.99	2.51	2.53	1.64
CEQG for Protection of Aquatic Life: 26 ng/L				

* Samples excluded from annual average calculation
** Samples discarded due to lab miscommunication
MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1
Station G-7 was changed from quarterly to monthly sampling in October 2015
Tributary-5A was changed from quarterly to monthly sampling in July 2016
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample
NA

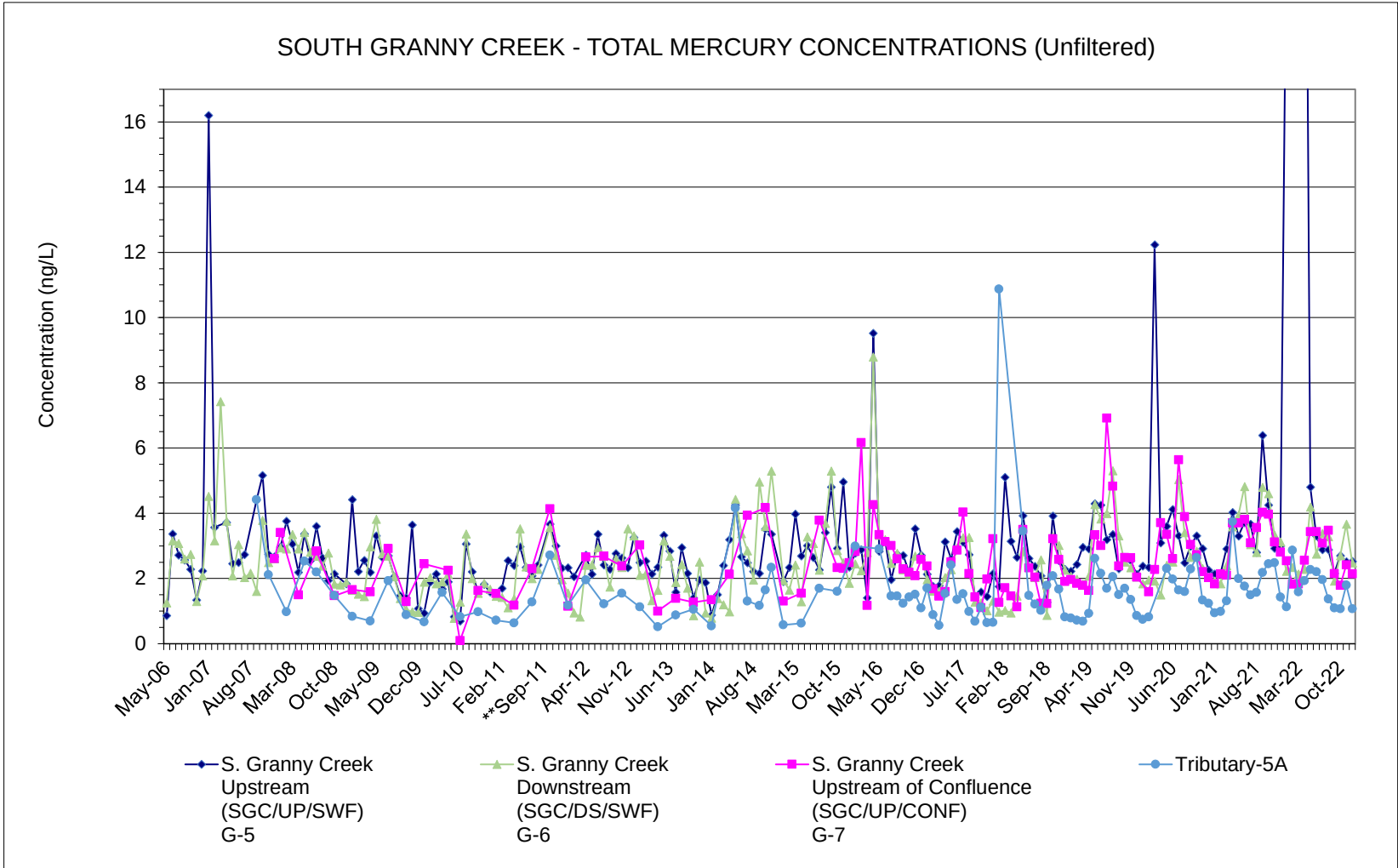


Table10c: Total Mercury - Granny Creek
Confluence (Unfiltered)
(concentrations in ng/L)

Date	Granny Creek Confluence (GC/CONF-7) G-8	Tributary-5A
	CEQG for Protection of Aquatic Life: 26 ng/L	
Sep-07		4.42
Oct-07		
Nov-07		2.12
Dec-07	2.41	
Jan-08	2.85	
Feb-08		0.98
Mar-08		
Apr-08	4.30	
May-08		2.53
Jun-08		
Jul-08	3.72	2.20
Aug-08		
Sep-08		
Oct-08	1.60	1.48
Nov-08		
Dec-08		
Jan-09	1.62	0.84
Feb-09		
Mar-09		
Apr-09	1.33	0.70
May-09		
Jun-09		
Jul-09	3.73	1.93
Aug-09		
Sep-09		
Oct-09	1.52	0.89
Nov-09		
Dec-09		
Jan-10	1.24	0.67
Feb-10		
Mar-10		
Apr-10		1.57
May-10	2.08	
Jun-10		
Jul-10	0.15	0.83
Aug-10		
Sep-10		
Oct-10	1.71	0.98
Nov-10		
Dec-10		
Jan-11	1.46	0.72
Feb-11		
Mar-11		
Apr-11	1.28	0.64
May-11		
Jun-11		
Jul-11	2.34	1.28
Aug-11		
Sep-11		
Oct-11		2.72
Nov-11		
Dec-11		
Jan-12	1.59	1.18
Feb-12		
Mar-12		
Apr-12	2.74	1.96
May-12		
Jun-12		
Jul-12	2.46	1.22
Aug-12		
Sep-12		
Oct-12	2.62	1.55
Nov-12		
Dec-12		
Jan-13	2.93	1.13
Feb-13		
Mar-13		
Apr-13	0.95	0.52
May-13		
Jun-13		
Jul-13	1.66	0.88
Aug-13		
Sep-13		
Oct-13	1.10	1.06
Nov-13		
Dec-13		

Table10c: Total Mercury - Granny Creek
Confluence (Unfiltered)
(concentrations in ng/L)

Date	Granny Creek Confluence (GC/CONF-7) G-8	Tributary-5A
	CEQG for Protection of Aquatic Life: 26 ng/L	
Jan-14	1.30	0.55
Feb-14		
Mar-14		
Apr-14	0.48	
May-14		4.16
Jun-14		
Jul-14	1.42	1.31
Aug-14		
Sep-14		1.17
Oct-14	2.90	1.65
Nov-14		2.34
Dec-14		
Jan-15		0.58
Feb-15	1.49	
Mar-15		
Apr-15	1.06	0.63
May-15		
Jun-15		
Jul-15	1.70	1.70
Aug-15		
Sep-15		
Oct-15	2.80	1.61
Nov-15	2.27	
Dec-15	1.80	
Jan-16	2.37	2.99
Feb-16	3.49	
Mar-16	1.29	
Apr-16	8.76	
May-16	4.17	2.91
Jun-16	3.93	
Jul-16	2.67	1.46
Aug-16	2.99	1.47
Sep-16	2.84	1.24
Oct-16	2.87	1.43
Nov-16	2.70	1.51
Dec-16	2.47	1.10
Jan-17	1.87	1.71
Feb-17	1.44	0.89
Mar-17	1.48	0.57
Apr-17	1.45	1.54
May-17	3.16	2.42
Jun-17	3.72	1.35
Jul-17	3.90	1.53
Aug-17	2.40	0.99
Sep-17	1.19	0.69
Oct-17	1.36	1.12
Nov-17	0.92	0.64
Dec-17	2.22	0.66
Jan-18	1.48	10.87
Feb-18	1.05	F
Mar-18	1.15	F
Apr-18	1.00	F
May-18	3.37	3.46
Jun-18	2.88	1.48
Jul-18	2.37	1.22
Aug-18	2.07	1.02
Sep-18	3.34	1.79
Oct-18	3.65	2.09
Nov-18	2.65	1.67
Dec-18	1.94	0.83
Jan-19	1.99	0.79
Feb-19	1.78	0.72
Mar-19	1.52	0.69
Apr-19	3.17	0.93
May-19	4.04	2.62
Jun-19	3.77	2.15
Jul-19	3.73	1.70
Aug-19	3.55	2.06
Sep-19	2.72	1.51
Oct-19	3.03	1.70
Nov-19	2.91	1.36
Dec-19	1.80	0.86
Jan-20	1.63	0.74
Feb-20	1.59	0.83
Mar-20	1.48	
Apr-20	1.36	
May-20	3.93	2.31
Jun-20	3.92	1.98
Jul-20	4.85	1.65
Aug-20	3.80	1.60
Sep-20	3.71	2.29
Oct-20	3.94	2.65
Nov-20	2.64	1.34
Dec-20	2.05	1.24

Table10c: Total Mercury - Granny Creek
Confluence (Unfiltered)
(concentrations in ng/L)

Date	Granny Creek Confluence (GC/CONF-7) G-8	Tributary-5A
	CEQG for Protection of Aquatic Life: 26 ng/L	
Jan-21	1.92	0.95
Feb-21	2.02	0.99
Mar-21	2.08	1.32
Apr-21	4.01	3.75
May-21	3.50	2.00
Jun-21	4.02	1.77
Jul-21	3.40	1.50
Aug-21	3.58	1.58
Sep-21	4.45	2.19
Oct-21	4.34	2.45
Nov-21	3.22	2.49
Dec-21	3.03	1.43
Jan-22	2.06	1.13
Feb-22	2.04	2.87
Mar-22	1.50	1.59
Apr-22	2.04	1.93
May-22	7.18	2.27
Jun-22	4.49	2.20
Jul-22	4.25	1.97
Aug-22	3.44	1.37
Sep-22	2.22	1.10
Oct-22	1.83	1.07
Nov-22	2.54	1.80
Dec-22	3.21	1.07
Average 2009	2.05	1.09
Average 2010	1.30	1.01
Average 2011	1.69	1.34
Average 2012	2.35	1.48
Average 2013	1.66	0.90
Average 2014	1.53	1.86
Average 2015	1.85	1.13
Average 2016	3.38	1.76
Average 2017	2.09	1.18
Average 2018	2.24	2.71
Average 2019	2.83	1.42
Average 2020	2.91	1.66
Average 2021	3.30	1.87
Average 2022	3.07	1.70
Average All Data	2.58	1.64

CEQG for Protection of Aquatic Life: 26 ng/L

MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1

Station G-8 was changed from quarterly to monthly sampling in October 2015

Tributary-5A was changed from quarterly to monthly sampling in July 2016

Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.

Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.

D: Dry

F: Frozen

US: Unsafe to sample

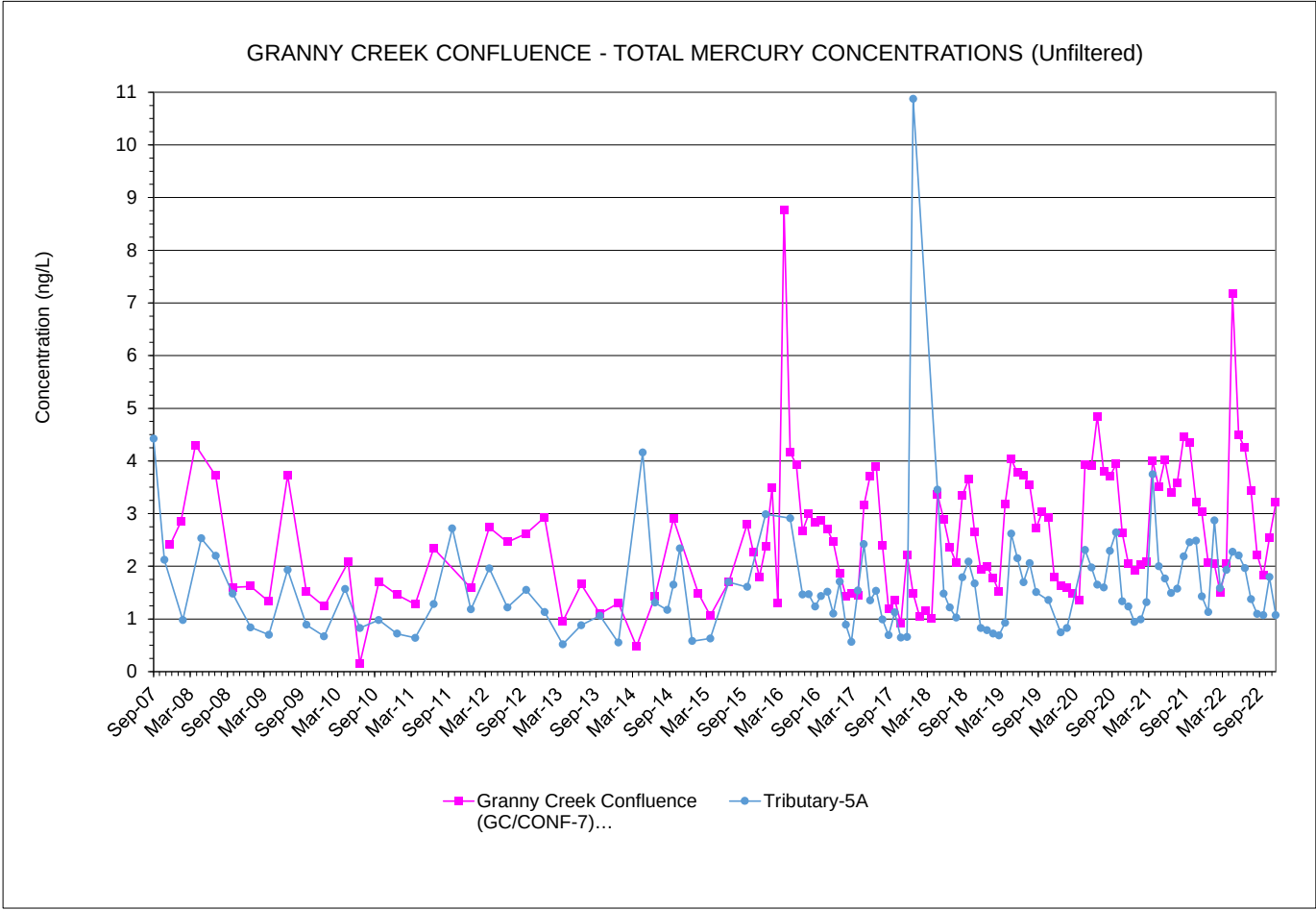


Table 11a: Total Mercury - North Granny Creek (Filtered)
(concentrations in ng/L)

Date	N. Granny Creek Upstream of Supplementation G-0	N. Granny Creek Upstream (NGC/UP/NWF) G-1	N. Granny Creek Downstream (NGC/DN/NWF) G-2	N. Granny Creek Downstream (NGC/DN/NEF) G-3	N. Granny Creek Upstream of Confluence (NGC/UP/CONF) G-4	Tributary-5A
May-06			0.87	0.90		
Jun-06			2.91			
Jul-06			2.33	2.22		
Aug-06			3.43	3.03		
Sep-06			1.64	1.70		
Oct-06				1.30		
Dec-06			1.98	3.98		
Jan-07		1.06	1.23	1.40		
Feb-07				0.75		
Mar-07		7.05	5.74	F		
Apr-07		4.19	4.19	2.50		
May-07		2.40	2.40	2.56		
Jun-07		2.51	2.81	2.64		
Jul-07		2.96	1.97	2.10		
Aug-07		1.52	1.90	1.81		
Sep-07		1.96	1.94	1.75		4.05
Oct-07		5.19		5.60		
Nov-07		2.91	3.01	2.74		1.97
Dec-07		2.05	2.22	2.18	2.10	
Jan-08		1.42	1.65	1.63	1.85	
Feb-08		1.91	1.74	1.60		0.73
Mar-08		1.76	1.64	1.63		
Apr-08		1.84	2.57	F	3.29	
May-08		3.16	3.27	3.21		2.21
Jun-08		2.74	2.81	2.72		
Jul-08		2.95	2.94	1.49	4.17	2.16
Aug-08		2.39	2.42	2.34		
Sep-08		1.35		1.88		
Oct-08		1.19	1.44	1.40	1.55	1.16
Nov-08		2.28	2.23	2.15		
Dec-08		1.30	1.72	1.65		
Jan-09		1.33	1.20	1.27	1.25	0.59
Feb-09		1.15	1.18	1.05		
Mar-09		1.15	1.05	1.40		
Apr-09		1.56	0.96	1.09		0.53
May-09		2.43	2.12	2.34		
Jun-09		3.24	3.16	3.19		
Jul-09		2.57	2.37	2.93	2.19	1.47
Aug-09		1.66	1.69	1.69		
Sep-09		1.54	1.63	1.63		
Oct-09		1.45	1.65	1.38	1.45	0.69
Nov-09		1.51	1.51	1.45		
Dec-09		0.97	0.99	0.68		
Jan-10		1.07	1.12	1.11	1.00	<0.10
Feb-10		0.88	1.08	1.05		
Mar-10		0.96	1.08	1.02		
Apr-10		0.97	0.99	1.10		1.16
May-10		1.43	1.37	1.11	1.48	
Jun-10		1.47	0.91	0.87		
Jul-10		0.89	0.61	0.65	0.71	0.67
Aug-10		3.33	2.54	2.10		
Sep-10		1.66	1.85	1.57		
Oct-10		1.38	1.69	0.54	1.74	0.38
Nov-10		1.59	1.56	1.63		
Dec-10		0.98	0.98	0.92		
Jan-11		0.82	0.86	0.81	0.76	0.62
Feb-11		1.30	1.05	1.44		
Mar-11		0.94	0.66	0.70		
Apr-11		0.69	1.13	0.73	0.90	0.56
May-11		2.24	2.06	1.95		
Jun-11		2.94	2.59	2.45		
Jul-11		1.19	1.42	1.85	1.69	0.98
Aug-11		0.73	0.86	0.84		
**Sep-11						
Oct-11		2.96	2.56	2.36	3.19	2.01
Nov-11		2.53	2.59	2.40		
Dec-11		1.05	1.22	1.20		
Jan-12			0.93		0.87	0.52
Feb-12		0.46	0.41	0.38		
Mar-12		0.42	0.33*	0.34		
Apr-12			1.62		1.93	1.39
May-12		1.66	1.56	1.56		
Jun-12		3.47	3.26	3.16		
Jul-12		1.54	1.52	1.60	1.64	0.84
Aug-12		0.86	0.97	0.98		
Sep-12		1.13	1.51	1.46		
Oct-12			1.91		1.47	1.10
Nov-12			1.94	3.10		
Dec-12		1.59	1.58	1.88		
Jan-13		F	1.85	F	1.78	0.62
Feb-13		1.27	1.30	1.13		
Mar-13		0.86	0.86	0.79		
Apr-13		0.82	0.79	0.82	0.64	0.44
May-13		3.25	3.20	2.86		
Jun-13		2.86	2.90	2.72		
Jul-13		0.80	0.90	0.90	0.70	0.50
Aug-13		0.79	1.06	0.82		
Sep-13		1.27	1.71	1.69		
Oct-13		0.83	0.98	0.91	0.76	0.88
Nov-13		0.76	0.73	0.71		
Dec-13		0.72	1.31	0.56		
Jan-14		0.68	0.74	0.63	1.00	0.26
Feb-14		0.82	1.15	0.80		
Mar-14		0.70	0.62	0.58		
Apr-14		0.90	0.73	0.46	0.62	
May-14		2.19	3.04	1.21		2.46
Jun-14		3.54	3.34	3.12		
Jul-14		1.94	2.17	2.07	1.13	1.11

Table 11a: Total Mercury - North Granny Creek (Filtered)
(concentrations in ng/L)

Date	N. Granny Creek Upstream of Supplementation G-0	N. Granny Creek Upstream (NGC/UP/NWF) G-1	N. Granny Creek Downstream (NGC/DN/NWF) G-2	N. Granny Creek Downstream (NGC/DN/NEF) G-3	N. Granny Creek Upstream of Confluence (NGC/UP/CONF) G-4	Tributary-5A
Aug-14		0.99	0.93	0.87		
Sep-14		1.61	2.18	2.16		1.01
Oct-14		4.04	3.44	2.67	3.33	1.30
Nov-14		2.84	2.90	2.73		1.45
Dec-14		US	1.35	2.02		-
Jan-15			1.30	1.11	1.06	0.58
Feb-15		1.08	0.83	0.86		
Mar-15		1.80	1.73	1.63		
Apr-15		2.37	0.80	0.96	0.70	0.18
May-15		3.48	3.20	2.94		
Jun-15		3.40	0.25	2.75		
Jul-15		3.97	3.02	4.00	3.64	1.42
Aug-15		2.89	2.84	3.60		
Sep-15		5.74	2.03	2.42		
Oct-15		1.60	1.67	1.81	1.45	1.04
Nov-15		1.64	1.66	1.51	1.72	
Dec-15		1.58	1.58	1.51	1.85	
Jan-16		1.59	1.28	0.93	1.30	0.64
Feb-16		1.33	1.17	1.06	1.09	
Mar-16		1.27	1.15	1.02	1.09	
Apr-16		1.30	1.12	1.08	1.03	
May-16		1.10	1.09	1.11	1.53	1.83
Jun-16		2.66	2.50	1.94	2.29	
Jul-16		1.93	1.86	1.66	1.77	1.21
Aug-16		1.54	1.58	1.51	2.60	1.20
Sep-16		1.44	1.68	1.85	1.62	0.84
Oct-16		2.41	2.22	2.20	2.41	1.20
Nov-16		2.50	2.38	2.05	1.87	1.16
Dec-16		1.67	1.59	2.03	1.14	0.85
Jan-17		1.24	1.23	1.25	0.94	0.40
Feb-17		0.82	0.93	0.96	0.74	0.31
Mar-17		0.93	0.83	0.77	0.66	0.23
Apr-17		1.41	1.12	0.97	0.79	0.79
May-17	1.94	1.87	1.66	1.59	1.88	2.07
Jun-17	2.87	3.28	3.00	2.34	2.26	1.30
Jul-17		2.38	2.05	2.10	2.55	1.30
Aug-17	1.45	0.85	0.96	0.84	0.86	0.73
Sep-17	1.23	0.96	0.94	0.96	0.77	0.57
Oct-17	1.49	1.30	1.13	1.09	1.21	1.07
Nov-17	0.89	1.04	0.90	0.76	0.71	0.65
Dec-17	0.66	0.71	0.64	0.53	0.61	0.40
Jan-18	<0.69	0.77	<0.69	<0.69	<0.69	<0.69
Feb-18	<0.69	<0.69	<0.69	<0.69	<0.69	F
Mar-18	<0.69	0.69	<0.69	<0.69	<0.69	F
Apr-18	<0.69	<0.69	<0.69	<0.69	<0.69	F
May-18	2.27	2.73	2.70	2.50	2.07	2.04
Jun-18	2.66	3.11	2.85	2.48	1.55	1.20
Jul-18	1.80	2.12	1.56	1.68	1.55	0.92
Aug-18	2.01	3.13	3.06	3.02	1.30	0.94
Sep-18	1.69	1.33	1.24	1.64	1.54	1.52
Oct-18	3.21	3.57	3.89	2.62	3.07	1.60
Nov-18	2.52	2.58	2.41	2.23	2.14	1.44
Dec-18	1.37	1.52	1.32	1.27	1.20	0.67
Jan-19	1.19	1.36	1.19	1.12	1.24	0.53
Feb-19	0.82	1.23	1.09	1.00	0.99	0.23
Mar-19	0.80	1.46	1.16	1.02	0.99	0.26
Apr-19	1.56	1.31	1.10	0.93	0.97	0.47
May-19	3.21	2.64	2.46	2.42	3.23	2.13
Jun-19	3.78	3.60	3.29	2.89	2.38	1.85
Jul-19	2.37	2.75	2.46	2.32	2.46	1.42
Aug-19	3.22	3.36	2.62	3.37	2.53	1.67
Sep-19	1.20	1.71	1.89	2.48	1.25	0.85
Oct-19	2.53	1.95	1.80	1.77	1.93	1.35
Nov-19	2.51	1.93	2.01	2.05	1.90	1.13
Dec-19	1.28	1.28	1.23	1.10	1.07	0.61
Jan-20		1.25	1.25	1.11	1.11	0.45
Feb-20	0.78	1.15	1.14	1.00	0.95	0.30
Mar-20	0.54	1.09	0.95	0.17	0.79	
Apr-20	0.52	0.97	1.01	0.70	0.76	
May-20	0.64	1.34	1.93	1.10	1.42	1.70
Jun-20	4.34	3.19	3.10	2.69	2.71	1.76
Jul-20	2.25	1.93	1.59	2.57	2.91	1.18
Aug-20	1.87	1.59	1.61	2.31	2.61	1.14
Sep-20	3.64	3.24	2.96	2.85	2.21	2.10
Oct-20	3.05	2.86	2.57	2.47	2.58	1.76
Nov-20	2.36	2.36	2.43	2.24	1.85	1.09
Dec-20	1.77	2.00	1.90	1.81	1.78	0.97
Jan-21	1.35	1.21	1.17	1.14	0.96	0.54
Feb-21	1.06	1.06	0.99	0.85	0.94	0.42
Mar-21	1.06	1.06	0.99	0.85	0.86	0.41
Apr-21	1.46	0.95	2.50	1.06	1.08	2.24
May-21	2.84	2.68	2.69	2.41	1.08	1.71
Jun-21	3.68	0.95	2.50	1.06	2.83	1.87
Jul-21	2.43	3.81	2.15	2.45	3.71	1.47
Aug-21	1.62	1.59	1.52	2.77	2.10	1.30
Sep-21	3.21	4.48	4.59	3.80	3.11	1.64
Oct-21	3.48	3.24	3.00	2.87	3.21	1.77
Nov-21	3.01	2.50	2.32	2.14	2.03	1.28
Dec-21	2.12	1.70	1.70	1.56	1.52	1.11
Jan-22	1.17	1.06	1.11	1.00	0.92	0.39
Feb-22	1.12	1.08	1.04	0.86	0.87	0.56
Mar-22	0.82	1.07	0.94	0.76	0.86	0.49
Apr-22	0.90	1.10	0.85	0.88	0.84	0.42
May-22	3.01	2.35	2.09	2.20	2.74	1.89
Jun-22	3.80	2.89	2.96	2.83	3.04	1.86
Jul-22	2.76	2.54	2.50	2.42	2.50	2.40
Aug-22	1.85	1.90	3.01	2.28	2.27	1.38
Sep-22	2.07	1.72	1.75	2.06	2.03	0.88
Oct-22	1.23	1.14	1.20	1.21	1.70	0.77
Nov-22	2.34	2.41	2.35	1.97	2.10	1.30
Dec-22	1.43	1.29	1.33	1.30	1.00	0.85
Average 2009		1.71	1.63	1.68	1.63	0.82
Average 2010		1.38	1.32	1.14	1.23	<0.58
Average 2011		1.58	1.55	1.52	1.64	1.04
Average 2012		1.39	1.56	1.61	1.48	0.96
Average 2013		1.29	1.47	1.26	0.97	0.61

Table 11a: Total Mercury - North Granny Creek (Filtered)
(concentrations in ng/L)

Date	N. Granny Creek Upstream of Supplementation G-0	N. Granny Creek Upstream (NGC/UP/NWF) G-1	N. Granny Creek Downstream (NGC/DN/NWF) G-2	N. Granny Creek Downstream (NGC/DN/NEF) G-3	N. Granny Creek Upstream of Confluence (NGC/UP/CONF) G-4	Tributary-5A
Average 2014		1.84	1.88	1.61	1.52	1.27
Average 2015		2.69	1.74	2.09	1.74	0.81
Average 2016		1.73	1.63	1.54	1.64	1.12
Average 2017	1.50	1.40	1.28	1.18	1.16	0.82
Average 2018	1.69	<1.91	<1.81	<1.68	1.43	<1.23
Average 2019	2.04	2.05	1.86	1.87	1.74	1.04
Average 2020	1.98	1.91	1.87	1.75	1.81	1.24
Average 2021	2.28	2.10	2.17	1.91	1.95	1.31
Average 2022	1.87	1.71	1.76	1.65	1.74	1.10
Average All Data	1.93	<1.87	<1.78	<1.69	1.64	<1.11

* Samples excluded from annual average calculation
** Samples discarded due to lab miscommunication
MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.
North Granny Creek receives effluent from the PKC facility
Station G-4 was changed from quarterly to monthly sampling in October 2015
Tributary-5A was changed from quarterly to monthly sampling in July 2016
Sampling at Station G-0 was initiated in May 2017
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample

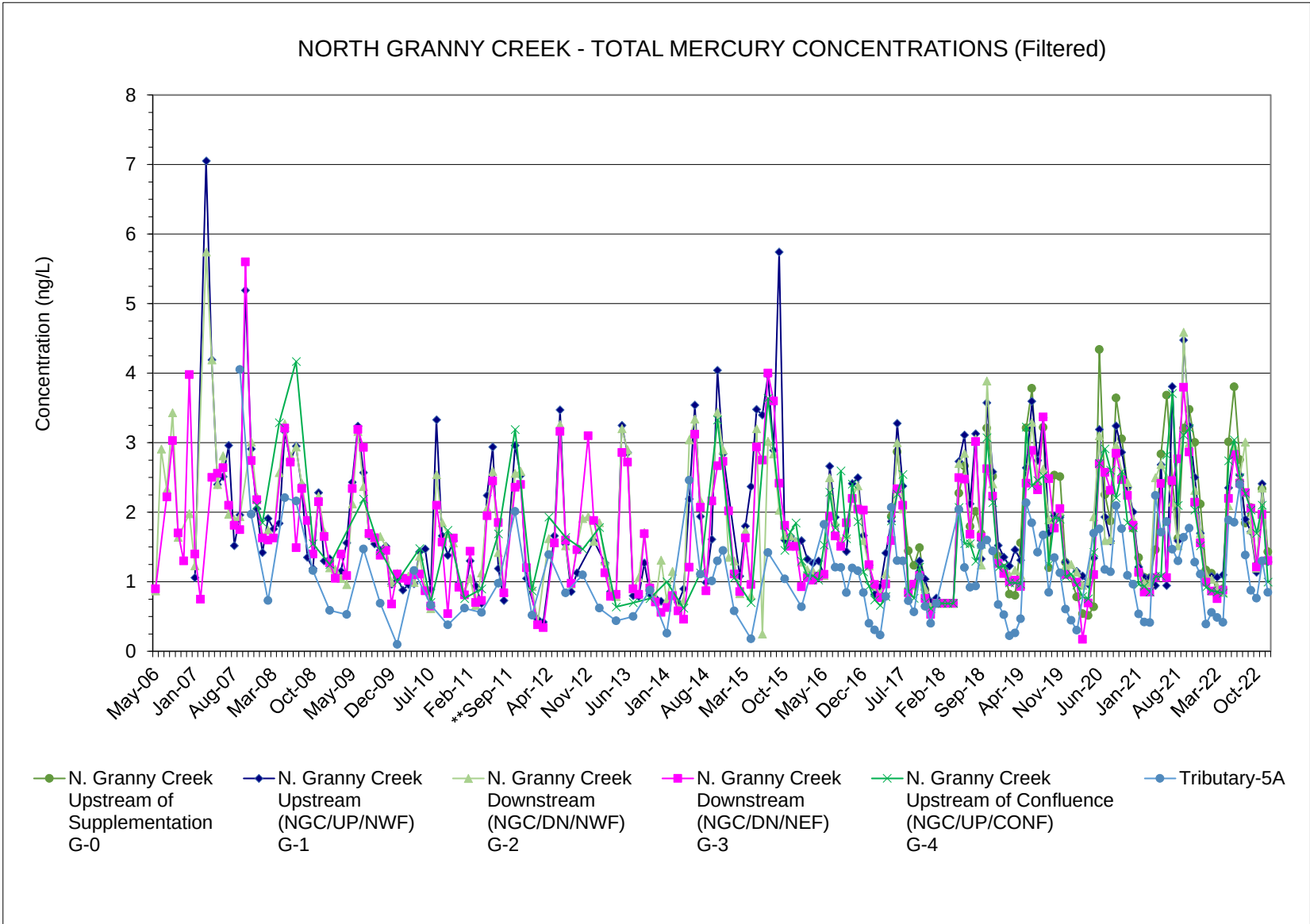


Table 11b: Total Mercury - South Granny Creek (Filtered)
(concentrations in ng/L)

Date	S. Granny Creek Upstream (SGC/UP/SWF) G-5	S. Granny Creek Downstream (SGC/DS/SWF) G-6	S. Granny Creek Upstream of Confluence (SGC/UP/CONF) G-7	Tributary-5A
May-06	0.55	0.90		
Jun-06		2.83		
Jul-06	2.07	1.94		
Aug-06	2.07	1.94		
Sep-06	1.34	2.11		
Oct-06	1.11	0.97		
Dec-06	1.92	1.58		
Jan-07	2.01	3.37		
Feb-07	0.79	1.90		
Mar-07	F	2.92		
Apr-07	1.96	1.84		
May-07	2.40	1.83		
Jun-07	2.26	1.79		
Jul-07	2.32	2.01		
Aug-07		1.70		
Sep-07	3.87	1.49		4.05
Oct-07	4.76	3.42		
Nov-07	2.45	2.16		1.97
Dec-07	2.35	2.61	1.48	
Jan-08	2.21	2.33	2.49	
Feb-08	2.24	2.08		0.73
Mar-08	1.76	1.98		
Apr-08	1.63	2.06	0.78	
May-08	2.90	2.97		
Jun-08	2.29	2.36		
Jul-08	2.84	2.32	2.48	2.16
Aug-08	2.23	2.06		
Sep-08	1.62	1.60		
Oct-08	1.88	1.27	1.34	1.16
Nov-08		1.73		
Dec-08	1.77	1.71		
Jan-09	2.05	1.34	1.35	0.59
Feb-09	1.68	1.19		
Mar-09	1.75	1.22		
Apr-09	1.34	1.78	1.19	0.53
May-09	1.98	2.19		
Jun-09	2.75	2.71		
Jul-09	2.20	1.96	2.07	1.47
Aug-09	1.80	1.59		
Sep-09	1.39	1.39		
Oct-09	1.01	1.08	1.02	0.69
Nov-09	2.01	0.80		
Dec-09	0.95	0.75		
Jan-10	1.29	1.31	1.05	<0.10
Feb-10	1.37	1.32		
Mar-10	1.11	1.23		
Apr-10	1.14	1.07		1.16
May-10	1.54	1.45	1.42	
Jun-10	0.68	0.60		
Jul-10	0.50	0.70	<0.10	0.67
Aug-10	2.72	2.25		
Sep-10	1.69	1.48		
Oct-10	1.71	1.61	1.54	0.38
Nov-10	1.61	1.54		
Dec-10	1.08	0.95		
Jan-11	1.07	1.02	0.96	0.62
Feb-11	1.65	1.02		
Mar-11	0.75	0.69		
Apr-11	0.77	0.76	1.04	0.56
May-11	1.85	1.83		
Jun-11	2.13	2.16		
Jul-11	1.72	1.16	1.81	0.98
Aug-11	1.09	1.10		
**Sep-11				
Oct-11	2.71	2.30	2.71	2.01
Nov-11	2.45	1.95		
Dec-11	1.67	1.21		
Jan-12	1.68	0.99	0.68	0.52
Feb-12	1.03	0.49		
Mar-12	0.41	0.38		
Apr-12	1.84	1.44	1.45	1.39
May-12	1.58	1.52		
Jun-12	2.63	2.28		
Jul-12	1.57	1.61	1.44	0.84
Aug-12	1.30	1.02		
Sep-12	2.09	2.09		
Oct-12	2.13	1.48	1.40	1.10
Nov-12	1.94	1.81		
Dec-12	1.67	1.49		
Jan-13	1.50	1.10	1.85	0.62
Feb-13	1.56	1.29		
Mar-13	1.08	0.81		
Apr-13	0.70	0.82	0.57	0.44
May-13	2.05	2.59		
Jun-13	2.58	2.20		
Jul-13	1.00	1.20	0.90	0.50
Aug-13	0.73	1.09		
Sep-13	1.10	1.37		
Oct-13	0.69	0.85	0.78	0.88
Nov-13	1.00	0.10		
Dec-13	0.63	0.72		
Jan-14	0.59	0.64	0.49	0.26
Feb-14	0.78	0.85		
Mar-14	0.31	0.65		
Apr-14	0.44	0.70	0.56	
May-14	3.27	2.76		2.46
Jun-14	2.51	2.81		
Jul-14	1.47	1.99	1.55	1.11

Table 11b: Total Mercury - South Granny Creek (Filtered)
(concentrations in ng/L)

Date	S. Granny Creek Upstream (SGC/UP/SWF) G-5	S. Granny Creek Downstream (SGC/DS/SWF) G-6	S. Granny Creek Upstream of Confluence (SGC/UP/CONF) G-7	Tributary-5A
Aug-14	1.13	0.75		
Sep-14	1.49	1.65		1.01
Oct-14	3.27	3.19	1.70	1.30
Nov-14	2.68	1.87		1.45
Dec-14	NA	NA		
Jan-15	1.41	1.19	0.94	0.58
Feb-15	1.17	1.07		
Mar-15	1.78	1.78		
Apr-15	0.63	0.92	0.73	0.18
May-15	3.08	2.02		
Jun-15	2.35	2.77		
Jul-15	2.10	1.95	2.67	1.42
Aug-15	2.68	3.00		
Sep-15	3.08	2.53		
Oct-15	1.83	1.92	1.47	1.04
Nov-15	2.21	1.46	1.28	
Dec-15	1.73	1.67	1.80	
Jan-16	1.58	1.21	1.38	0.64
Feb-16	1.56	1.32	1.30	
Mar-16	1.07	1.04	1.00	
Apr-16	0.88	0.95	0.92	
May-16	1.22	1.12	1.41	1.83
Jun-16	2.48	2.21	3.19	
Jul-16	1.81	1.97	1.93	1.21
Aug-16	1.57	2.16	2.26	1.20
Sep-16	1.17	1.36	1.39	0.84
Oct-16	1.66	1.50	1.67	1.20
Nov-16	1.26	2.09	1.44	1.16
Dec-16	2.16	1.29	1.17	0.85
Jan-17	1.42	1.09	0.93	0.40
Feb-17	1.20	0.91	0.77	0.31
Mar-17	0.88	0.84	0.66	0.23
Apr-17	1.77	0.93	0.59	0.79
May-17	1.69	1.33	1.44	2.07
Jun-17	2.72	2.24	1.84	1.30
Jul-17	2.40	2.38	2.81	1.30
Aug-17	1.75	2.70	1.69	0.73
Sep-17	0.84	0.89	0.95	0.57
Oct-17	1.39	1.04	0.93	1.07
Nov-17	0.87	0.64	1.14	0.65
Dec-17	0.80	0.63	0.73	0.40
Jan-18	<0.69	<0.69	<0.69	<0.69
Feb-18	<0.69	<0.69	<0.69	F
Mar-18	<0.69	<0.69	<0.69	F
Apr-18	<0.69	0.84	0.85	F
May-18	2.48	1.59	1.63	2.04
Jun-18	2.28	1.81	1.35	1.20
Jul-18	1.75	1.19	1.40	0.92
Aug-18	1.55	1.74	0.93	0.94
Sep-18	1.05	0.72	0.85	1.52
Oct-18	3.75	2.72	1.99	1.60
Nov-18	1.66	2.65	1.65	1.44
Dec-18	1.88	1.18	1.06	0.67
Jan-19	1.59	1.23	1.26	0.53
Feb-19	1.38	1.17	1.01	0.23
Mar-19	1.23	1.19	1.02	0.26
Apr-19	0.79	1.47	0.95	0.47
May-19	3.43	2.55	2.43	2.13
Jun-19	3.33	2.36	2.46	1.85
Jul-19	2.42	2.65	2.61	1.42
Aug-19	2.31	3.27	3.28	1.67
Sep-19	1.31	1.44	1.57	0.85
Oct-19	2.09	1.68	1.86	1.35
Nov-19	2.09	1.59	1.66	1.13
Dec-19	1.51	1.30	1.18	0.61
Jan-20	1.49	1.15		0.45
Feb-20	1.23	1.19	0.92	0.30
Mar-20	0.71	0.95	1.17	
Apr-20	0.76	0.99	0.74	
May-20	2.42	1.06	1.28	1.70
Jun-20	3.77	2.05	2.04	1.76
Jul-20	2.25	2.43	3.66	1.18
Aug-20	1.72	1.80	3.65	1.14
Sep-20	2.69	2.19	2.32	2.10
Oct-20	2.48	1.98	1.79	1.76
Nov-20	2.38	1.54	1.41	1.09
Dec-20	2.01	1.52	1.47	0.97
Jan-21	1.46	1.03	0.85	0.54
Feb-21	1.37	1.02	1.00	0.42
Mar-21	1.61	1.15	0.85	0.41
Apr-21	2.50	2.09	0.80	2.24
May-21	2.57	2.25	0.80	1.71
Jun-21	3.47	3.22	2.66	1.87
Jul-21	2.74	2.67	2.43	1.47
Aug-21	1.73	2.00	2.52	1.30
Sep-21	4.42	3.59	2.49	1.64
Oct-21	3.34	2.70	2.90	1.77
Nov-21	2.57	1.83	1.93	1.28
Dec-21	2.50	1.82	1.67	1.11
Jan-22	1.48	1.00	1.23	0.39
Feb-22	1.36	1.08	0.95	0.56
Mar-22	0.81	1.01	1.07	0.49
Apr-22	0.63	0.97	1.27	0.42
May-22	2.85	2.36	2.32	1.89
Jun-22	3.19	2.52	2.32	1.86
Jul-22	1.99	1.84	2.02	2.40
Aug-22	1.99	2.42	2.18	1.38
Sep-22	1.36	1.84	1.49	0.88
Oct-22	1.11	1.11	1.29	0.77
Nov-22	1.88	1.34	1.47	1.30
Dec-22	1.47	1.36	1.17	0.85
Average 2009	1.74	1.50	1.41	0.82
Average 2010	1.37	1.29	1.03	<0.58
Average 2011	1.62	1.38	1.63	1.04
Average 2012	1.66	1.38	1.24	0.96
Average 2013	1.22	1.18	1.03	0.61

Table 11b: Total Mercury - South Granny Creek (Filtered)
(concentrations in ng/L)

Date	S. Granny Creek Upstream (SGC/UP/SWF) G-5	S. Granny Creek Downstream (SGC/DS/SWF) G-6	S. Granny Creek Upstream of Confluence (SGC/UP/CONF) G-7	Tributary-5A
Average 2014	1.63	1.62	1.08	1.27
Average 2015	2.00	1.86	1.48	0.81
Average 2016	1.53	1.52	1.59	1.12
Average 2017	1.48	1.30	1.21	0.82
Average 2018	1.60	1.38	1.15	1.23
Average 2019	1.96	1.82	1.77	1.04
Average 2020	1.99	1.57	1.86	1.24
Average 2021		2.11	1.74	1.31
Average 2022	1.68	1.57	1.56	1.10
Average All Data	1.77	1.62	1.49	<1.10

** Samples discarded due to lab miscommunication
MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.
Station G-7 was changed from quarterly to monthly sampling in October 2015
Tributary-5A was changed from quarterly to monthly sampling in July 2016
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample

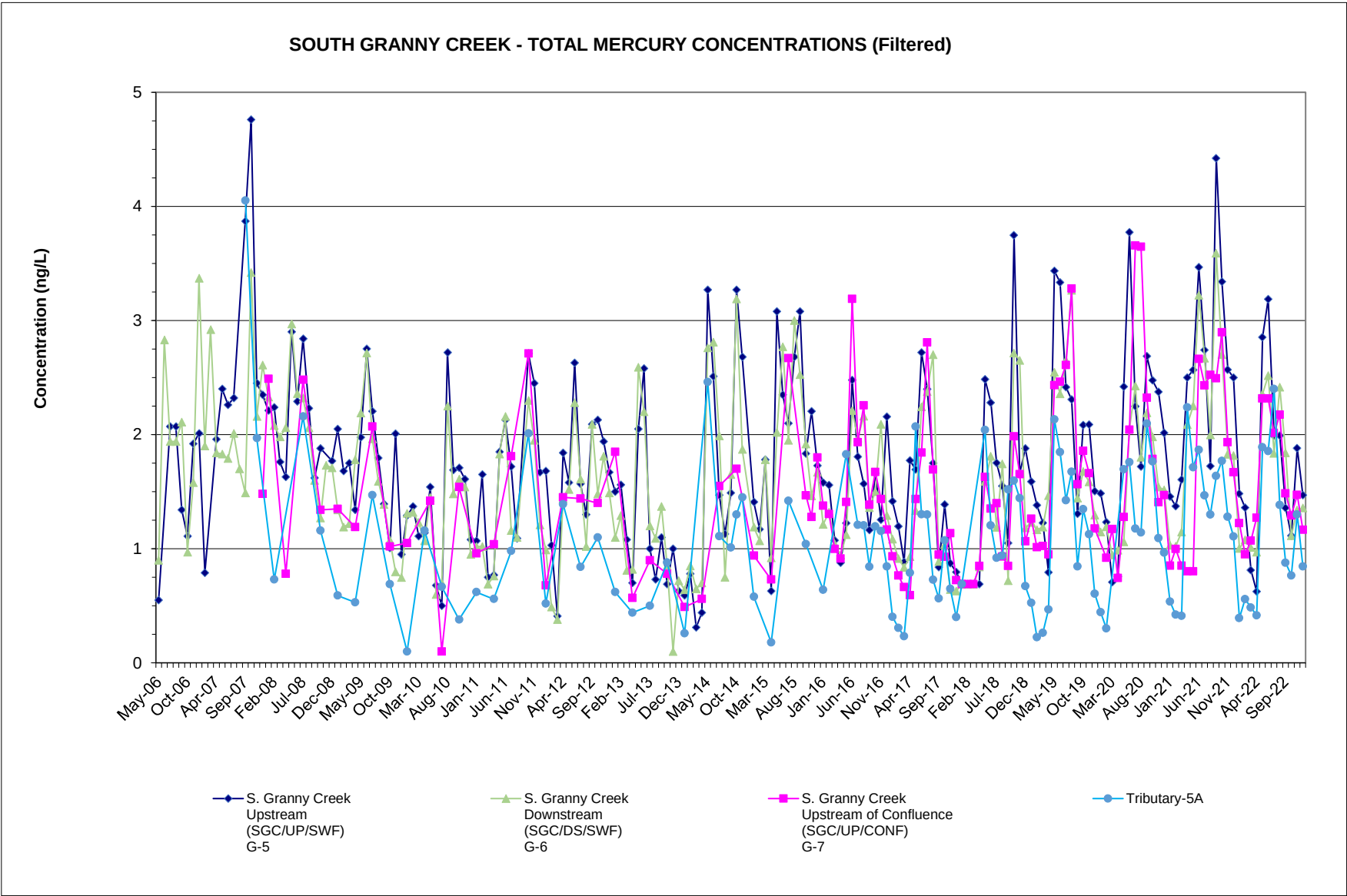


Table 11c: Total Mercury - Granny Creek
Confluence (Filtered)
(concentrations in ng/L)

Date	Granny Creek Confluence (GC/CONF-7) G-8	Tributary-5A
Sep-07		4.05
Oct-07		
Nov-07		1.97
Dec-07	2.15	
Jan-08	2.11	
Feb-08		0.73
Mar-08		
Apr-08	3.65	
May-08		2.21
Jun-08		
Jul-08	3.24	2.16
Aug-08		
Sep-08		
Oct-08	1.43	1.16
Nov-08		
Dec-08		
Jan-09	1.37	0.59
Feb-09		
Mar-09		
Apr-09	1.03	0.53
May-09		
Jun-09		
Jul-09	2.22	1.47
Aug-09		
Sep-09		
Oct-09	1.27	0.69
Nov-09		
Dec-09		
Jan-10	0.89	<0.10
Feb-10		
Mar-10		
Apr-10		1.16
May-10	1.31	
Jun-10		
Jul-10	0.11	0.67
Aug-10		
Sep-10		
Oct-10	1.23	0.38
Nov-10		
Dec-10		
Jan-11	0.89	0.62
Feb-11		
Mar-11		
Apr-11	1.19	0.56
May-11		
Jun-11		
Jul-11	1.63	0.98
Aug-11		
**Sep-11		
Oct-11	1.24	2.01
Nov-11		
Dec-11		
Jan-12	0.85	0.52
Feb-12		
Mar-12		
Apr-12	1.77	1.39
May-12		
Jun-12		
Jul-12	1.59	0.84
Aug-12		
Sep-12		
Oct-12	1.54	1.10
Nov-12		
Dec-12		
Jan-13	1.87	0.62
Feb-13		
Mar-13		
Apr-13	0.53	0.44
May-13		
Jun-13		
Jul-13	1.00	0.50
Aug-13		
Sep-13		

Table 11c: Total Mercury - Granny Creek
Confluence (Filtered)
(concentrations in ng/L)

Date	Granny Creek Confluence (GC/CONF-7) G-8	Tributary-5A
Oct-13	0.68	0.88
Nov-13		
Dec-13		
Jan-14	0.69	0.26
Feb-14		
Mar-14		
Apr-14	0.39	
May-14		2.46
Jun-14		
Jul-14	1.07	1.11
Aug-14		
Sep-14		1.01
Oct-14	1.86	1.30
Nov-14		1.45
Dec-14		
Jan-15		0.58
Feb-15	0.94	
Mar-15		
Apr-15	0.64	0.18
May-15		
Jun-15		
Jul-15	1.60	1.42
Aug-15		
Sep-15		
Oct-15	1.62	1.04
Nov-15	1.07	
Dec-15	1.55	
Jan-16	1.26	0.64
Feb-16	1.19	
Mar-16	1.05	
Apr-16	1.02	
May-16	1.09	1.83
Jun-16	2.14	
Jul-16	1.69	1.21
Aug-16	2.06	1.20
Sep-16	1.68	0.84
Oct-16	2.16	1.20
Nov-16	1.67	1.16
Dec-16	1.39	0.85
Jan-17	1.11	0.40
Feb-17	0.75	0.31
Mar-17	0.70	0.23
Apr-17	0.77	0.79
May-17	1.77	2.07
Jun-17	2.32	1.30
Jul-17	2.30	1.30
Aug-17	1.77	0.73
Sep-17	0.89	0.57
Oct-17	1.14	1.07
Nov-17	0.66	0.65
Dec-17	0.87	0.40
Jan-18	0.98	<0.69
Feb-18	<0.69	F
Mar-18	0.73	F
Apr-18	<0.69	F
May-18	1.89	2.04
Jun-18	2.07	1.20
Jul-18	1.40	0.92
Aug-18	1.58	0.94
Sep-18	2.25	1.52
Oct-18	2.51	1.60
Nov-18	1.83	1.44
Dec-18	1.36	0.67
Jan-19	1.04	0.53
Feb-19	0.90	0.23
Mar-19	0.92	0.26
Apr-19	1.45	0.47
May-19	2.81	2.13
Jun-19	2.70	1.85
Jul-19	2.63	1.42
Aug-19	3.18	1.67
Sep-19	1.50	0.85
Oct-19	1.99	1.35
Nov-19	1.91	1.13
Dec-19	1.16	0.61
Jan-20	1.09	0.45
Feb-20	0.98	0.30
Mar-20	0.76	
Apr-20	0.69	
May-20	2.07	1.70
Jun-20	2.78	1.76
Jul-20	3.30	1.18
Aug-20	2.82	1.14
Sep-20	2.71	2.10
Oct-20	2.43	1.76
Nov-20	1.75	1.09
Dec-20	1.34	0.97
Jan-21	0.93	0.54
Feb-21	0.96	0.42
Mar-21	0.86	0.41
Apr-21	2.33	2.24
May-21	2.59	1.71
Jun-21	2.98	1.87
Jul-21	2.48	1.47
Aug-21	2.51	1.30
Sep-21	3.09	1.64
Oct-21	3.05	1.77
Nov-21	1.63	1.28
Dec-21	1.59	1.11
Jan-22	0.84	0.39
Feb-22	0.88	0.56
Mar-22	0.74	0.49
Apr-22	1.13	0.42
May-22	2.64	1.89
Jun-22	2.68	1.86
Jul-22	3.41	2.40
Aug-22	2.75	1.38
Sep-22	1.42	0.88
Oct-22	1.42	0.77
Nov-22	1.85	1.30
Dec-22	1.26	0.85
Average 2009	1.47	0.82

Table 11c: Total Mercury - Granny Creek
Confluence (Filtered)
(concentrations in ng/L)

Date	Granny Creek Confluence (GC/CONF-7) G-8	Tributary-5A
Average 2010	0.89	<0.58
Average 2011	1.24	1.04
Average 2012	1.44	0.96
Average 2013	1.02	0.61
Average 2014	1.00	1.27
Average 2015	1.24	0.81
Average 2016	1.53	1.12
Average 2017	1.25	0.82
Average 2018	1.50	1.23
Average 2019	1.85	1.04
Average 2020	1.89	1.24
Average 2021	2.08	1.31
Average 2022	1.75	1.10
Average All Data	1.60	<1.11

** Samples discarded due to lab miscommunication
MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1
Station G-8 was changed from quarterly to monthly sampling in October 2015
Tributary-5A was changed from quarterly to monthly sampling in July 2016
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample

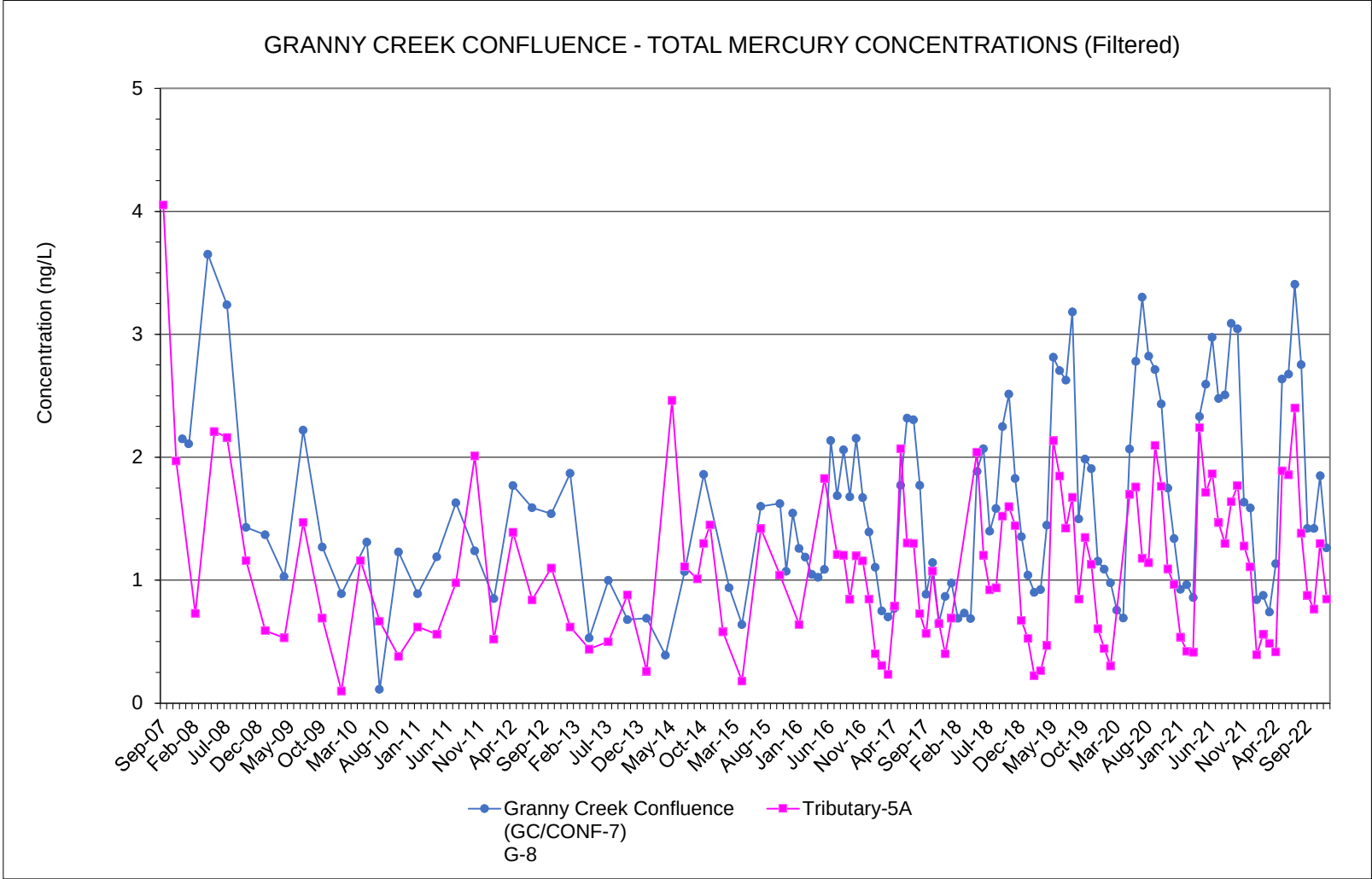


TABLE 12a
METHYL MERCURY - NORTH GRANNY CREEK (Unfiltered)
(concentrations in ng/L)

Date	N. Granny Creek Upstream of Supplementation G-0	N. Granny Creek Upstream (NGC/UP/NWF) G-1	N. Granny Creek Downstream (NGC/DN/NWF) G-2	N. Granny Creek Downstream (NGC/DN/NEF) G-3	N. Granny Creek Upstream of Confluence (NGC/UP/CONF) G-4	Tributary-5A
CEQG for Protection of Aquatic Life: 4 ng/L						
Jul-06			0.11	0.10		
Oct-06				0.13		
Jan-07		0.12		0.18		
Feb-07						
Mar-07						
Apr-07						
May-07		0.07		0.09		
Jun-07						
Jul-07		0.09	0.07	0.10		
Aug-07						
Sep-07						0.08
Oct-07		0.09	0.15	0.10		
Nov-07						0.03
Dec-07					0.20	
Jan-08		<0.02		0.26	0.24	0.03
Feb-08		0.09	0.47	<0.02		0.12
Mar-08		<0.02		0.29		
Apr-08		0.44	1.44	0.13	0.15	
May-08						0.20
Jun-08						
Jul-08		0.09	0.09	0.52	0.52	0.03
Aug-08						
Sep-08						
Oct-08		0.04	0.07	0.11	0.18	<0.02
Nov-08						
Dec-08						
Jan-09		0.04	0.04	0.08	0.06	0.03
Feb-09						
Mar-09						
Apr-09		0.04	<0.02	<0.02		<0.02
May-09						
Jun-09						
Jul-09		0.06	0.02	0.02	<0.02	0.04
Aug-09						
Sep-09						
Oct-09		<0.02	0.07	0.07	0.14	0.03
Nov-09						
Dec-09						
Jan-10		0.19	0.11	0.11	0.14	0.06
Feb-10						
Mar-10						
Apr-10		0.06	0.10	0.10	<0.02	0.05
May-10					0.03	
Jun-10						
Jul-10		0.06	0.04	0.19	1.13	0.07
Aug-10						
Sep-10						
Oct-10		0.07	0.12	0.16	0.19	0.02
Nov-10						
Dec-10						
Jan-11		0.07	0.07	0.09	0.11	0.02
Feb-11						
Mar-11						
Apr-11		<0.02	<0.02	0.06	<0.02	0.02
May-11		0.05	0.13			
Jun-11		0.07	0.11			
Jul-11		0.06	0.21	0.35	0.48	0.04
Aug-11		0.10	0.56	0.53		
Sep-11						
Oct-11		<0.02	0.21		0.30	0.03
Nov-11		0.11	0.16			
Dec-11		0.08	0.17			
Jan-12			0.09	0.18	0.08	0.09
Feb-12		0.03	0.08	0.07		
Mar-12		0.03	0.05	0.04		
Apr-12			0.07	0.22	0.08	0.05
May-12		0.05	0.09	0.11		
Jun-12		0.05	0.10	0.12		
Jul-12		0.06	0.20	0.24	0.28	0.04
Aug-12		0.02	0.40			
Sep-12		0.07	0.47			
Oct-12			0.16	0.19	0.27	<0.02
Nov-12			1.58			
Dec-12		0.12	0.13			
Jan-13		F	0.03	F	0.11	0.03
Feb-13		0.04	0.06	0.09		
Mar-13		0.04	0.04	0.09		
Apr-13		0.11	0.06	0.14	0.08	0.04
May-13		0.06	0.09			
Jun-13		0.06	0.13			
Jul-13		0.07	0.27	0.30	0.28	0.06
Aug-13		0.08	0.43	0.52		
Sep-13		0.14	0.49	0.43		
Oct-13		0.22	0.39	0.30	0.47	<0.02
Nov-13		0.05	0.12	0.16		
Dec-13		0.03	0.09	0.14		
Jan-14		<0.02	0.06	0.11	0.11	0.06
Feb-14		0.05	0.06	0.05		
Mar-14		0.05	0.17	0.08		
Apr-14		0.15	0.06	0.05	0.13	
May-14		0.10	0.44	0.26		0.04
Jun-14		0.08	0.18	0.18		
Jul-14		0.17	0.29	0.31	0.36	0.02
Aug-14		0.32	0.25	0.24		
Sep-14		0.50	0.49	0.41		0.02

TABLE 12a
METHYL MERCURY - NORTH GRANNY CREEK (Unfiltered)
(concentrations in ng/L)

Date	N. Granny Creek Upstream of Supplementation G-0	N. Granny Creek Upstream (NGC/UP/NWF) G-1	N. Granny Creek Downstream (NGC/DN/NWF) G-2	N. Granny Creek Downstream (NGC/DN/NEF) G-3	N. Granny Creek Upstream of Confluence (NGC/UP/CONF) G-4	Tributary-5A
	CEQG for Protection of Aquatic Life: 4 ng/L					
Oct-14		0.14	0.15	0.18	0.19	0.02
Nov-14		0.08	0.13	0.15		0.03
Dec-14		US	0.13	0.13		
Jan-15			0.07	0.13	0.13	0.03
Feb-15		0.12	0.13	0.14		
Mar-15		0.10	0.14	0.09		
Apr-15		0.04	0.05	0.06	0.05	<0.02
May-15		0.05	0.04	0.06		
Jun-15		0.08	0.09	0.09		
Jul-15		0.16	0.25	2.31	0.73	0.04
Aug-15		0.25	0.49	1.55		
Sep-15		0.15	0.65	1.29		
Oct-15		0.12	0.08	0.29	0.29	<0.02
Nov-15		0.07	0.09	0.13	0.25	
Dec-15		0.08	0.11	0.15	0.17	
Jan-16		0.07	0.10	0.25	0.18	0.05
Feb-16		0.04	0.07	0.09	0.14	
Mar-16		0.07	0.06	0.07	0.38	
Apr-16		0.04	0.05	0.07	0.13	
May-16		0.03	0.04	0.07	0.13	0.03
Jun-16		0.21	0.14	0.15	0.16	
Jul-16		0.14	0.19	0.23	0.40	0.03
Aug-16		0.18	0.25	0.27	0.56	0.03
Sep-16		0.56	0.50	0.36	0.59	<0.02
Oct-16		0.21	0.20	0.31	0.46	0.02
Nov-16		0.10	0.14	0.14	0.21	0.03
Dec-16		0.10	0.10	0.12	0.15	<0.02
Jan-17		0.05	0.09	0.06	0.17	0.08
Feb-17		0.04	0.04	0.06	0.10	<0.02
Mar-17		0.04	0.03	0.05	0.06	<0.02
Apr-17		0.05	0.05	0.07	0.07	<0.02
May-17	0.08	0.05	0.06	0.10	0.13	0.04
Jun-17	0.12	0.14	0.23	0.27	0.03	0.02
Jul-17	0.16	0.13	0.31	0.32	0.73	0.03
Aug-17	0.21	0.22	0.42	0.33	0.40	0.05
Sep-17	0.28	0.30	0.51	0.53	0.32	0.03
Oct-17	0.15	0.12	0.22	0.27	0.27	0.03
Nov-17	0.16	0.33	0.12	0.17	0.15	<0.02
Dec-17	0.32	0.06	0.09	0.13	0.12	0.02
Jan-18	0.29	0.03	0.06	0.10	0.11	0.18
Feb-18	0.26	0.02	0.04	0.05	0.05	F
Mar-18	0.10	0.03	0.04	0.05	0.07	F
Apr-18	0.14	0.04	0.06	0.06	0.04	F
May-18	0.07	0.07	0.11	0.25	0.26	0.03
Jun-18	0.11	0.09	0.12	0.17	0.17	0.04
Jul-18	0.19	0.21	0.23	0.24	0.31	0.03
Aug-18	0.37	0.51	0.60	0.71	0.43	<0.02
Sep-18	0.19	0.39	0.47	0.67	0.39	<0.02
Oct-18	0.11	0.14	0.26	0.39	0.26	0.04
Nov-18	0.13	0.10	0.12	0.18	0.20	<0.02
Dec-18	0.10	0.12	0.21	0.27	0.25	<0.02
Jan-19	0.12	0.10	0.15	0.23	0.21	<0.02
Feb-19	0.12	0.09	0.11	0.45	0.15	<0.02
Mar-19	0.12	0.04	0.07	0.13	0.10	<0.02
Apr-19	0.12	0.05	0.10	0.15	0.11	0.03
May-19	0.04	0.07	0.10	0.12	0.21	<0.02
Jun-19	0.09	0.10	0.13	0.16	0.55	<0.02
Jul-19	0.18	0.25	0.31	0.64	1.01	0.04
Aug-19	0.59	0.24	0.41	1.18	1.05	0.03
Sep-19	0.16	0.26	0.40	1.25	0.49	0.03
Oct-19	0.18	0.15	0.19	0.37	0.35	0.03
Nov-19	0.13	0.12	0.11	0.19	0.19	<0.02
Dec-19	0.12	0.07	0.09	0.17	0.16	0.03
Jan-20		0.07	0.07	0.11	0.11	0.03
Feb-20	0.11	0.07	0.09	0.11	0.11	0.03
Mar-20	0.12	0.05	0.04	0.07	0.10	
Apr-20	0.09	0.04	0.04	0.10	0.12	
May-20	0.05	0.07	0.70	0.16	0.20	0.02
Jun-20	0.09	0.15	0.13	0.17	0.15	0.05
Jul-20	0.29	0.17	0.34	1.25	1.26	0.03
Aug-20	0.29	0.30	0.27	1.21	1.09	0.03
Sep-20	0.15	0.16	0.20	0.34	0.33	0.02
Oct-20	0.09	0.12	0.23	0.30	0.22	0.06
Nov-20	0.09	0.10	0.11	0.20	0.13	<0.02
Dec-20	0.11	0.07	0.10	0.12	0.14	<0.02
Jan-21	0.13	0.10	0.15	0.14	0.11	0.07
Feb-21	0.13	0.11	0.10	0.22	0.13	<0.02
Mar-21	0.21	0.11	0.10	0.22	0.33	0.09
Apr-21	0.09	0.11	0.33	0.17	0.32	0.06
May-21	0.07	0.10	0.15	0.09	0.32	0.12
Jun-21	0.14	0.11	0.33	0.17	0.37	0.08
Jul-21	0.14	0.11	0.18	0.62	0.46	<0.02
Aug-21	0.15	0.14	0.27	1.63	1.06	<0.02
Sep-21	0.32	0.14	0.19	0.54	0.96	<0.02
Oct-21	0.18	0.23	0.22	0.52	0.66	<0.02
Nov-21	0.51	0.10	0.14	0.27	0.23	<0.02
Dec-21	0.13	0.11	0.11	0.25	0.20	<0.02
Jan-22	0.50	0.12	0.10	0.20	0.19	0.03
Feb-22	0.14	0.03	0.04	0.08	0.09	0.05
Mar-22	0.37	0.04	0.05	0.08	0.13	0.08
Apr-22	0.45	0.05	0.06	0.08	0.09	0.09
May-22	0.07	0.11	0.12	0.62	0.16	0.03
Jun-22	0.10	0.15	0.14	0.30	0.21	0.04
Jul-22	0.08	0.11	0.14	0.44	0.38	<0.03
Aug-22	0.24	0.13	0.29	1.08	0.96	0.06
Sep-22	0.12	0.15	0.27	0.88	0.99	0.03
Oct-22	0.07	0.11	0.25	0.36	0.23	<0.03
Nov-22	0.10	0.14	0.14	0.31	0.23	0.04
Dec-22	0.08	0.09	0.30	0.22	0.17	<0.03
2009 Average		<0.04	<0.04	<0.05	<0.07	<0.03
2010 Average		0.09	0.09	0.14	0.30	0.05
2011 Average		<0.06	<0.18	0.26	<0.23	0.03

TABLE 12a
METHYL MERCURY - NORTH GRANNY CREEK (Unfiltered)
(concentrations in ng/L)

Date	N. Granny Creek Upstream of Supplementation G-0	N. Granny Creek Upstream (NGC/UP/NWF) G-1	N. Granny Creek Downstream (NGC/DN/NWF) G-2	N. Granny Creek Downstream (NGC/DN/NEF) G-3	N. Granny Creek Upstream of Confluence (NGC/UP/CONF) G-4	Tributary-5A
CEQG for Protection of Aquatic Life: 4 ng/L						
2012 Average		0.05	0.28	0.14	0.18	<0.05
2013 Average		0.08	0.18	0.24	0.24	<0.04
2014 Average		<0.15	0.20	0.18	0.20	0.03
2015 Average		0.11	0.18	0.52	0.27	<0.03
2016 Average		0.15	0.15	0.18	0.29	<0.03
2017 Average	0.18	0.13	0.18	0.20	0.21	<0.03
2018 Average	0.17	0.15	0.19	0.26	0.21	0.05
2019 Average	0.16	0.13	0.18	0.42	0.38	<0.03
2020 Average	0.13	0.11	0.19	0.34	0.33	<0.03
2021 Average	0.18	0.12	0.19	0.40	0.43	<0.06
2022 Average	0.19	0.10	0.16	0.39	0.32	<0.05
Average All Years	0.17	<0.11	<0.19	<0.28	<0.29	<0.04
CEQG for Protection of Aquatic Life: 4 ng/L						

Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G
MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury), as per Section 1.
North Granny Creek receives effluent from the PKC facility
Station G-4 was changed from quarterly to monthly sampling in October 2015
Tributary-5A was changed from quarterly to monthly sampling in July 2016
Sampling at Station G-0 was initiated in May 2017
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample

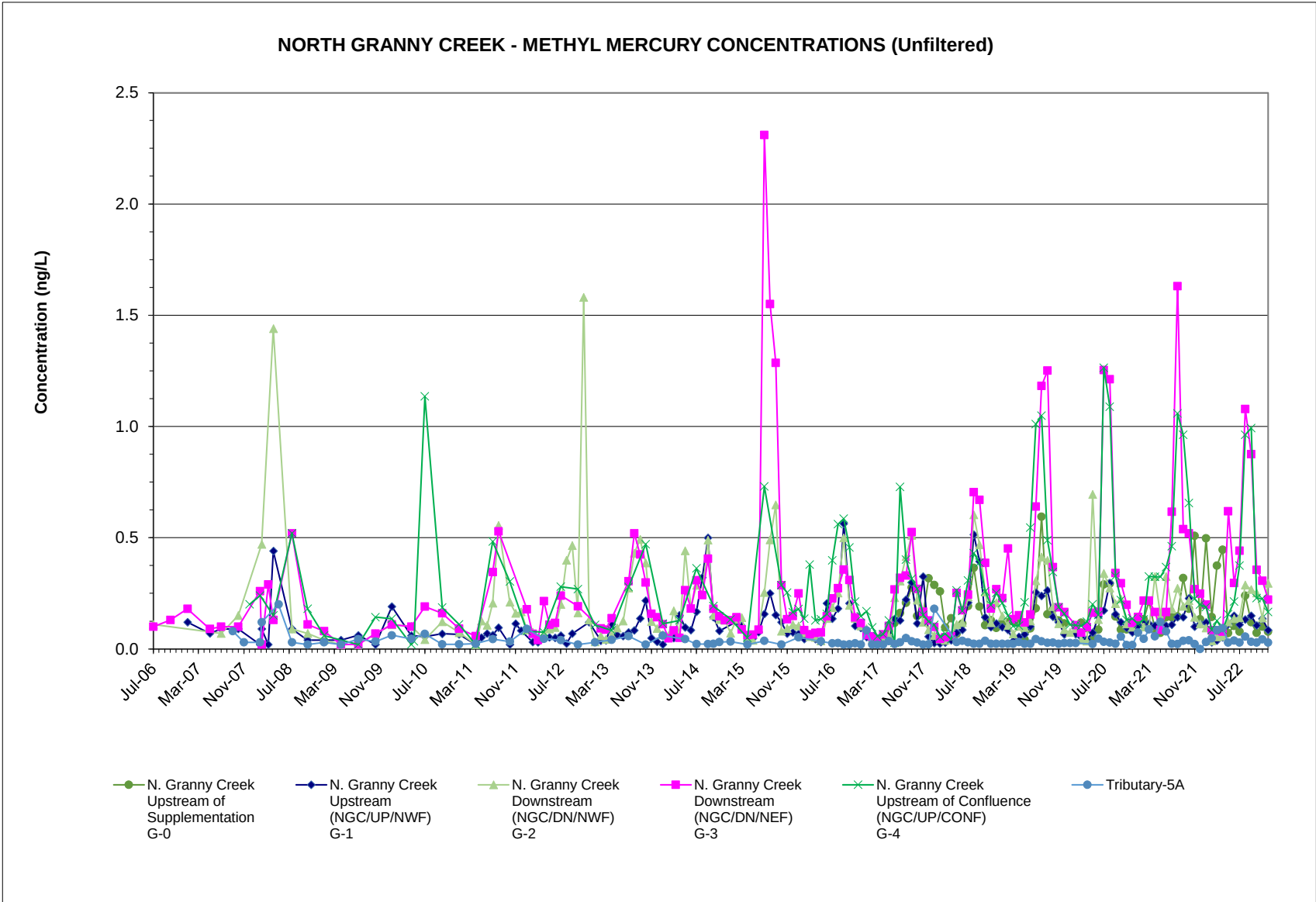


TABLE 12b
METHYL MERCURY - SOUTH GRANNY CREEK (Unfiltered)
(concentrations in ng/L)

Date	S. Granny Creek Upstream (SGC/UP/SWF) G-5	S. Granny Creek Downstream (SGC/DS/SWF) G-6	S. Granny Creek Upstream of Confluence (SGC/UP/CONF) G-7	Tributary-5A
	CEQG for Protection of Aquatic Life: 4 ng/L			
Jul-06	0.06	0.04		
Oct-06	0.03	0.11		
Jan-07	0.10	0.13		
Feb-07				
Mar-07				
Apr-07				
May-07	0.04	0.06		
Jun-07				
Jul-07	0.05	0.05		
Aug-07				
Sep-07				0.08
Oct-07	0.05	0.07		
Nov-07				0.03
Dec-07			0.13	
Jan-08			0.17	
Feb-08	0.17	0.11		0.12
Mar-08				
Apr-08	0.06	0.15	0.35	
May-08				0.20
Jun-08				
Jul-08	0.06	0.07	0.26	0.03
Aug-08				
Sep-08				
Oct-08	0.02	0.04	0.10	<0.02
Nov-08				
Dec-08				
Jan-09	<0.02	0.06	0.04	0.03
Feb-09				
Mar-09				
Apr-09	0.08	0.06	0.04	<0.02
May-09				
Jun-09				
Jul-09	<0.02	0.05	0.03	0.04
Aug-09				
Sep-09				
Oct-09	<0.02	<0.02	0.23	0.03
Nov-09				
Dec-09				
Jan-10	0.06	0.07	0.11	0.06
Feb-10				
Mar-10				
Apr-10	0.05	0.08	<0.02	0.05
May-10			0.11	
Jun-10				
Jul-10	0.06	0.08	1.22	0.07
Aug-10				
Sep-10				
Oct-10	0.04	0.07	0.15	0.02
Nov-10				
Dec-10				
Jan-11	0.03	0.17	0.11	0.02
Feb-11				
Mar-11				
Apr-11	0.09	<0.02	<0.02	0.02
May-11				
Jun-11				
Jul-11	0.05	0.14	0.46	0.04
Aug-11				
Sep-11				
Oct-11	0.04	0.23	0.03	0.03
Nov-11				
Dec-11				
Jan-12	0.25	0.07	0.10	0.09
Feb-12				
Mar-12				
Apr-12	0.08	0.07	0.08	0.05
May-12				
Jun-12				
Jul-12	0.07	0.17	0.19	0.04
Aug-12				
Sep-12				
Oct-12	0.03	0.09	0.37	<0.02
Nov-12				
Dec-12				
Jan-13	0.06	0.08	0.09	0.03
Feb-13	0.08	0.08		
Mar-13	0.07	0.05		
Apr-13	0.09	0.10	0.05	0.04
May-13				
Jun-13				
Jul-13	0.07	0.49	0.67	0.06
Aug-13				
Sep-13				
Oct-13	0.06	0.25	0.33	<0.02
Nov-13				
Dec-13	NA	NA		
Jan-14	0.11	0.06	0.13	0.06
Feb-14	0.07	0.05		
Mar-14	NA	NA		
Apr-14	0.08	0.03	0.08	
May-14	NA	NA		0.04
Jun-14	NA	NA		
Jul-14	0.19	0.06	1.26	0.02
Aug-14	0.08	0.26		
Sep-14	0.05	0.43		0.02
Oct-14	0.14	0.04	0.23	0.02
Nov-14	0.05	0.29		0.03

TABLE 12b
METHYL MERCURY - SOUTH GRANNY CREEK (Unfiltered)
(concentrations in ng/L)

Date	S. Granny Creek Upstream (SGC/UP/SWF) G-5	S. Granny Creek Downstream (SGC/DS/SWF) G-6	S. Granny Creek Upstream of Confluence (SGC/UP/CONF) G-7	Tributary-5A
	CEQG for Protection of Aquatic Life: 4 ng/L			
Dec-14				
Jan-15	0.05	0.11	0.22	0.03
Feb-15	0.08	0.17		
Mar-15	0.06	0.07		
Apr-15	0.05	0.05	0.07	<0.02
May-15	0.03	0.05		
Jun-15	0.11	0.04		
Jul-15	0.32	0.32	0.49	0.04
Aug-15	0.07	0.75		
Sep-15				
Oct-15	0.05	0.41	0.36	<0.02
Nov-15	0.73	0.13	0.31	
Dec-15	0.04	0.13	0.22	
Jan-16	0.07	0.16	0.34	0.05
Feb-16	0.07	0.09	0.82	
Mar-16	0.10	0.23	0.18	
Apr-16	0.41	0.35	0.53	
May-16	0.04	0.23	0.17	0.03
Jun-16	0.05	0.15	0.18	
Jul-16	0.06	0.44	0.77	0.03
Aug-16	0.08	1.00	0.94	0.03
Sep-16	0.07	0.70	0.61	<0.02
Oct-16	0.04	0.43	0.61	0.02
Nov-16	0.16	0.05	0.20	0.03
Dec-16	0.04	0.09	0.21	<0.02
Jan-17	0.06	0.09	0.19	0.08
Feb-17	0.05	0.13	0.21	<0.02
Mar-17	0.06	0.08	0.14	<0.02
Apr-17	0.07	0.12	0.14	<0.02
May-17	0.05	0.09	0.12	0.04
Jun-17	0.06	0.23	0.59	0.02
Jul-17	0.06	0.51	1.43	0.03
Aug-17	0.11	1.89	1.37	0.05
Sep-17	0.05	0.53	0.67	0.03
Oct-17	0.04	0.23	0.30	0.03
Nov-17	0.07	0.21	1.00	<0.02
Dec-17	0.08	0.16	0.43	0.02
Jan-18	0.09	0.09	0.16	0.18
Feb-18	0.17	0.04	0.13	F
Mar-18	0.26	0.04	0.08	F
Apr-18	0.25	0.05	0.05	F
May-18	0.04	0.18	0.26	0.03
Jun-18	0.05	0.18	0.26	0.04
Jul-18	0.05	0.27	0.62	0.03
Aug-18	0.06	0.78	0.41	<0.02
Sep-18	0.05	0.22	0.31	<0.02
Oct-18	0.04	0.16	0.27	0.04
Nov-18	0.30	0.06	0.26	<0.02
Dec-18	0.05	0.41	0.31	<0.02
Jan-19	0.11	0.25	0.38	<0.02
Feb-19	0.08	0.18	0.24	<0.02
Mar-19	0.08	0.13	0.20	<0.02
Apr-19	0.07	0.17	0.12	0.03
May-19	0.03	0.15	0.20	<0.02
Jun-19	0.05	0.23	0.62	<0.02
Jul-19	0.07	1.14	1.64	0.04
Aug-19	0.06	2.14	1.90	0.03
Sep-19	0.05	0.86	0.94	0.03
Oct-19	0.04	0.54	0.73	0.03
Nov-19	0.04	0.26	0.51	<0.02
Dec-19	0.06	0.38	0.56	0.03
Jan-20	0.08	0.09		0.03
Feb-20	0.08	0.18	0.21	0.03
Mar-20	0.18	0.05	0.56	
Apr-20	0.07	0.04	0.40	
May-20	0.07	0.14	0.31	0.02
Jun-20	0.06	0.17	0.27	0.05
Jul-20	0.07	1.38	2.50	0.03
Aug-20	0.07	1.00	2.17	0.03
Sep-20	0.03	0.26	0.56	0.02
Oct-20	0.05	0.17	0.46	0.06
Nov-20	0.05	0.20	0.28	0.02
Dec-20	0.04	0.21	0.29	0.02
Jan-21	0.12	0.18	0.35	0.07
Feb-21	0.09	0.14	0.35	0.05
Mar-21	0.14	0.36	0.45	0.09
Apr-21	0.06	0.12	0.23	0.06
May-21	0.07	0.20	0.23	0.12
Jun-21	0.10	0.81	0.61	0.08
Jul-21	0.05	0.69	0.99	0.02
Aug-21	0.09	1.01	1.42	0.02
Sep-21	0.06	0.43	1.03	0.04
Oct-21	0.09	0.49	0.87	0.04
Nov-21	0.06	0.26	0.29	0.02
Dec-21	0.06	0.29	0.40	<0.02
Jan-22	0.50	0.15	0.32	0.03
Feb-22	0.98	0.07	0.14	0.05
Mar-22	3.78	0.11	0.11	0.08
Apr-22	0.69	0.15	0.26	0.09
May-22	0.07	0.12	0.21	0.03
Jun-22	0.07	0.25	0.21	0.04
Jul-22	0.11	0.36	0.42	0.03
Aug-22	0.11	1.05	1.29	0.06
Sep-22	0.07	0.61	0.96	0.03
Oct-22	0.41	0.41	0.28	0.03
Nov-22	0.05	0.23	0.20	0.04
Dec-22	0.07	0.29	0.24	0.03
2009 Average	<0.04	<0.05	0.09	<0.03
2010 Average	0.05	0.08	0.32	0.05
2011 Average	0.05	<0.14	<0.15	0.03
2012 Average	0.11	0.10	0.18	<0.05
2013 Average	0.07	0.17	<0.29	<0.04
2014 Average	0.10	0.15	0.42	0.03
2015 Average	0.14	0.20	0.28	<0.03

TABLE 12b
METHYL MERCURY - SOUTH GRANNY CREEK (Unfiltered)
(concentrations in ng/L)

Date	S. Granny Creek Upstream (SGC/UP/SWF) G-5	S. Granny Creek Downstream (SGC/DS/SWF) G-6	S. Granny Creek Upstream of Confluence (SGC/UP/CONF) G-7	Tributary-5A
	CEQG for Protection of Aquatic Life: 4 ng/L			
2016 Average	0.10	0.33	0.46	<0.03
2017 Average	0.06	0.36	0.55	<0.03
2018 Average	0.12	0.21	0.26	0.05
2019 Average	0.06	0.54	0.67	0.03
2020 Average	0.07	0.32	0.73	0.03
2021 Average	0.08	0.41	0.60	0.06
2022 Average	0.58	0.32	0.39	0.05
Average All Years	<0.13	<0.27	<0.44	<0.04
CEQG for Protection of Aquatic Life: 4 ng/L				

Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G
MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury), as per Section 1.
Station G-7 was changed from quarterly to monthly sampling in October 2015
Tributary-5A was changed from quarterly to monthly sampling in July 2016
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample

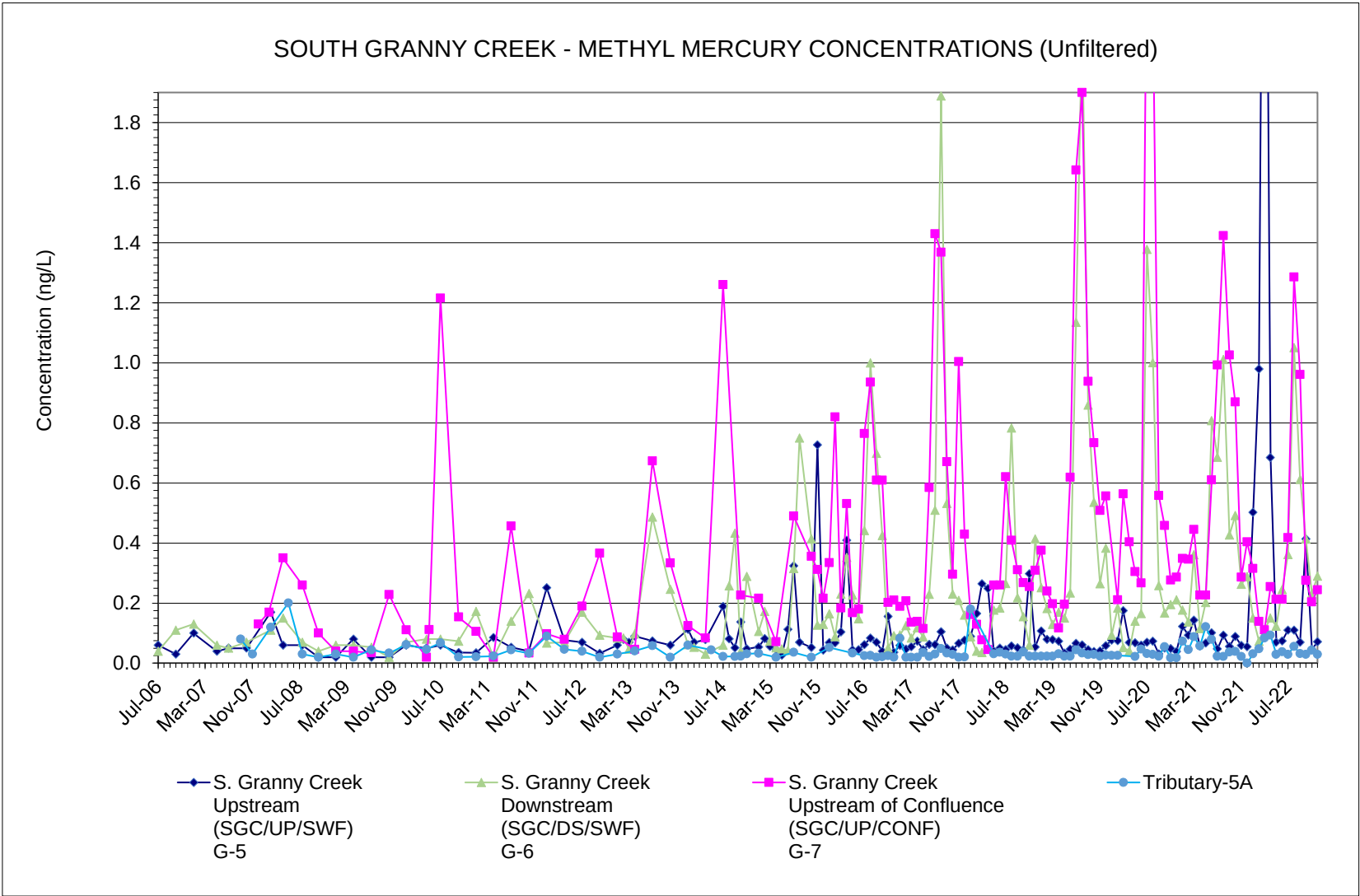


TABLE 12c METHYL MERCURY -
GRANNY CREEK CONFLUENCE
(Unfiltered) (concentrations in ng/L)

Date	Granny Creek Confluence (GC/CONF-7) G-8	Tributary-5A
	CEQG for Protection of Aquatic Life: 4 ng/L	
Sep-07		0.08
Oct-07		
Nov-07		0.03
Dec-07	0.16	
Jan-08	0.15	
Feb-08		0.12
Mar-08		
Apr-08	0.11	
May-08		<0.20
Jun-08		
Jul-08	0.33	0.03
Aug-08		
Sep-08		
Oct-08	0.14	<0.02
Nov-08		
Dec-08		
Jan-09	0.06	0.03
Feb-09		
Mar-09		
Apr-09	0.04	0.02
May-09		
Jun-09		
Jul-09	0.07	0.04
Aug-09		
Sep-09		
Oct-09	0.12	0.03
Nov-09		
Dec-09		
Jan-10	0.09	0.06
Feb-10		
Mar-10		
Apr-10	0.02	0.05
May-10	0.09	
Jun-10		
Jul-10	1.23	0.07
Aug-10		
Sep-10		
Oct-10	0.14	0.02
Nov-10		
Dec-10		
Jan-11	0.16	0.02
Feb-11		
Mar-11		
Apr-11	<0.02	0.02
May-11		
Jun-11		
Jul-11	0.39	0.04
Aug-11		
**Sep-11		
Oct-11		0.03
Nov-11		
Dec-11		
Jan-12	0.17	0.09
Feb-12		
Mar-12		
Apr-12	0.12	0.05
May-12		
Jun-12		
Jul-12	0.27	0.04
Aug-12		
Sep-12		
Oct-12	0.18	<0.02
Nov-12		
Dec-12		
Jan-13	0.07	0.03
Feb-13		
Mar-13		
Apr-13	0.10	0.04
May-13		
Jun-13		
Jul-13	0.27	0.06
Aug-13		
Sep-13		
Oct-13	0.27	<0.02
Nov-13		
Dec-13		

TABLE 12c METHYL MERCURY -
GRANNY CREEK CONFLUENCE
(Unfiltered) (concentrations in ng/L)

Date	Granny Creek Confluence (GC/CONF-7) G-8	Tributary-5A
	CEQG for Protection of Aquatic Life: 4 ng/L	
Jan-14	0.13	0.06
Feb-14		
Mar-14		
Apr-14	0.03	
May-14		0.04
Jun-14		
Jul-14	0.07	0.02
Aug-14		
Sep-14		0.02
Oct-14	0.04	0.02
Nov-14		0.03
Dec-14		
Jan-15		0.03
Feb-15	0.18	
Mar-15		
Apr-15	0.07	<0.02
May-15		
Jun-15		
Jul-15	0.07	0.04
Aug-15		
Sep-15		
Oct-15	0.33	<0.02
Nov-15	0.23	
Dec-15	0.16	
Jan-16	0.26	0.05
Feb-16	0.26	
Mar-16	0.19	
Apr-16	0.52	
May-16	0.15	0.03
Jun-16	0.19	
Jul-16	0.53	0.03
Aug-16	0.69	0.03
Sep-16	0.58	<0.02
Oct-16	0.30	0.02
Nov-16	0.21	0.03
Dec-16	0.14	<0.02
Jan-17	0.14	0.08
Feb-17	0.12	<0.02
Mar-17	0.10	<0.02
Apr-17	0.09	<0.02
May-17	0.14	0.04
Jun-17	0.40	0.02
Jul-17	0.61	0.03
Aug-17	1.07	0.05
Sep-17	0.43	0.03
Oct-17	0.29	0.03
Nov-17	0.15	<0.02
Dec-17	0.40	0.02
Jan-18	0.14	0.18
Feb-18	0.08	F
Mar-18	0.06	F
Apr-18	0.04	F
May-18	0.18	0.03
Jun-18	0.19	0.04
Jul-18	0.65	0.03
Aug-18	0.58	<0.02
Sep-18	0.48	<0.02
Oct-18	0.23	0.04
Nov-18	0.17	<0.02
Dec-18	0.27	<0.02
Jan-19	0.32	<0.02
Feb-19	0.19	<0.02
Mar-19	0.10	<0.02
Apr-19	0.20	0.03
May-19	0.15	<0.02
Jun-19	0.31	<0.02
Jul-19	0.86	0.04
Aug-19	1.26	0.03
Sep-19	0.82	0.03
Oct-19	0.58	0.03
Nov-19	0.25	<0.02
Dec-19	0.26	0.03
Jan-20	0.14	0.03
Feb-20	0.11	0.03
Mar-20	0.10	
Apr-20	0.06	
May-20	0.20	0.02
Jun-20	0.48	0.05
Jul-20	1.48	0.03
Aug-20	1.40	0.03
Sep-20	0.49	0.02
Oct-20	0.24	0.06
Nov-20	0.20	0.02
Dec-20	0.20	0.02
Jan-21	0.22	0.07
Feb-21	0.17	0.05
Mar-21	0.25	0.09
Apr-21	0.13	0.06
May-21	1.63	0.12
Jun-21	0.36	0.08
Jul-21	0.63	0.02
Aug-21	1.06	0.02
Sep-21	0.92	0.04
Oct-21	0.89	0.04
Nov-21	0.28	0.02
Dec-21	0.27	<0.02
Jan-22	0.16	0.03
Feb-22	0.09	0.05
Mar-22	0.07	0.08
Apr-22	0.15	0.09
May-22	0.16	0.03
Jun-22	0.33	0.04
Jul-22	0.45	<0.03
Aug-22	1.27	0.06
Sep-22	0.79	0.03
Oct-22	0.29	<0.03
Nov-22	0.23	0.04
Dec-22	0.23	<0.03

TABLE 12c METHYL MERCURY -
GRANNY CREEK CONFLUENCE
(Unfiltered) (concentrations in ng/L)

Date	Granny Creek Confluence (GC/CONF-7) G-8	Tributary-5A
	CEQG for Protection of Aquatic Life: 4 ng/L	
Average 2009	0.07	0.04
Average 2010	0.31	0.05
Average 2011	<0.19	0.03
Average 2012	0.18	<0.05
Average 2013	0.18	<0.04
Average 2014	0.07	0.03
Average 2015	0.17	<0.03
Average 2016	0.34	<0.03
Average 2017	0.33	<0.03
Average 2018	0.26	<0.05
Average 2019	0.44	<0.03
Average 2020	0.42	0.03
Average 2021	0.57	0.06
Average 2022	0.35	0.05
Average All Data	<0.32	<0.04

CEQG for Protection of Aquatic Life: 4 ng/L

Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G

MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury), as per Section 1.

Station G-8 was changed from quarterly to monthly sampling in October 2015

Tributary-5A was changed from quarterly to monthly sampling in July 2016

Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.

Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.

D: Dry

F: Frozen

US: Unsafe to sample

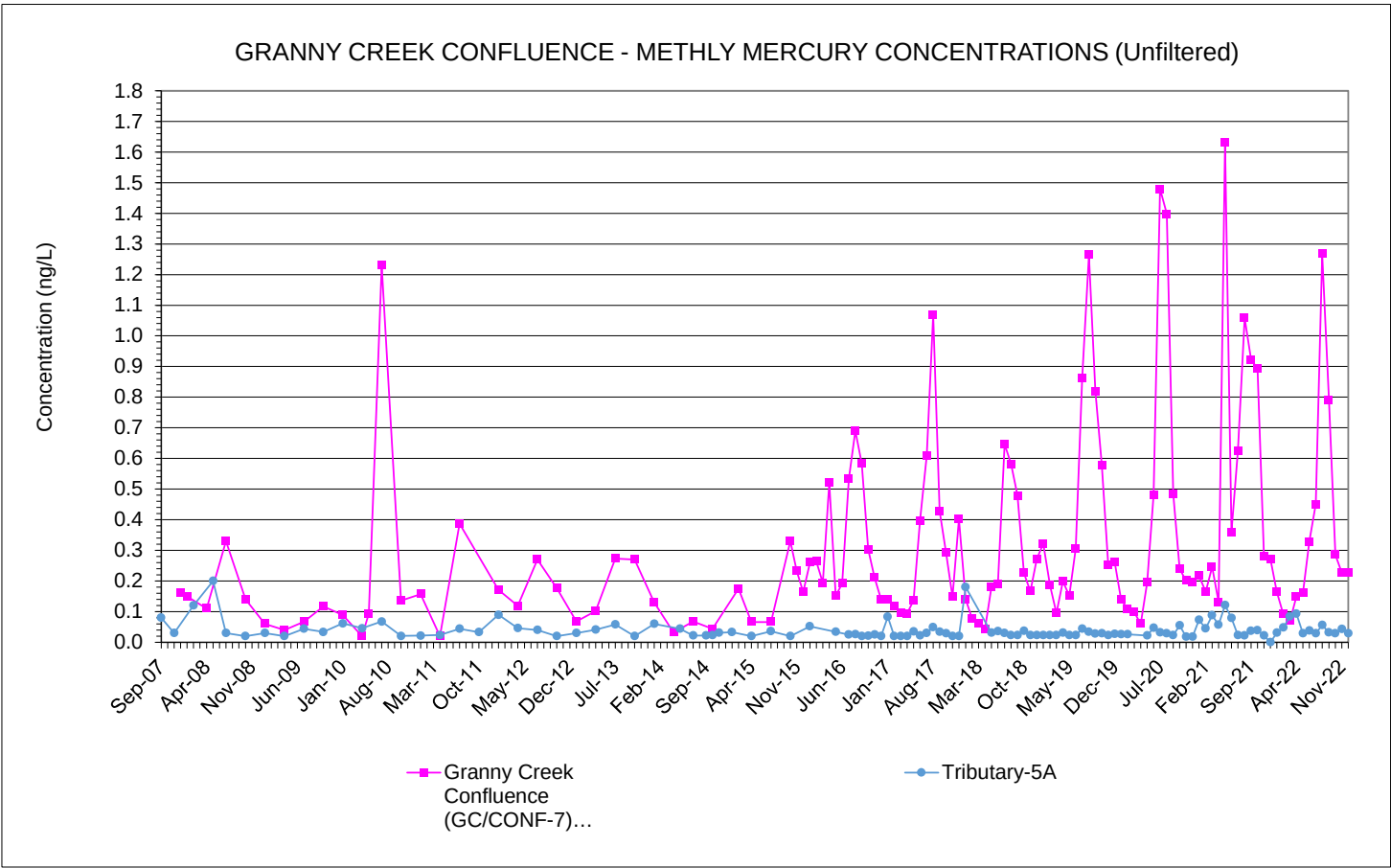


TABLE 13a METHYL MERCURY - NORTH GRANNY CREEK (Filtered) (concentrations in ng/L)

Date	N. Granny Creek Upstream of Supplementation G-0	N. Granny Creek Upstream (NGC/UP/NWF) G-1	N. Granny Creek Downstream (NGC/DN/NWF) G-2	N. Granny Creek Downstream (NGC/DN/NEF) G-3	N. Granny Creek Upstream of Confluence (NGC/UP/CONF) G-4	Tributary-5A
	Draft USEPA Criteria: 0.05 ng/L					
May-06						
Jun-06						
Jul-06			0.05	0.08		
Aug-06						
Sep-06						
Oct-06				0.14		
Nov-06						
Dec-06						
Jan-07		0.08		0.13		
Feb-07						
Mar-07						
Apr-07						
May-07		0.06	0.07	0.09		
Jun-07						
Jul-07		0.06	0.09	0.10		
Aug-07						
Sep-07						0.07
Oct-07		0.09	0.11	0.07		
Nov-07						0.04
Dec-07					0.20	
Jan-08		<0.02		0.15	0.13	
Feb-08		0.06	0.14	<0.02		<0.02
Mar-08		<0.02		0.17		
Apr-08		0.08	0.41	0.05	0.05	
May-08						0.20
Jun-08						
Jul-08		0.09	0.09	0.49	0.48	0.03
Aug-08						
Sep-08						
Oct-08		0.05	0.04	0.11	0.15	<0.02
Nov-08						
Dec-08						
Jan-09		0.03	0.04	0.06	0.06	<0.02
Feb-09						
Mar-09						
Apr-09		0.02	<0.02	<0.02		<0.02
May-09						
Jun-09					0.11	
Jul-09		0.06	0.06	0.12	0.08	0.03
Aug-09						
Sep-09						
Oct-09		0.04	0.04	0.04	0.11	0.04
Nov-09						
Dec-09						
Jan-10		0.05	0.04	0.04	0.08	<0.02
Feb-10						
Mar-10						
Apr-10		0.03	0.03	0.05		0.02
May-10					0.06	
Jun-10						
Jul-10		0.05	0.07	0.10	0.08	0.03
Aug-10						
Sep-10						
Oct-10		0.05	0.08	0.13	0.13	0.02
Nov-10						
Dec-10						
Jan-11		0.03	0.05	<0.02	0.04	0.05
Feb-11						
Mar-11						
Apr-11		<0.02	detect	0.03	<0.02	<0.02
May-11		0.04	0.08			
Jun-11		<0.02	0.09			
Jul-11		0.04	0.45	0.39	0.32	0.04
Aug-11		0.09	0.46	0.21		
Sep-11						
Oct-11		<0.02	0.18	0.18	0.27	0.03
Nov-11		0.07	0.09			
Dec-11		0.05	0.13			
Jan-12			0.07	0.06	0.05	0.05
Feb-12		<0.02	0.03	0.02		
Mar-12		<0.02	<0.02	<0.02		
Apr-12			0.07	0.15	0.06	0.03
May-12		0.04	0.05	0.09		
Jun-12		0.04	0.07	0.10		
Jul-12		0.05	0.15	0.18	0.22	0.02
Aug-12		<0.02	0.29			
Sep-12		0.04	0.41			
Oct-12			0.11	0.16	0.22	<0.02
Nov-12			0.11			
Dec-12		0.05	0.11			
Jan-13		F	0.09	F	0.10	<0.02
Feb-13		0.04	0.04	0.08		
Mar-13		0.03	0.03	0.06		
Apr-13		0.04	0.02	0.10	0.05	<0.02
May-13		<0.02	0.08			
Jun-13		0.05	0.11			
Jul-13		0.03	0.21	0.22	0.25	0.05
Aug-13		0.07	0.34	0.37		
Sep-13		0.09	0.43	0.05		
Oct-13		0.06	0.19	0.25	0.31	<0.02
Nov-13		<0.02	0.10	0.11		
Dec-13		0.02	0.05	0.09		
Jan-14		<0.02	0.02	0.05	0.15	<0.02
Feb-14		<0.02	0.03	0.04		
Mar-14		0.03	0.10	0.06		<0.02

TABLE 13a METHYL MERCURY - NORTH GRANNY CREEK (Filtered) (concentrations in ng/L)

Date	N. Granny Creek Upstream of Supplementation G-0	N. Granny Creek Upstream (NGC/UP/NWF) G-1	N. Granny Creek Downstream (NGC/DN/NWF) G-2	N. Granny Creek Downstream (NGC/DN/NEF) G-3	N. Granny Creek Upstream of Confluence (NGC/UP/CONF) G-4	Tributary-5A
	Draft USEPA Criteria: 0.05 ng/L					
Apr-14		<0.02	0.03	0.03	0.03	
May-14		0.03	0.23	0.09		
Jun-14		0.07	0.17	0.17		
Jul-14		0.12	0.19	0.27	0.29	0.03
Aug-14		0.16	0.22	0.17		
Sep-14		0.31	0.33	0.28		<0.02
Oct-14		0.12	0.13	0.13	0.14	<0.02
Nov-14		0.08	0.12	0.12		<0.02
Dec-14		US	0.10	0.10		
Jan-15			0.06	0.11	0.10	<0.02
Feb-15		0.07	0.09	0.08		
Mar-15		0.04	0.05	0.05		
Apr-15		0.02	0.04	0.04	0.05	0.03
May-15		0.05	0.06	0.07		
Jun-15		0.03	0.06	0.08		
Jul-15		<0.02	0.06	0.67	0.66	<0.02
Aug-15		0.13	0.49	1.14		
Sep-15		0.17	0.44	0.90		
Oct-15		0.10	0.20	0.30	0.21	<0.02
Nov-15		0.06	0.09	0.14	0.18	
Dec-15		0.05	0.08	0.12	0.16	
Jan-16		0.05	0.06	0.11	0.13	0.02
Feb-16		0.03	0.05	0.05	0.08	
Mar-16		0.02	0.03	0.03	0.07	
Apr-16		0.03	0.03	0.03	0.06	
May-16		0.02	0.03	0.05	0.07	0.02
Jun-16		0.07	0.10	0.10	0.10	
Jul-16		0.08	0.13	0.17	0.28	<0.02
Aug-16		0.19	0.20	0.23	0.50	0.02
Sep-16		0.40	0.32	0.29	0.42	<0.02
Oct-16		0.20	0.26	0.30	0.40	<0.02
Nov-16		0.09	0.13	0.13	0.16	<0.02
Dec-16		0.06	0.07	0.08	0.10	<0.02
Jan-17		0.05	0.05	0.06	0.08	<0.02
Feb-17		0.02	0.04	0.03	0.05	<0.02
Mar-17		0.03	0.03	0.03	0.03	<0.02
Apr-17		0.03	0.03	0.04	0.03	<0.02
May-17	0.04	0.03	0.05	0.06	0.05	0.03
Jun-17	0.10	0.11	0.16	0.20	0.33	0.02
Jul-17	0.11	0.10	0.23	0.31	0.56	<0.02
Aug-17	0.12	0.14	0.30	0.24	0.28	0.02
Sep-17	0.17	0.18	0.30	0.38	0.22	<0.02
Oct-17	0.10	0.06	0.09	0.14	0.17	<0.02
Nov-17	0.11	0.07	0.08	0.13	0.15	<0.02
Dec-17	0.11	0.04	0.05	0.11	0.09	<0.02
Jan-18	0.08	<0.02	0.04	0.06	0.03	0.03
Feb-18	0.08	<0.02	0.03	0.03	0.04	F
Mar-18	0.07	0.02	<0.02	0.03	0.02	F
Apr-18	0.08	0.03	0.03	0.05	0.04	F
May-18	0.04	0.04	0.05	0.09	0.13	0.02
Jun-18	0.08	0.09	0.11	0.15	0.12	0.02
Jul-18	0.19	0.18	0.20	0.23	0.27	0.03
Aug-18	0.29	0.49	0.57	0.66	0.43	<0.02
Sep-18	0.15	0.20	0.28	0.47	0.28	0.02
Oct-18	0.07	0.12	0.20	0.30	0.21	0.03
Nov-18	0.11	0.06	0.10	0.15	0.12	<0.02
Dec-18	0.08	0.07	0.13	0.22	0.17	<0.02
Jan-19	0.07	0.05	0.08	0.21	0.13	<0.02
Feb-19	0.05	0.05	0.08	0.13	0.10	<0.02
Mar-19	0.04	0.04	0.06	0.07	0.07	<0.02
Apr-19	0.07	0.04	0.07	0.08	0.06	<0.02
May-19	0.04	0.06	0.06	0.07	0.16	<0.02
Jun-19	0.10	0.09	0.11	0.14	0.43	<0.02
Jul-19	0.15	0.16	0.24	0.48	0.76	<0.02
Aug-19	0.24	0.19	0.28	0.94	0.94	0.03
Sep-19	0.08	0.16	0.28	0.91	0.39	<0.02
Oct-19	0.16	0.11	0.10	0.29	0.29	<0.02
Nov-19	0.07	0.06	0.08	0.14	0.14	<0.02
Dec-19	0.06	0.05	0.06	0.09	0.08	<0.02
Jan-20		0.06	0.06	0.13	0.11	<0.02
Feb-20	0.06	0.04	0.04	0.06	0.07	<0.02
Mar-20	0.06	0.03	0.02	0.07	0.05	
Apr-20	0.05	0.03	0.04	0.05	0.04	
May-20	< 0.02	0.03	0.22	0.06	0.07	<0.02
Jun-20	0.09	0.05	0.09	0.11	0.10	0.03
Jul-20	0.18	0.13	0.21	1.22	1.14	0.04
Aug-20	0.13	0.09	0.18	0.77	0.77	0.03
Sep-20	0.12	0.12	0.15	0.32	0.22	0.02
Oct-20	0.10	0.10	0.20	0.24	0.25	0.04
Nov-20	0.06	0.05	0.08	0.12	0.10	<0.02
Dec-20	0.06	0.08	0.09	0.10	0.09	<0.02
Jan-21		0.10	0.11	0.12	0.07	0.05
Feb-21	0.10	0.08	0.03	0.06	0.09	<0.03
Mar-21	0.08	0.08	0.03	0.06	0.07	<0.03
Apr-21	0.11	0.10	0.24	0.16	0.30	0.04
May-21	0.08	0.07	0.11	0.09	0.30	0.09
Jun-21	0.09	0.10	0.24	0.16	0.33	0.04
Jul-21	0.14	0.10	0.12	0.48	0.32	<0.02
Aug-21	0.09	0.08	0.18	1.21	0.76	<0.02
Sep-21	0.07	0.11	0.15	0.42	0.83	<0.02
Oct-21	0.23	0.12	0.18	0.38	0.56	<0.02
Nov-21	0.11	0.07	0.13	0.18	0.17	<0.02
Dec-21	0.09	0.08	0.08	0.18	0.18	<0.02
Jan-22	0.13	0.05	0.06	0.11	0.09	<0.02
Feb-22	0.08	<0.02	0.03	0.04	0.05	0.03
Mar-22	0.12	<0.02	<0.02	0.03	0.04	0.05
Apr-22	0.14	<0.03	<0.03	0.04	0.04	0.04
May-22	0.05	0.03	0.03	0.26	0.08	0.03
Jun-22	0.09	0.10	0.13	0.23	0.18	0.04
Jul-22	0.10	0.09	0.11	0.35	0.30	<0.03
Aug-22	0.07	0.11	0.19	0.88	0.84	<0.03
Sep-22	0.11	0.09	0.20	0.67	0.79	<0.03
Oct-22	0.06	0.09	0.16	0.31	0.17	<0.03

TABLE 13a METHYL MERCURY - NORTH GRANNY CREEK (Filtered) (concentrations in ng/L)

Date	N. Granny Creek Upstream of Supplementation G-0	N. Granny Creek Upstream (NGC/UP/NWF) G-1	N. Granny Creek Downstream (NGC/DN/NWF) G-2	N. Granny Creek Downstream (NGC/DN/NEF) G-3	N. Granny Creek Upstream of Confluence (NGC/UP/CONF) G-4	Tributary-5A
Draft USEPA Criteria: 0.05 ng/L						
Nov-22	0.11	0.07	0.13	0.14	0.20	<0.03
Dec-22	0.05	0.06	0.20	0.18	0.11	<0.03
2009 Average		0.04	<0.04	<0.06	0.09	<0.03
2010 Average		0.04	0.06	0.08	0.09	<0.02
2011 Average		<0.04	0.19	<0.17	<0.16	<0.04
2012 Average		<0.03	<0.12	<0.10	0.14	<0.03
2013 Average		<0.04	0.14	0.15	0.18	<0.03
2014 Average		<0.09	0.14	0.12	0.15	<0.02
2015 Average		<0.07	0.14	0.31	0.23	<0.02
2016 Average		0.10	0.12	0.13	0.20	<0.02
2017 Average	0.11	0.07	0.12	0.14	0.17	<0.02
2018 Average	0.11	0.11	0.15	0.20	0.16	<0.02
2019 Average	0.09	0.09	0.13	0.30	0.30	<0.02
2020 Average	0.08	0.07	0.11	0.27	0.25	<0.03
2021 Average	0.11	0.09	0.13	0.29	0.33	<0.04
2022 Average	0.09	0.06	0.11	0.27	0.24	<0.03
Average All Years	0.10	<0.07	<0.13	<0.20	<0.21	<0.03

Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G
MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury), as per Section 1.
North Granny Creek receives effluent from the PKC facility
Station G-4 was changed from quarterly to monthly sampling in October 2015
Sampling at Station G-0 was initiated in May 2017
Tributary-5A was changed from quarterly to monthly sampling in July 2016
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample

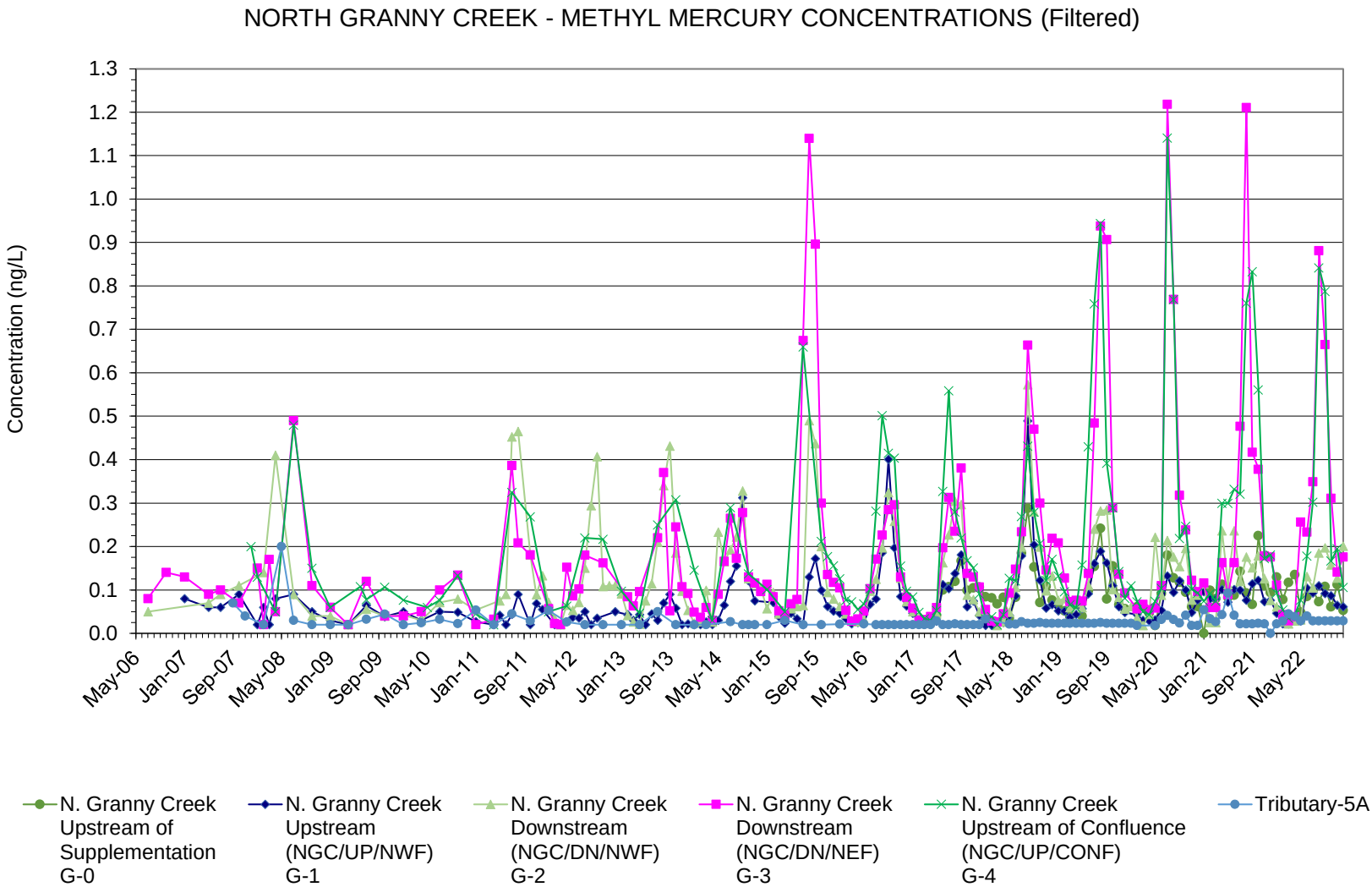


TABLE 13b METHYL MERCURY - SOUTH GRANNY CREEK (Filtered)
(concentrations in ng/L)

Date	S. Granny Creek Upstream (SGC/UP/SWF) G-5	S. Granny Creek Downstream (SGC/DS/SWF) G-6	S. Granny Creek Upstream of Confluence (SGC/UP/CONF) G-7	Tributary-5A
	Draft USEPA Criteria: 0.05 ng/L			
Jul-06	0.05	0.02		
Oct-06	0.03	0.08		
Jan-07	0.08	0.10		
Feb-07				
Mar-07				
Apr-07				
May-07	0.04	0.06		
Jun-07				
Jul-07	0.05	0.04		
Aug-07				
Sep-07				0.07
Oct-07	0.04	0.05		
Nov-07				0.04
Dec-07			0.09	
Jan-08			0.09	
Feb-08	0.10	0.07		<0.02
Mar-08				
Apr-08	0.04	0.09	0.35/0.2	
May-08				0.20
Jun-08				
Jul-08	0.04	0.06	0.30	0.03
Aug-08				
Sep-08				
Oct-08	0.02	0.03	0.06	<0.02
Nov-08				
Dec-08				
Jan-09	0.06	0.04	0.04	<0.02
Feb-09				
Mar-09				
Apr-09	0.02	0.02	<0.02	<0.02
May-09				
Jun-09				
Jul-09	0.04	0.05	0.03	0.03
Aug-09				
Sep-09				
Oct-09	0.05	0.02	0.23	0.04
Nov-09				
Dec-09				
Jan-10	0.04	0.02	0.11	<0.02
Feb-10				
Mar-10				
Apr-10	0.04	0.05	<0.02	0.02
May-10			0.11	
Jun-10				
Jul-10	0.02	0.06	1.22	0.03
Aug-10				
Sep-10				
Oct-10	0.04	0.07	0.15	0.02
Nov-10				
Dec-10				
Jan-11	0.03	0.11	0.09	0.05
Feb-11				
Mar-11				
Apr-11	0.04	<0.02	<0.02	<0.02
May-11				
Jun-11				
Jul-11	0.05	0.11	0.35	0.04
Aug-11				
Sep-11				
Oct-11	<0.02	0.08	0.24	0.03
Nov-11				
Dec-11				
Jan-12	0.10	0.04	0.09	0.05
Feb-12				
Mar-12				
Apr-12	0.03	0.07	0.06	0.03
May-12				
Jun-12				
Jul-12	0.05	0.12	0.14	0.02
Aug-12				
Sep-12				
Oct-12	0.03	0.08	0.30	<0.02
Nov-12				
Dec-12				
Jan-13	0.04	0.06	0.08	<0.02
Feb-13				
Mar-13				
Apr-13	0.03	0.08	0.02	<0.02
May-13				
Jun-13				
Jul-13	0.05	0.33	0.48	0.05
Aug-13				
Sep-13				
Oct-13	0.05	0.16	0.24	<0.02
Nov-13				
Dec-13				
Jan-14	0.08	<0.02	0.05	<0.02
Feb-14				
Mar-14				<0.02
Apr-14	<0.02	<0.02	0.03	
May-14				
Jun-14				
Jul-14	0.15	0.05	1.06	0.03
Aug-14				
Sep-14				<0.02
Oct-14	0.07	0.03	0.11	<0.02
Nov-14				<0.02
Dec-14				
Jan-15	0.02	0.04	0.11	<0.02
Feb-15	0.05	0.13		
Mar-15	0.04	0.06		

TABLE 13b METHYL MERCURY - SOUTH GRANNY CREEK (Filtered)
(concentrations in ng/L)

Date	S. Granny Creek Upstream (SGC/UP/SWF) G-5	S. Granny Creek Downstream (SGC/DS/SWF) G-6	S. Granny Creek Upstream of Confluence (SGC/UP/CONF) G-7	Tributary-5A
	Draft USEPA Criteria: 0.05 ng/L			
Apr-15	0.04	0.03	0.09	0.03
May-15	0.03	0.06		
Jun-15	0.09	0.05		
Jul-15	0.12	0.12	0.63	<0.02
Aug-15				
Sep-15				
Oct-15	0.06	0.38	0.29	<0.02
Nov-15	0.73	0.12	0.21	
Dec-15	0.03	0.11	0.19	
Jan-16	0.05	0.12	0.25	0.02
Feb-16	0.05	0.06	0.18	
Mar-16	0.04	0.12	0.12	
Apr-16	0.02	<0.02	0.13	
May-16	0.02	0.07	0.09	0.02
Jun-16	0.03	0.09	0.13	
Jul-16	0.04	0.34	0.63	<0.02
Aug-16	0.05	0.75	0.82	0.02
Sep-16	0.04	0.46	0.45	<0.02
Oct-16	0.04	0.33	0.48	<0.02
Nov-16	0.07	0.05	0.17	<0.02
Dec-16	0.03	0.06	0.14	<0.02
Jan-17	0.03	0.07	0.12	<0.02
Feb-17	0.03	0.08	0.11	<0.02
Mar-17	0.03	0.05	0.10	<0.02
Apr-17	0.03	0.08	0.06	<0.02
May-17	0.03	0.03	0.05	0.03
Jun-17	0.06	0.21	0.46	0.02
Jul-17	0.06	0.45	1.11	<0.02
Aug-17	0.06	1.35	1.01	0.02
Sep-17	0.02	0.43	0.48	<0.02
Oct-17	0.03	0.15	0.21	<0.02
Nov-17	0.03	0.17	0.77	<0.02
Dec-17	0.04	0.12	0.21	<0.02
Jan-18	0.04	0.07	0.14	0.03
Feb-18	0.05	0.04	0.06	F
Mar-18	0.10	0.02	0.03	F
Apr-18	0.11	0.03	0.03	F
May-18	0.03	0.08	0.11	0.02
Jun-18	0.03	0.13	0.20	0.02
Jul-18	0.04	0.21	0.51	0.03
Aug-18	0.05	0.66	0.42	<0.02
Sep-18	<0.02	0.19	0.20	0.02
Oct-18	0.05	0.15	0.21	0.03
Nov-18	0.22	0.04	0.19	<0.02
Dec-18	0.06	0.29	0.24	<0.02
Jan-19	0.06	0.14	0.23	<0.02
Feb-19	0.04	0.11	0.13	<0.02
Mar-19	0.07	0.07	0.15	<0.02
Apr-19	0.03	0.11	0.10	<0.02
May-19	0.03	0.08	0.16	<0.02
Jun-19	0.03	0.14	0.44	<0.02
Jul-19	0.06	1.00	1.12	<0.02
Aug-19	0.05	1.51	1.84	0.03
Sep-19	0.03	0.42	0.67	<0.02
Oct-19	0.04	0.42	0.59	<0.02
Nov-19	<0.02	0.25	0.36	<0.02
Dec-19	0.04	0.27	0.35	<0.02
Jan-20	0.06	0.06		<0.02
Feb-20	0.06	0.13	0.13	<0.02
Mar-20	0.04	0.02	0.35	
Apr-20	0.04	0.05	0.09	
May-20	0.03	0.07	0.13	<0.02
Jun-20	0.03	0.15	0.23	0.03
Jul-20	0.06	1.06	2.31	0.04
Aug-20	0.04	0.43	1.48	0.03
Sep-20	0.03	0.22	0.49	0.02
Oct-20	0.05	0.17	0.42	0.04
Nov-20	0.05	0.16	0.21	<0.02
Dec-20	0.04	0.18	0.18	<0.02
Jan-21	0.06	0.15	0.21	<0.05
Feb-21	0.06	0.10	0.28	<0.03
Mar-21	0.08	0.19	0.24	<0.03
Apr-21	0.05	0.10	0.09	<0.04
May-21	0.08	0.21	0.09	<0.09
Jun-21	0.07	0.78	0.57	<0.04
Jul-21	0.03	0.46	0.70	<0.02
Aug-21	0.04	0.66	1.05	<0.02
Sep-21	0.05	0.35	0.93	<0.02
Oct-21	0.06	0.44	0.71	<0.02
Nov-21	0.05	0.21	0.21	<0.02
Dec-21	0.06	0.19	0.33	<0.02
Jan-22	0.04	0.07	0.19	<0.02
Feb-22	0.03	0.05	0.09	0.03
Mar-22	<0.02	0.03	0.07	0.05
Apr-22	<0.03	0.11	0.10	0.04
May-22	<0.03	0.07	0.17	<0.03
Jun-22	0.05	0.19	0.17	0.04
Jul-22	0.06	0.29	0.39	<0.03
Aug-22	0.06	0.53	0.97	<0.03
Sep-22	0.07	0.57	0.81	<0.03
Oct-22	0.20	0.20	0.20	<0.03
Nov-22	0.05	0.11	0.17	<0.03
Dec-22	0.08	0.16	0.15	<0.03

TABLE 13b METHYL MERCURY - SOUTH GRANNY CREEK (Filtered)
(concentrations in ng/L)

Date	S. Granny Creek Upstream (SGC/UP/SWF) G-5	S. Granny Creek Downstream (SGC/DS/SWF) G-6	S. Granny Creek Upstream of Confluence (SGC/UP/CONF) G-7	Tributary-5A
	Draft USEPA Criteria: 0.05 ng/L			
2009 Average	0.04	0.03	<0.08	<0.03
2010 Average	0.04	0.05	0.32	<0.02
2011 Average	<0.03	<0.08	<0.17	<0.04
2012 Average	0.05	0.08	0.15	<0.03
2013 Average	0.04	0.16	0.20	<0.03
2014 Average	0.08	<0.03	0.31	<0.02
2015 Average	0.12	0.11	0.25	<0.02
2016 Average	0.04	<0.20	0.30	<0.02
2017 Average	0.04	0.27	0.37	<0.02
2018 Average	<0.07	0.16	0.19	<0.02
2019 Average	<0.04	0.38	0.51	<0.02
2020 Average	<0.04	0.22	0.55	<0.03
2021 Average	<0.06	0.32	0.45	<0.04
2022 Average	0.06	0.20	0.29	<0.03
Average All Years	<0.05	<0.19	<0.33	<0.03

Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G
MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury), as per Section 1.
Station G-7 was changed from quarterly to monthly sampling in October 2015
Tributary-5A was changed from quarterly to monthly sampling in July 2016
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample

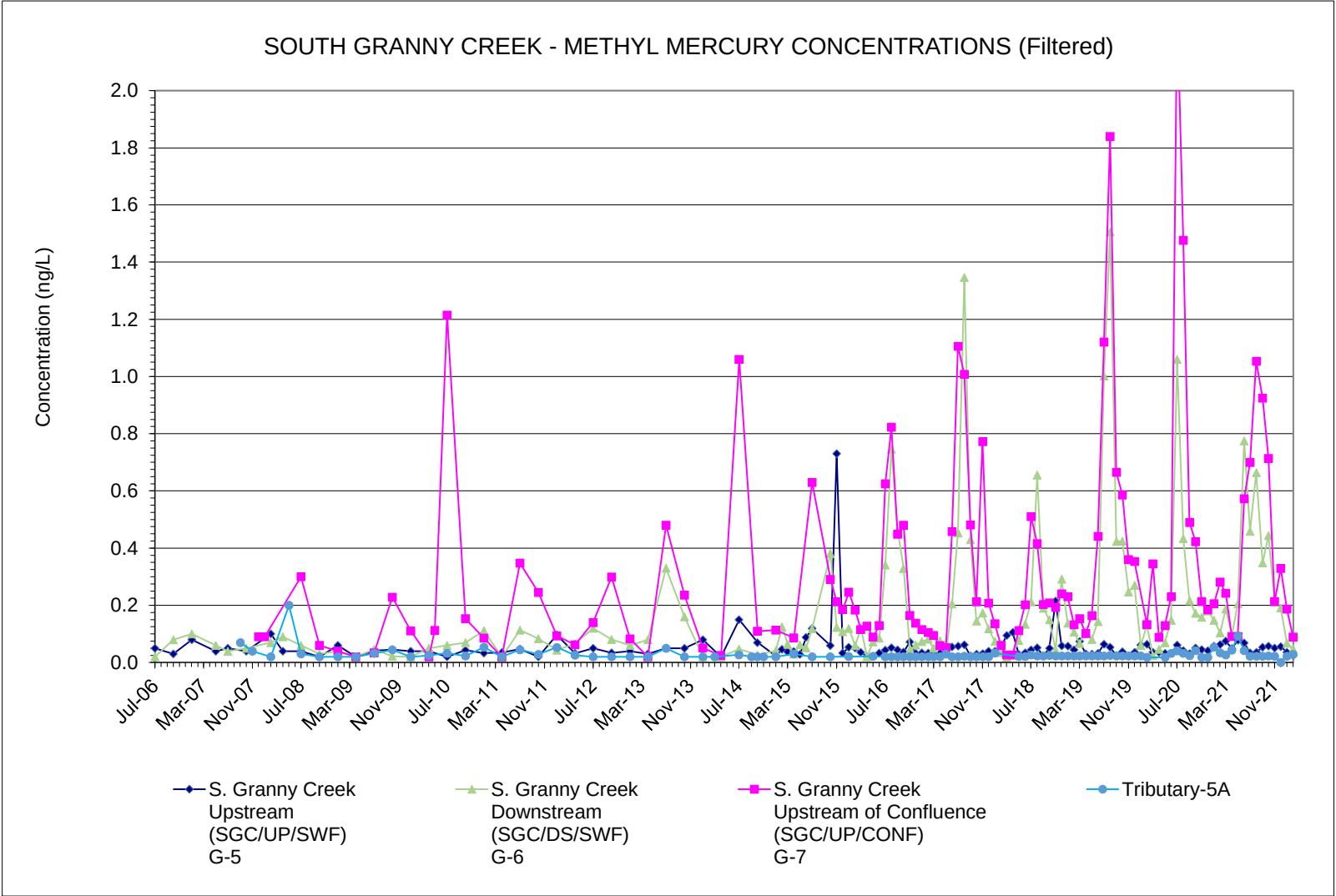


TABLE 13c METHYL MERCURY -
GRANNY CREEK CONFLUENCE
(Filtered) (concentrations in ng/L)

Date	Granny Creek Confluence G-8	Tributary-5A
	Draft USEPA Criteria: 0.05 ng/L	
Sep-07		0.07
Oct-07		
Nov-07		0.04
Dec-07	0.11	
Jan-08	0.12	
Feb-08		<0.02
Mar-08		
Apr-08	0.05	
May-08		0.20
Jun-08		
Jul-08	0.32	0.03
Aug-08		
Sep-08		
Oct-08	0.10	<0.02
Nov-08		
Dec-08		
Jan-09	0.05	<0.02
Feb-09		
Mar-09		
Apr-09	<0.02	<0.02
May-09		
Jun-09		
Jul-09	0.18	0.03
Aug-09		
Sep-09		
Oct-09	0.12	0.04
Nov-09		
Dec-09		
Jan-10	0.31	<0.02
Feb-10		
Mar-10		
Apr-10	0.02	0.02
May-10	0.07	
Jun-10		
Jul-10	0.83	0.03
Aug-10		
Sep-10		
Oct-10	0.10	0.02
Nov-10		
Dec-10		
Jan-11	0.08	0.05
Feb-11		
Mar-11		
Apr-11	<0.02	<0.02
May-11		
Jun-11		
Jul-11	0.06	0.04
Aug-11		
**Sep-11		
Oct-11	0.05	0.03
Nov-11		
Dec-11		
Jan-12	0.07	0.05
Feb-12		
Mar-12		
Apr-12	0.08	0.03
May-12		
Jun-12		
Jul-12	0.18	0.02
Aug-12		
Sep-12		
Oct-12	0.13	<0.02
Nov-12		
Dec-12		
Jan-13	0.14	<0.02
Feb-13		
Mar-13		
Apr-13	0.06	<0.02
May-13		
Jun-13		
Jul-13	<0.02	0.05
Aug-13		
Sep-13		
Oct-13	0.18	<0.02
Nov-13		
Dec-13		
Jan-14	0.09	<0.02
Feb-14		
Mar-14		<0.02
Apr-14	0.03	
May-14		
Jun-14		
Jul-14	0.04	0.03
Aug-14		
Sep-14		<0.02
Oct-14	0.03	<0.02
Nov-14		<0.02
Dec-14		

TABLE 13c METHYL MERCURY -
GRANNY CREEK CONFLUENCE
(Filtered) (concentrations in ng/L)

Date	Granny Creek Confluence G-8	Tributary-5A
	Draft USEPA Criteria: 0.05 ng/L	
Jan-15		<0.02
Feb-15	0.13	
Mar-15		
Apr-15	0.06	0.03
May-15		
Jun-15		
Jul-15	0.04	<0.02
Aug-15		
Sep-15		
Oct-15	0.30	<0.02
Nov-15	0.17	
Dec-15	0.15	
Jan-16	0.18	0.02
Feb-16	0.12	
Mar-16	0.09	
Apr-16	0.07	
May-16	0.06	0.02
Jun-16	0.10	
Jul-16	0.38	<0.02
Aug-16	0.68	0.02
Sep-16	0.43	<0.02
Oct-16	0.26	<0.02
Nov-16	0.15	<0.02
Dec-16	0.10	<0.02
Jan-17	0.10	<0.02
Feb-17	0.08	<0.02
Mar-17	0.07	<0.02
Apr-17	0.05	<0.02
May-17	0.06	0.03
Jun-17	0.26	0.02
Jul-17	0.46	<0.02
Aug-17	0.89	0.02
Sep-17	0.36	<0.02
Oct-17	0.19	<0.02
Nov-17	0.14	<0.02
Dec-17	0.26	<0.02
Jan-18	0.09	0.03
Feb-18	0.05	F
Mar-18	0.03	F
Apr-18	0.03	F
May-18	0.11	0.02
Jun-18	0.16	0.02
Jul-18	0.43	0.03
Aug-18	0.53	<0.02
Sep-18	0.32	0.02
Oct-18	0.16	0.03
Nov-18	0.15	<0.02
Dec-18	0.25	<0.02
Jan-19	0.19	<0.02
Feb-19	0.13	<0.02
Mar-19	0.07	<0.02
Apr-19	0.11	<0.02
May-19	0.13	<0.02
Jun-19	0.21	<0.02
Jul-19	0.71	<0.02
Aug-19	1.10	0.03
Sep-19	0.66	<0.02
Oct-19	0.49	<0.02
Nov-19	0.19	<0.02
Dec-19	0.17	<0.02
Jan-20	0.11	<0.02
Feb-20	0.09	<0.02
Mar-20	0.06	
Apr-20	0.06	
May-20	0.11	<0.02
Jun-20	0.35	0.03
Jul-20	1.38	0.04
Aug-20	1.07	0.03
Sep-20	0.39	0.02
Oct-20	0.27	0.04
Nov-20	0.15	<0.02
Dec-20	0.14	<0.02
Jan-21	0.15	<0.05
Feb-21	0.16	<0.03
Mar-21	0.12	<0.03
Apr-21	0.10	<0.04
May-21	0.18	<0.09
Jun-21	0.32	<0.04
Jul-21	0.48	<0.02
Aug-21	0.77	<0.02
Sep-21	0.84	<0.02
Oct-21	0.69	<0.02
Nov-21	0.20	<0.02
Dec-21	0.23	<0.02
Jan-22	0.14	<0.022
Feb-22	0.06	0.03
Mar-22	0.05	0.05
Apr-22	0.09	0.04
May-22	0.07	<0.029
Jun-22	0.28	0.04
Jul-22	0.38	<0.029
Aug-22	0.76	<0.029
Sep-22	0.67	<0.029
Oct-22	0.27	<0.029
Nov-22	0.13	<0.029
Dec-22	0.15	<0.029

TABLE 13c METHYL MERCURY -
GRANNY CREEK CONFLUENCE
(Filtered) (concentrations in ng/L)

Date	Granny Creek Confluence G-8	Tributary-5A
	Draft USEPA Criteria: 0.05 ng/L	
Average 2009	<0.09	<0.03
Average 2010	0.27	<0.02
Average 2011	<0.05	<0.04
Average 2012	0.11	<0.03
Average 2013	<0.10	<0.03
Average 2014	0.05	<0.02
Average 2015	0.14	<0.02
Average 2016	0.22	<0.02
Average 2017	0.24	<0.02
Average 2018	0.19	<0.02
Average 2019	0.35	<0.02
Average 2020	0.35	<0.03
Average 2021	0.35	<0.04
Average 2022	0.25	<0.04
Average All Data	<0.23	<0.03

Quarterly sampling in accordance with Amended C. of A. #3960-7Q4K2G
MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.
Station G-8 was changed from quarterly to monthly sampling in October 2015
Tributary-5A was changed from quarterly to monthly sampling in July 2016
Annotation is provided for missing data for the years 2013 and later. Historical annotation previous to this was unavailable or could not be verified.
Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.
D: Dry
F: Frozen
US: Unsafe to sample

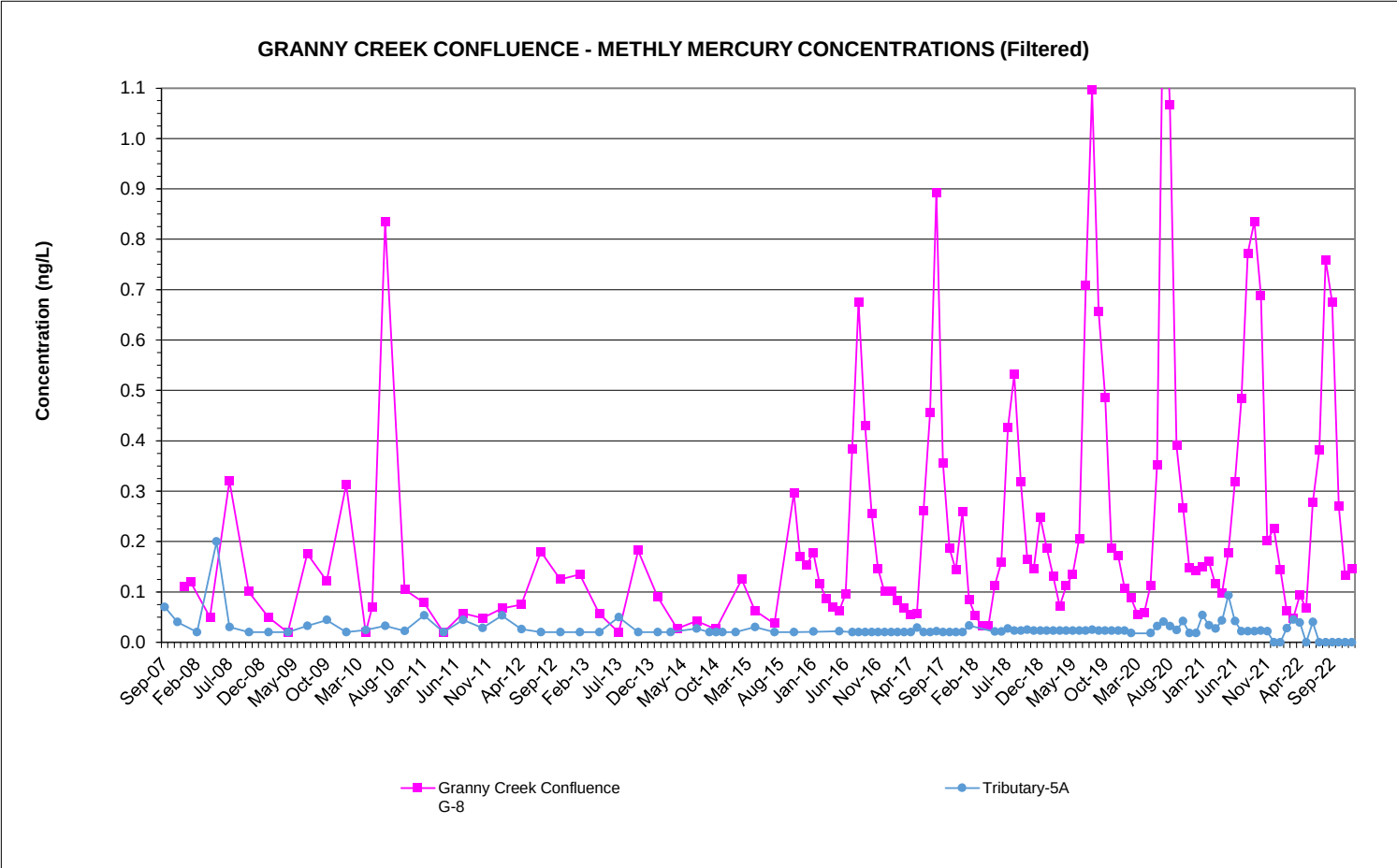


Table 14: North Granny Creek Summer Condition Methyl Mercury Concentrations (concentrations in ng/L)

Table 14a: Flow and Water Quality Data with Loading Calculations

Year / Date	Flow / Discharge Rates			Water Quality			Calculated Water Quality in the Absence of Supplementation or PKC Discharge (ng/L)
	NGC 5-day Average Flow at NG-001 (m³/d)	NGC 5-day Average Flow Supplementation Rate (m³/d)	Fine PKC Effluent Discharge (m³/d)	NGC-DN-NEF (G-3) (Filtered) (ng/L)	Flow Supplementation Water (A-2) (ng/L - Filtered)	Fine PKC Discharge (CQ) (ng/L - Filtered)	
2013							
1-Jul-13	11,886	5,209	0	0.22	<0.02	-	0.38
5-Aug-13	10,508	8,672	0	0.37	0.18	-	1.27
2-Sep-13	12,558	10,019	0	0.05	0.06	-	0.01
2014							
2-Jun-14	61,422	0	0	0.17	0.04	-	0.17
7-Jul-14	18,118	1,056	0	0.27	0.03	-	0.28
4-Aug-14	11,798	9,385	0	0.17	0.04	-	0.68
1-Sep-14	21,821	2,590	0	0.28	0.05	-	0.31
2015							
1-Jun-15	67,875	0	0	0.08	0.03	-	0.08
3-Jul-15	51,222	719	0	0.67	<0.02	-	0.68
3-Aug-15	74,630	0	4,701	1.14	0.05	0.34	1.19
7-Sep-15	142,070	0	10,772	0.90	0.04	0.38	0.94
2016							
1-Jun-16	61,844	0	4,499	0.10	0.03	0.02	0.11
3-Jul-16	23,292	0	0	0.17	0.03	-	0.17
3-Aug-16	16,581	8,723	0	0.23	0.03	-	0.45
7-Sep-16	21,455	3,133	0	0.29	0.03	-	0.33
2017							
12-Jun-17	128,641	0	0	0.20	0.04	-	0.20
10-Jul-17	42,166	0	2,356	0.31	0.03	0.11	0.33
7-Aug-17	12,387	8,975	0	0.24	0.02	-	0.81
4-Sep-17	13,199	9,371	0	0.38	0.01	-	1.29
2018							
4-Jun-18	58,530	0	0	0.15	0.04	-	0.15
2-Jul-18	18,630	9,650	0	0.23	0.03	-	0.45
6-Aug-18	14,205	1,397	0	0.66	0.05	-	0.73
3-Sep-18	11,553	9,633	0	0.47	<0.02	-	2.71
2019							
11-Jun-19	68,279	0	0	0.14	0.03	-	0.14
15-Jul-19	48,516	0	0	0.48	0.05	-	0.48
7-Aug-19	38,871	0	0	0.94	0.04	-	0.94
5-Sep-19	13,296	34	0	0.91	<0.02	-	0.91
2020							
2-Jun-20	84,607	0	0	0.11	0.03	-	0.11
14-Jul-20	10,852	5,035	0	1.22	0.04	-	2.23
4-Aug-20	13,877	5,999	0	0.77	0.02	-	1.34
15-Sep-20	52,023	0	0	0.32	<0.04	-	0.32
2021							
4-Jun-21	89,266	0	0	0.16	0.02		0.16
6-Jul-21	19,779	7,942	0	0.48	0.03		0.78
3-Aug-21	13,592	8,005	0	1.21	0.03		2.91
7-Sep-21	182,244	0	0	0.42	<0.04		0.42
2022							
20-Jun-22	72,107	0	0	0.35	0.09		0.35
5-Jul-22	40,260	0	0	0.35	0.10		0.35
2-Aug-22	20,848	0	0	0.88	0.07		0.88
6-Sep-22	14,985	0	0	0.67	0.11		0.67

Table 14b: Data for Chart 14a

NGC 5-day Average Flow at NG-001 (m³/d)	NGC-DN-NEF G-3 (Filtered) (ng/L)
11,886	0.22
10,508	0.37
12,558	0.05
61,422	0.17
18,118	0.27
11,798	0.17
21,821	0.28
67,875	0.08
51,222	0.67
74,630	1.14
142,070	0.90
61,844	0.10
23,292	0.17
16,581	0.23
21,455	0.29
128,641	0.20
42,166	0.31
12,387	0.24
13,199	0.38
58,530	0.15
18,630	0.23
14,205	0.66
11,553	0.47
68,279	0.14
48,516	0.48
38,871	0.94
13,296	0.91
84,607	0.11
10,852	1.22
13,877	0.77
52,023	0.32
89,266	0.16
19,779	0.48
13,592	1.21
182,244	0.42

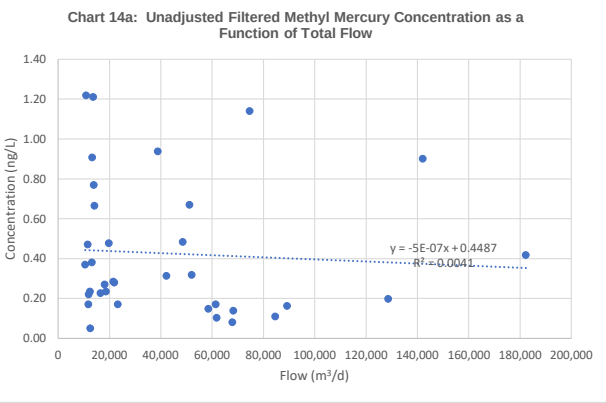


Table 14c: Data for Chart 14b

NGC 5-day Average Flow at NG-001 (m³/d)	NGC-DN-NEF (G-3) Absence of Flow Suppl or PKC Discharge (Filtered) (ng/L)
11,886	0.38
10,508	1.27
12,558	0.01
61,422	0.17
18,118	0.28
11,798	0.68
21,821	0.31
67,875	0.08
51,222	0.68
74,630	1.19
142,070	0.94
61,844	0.11
23,292	0.17
16,581	0.45
21,455	0.33
128,641	0.20
42,166	0.33
12,387	0.81
13,199	1.29
58,530	0.15
18,630	0.45
14,205	0.73
11,553	2.71
68,279	0.14
48,516	0.48
38,871	0.94
13,296	0.91
84,607	0.11
10,852	2.23
13,877	1.34
52,023	0.32
89,266	0.16
19,779	0.78
13,592	2.91
182,244	0.42

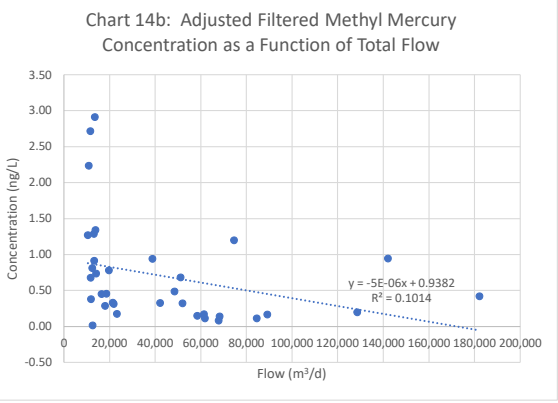


Table 14d: Methyl Mercury as a Function of Natural Flow - July (data for Chart 14c)

Year	Natural Flow (m³/d)	Adjusted NGC-DN-NEF (G-3) (Filtered) (ng/L)
2013	6,677	0.38
2014	17,062	0.28
2015	50,503	0.68
2016	23,292	0.17
2017	42,166	0.33
2018	18,630	0.45
2019	48,516	0.48
2020	10,852	2.23
2021	19,779	0.78

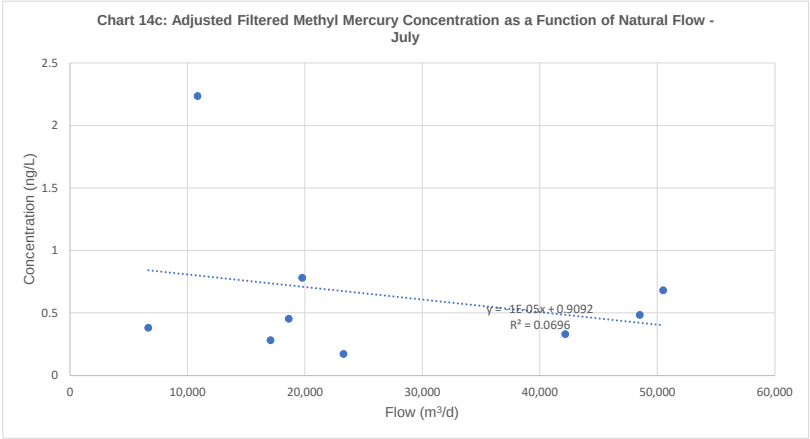


Table 14e: Methyl Mercury as a Function of Natural Flow - August (data for Chart 14d)		
Year	Natural Flow (m³/d)	Adjusted NGC-DN-NEF (G-3) (Filtered) (ng/L)
2013	1,836	1.27
2014	2,413	0.68
2015	69,929	1.19
2016	7,858	0.45
2017	12,387	0.81
2018	14,205	0.73
2019	38,871	0.94
2020	13,877	1.34
2021	13,592	2.91

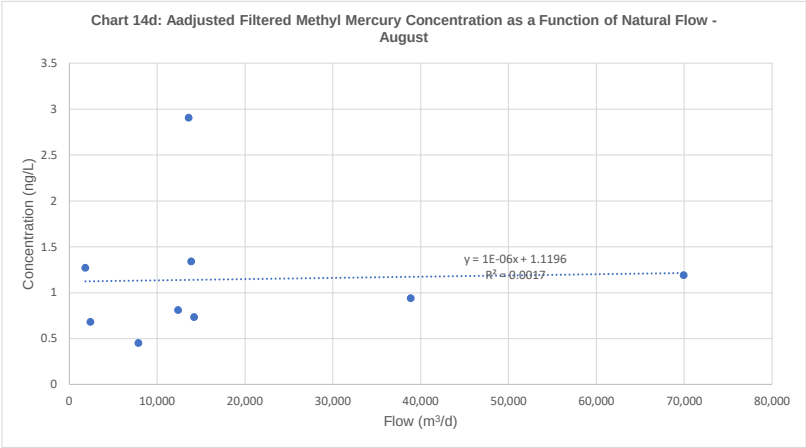


Table 14f: Methyl Mercury as a Function of Natural Flow - September (data for Chart 14e)		
Year	Natural Flow (m³/d)	Adjusted NGC-DN-NEF (G-3) (Filtered) (ng/L)
2013	2,539	0.01
2014	19,231	0.31
2015	131,298	0.94
2016	18,322	0.33
2017	13,199	1.29
2018	11,553	2.71
2019	13,296	0.91
2020	52,023	0.32
2021	182,244	0.42

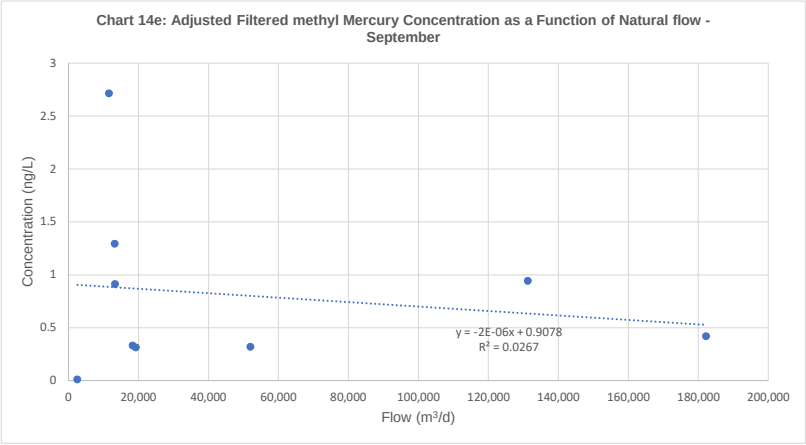


Table 14: North Granny Creek Summer Condition Methyl Mercury Concentrations (concentrations in ng/L)

Year / Date	Flow / Discharge Rates			Water Quality			Calculated Water Quality in the Absence of Supplementation or PKC Discharge (ng/L)
	NGC 5-day Average Flow at NG-001 (m³/d)	NGC 5-day Average Flow Supplementation Rate (m³/d)	Fine PKC Effluent Discharge (m³/d)	NGC-DN-NEF (G-3) (Filtered) (ng/L)	Flow Supplementation Water (A-2) (ng/L - Filtered)	Fine PKC Discharge (CQ) (ng/L - Filtered)	
2013							
1-Jul-13	11,886	5,209	0	0.22	<0.02	-	0.38
5-Aug-13	10,508	8,672	0	0.37	0.18	-	1.27
2-Sep-13	12,558	10,019	0	0.05	0.06	-	0.01
2014							
2-Jun-14	61,422	0	0	0.17	0.04	-	0.17
7-Jul-14	18,118	1,056	0	0.27	0.03	-	0.28
4-Aug-14	11,798	9,385	0	0.17	0.04	-	0.68
1-Sep-14	21,821	2,590	0	0.28	0.05	-	0.31
2015							
1-Jun-15	67,875	0	0	0.08	0.03	-	0.08
3-Jul-15	51,222	719	0	0.67	<0.02	-	0.68
3-Aug-15	74,630	0	4,701	1.14	0.05	0.34	1.19
7-Sep-15	142,070	0	10,772	0.90	0.04	0.38	0.94
2016							
1-Jun-16	61,844	0	4,499	0.10	0.03	0.02	0.11
3-Jul-16	23,292	0	0	0.17	0.03	-	0.17
3-Aug-16	16,581	8,723	0	0.23	0.03	-	0.45
7-Sep-16	21,455	3,133	0	0.29	0.03	-	0.33
2017							
12-Jun-17	128,641	0	0	0.20	0.04	-	0.20
10-Jul-17	42,166	0	2,356	0.31	0.03	0.11	0.33
7-Aug-17	12,387	8,975	0	0.24	0.02	-	0.81
4-Sep-17	13,199	9,371	0	0.38	0.01	-	1.29
2018							
4-Jun-18	58,530	0	0	0.15	0.04	-	0.15
2-Jul-18	18,630	9,650	0	0.23	0.03	-	0.45
6-Aug-18	14,205	1,397	0	0.66	0.05	-	0.73
3-Sep-18	11,553	9,633	0	0.47	<0.02	-	2.71
2019							
11-Jun-19	68,279	0	0	0.14	0.03	-	0.14
15-Jul-19	48,516	0	0	0.48	0.05	-	0.48
7-Aug-19	38,871	0	0	0.94	0.04	-	0.94
5-Sep-19	13,296	34	0	0.91	<0.02	-	0.91
2020							
2-Jun-20	84,607	0	0	0.11	0.03	-	0.11
14-Jul-20	10,852	5,035	0	1.22	0.04	-	2.23
4-Aug-20	13,877	5,999	0	0.77	0.02	-	1.34
15-Sep-20	52,023	0	0	0.32	<0.04	-	0.32
2021							
4-Jun-21	89,266	0	0	0.16	0.02	-	0.16
6-Jul-21	19,779	7,942	0	0.48	0.03	-	0.78
3-Aug-21	13,592	8,005	0	1.21	0.03	-	2.91
7-Sep-21	182,244	0	0	0.42	<0.04	-	0.42
2022							
20-Jun-22	72,107	0	0	0.35	0.09	-	0.35
5-Jul-22	40,260	0	0	0.35	0.10	-	0.35
2-Aug-22	20,848	0	0	0.88	0.07	-	0.88
6-Sep-22	14,985	0	0	0.67	0.11	-	0.67

Table 14b: Data for Chart 14a

NGC 5-day Average Flow at NG-001 (m³/d)	NGC-DN-NEF G-3 (Filtered) (ng/L)
11,886	0.22
10,508	0.37
12,558	0.05
61,422	0.17
18,118	0.27
11,798	0.17
21,821	0.28
67,875	0.08
51,222	0.67
74,630	1.14
142,070	0.90
61,844	0.10
23,292	0.17
16,581	0.23
21,455	0.29
128,641	0.20
42,166	0.31
12,387	0.24
13,199	0.38
58,530	0.15
18,630	0.23
14,205	0.66
11,553	0.47
68,279	0.14
48,516	0.48
38,871	0.94
13,296	0.91
84,607	0.11
10,852	1.22
13,877	0.77
52,023	0.32
89,266	0.16
19,779	0.48
13,592	1.21
182,244	0.42

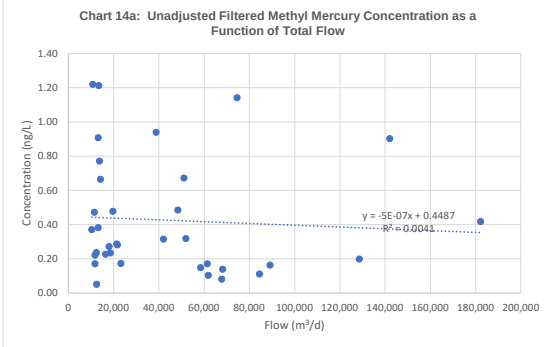


Table 14c: Data for Chart 14b

NGC 5-day Average Flow at NG-001 (m³/d)	NGC-DN-NEF (G-3) Absence of Flow Suppl or PKC Discharge (Filtered) (ng/L)
11,886	0.38
10,508	1.27
12,558	0.01
61,422	0.17
18,118	0.28
11,798	0.68
21,821	0.31
67,875	0.08
51,222	0.68
74,630	1.19
142,070	0.94
61,844	0.11
23,292	0.17
16,581	0.45
21,455	0.33
128,641	0.20
42,166	0.33
12,387	0.81
13,199	1.29
58,530	0.15
18,630	0.45
14,205	0.73
11,553	2.71
68,279	0.14
48,516	0.48
38,871	0.94
13,296	0.91
84,607	0.11
10,852	2.23
13,877	1.34
52,023	0.32
89,266	0.16
19,779	0.78
13,592	2.91
182,244	0.42

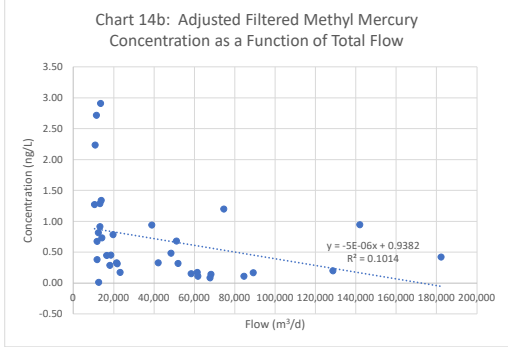


Table 14d: Methyl Mercury as a Function of Natural Flow - July (data for Chart 14c)

Year	Natural Flow (m³/d)	Adjusted NGC-DN-NEF (G-3) (Filtered) (ng/L)
2013	6,677	0.38
2014	17,062	0.28
2015	50,503	0.68
2016	23,292	0.17
2017	42,166	0.33
2018	18,630	0.45
2019	48,516	0.48
2020	10,852	2.23
2021	19,779	0.78

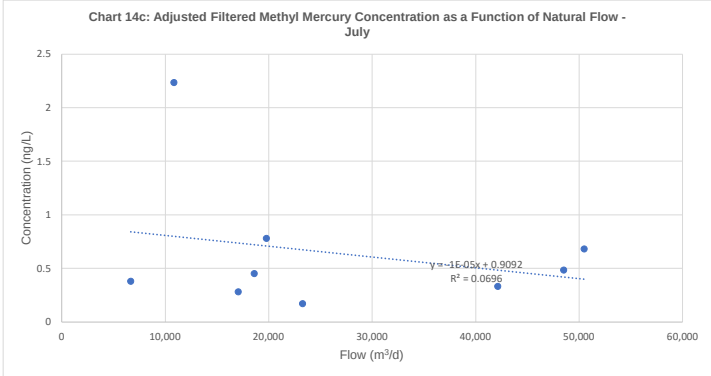


Table 14e: Methyl Mercury as a Function of Natural Flow - August (data for Chart 14d)

Year	Natural Flow (m³/d)	Adjusted NGC-DN-NEF (G-3) (Filtered) (ng/L)
2013	1,836	1.27
2014	2,413	0.68
2015	69,929	1.19
2016	7,858	0.45
2017	12,387	0.81
2018	14,205	0.73
2019	38,871	0.94
2020	13,877	1.34
2021	13,592	2.91

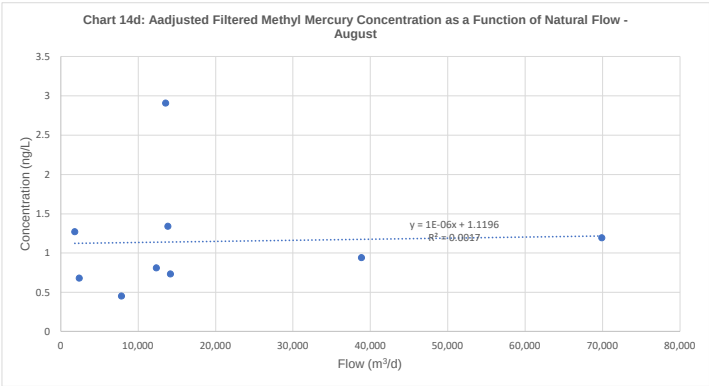


Table 14f: Methyl Mercury as a Function of Natural Flow - September (data for Chart 14e)

Year	Natural Flow (m³/d)	Adjusted NGC-DN-NEF (G-3) (Filtered) (ng/L)
2013	2,539	0.01
2014	19,231	0.31
2015	131,298	0.94
2016	18,322	0.33
2017	13,199	1.29
2018	11,553	2.71
2019	13,296	0.91
2020	52,023	0.32
2021	182,244	0.42

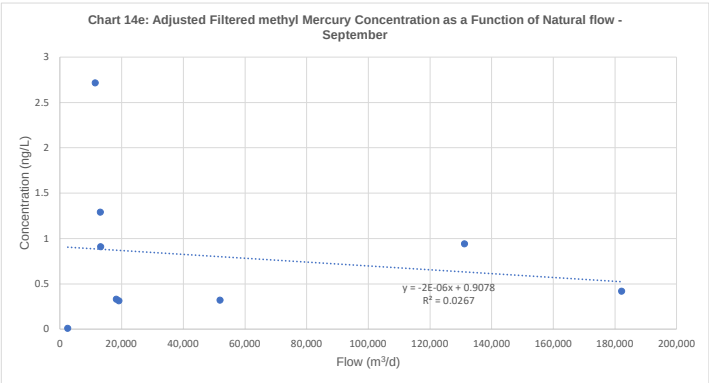


Table 15a: July / October Methyl Mercury Concentrations For Downstream Granny Creek Stations G4, G7 and G8 (Filtered) (concentrations in ng/L)

Station / Year	Month		
	July	Oct	Average
G4			
2008	0.48	0.15	0.32
2009	0.08	0.11	0.10
2010	0.08	0.13	0.11
2011	0.32	0.27	0.30
2012	0.22	0.22	0.22
2013	0.25	0.31	0.28
2014	0.29	0.14	0.22
2015	0.66	0.21	0.44
2016	0.28	0.40	0.34
2017	0.56	0.17	0.36
2018	0.27	0.21	0.24
2019	0.76	0.29	0.52
2020	1.14	0.25	0.69
2021	0.32	0.56	0.44
2022	0.30	0.17	0.23
G7			
2008	0.30	0.06	0.18
2009	0.03	0.23	0.13
2010	1.22	0.15	0.69
2011	0.35	0.24	0.30
2012	0.14	0.30	0.22
2013	0.48	0.24	0.36
2014	1.06	0.11	0.59
2015	0.63	0.29	0.46
2016	0.63	0.48	0.55
2017	1.11	0.21	0.66
2018	0.51	0.21	0.36
2019	1.12	0.59	0.85
2020	2.31	0.42	1.36
2021	0.70	0.71	0.71
2022	0.39	0.20	0.30
G8			
2008	0.32	0.10	0.21
2009	0.18	0.12	0.15
2010	0.83	0.10	0.47
2011	0.06	0.05	0.06
2012	0.18	0.13	0.16
2013	0.02	0.18	0.10
2014	0.04	0.03	0.04
2015	0.04	0.30	0.17
2016	0.38	0.26	0.32
2017	0.46	0.19	0.33
2018	0.43	0.16	0.29
2019	0.71	0.49	0.60
2020	1.38	0.27	0.82
2021	0.48	0.69	0.59
2022	0.38	0.27	0.33

Year	Station July/October Average		
	NGC (G4)	SGC (G7)	GC (G8)
2008	0.32	0.18	0.21
2009	0.10	0.13	0.15
2010	0.11	0.69	0.47
2011	0.30	0.30	0.06
2012	0.22	0.22	0.16
2013	0.28	0.36	0.10
2014	0.22	0.59	0.04
2015	0.44	0.46	0.17
2016	0.34	0.55	0.32
2017	0.36	0.66	0.33
2018	0.24	0.36	0.29
2019	0.52	0.85	0.60
2020	0.69	1.36	0.82
2021	0.44	0.71	0.59
2022	0.23	0.30	0.33

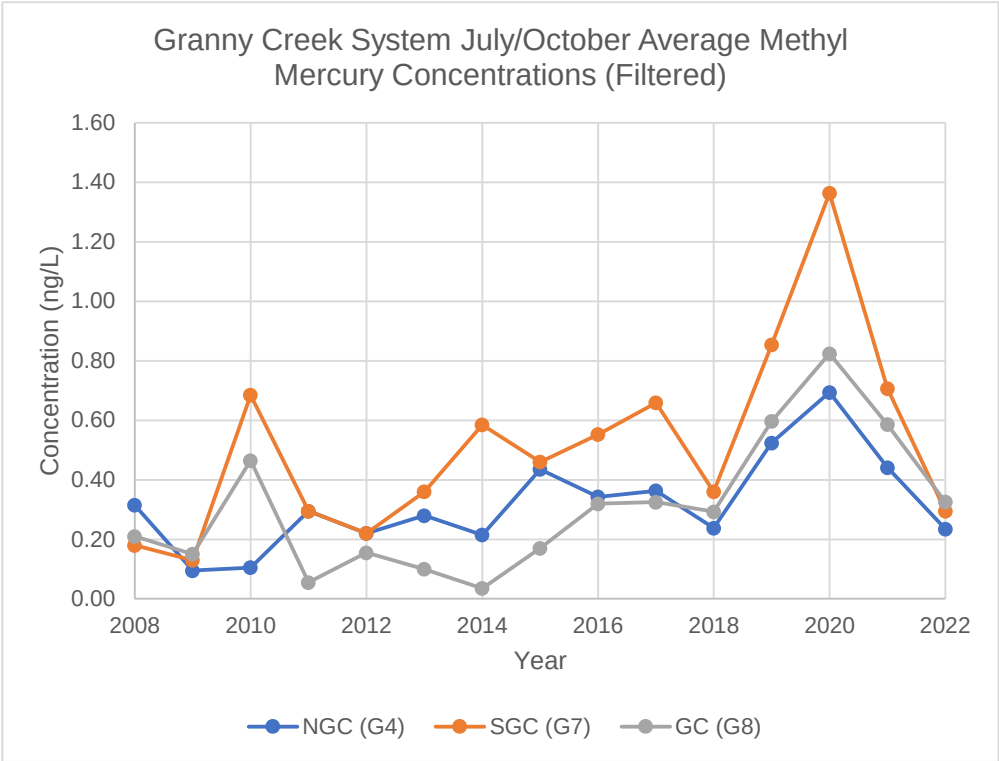


Table 15b: July / October Methyl Mercury Concentrations for Downstream Granny Creek Stations G4, G7 and G8 (Unfiltered) (concentrations in ng/L)

Station / Year	Month		
	July	Oct	Average
G4			
2008	0.52	0.18	0.35
2009	0.02	0.14	0.08
2010	1.13	0.19	0.66
2011	0.48	0.30	0.39
2012	0.28	0.27	0.28
2013	0.28	0.47	0.38
2014	0.36	0.19	0.28
2015	0.73	0.25	0.49
2016	0.40	0.46	0.43
2017	0.73	0.27	0.50
2018	0.31	0.26	0.28
2019	1.01	0.35	0.68
2020	1.26	0.22	0.74
2021	0.46	0.66	0.56
2022	0.38	0.23	0.30
G7			
2008	0.26	0.10	0.18
2009	0.03	0.22	0.13
2010	1.22	0.15	0.68
2011	0.46	0.03	0.25
2012	0.19	0.37	0.28
2013	0.67	0.33	0.50
2014	1.26	0.23	0.75
2015	0.49	0.36	0.43
2016	0.77	0.61	0.69
2017	1.43	0.30	0.86
2018	0.62	0.27	0.45
2019	1.64	0.73	1.19
2020	2.50	0.46	1.48
2021	0.99	0.87	0.93
2022	0.42	0.28	0.35
G8			
2008	0.33	0.14	0.24
2009	0.07	0.12	0.10
2010	1.23	0.14	0.69
2011	0.27	0.18	0.23
2012	0.18	0.13	0.16
2013	0.27	0.27	0.27
2014	0.07	0.04	0.06
2015	0.07	0.33	0.20
2016	0.53	0.30	0.42
2017	0.61	0.29	0.45
2018	0.65	0.23	0.44
2019	0.86	0.58	0.72
2020	1.48	0.24	0.86
2021	0.63	0.89	0.76
2022	0.45	0.29	0.37

Year	Station July/October Average		
	NGC (G4)	SGC (G7)	GC (G8)
2008	0.35	0.18	0.24
2009	0.08	0.13	0.10
2010	0.66	0.68	0.69
2011	0.39	0.25	0.23
2012	0.28	0.28	0.16
2013	0.38	0.50	0.27
2014	0.28	0.75	0.06
2015	0.49	0.43	0.20
2016	0.43	0.69	0.42
2017	0.50	0.86	0.45
2018	0.28	0.45	0.44
2019	0.68	1.19	0.72
2020	0.74	1.48	0.86
2021	0.56	0.93	0.76
2022	0.30	0.35	0.37

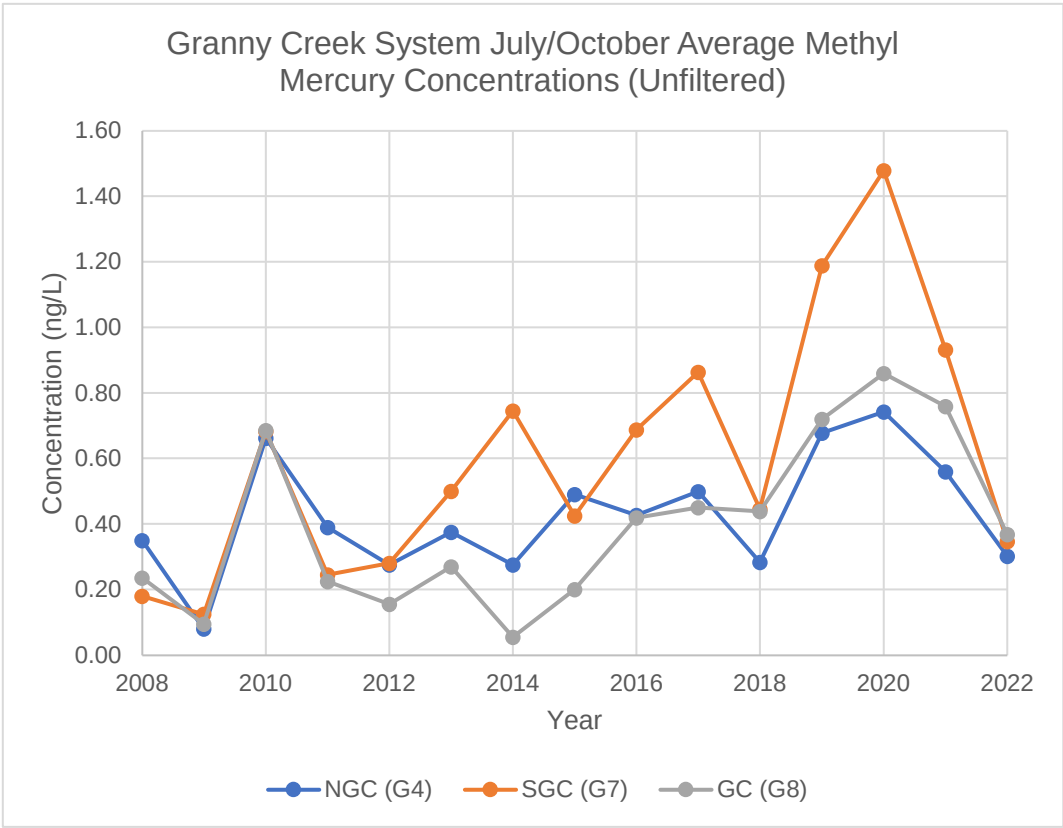


Table 16a: Total Mercury - Nayshkootayaow and Attawapiskat Rivers (Unfiltered) (concentrations in ng/L)

Date	Nayshkootayaow River Upstream N-1 (Naysh Riv UP)	Nayshkootayaow River Middle N-2 (Naysh Riv DN)	Nayshkootayaow River Downstream of NGC SGC Confluence (Naysh DN Conf)	Nayshkootayaow River Downstream N-3 (Naysh Riv UP Att Riv)	Monument Channel (Naysh Riv Control)	Attawapiskat River A-1 (Att Riv UP 2)	Attawapiskat River A-2 (Att Riv UP A2-1)	Attawapiskat River A-5 (Att Riv DN 500)	Attawapiskat River A-3 (Att Riv DN A3-1)	Attawapiskat River A-4 (Att Riv DN Naysh Riv)
CEQG for Protection of Aquatic Life: 26 ng/L										
Feb-08	1.48	1.47	-	5.33	0.81	8.75	2.19	-	10.50	2.20
May-08	4.31	4.58	-	3.30	3.15	3.41	3.64	-	3.64	3.61
Aug-08	1.98	2.14	-	2.28	2.13	1.91	2.32	-	2.09	1.82
Oct-08	2.30	2.31	-	2.53	1.86	1.93	1.25	-	1.72	1.79
Jan-09	1.39	1.19	-	2.00	1.07	1.39	2.09	-	2.35	1.34
Feb-09	-	-	-	-	-	-	2.17	-	1.84	-
Mar-09	-	-	-	-	-	-	1.36	-	1.28	-
Apr-09	-	1.00	-	1.47	0.69	1.36	1.26	-	1.93	1.22
May-09	5.26	-	-	-	-	-	4.17	-	3.19	-
Jun-09	-	-	-	-	-	-	2.81	-	2.57	-
Jul-09	2.80	2.58	-	2.47	2.83	3.58	3.23	-	3.48	3.50
Aug-09	-	-	-	-	-	-	1.69	-	1.79	-
Sep-09	-	-	-	-	-	-	1.56	-	1.56	-
Oct-09	0.80	0.70	-	1.33	1.07	1.58	1.25	-	1.39	1.35
Nov-09	-	-	-	-	-	-	1.07	-	1.13	-
Dec-09	-	-	-	-	-	-	0.81	-	0.96	-
Jan-10	-	-	-	-	-	-	1.20	-	1.52	-
Feb-10	1.39	1.11	-	1.50	1.03	1.76	1.43	-	1.93	1.52
Mar-10	-	-	-	-	-	-	1.67	-	1.80	-
Apr-10	-	-	-	-	1.60	-	2.13	-	2.31	-
May-10	2.54	2.21	-	2.17	-	2.58	2.68	-	2.82	2.77
Jun-10	-	-	-	-	-	-	0.70	-	0.94	-
Jul-10	1.28	1.10	-	1.12	1.10	1.40	1.08	-	0.87	0.90
Aug-10	-	-	-	-	-	-	2.50	-	1.89	-
Sep-10	-	-	-	-	-	-	1.23	-	1.12	-
Oct-10	1.27	1.35	-	1.28	1.30	1.31	1.71	-	1.24	1.26
Nov-10	-	-	-	-	-	-	1.52	-	1.28	-
Dec-10	-	-	-	-	-	-	2.17	-	1.35	-
Jan-11	0.86	0.86	-	0.98	0.74	1.07	1.31	-	1.10	1.05
Feb-11	-	-	-	-	-	-	1.12	-	1.39	-
Mar-11	-	-	-	-	-	-	2.67	-	1.22	-
Apr-11	0.69	0.66	-	1.30	0.68	0.70	2.18	-	0.93	0.77
May-11	-	-	-	-	-	-	3.20	-	3.83	-
Jun-11	-	-	-	-	-	-	1.76	-	1.90	-
Jul-11	1.16	1.46	-	1.67	2.14	1.36	1.42	-	1.43	1.44
Aug-11	-	-	-	-	-	-	1.48	-	1.55	-
Sep-11*	-	-	-	-	-	-	-	-	-	-
Oct-11	1.90	2.53	-	2.09	2.99	-	2.85	-	1.99	1.95
Nov-11	-	-	-	-	-	-	1.79	-	2.09	-
Dec-11	-	-	-	-	-	-	3.51	-	1.23	-
Jan-12	1.53	1.28	-	1.47	0.94	1.27	1.16	-	1.28	1.15
Feb-12	-	-	-	-	-	-	0.85	-	0.88	-
Mar-12	-	-	-	-	-	-	0.73	-	0.75	-
Apr-12	-	-	-	-	-	-	US	-	US	-
May-12	2.22	1.86	-	2.06	2.54	1.80	1.62	-	1.51	1.61
Jun-12	-	-	-	-	-	-	3.59	-	4.00	-
Jul-12	2.00	1.79	-	1.77	2.39	2.27	2.93	-	2.20	2.37
Aug-12	-	-	-	-	-	-	1.76	-	1.51	-
Sep-12	-	-	-	-	-	-	1.43	-	1.88	-
Oct-12	1.82	1.80	-	1.91	2.56	1.30	1.08	-	1.03	1.09
Nov-12	-	-	-	-	-	-	US	-	US	-
Dec-12	-	-	-	-	-	-	2.11	-	2.24	-
Jan-13	2.13	6.63	-	1.47	3.72	1.58	3.14	-	2.63	-
Feb-13	-	-	-	-	-	-	2.00	-	1.89	-
Mar-13	-	-	-	-	-	-	1.24	-	1.36	1.32
Apr-13	0.82	0.88	-	0.78	2.79	1.77	1.09	-	1.01	0.83
May-13	-	-	-	-	-	-	3.11	-	2.43	-
Jun-13	-	-	-	-	-	-	3.06	-	2.48	-
Jul-13	0.77	0.76	-	0.84	0.99	1.04	1.16	0.98	0.95	1.06
Aug-13	-	-	-	-	-	-	1.90	1.48	1.34	-
Sep-13	-	-	-	-	-	-	1.70	1.63	1.60	-
Oct-13	0.96	1.16	-	1.12	1.08	1.08	1.03	1.22	1.21	1.35
Nov-13	-	-	-	-	-	-	1.14	US	0.97	-
Dec-13	-	-	-	-	-	-	0.82	US	0.82	-
Jan-14	-	0.30	-	0.63	<0.1	0.31	0.81	US	0.43	0.55
Feb-14	-	-	-	-	-	-	1.10	US	1.35	-
Mar-14	0.69	-	-	-	-	-	0.87	US	1.09	-
Apr-14	0.98	0.81	-	1.32	0.52	0.82	1.42	US	2.05	2.38
May-14	-	-	-	-	-	-	4.02	4.54	6.34	-
Jun-14	-	-	-	-	-	-	2.69	2.79	2.80	-
Jul-14	1.71	1.81	-	2.07	1.74	2.54	2.59	2.41	2.42	2.84
Aug-14	-	-	-	-	-	-	1.94	2.11	1.58	-
Sep-14	-	-	-	-	-	-	3.00	3.03	2.25	-
Oct-14	2.24	2.75	-	3.62	2.23	4.81	2.01	1.29	1.38	3.28
Nov-14	-	-	-	-	-	-	1.83	US	1.85	-
Dec-14	-	-	-	-	-	-	1.59	US	US	-
Jan-15	-	-	-	-	0.77	-	6.91	US	NA	-
Feb-15	1.03	7.05	-	4.78	-	1.37	1.42	US	1.36	1.16
Mar-15	-	-	-	-	-	-	2.39	US	4.87	-
Apr-15	-	0.66	-	0.68	2.78	1.16	1.54	US	1.88	1.28
May-15	2.24	-	-	-	-	-	2.77	2.48	2.75	-
Jun-15	-	-	-	-	-	-	2.09	1.98	2.40	-
Jul-15	1.66	1.79	-	1.90	-	1.50	1.76	1.74	1.60	1.53
Aug-15	-	-	-	-	-	-	2.43	2.71	2.89	-
Sep-15	-	-	-	-	3.40	-	2.19	2.28	1.81	-
Oct-15	1.61	1.23	-	1.82	-	2.00	2.07	1.98	1.70	1.84
Nov-15	-	-	-	-	1.76	-	2.38	US	2.14	-
Dec-15	-	-	-	-	-	-	US	US	US	-
Jan-16	1.52	1.44	-	2.33	-	1.95	1.78	US	US	3.59
Feb-16	-	-	-	-	1.03	-	1.76	US	1.85	-
Mar-16	-	-	-	-	-	-	1.70	US	1.60	-
Apr-16	1.37	1.45	-	1.38	-	1.83	3.66	US	1.55	2.07
May-16	-	-	-	-	4.05	-	2.09	2.27	2.27	-
Jun-16	-	-	-	-	-	-	2.59	2.92	3.30	-
Jul-16	1.63	1.49	-	1.47	2.15	1.70	1.73	2.00	2.12	1.83
Aug-16	-	-	-	-	-	-	1.46	2.03	1.81	-
Sep-16	-	-	-	-	-	-	2.28	2.33	2.16	-
Oct-16	1.75	1.79	-	1.63	-	2.09	2.47	2.73	2.77	1.86
Nov-16	-	-	-	-	1.64	-	1.76	1.85	2.15	-
Dec-16	-	-	-	-	-	-	US	US	US	-



Table 16a: Total Mercury - Nayshkootayaow and Attawapiskat Rivers (Unfiltered) (concentrations in ng/L)

Date	Nayshkootayaow River Upstream N-1 (Naysh Riv UP)		Nayshkootayaow River Middle N-2 (Naysh Riv DN)		Nayshkootayaow River Downstream of NGC SGC Confluence (Naysh DN Conf)		Nayshkootayaow River Downstream N-3 (Naysh Riv UP Att Riv)		Monument Channel (Naysh Riv Control)		Attawapiskat River A-1 (Att Riv UP 2)		Attawapiskat River A-2 (Att Riv UP A2-1)		Attawapiskat River A-5 (Att Riv DN 500)		Attawapiskat River A-3 (Att Riv DN A3-1)		Attawapiskat River A-4 (Att Riv DN Naysh Riv)	
	CEQG for Protection of Aquatic Life: 26 ng/L																			
Jan-17	US		1.12		-		2.20		-		1.66		US		US		US		1.56	
Feb-17	-		-		-		-		-		-		1.36		US		8.25		-	
Mar-17	US		-		-		-		0.67		-		1.40		US		1.53		-	
Apr-17	-		-		-		-		-		-		US		US		US		-	
May-17	-		-		3.30		-		-		-		US		US		US		-	
Jun-17	3.94		2.44		1.93		3.52		1.82		2.56		2.28		2.34		2.29		2.73	
Jul-17	1.88		1.77		2.19		2.11		-		2.71		1.41		US		1.42		2.16	
Aug-17	-		-		1.67		-		0.99		-		1.02		US		0.98		-	
Sep-17	-		-		0.92		-		-		-		0.85		US		1.03		-	
Oct-17	0.96		0.96		1.12		1.02		-		1.19		2.13		1.23		1.31		12.28	
Nov-17	-		-		0.60		-		0.98		-		0.88		US		1.09		-	
Dec-17	-		-		0.81		-		-		-		0.98		US		1.36		-	
Jan-18	0.81		<0.69		0.83		<0.69		-		1.89		0.84		US		0.85		0.92	
Feb-18	-		-		0.84		-		<0.69		-		1.00		US		1.00		-	
Mar-18	-		-		0.93		-		-		-		0.88		US		1.29		-	
Apr-18	0.84		0.77		0.92		0.80		-		0.90		0.86		US		1.18		0.77	
May-18	-		-		4.10		-		-		-		2.61		1.85		2.86		-	
Jun-18	-		-		1.97		-		1.93		-		1.98		US		1.95		-	
Jul-18	2.23		3.54		1.41		2.76		-		2.96		1.67		US		1.60		2.26	
Aug-18	-		-		1.81		-		-		-		1.59		US		1.56		-	
Sep-18	-		-		0.89		-		3.17		-		0.86		0.94		0.97		-	
Oct-18	-		-		3.13		-		2.30		-		2.79		2.73		2.76		-	
Nov-18	-		-		2.97		-		-		-		2.03		2.03		2.06		-	
Dec-18	1.22		1.18		3.12		1.19		-		1.85		3.03		US		US		1.68	
Jan-19	US				1.32		1.33				5.70		4.25		US		2.02		2.01	
Feb-19			1.19		1.24				0.92				3.83		US		1.96			
Mar-19					1.36								17.79		US		1.94			
Apr-19	1.20		1.16		1.39		1.69				1.81		1.87		US		1.66		1.32	
May-19					5.82				5.65				3.33		3.41		3.39			
Jun-19					2.97								3.17		US		3.21			
Jul-19	2.71		2.81		2.06		2.86				4.53		4.16		3.98		2.08		3.66	
Aug-19					2.50				1.58				2.11		2.00		2.06			
Sep-19					1.44								1.48		1.29		1.46			
Oct-19	2.56		1.88		1.96		2.01		2.07		3.12		1.50		2.55		1.50		2.37	
Nov-19					1.66								1.68		US		1.80			
Dec-19					1.20								US		US		2.02			
Jan-20	1.07		1.07		1.03		1.08		1.10		2.63		2.79		1.72		1.74		1.78	
Feb-20					1.14								1.84		1.76		1.73			
Mar-20					1.04								1.63				1.76			
Apr-20					0.97								1.48		1.39					
May-20					4.46				4.81								7.65			
Jun-20	2.55		2.57		4.17		2.65				3.13		4.41		3.80		2.41		2.92	
Jul-20					4.16								2.53		2.73		2.70			
Aug-20	2.38		1.66		2.31		2.02		1.99		2.20		1.38		1.50		1.43		2.16	
Sep-20					2.02															

Table 16b: Total Mercury - Nayshkootayaow and Attawapiskat Rivers (Filtered) (concentrations in ng/L)

Date	Nayshkootayaow River Upstream N-1 (Naysh Riv UP)	Nayshkootayaow River Middle N-2 (Naysh Riv DN)	Nayshkootayaow River Downstream of NGC SGC Confluence (Naysh DN Conf)	Nayshkootayaow River Downstream N-3 (Naysh Riv UP Att Riv)	Monument Channel (Naysh Riv Control)	Attawapiskat River A-1 (Att Riv UP 2)	Attawapiskat River A-2 (Att Riv UP A2-1)	Attawapiskat River A-5 (Att Riv DN 500(40))	Attawapiskat River A-3 (Att Riv DN A3-1)	Attawapiskat River A-4 (Att Riv DN Naysh Riv)
Feb-08	1.15	1.12	-	2.31	0.69	2.36	2.12	-	1.73	1.97
May-08	2.71	2.71	-	2.35	2.57	2.62	2.58	-	2.80	2.64
Aug-08	1.66	1.71	-	1.89	1.68	1.57	1.53	-	1.53	1.49
Oct-08	1.79	1.79	-	1.90	1.72	1.60	1.24	-	1.39	1.39
Jan-09	0.96	0.99	-	1.99	0.80	1.14	1.58	-	1.49	1.17
Feb-09	-	-	-	-	-	-	-	-	-	-
Mar-09	-	-	-	-	-	-	-	-	-	-
Apr-09	-	0.78	-	0.76	0.67	1.08	1.11	-	1.36	1.06
May-09	2.40	-	-	-	-	-	2.11	-	2.07	-
Jun-09	-	-	-	-	-	-	1.93	-	1.84	-
Jul-09	1.49	1.43	-	1.50	1.75	2.36	1.82	-	2.03	2.34
Aug-09	-	-	-	-	-	-	1.20	-	1.22	-
Sep-09	-	-	-	-	-	-	1.32	-	1.53	-
Oct-09	0.80	0.68	-	0.86	0.80	1.05	1.05	-	1.02	0.94
Nov-09	-	-	-	-	-	-	0.76	-	0.69	-
Dec-09	-	-	-	-	-	-	0.67	-	0.68	-
Jan-10	-	-	-	-	-	-	1.41	-	1.49	-
Feb-10	0.85	0.65	-	1.06	0.50	1.21	1.47	-	1.64	1.49
Mar-10	-	-	-	-	-	-	1.30	-	1.30	-
Apr-10	-	-	-	-	1.05	-	1.45	-	1.58	-
May-10	1.28	1.59	-	1.28	-	1.69	1.77	-	1.29	1.84
Jun-10	-	-	-	-	-	-	0.60	-	0.69	-
Jul-10	0.74	0.74	-	0.73	0.70	0.77	0.72	-	1.55	0.63
Aug-10	-	-	-	-	-	-	1.62	-	1.59	-
Sep-10	-	-	-	-	-	-	0.86	-	0.71	-
Oct-10	1.07	1.08	-	1.10	1.09	1.17	1.24	-	1.27	1.30
Nov-10	-	-	-	-	-	-	1.04	-	1.39	-
Dec-10	-	-	-	-	-	-	0.98	-	0.94	-
Jan-11	0.62	0.59	-	0.62	0.51	0.92	0.98	-	0.89	0.99
Feb-11	-	-	-	-	-	-	0.85	-	0.94	-
Mar-11	-	-	-	-	-	-	1.05	-	0.98	-
Apr-11	0.68	0.46	-	1.12	0.37	0.67	0.78	-	0.73	0.94
May-11	-	-	-	-	-	-	1.99	-	2.06	-
Jun-11	-	-	-	-	-	-	1.18	-	1.21	-
Jul-11	1.15	1.15	-	1.28	0.94	1.28	0.93	-	0.88	0.90
Aug-11	-	-	-	-	-	-	<0.1	-	0.98	-
Sep-11*	-	-	-	-	-	-	-	-	-	-
Oct-11	1.35	1.53	-	1.51	1.72	1.35	1.73	-	1.31	1.33
Nov-11	-	-	-	-	-	-	1.28	-	1.23	-
Dec-11	-	-	-	-	-	-	1.00	-	0.91	-
Jan-12	1.47	0.68	-	0.84	0.43	0.77	0.72	-	0.75	0.73
Feb-12	-	-	-	-	-	-	0.49	-	0.52	-
Mar-12	-	-	-	-	-	-	0.49	-	0.45	-
Apr-12	-	-	-	-	-	-	US	-	US	-
May-12	1.07	1.06	-	1.23	1.49	0.94	0.81	-	0.86	0.87
Jun-12	-	-	-	-	-	-	1.68	-	1.62	-
Jul-12	0.99	0.99	-	1.02	1.46	1.23	1.28	-	1.18	1.03
Aug-12	-	-	-	-	-	-	0.81	-	0.82	-
Sep-12	-	-	-	-	-	-	1.05	-	1.23	-
Oct-12	1.08	0.96	-	1.08	1.57	0.78	0.80	-	0.69	0.66
Nov-12	-	-	-	-	-	-	US	-	US	-
Dec-12	-	-	-	-	-	-	1.26	-	1.20	-
Jan-13	1.58	1.62	-	0.63	1.73	1.24	1.98	-	1.94	-
Feb-13	-	-	-	-	-	-	1.29	-	1.18	-
Mar-13	-	-	-	-	-	-	0.91	-	0.87	0.82
Apr-13	0.40	0.44	-	0.47	0.41	0.63	0.74	-	0.75	0.48
May-13	-	-	-	-	-	-	1.65	-	1.23	-
Jun-13	-	-	-	-	-	-	1.61	-	1.64	-
Jul-13	0.40	0.40	-	0.50	0.40	0.70	0.70	0.6	0.60	0.60
Aug-13	-	-	-	-	-	-	0.82	0.79	0.80	-
Sep-13	-	-	-	-	-	-	1.31	1.28	1.32	-
Oct-13	0.82	0.25	-	0.68	1.07	0.73	0.78	1.03	0.73	0.76
Nov-13	-	-	-	-	-	-	0.10	US	0.71	-
Dec-13	-	-	-	-	-	-	0.59	US	0.78	-
Jan-14	-	0.25	-	0.19	0.15	0.38	0.74	US	0.51	0.45
Feb-14	-	-	-	-	-	-	0.94	US	1.94	-
Mar-14	0.45	-	-	-	-	-	1.30	US	0.95	-
Apr-14	0.40	0.50	-	0.75	0.34	0.70	0.65	US	0.74	0.92
May-14	-	-	-	-	-	-	1.81	2.46	2.11	-
Jun-14	-	1.03	-	1.28	-	-	2.28	1.94	2.42	-
Jul-14	1.15	-	-	-	1.56	1.75	1.68	1.54	1.56	1.73
Aug-14	-	-	-	-	-	-	1.24	1.28	1.16	-
Sep-14	-	-	-	-	-	-	2.26	2.12	1.60	-
Oct-14	1.70	2.18	-	1.56	1.21	2.10	1.22	1.24	1.32	1.98
Nov-14	-	-	-	-	-	-	1.33	US	1.50	-
Dec-14	-	-	-	-	-	-	1.44	US	US	-
Jan-15	-	-	-	-	0.51	-	1.57	US	ND	-
Feb-15	0.59	0.66	-	0.49	-	1.04	0.91	US	1.39	0.94
Mar-15	-	-	-	-	-	-	1.68	US	1.83	-
Apr-15	-	0.46	-	0.44	0.32	0.90	1.00	US	1.06	0.92
May-15	1.73	-	-	-	-	-	1.50	1.99	1.83	-
Jun-15	-	-	-	-	-	-	1.94	1.57	1.93	-
Jul-15	1.49	1.52	-	1.57	-	1.79	1.66	1.66	1.60	1.65
Aug-15	-	-	-	-	-	-	2.45	2.28	2.31	-
Sep-15	-	-	-	-	1.88	-	1.50	1.66	1.45	-
Oct-15	1.16	1.27	-	1.22	-	1.22	1.31	1.24	1.24	1.46
Nov-15	-	-	-	-	0.98	-	1.62	US	1.57	-
Dec-15	-	-	-	-	-	-	US	US	US	-
Jan-16	0.77	0.73	-	0.76	-	1.55	1.60	US	US	1.47
Feb-16	-	-	-	-	0.40	-	1.43	US	1.47	-
Mar-16	-	-	-	-	-	-	1.37	US	1.24	-
Apr-16	0.57	0.56	-	0.51	-	1.25	1.26	US	1.30	1.18
May-16	-	-	-	-	1.70	-	1.32	1.34	1.43	-
Jun-16	-	-	-	-	-	-	1.58	1.74	1.78	-
Jul-16	1.12	1.26	-	1.28	1.04	1.33	1.37	1.48	1.32	1.27
Aug-16	-	-	-	-	-	-	0.92	1.27	1.20	-
Sep-16	-	-	-	-	-	-	1.36	1.49	1.37	-
Oct-16	1.04	1.08	-	1.13	-	1.31	1.46	1.42	1.42	1.37
Nov-16	-	-	-	-	1.08	-	1.08	1.17	1.04	-
Dec-16	-	-	-	-	-	-	US	US	US	-



Table 16b: Total Mercury - Nayshkootayaow and Attawapiskat Rivers (Filtered) (concentrations in ng/L)

Date	Nayshkootayaow River Upstream N-1 (Naysh Riv UP)		Nayshkootayaow River Middle N-2 (Naysh Riv DN)		Nayshkootayaow River Downstream of NGC SGC Confluence (Naysh DN Conf)		Nayshkootayaow River Downstream N-3 (Naysh Riv UP Att Riv)		Monument Channel (Naysh Riv Control)		Attawapiskat River A-1 (Att Riv UP 2)		Attawapiskat River A-2 (Att Riv UP A2-1)		Attawapiskat River A-5 (Att Riv DN 500(40))		Attawapiskat River A-3 (Att Riv DN A3-1)		Attawapiskat River A-4 (Att Riv DN Naysh Riv)	
Jan-17	US		0.67		-		0.84		-		1.22		US		US		US		1.11	
Feb-17	-		-		-		-		-		-		1.18		US		1.48		-	
Mar-17	US		-		-		-		0.26		-		1.15		US		1.22		-	
Apr-17	-		-		-		-		-		-		US		US		US		-	
May-17	-		-		1.81		-		-		-		US		US		US		-	
Jun-17	1.74		1.29		1.18		1.77		1.31		1.56		1.43		1.37		1.42		1.61	
Jul-17	1.29		1.39		1.35		1.39		0.40		1.34		0.92		US		0.97		1.45	
Aug-17	-		-		0.83		-		-		-		0.68		US		0.71		-	
Sep-17	-		-		0.65		-		-		-		0.66		US		0.71		-	
Oct-17	0.77		0.91		0.91		0.87		-		1.04		1.21		1.09		1.24		1.16	
Nov-17	-		-		0.47		-		0.86		-		0.76		US		1.02		-	
Dec-17	-		-		0.37		-		-		-		0.65		US		0.71		-	
Jan-18	<0.69		<0.69		<0.69		<0.69		-		0.79		<0.69		US		0.73		<0.69	
Feb-18	-		-		<0.69		-		<0.69		-		<0.69		US		<0.69		-	
Mar-18	-		-		<0.69		-		-		-		0.80		US		1.05		-	
Apr-18	0.89		0.83		<0.69		<0.69		-		<0.69		0.88		US		<0.69		<0.69	
May-18	-		-		2.45		-		-		-		1.44		1.58		1.79		-	
Jun-18	-		-		1.34		-		1.33		-		1.34		1.33		1.38		-	
Jul-18	1.21		1.25		1.04		1.38		-		0.88		0.98		1.04		0.95		0.86	
Aug-18	-		-		1.33		-		-		-		1.11		1.23		1.06		-	
Sep-18	-		-		0.75		-		2.06		-		0.80		0.73		0.82		-	
Oct-18	-		-		1.48		-		1.63		-		1.49		1.61		1.51		-	
Nov-18	-		-		1.94		-		-		-		1.55		1.39		1.54		-	
Dec-18	0.75		0.75		0.86		0.74		-		1.39		1.58		US		US		1.41	
Jan-19	US				0.80		0.69				1.54		1.66		US		1.54		1.49	
Feb-19			0.73		0.65				0.49				1.41		US		1.48			
Mar-19					0.74								1.41		US		1.49			
Apr-19					0.73		1.10				1.12		1.48		US		1.34		0.84	
May-19	0.62		0.62		2.53				2.51				2.06		2.13		2.08			
Jun-19					1.72								1.93		US		1.96			
Jul-19	1.47		1.64		1.35		1.72				2.80		2.79		2.31		1.39		1.89	
Aug-19					1.88				1.38				1.29		1.34		1.37			
Sep-19					1.16								1.04		1.40		1.18			
Oct-19	1.23		1.20		1.25		1.29		1.57		1.18		1.11		1.06		1.07		1.20	
Nov-19					1.02								1.15		US		1.20			
Dec-19					0.73								US		US		1.62			
Jan-20	0.62		0.56		0.73		0.61		0.57		1.30		1.63		1.51		1.34		1.42	
Feb-20					0.63								1.44		1.43		1.52			
Mar-20					0.46								1.26				1.27			
Apr-20					0.47								1.13		1.10		1.08			
May-20					1.85				2.30								1.79			
Jun-20	1.67		1.66		2.19		1.72				2.02		2.16		2.12		1.76		1.84	
Jul-20					1.50								1.61		1.66		1.63			
Aug-20	1.39		0.99		1.45		1.36		1.17		1.20		0.92		0.98		1.03		1.12	
Sep-20					1.54								2.39		2.28		2.65			
Oct-20</																				

Table 17a: Methyl Mercury - Nayshkootayaow and Attawapiskat Rivers (Unfiltered) (concentrations in ng/L)

Date	Nayshkootayaow River Upstream N-1 (Naysh Riv UP)	Nayshkootayaow River Middle N-2 (Naysh Riv DN)	Nayshkootayaow River Downstream of NGC SGC Confluence (Naysh DN Conf)	Nayshkootayaow River Downstream N-3 (Naysh Riv UP Att Riv)	Monument Channel (Naysh Riv Control)	Attawapiskat River A-1 (Att Riv UP 2)	Attawapiskat River A-2 (Att Riv UP A2-1)	Attawapiskat River A-5 (Att Riv DN 500(40))	Attawapiskat River A-3 (Att Riv DN A3-1)	Attawapiskat River A-4 (Att Riv DN Naysh Riv)
CEQG for Protection of Aquatic Life: 4 ng/L										
Feb-08	0.03	0.03	-	0.09	0.04	0.14	0.03	-	0.20	0.04
May-08	0.04	0.04	-	<0.02	0.08	0.06	0.07	-	0.05	0.04
Aug-08	0.06	0.07	-	0.11	0.14	0.06	0.05	-	0.03	0.04
Oct-08	0.06	0.05	-	0.07	0.06	0.04	0.02	-	0.03	0.02
Jan-09	0.03	0.02	-	0.04	0.05	0.02	0.04	-	0.03	0.02
Feb-09	-	-	-	-	-	-	-	-	-	-
Mar-09	-	-	-	-	-	-	-	-	-	-
Apr-09	-	0.03	-	0.02	0.02	0.03	0.02	-	<0.02	0.03
May-09	0.03	-	-	-	-	-	0.02	-	0.02	-
Jun-09	-	-	-	-	-	-	0.10	-	0.07	-
Jul-09	0.05	0.05	-	0.03	0.03	0.04	0.04	-	0.10	0.02
Aug-09	-	-	-	-	-	-	-	-	-	-
Sep-09	-	-	-	-	-	-	-	-	-	-
Oct-09	0.06	0.05	-	0.05	0.10	0.09	0.06	-	0.05	0.10
Nov-09	-	-	-	-	-	-	0.04	-	0.05	-
Dec-09	-	-	-	-	-	-	0.08	-	0.10	-
Jan-10	-	-	-	-	-	-	0.09	-	0.08	-
Feb-10	0.20	0.04	-	0.03	0.02	0.04	0.05	-	0.07	0.03
Mar-10	-	-	-	-	-	-	0.06	-	0.03	-
Apr-10	-	-	-	-	0.07	-	0.06	-	0.06	-
May-10	0.05	<0.02	-	0.05	-	<0.02	<0.02	-	0.05	<0.02
Jun-10	-	-	-	-	-	-	0.08	-	0.05	-
Jul-10	<0.02	0.10	-	0.11	0.14	0.15	0.04	-	0.12	0.09
Aug-10	-	-	-	-	-	-	0.08	-	0.07	-
Sep-10	-	-	-	-	-	-	0.04	-	0.04	-
Oct-10	0.04	0.05	-	0.05	0.14	0.03	0.03	-	0.04	0.03
Nov-10	-	-	-	-	-	-	0.07	-	0.04	-
Dec-10	-	-	-	-	-	-	<0.02	-	0.04	-
Jan-11	0.03	0.03	-	<0.02	0.05	0.04	0.04	-	0.03	0.04
Feb-11	-	-	-	-	-	-	<0.02	-	<0.02	-
Mar-11	-	-	-	-	-	-	0.03	-	<0.02	-
Apr-11	-	-	-	-	-	-	0.06	-	0.03	-
May-11	-	-	-	-	-	-	0.07	-	0.05	-
Jun-11	-	-	-	-	-	-	0.03	-	0.03	-
Jul-11	0.07	0.06	-	0.08	0.13	0.05	0.05	-	0.05	0.03
Aug-11	-	-	-	-	-	-	0.07	-	0.07	-
Sep-11*	-	-	-	-	-	-	-	-	-	-
Oct-11	0.27	0.08	-	0.08	0.12	-	0.10	-	0.07	0.04
Nov-11	-	-	-	-	-	-	0.07	-	0.06	-
Dec-11	-	-	-	-	-	-	0.07	-	0.04	-
Jan-12	0.08	0.09	-	0.06	0.12	0.06	0.06	-	0.08	0.06
Feb-12	-	-	-	-	-	-	0.06	-	<0.02	-
Mar-12	-	-	-	-	-	-	0.03	-	0.03	-
Apr-12	-	-	-	-	-	-	US	-	US	-
May-12	0.05	0.05	-	0.05	0.10	0.07	0.06	-	0.06	0.04
Jun-12	-	-	-	-	-	-	<0.02	-	0.08	-
Jul-12	0.07	0.07	-	0.08	0.17	0.06	0.07	-	0.04	0.06
Aug-12	-	-	-	-	-	-	0.05	-	0.03	-
Sep-12	-	-	-	-	-	-	0.04	-	0.04	-
Oct-12	0.03	0.04	-	0.06	0.07	<0.02	0.02	-	<0.02	0.04
Nov-12	-	-	-	-	-	-	US	-	US	-
Dec-12	-	-	-	-	-	-	0.05	-	0.05	-
Jan-13	<0.02	0.03	-	<0.02	0.10	<0.02	0.04	-	0.04	-
Feb-13	-	-	-	-	-	-	0.04	-	0.04	-
Mar-13	-	-	-	-	-	-	0.03	-	0.04	-
Apr-13	0.04	0.03	-	0.03	0.09	0.05	0.08	-	0.03	0.04
May-13	-	-	-	-	-	-	0.04	-	0.09	0.02
Jun-13	-	-	-	-	-	-	0.07	-	0.06	-
Jul-13	0.02	<0.02	-	0.04	0.03	<0.02	0.04	0.05	0.02	0.08
Aug-13	-	-	-	-	-	-	0.05	0.06	0.07	-
Sep-13	-	-	-	-	-	-	0.07	0.05	0.05	-
Oct-13	0.18	0.08	-	0.05	0.11	0.04	0.04	<0.02	0.02	0.02
Nov-13	-	-	-	-	-	-	0.03	US	0.04	-
Dec-13	-	-	-	-	-	-	<0.02	US	<0.02	-
Jan-14	-	<0.02	-	0.04	0.05	<0.02	0.03	US	<0.02	0.04
Feb-14	-	-	-	-	-	-	0.03	US	0.05	-
Mar-14	0.03	-	-	-	-	-	0.02	US	0.03	-
Apr-14	0.04	<0.02	-	0.03	0.05	0.03	0.02	US	0.05	0.04
May-14	-	-	-	-	-	-	0.06	0.09	0.06	-
Jun-14	-	-	-	-	-	-	0.06	0.06	0.08	-
Jul-14	0.07	0.07	-	0.09	0.18	0.06	0.06	0.09	0.05	0.07
Aug-14	-	-	-	-	-	-	0.06	0.05	0.06	-
Sep-14	-	-	-	-	-	-	0.09	0.08	0.05	-
Oct-14	0.07	0.04	-	0.08	0.08	0.05	0.05	0.10	0.06	0.05
Nov-14	-	-	-	-	-	-	0.04	US	0.04	-
Dec-14	-	-	-	-	-	-	0.05	US	US	-
Jan-15	-	-	-	-	0.05	-	0.05	US	ND	-
Feb-15	0.07	0.14	-	0.19	-	0.05	0.04	US	0.08	0.05
Mar-15	-	-	-	-	-	-	0.05	US	0.09	-
Apr-15	-	0.03	-	0.03	0.04	0.03	0.04	US	0.03	0.03
May-15	0.04	-	-	-	-	-	0.04	0.05	0.03	-
Jun-15	-	-	-	-	-	-	0.04	0.03	0.04	-
Jul-15	0.07	0.07	-	0.08	-	0.07	0.06	0.06	0.06	0.07
Aug-15	-	-	-	-	-	-	0.06	0.07	0.06	-
Sep-15	-	-	-	-	0.10	-	0.09	0.06	0.04	-
Oct-15	0.03	0.03	-	0.06	-	0.03	0.20	0.02	0.03	0.03
Nov-15	-	-	-	-	0.08	-	0.05	US	0.03	-
Dec-15	-	-	-	-	-	-	US	US	US	-
Jan-16	0.04	0.03	-	0.06	-	0.04	0.26	US	US	0.06
Feb-16	-	-	-	-	0.05	-	0.04	US	0.03	-
Mar-16	-	-	-	-	-	-	0.04	US	0.04	-
Apr-16	0.04	0.03	-	0.04	-	0.04	0.08	US	0.04	0.04
May-16	-	-	-	-	0.07	-	0.03	0.03	0.02	-
Jun-16	-	-	-	-	-	-	0.04	0.04	0.06	-
Jul-16	0.06	0.05	-	0.07	<0.02	0.05	0.04	0.04	0.07	0.05
Aug-16	-	-	-	-	-	-	0.04	0.03	0.04	-
Sep-16	-	-	-	-	-	-	0.03	0.05	0.04	-
Oct-16	0.04	0.05	-	0.04	-	0.04	0.04	0.05	0.04	0.04
Nov-16	-	-	-	-	0.06	-	0.05	0.04	0.04	-
Dec-16	-	-	-	-	-	-	US	US	US	-



Table 17a: Methyl Mercury - Nayshkootayaow and Attawapiskat Rivers (Unfiltered) (concentrations in ng/L)

Date	Nayshkootayaow River Upstream N-1 (Naysh Riv UP)		Nayshkootayaow River Middle N-2 (Naysh Riv DN)		Nayshkootayaow River Downstream of NGC SGC Confluence (Naysh DN Conf)		Nayshkootayaow River Downstream N-3 (Naysh Riv UP Att Riv)		Monument Channel (Naysh Riv Control)		Attawapiskat River A-1 (Att Riv UP 2)		Attawapiskat River A-2 (Att Riv UP A2-1)		Attawapiskat River A-5 (Att Riv DN 500(40))		Attawapiskat River A-3 (Att Riv DN A3-1)		Attawapiskat River A-4 (Att Riv DN Naysh Riv)		
	CEQG for Protection of Aquatic Life: 4 ng/L																				
Jan-17	US		0.03		-		-		0.05		-		0.03		US		US		US		0.02
Feb-17	-		-		-		-		-		-		-		0.03		US		0.19		-
Mar-17	US		-		-		-		-		0.06		-		0.03		US		0.03		-
Apr-17	-		-		-		-		-		-		-		US		US		US		-
May-17	-		-		-		0.07		-		-		-		US		US		US		-
Jun-17	0.09		0.07		0.07		0.07		0.10		0.15		0.07		0.04		0.05		0.04		0.04
Jul-17	0.18		0.06		0.11		0.11		0.10		-		0.07		0.03		US		0.03		0.07
Aug-17	-		-		0.08		-		-		0.08		-		0.02		US		0.02		-
Sep-17	-		-		0.19		-		-		-		-		0.03		US		0.02		-
Oct-17	0.04		0.05		0.15		0.06		0.06		-		0.04		0.03		0.03		0.03		0.03
Nov-17	-		-		0.05		-		-		0.08		-		0.05		US		0.02		-
Dec-17	-		-		0.04		-		-		-		-		0.03		US		0.04		-
Jan-18	0.04		0.04		0.05		0.06		0.06		-		0.86		0.03		US		0.04		0.02
Feb-18	-		-		0.05		-		-		0.06		-		0.03		US		0.03		-
Mar-18	-		-		0.04		-		-		-		-		0.03		US		0.03		-
Apr-18	0.05		0.06		0.05		0.04		0.04		-		0.02		0.03		US		0.02		0.04
May-18	-		-		0.07		-		-		-		-		0.06		0.03		0.03		-
Jun-18	-		-		0.06		-		-		0.13		-		0.05		0.05		0.05		-
Jul-18	0.24		0.08		0.10		0.11		0.11		-		0.16		0.06		0.06		0.06		0.14
Aug-18	-		-		0.10		-		-		-		-		0.14		0.05		0.05		-
Sep-18	-		-		0.08		-		-		0.16		-		0.04		0.04		0.03		-
Oct-18	-		-		0.06		-		-		0.10		-		0.06		0.06		0.04		-
Nov-18	-		-		0.09		-		-		-		-		0.05		0.04		0.03		-
Dec-18	0.04		0.04		0.09		0.07		0.07		-		0.04		0.07		US		US		0.04
Jan-19	US				0.05		0.05		0.05				0.18		0.09		US		0.04		0.02
Feb-19			0.04		0.04						0.05				0.07		US		0.04		
Mar-19					0.03										0.25		US		0.03		
Apr-19	0.05		0.04		0.06		0.10		0.10				0.05		0.04		US		0.03		0.04
May-19					0.05						0.10				0.05		0.04		0.04		
Jun-19					0.07										0.05		US		0.05		
Jul-19	0.07		0.07		0.12		0.10		0.10				0.09		0.07		0.05		0.09		0.10
Aug-19					0.21						0.13				0.06		0.05		0.06		
Sep-19					0.13										0.03		0.05		0.03		
Oct-19	0.05		0.08		0.07		0.07		0.07		0.07		0.04		0.03		0.03		0.03		0.06
Nov-19					0.05										0.04		US		0.03		
Dec-19					0.05										US		US		0.04		
Jan-20	0.03		0.03		0.04		0.03		0.03		0.07		0.06		0.05		0.04		0.04		0.05
Feb-20					0.04										0.05		0.07		0.03		
Mar-20					0.05										0.04				0.04		
Apr-20					0.05										0.04		0.03		0.03		
May-20					0.10						0.12								0.12		
Jun-20	0.05		0.06		0.07		0.08		0.08				0.07		0.07		0.07		0.07		0.06
Jul-20					0.15										0.05		0.05		0.05		
Aug-20	0.13		0.09		0.20		0.14		0.14		0.13		0.07		0.04		0.05		0.04		0.06
Sep-20					0.06										0.11		0.06		0.05		
Oct-20	0.06		0.04		0.07		0.10		0.08		0.08		0.05		0.05		0.04		0.04		0.10
Nov-20					0.07																
Dec-20					0.14														0.10		
Jan-21					0.08										0.12		0.07		0.04		
Feb-21					0.19										0.08		0.06		0.07		
Mar-21	0.07		0.07		0.07		0.12		0.12		0.17		0.07		0.06		0.06		0.09		0.08
Apr-21																					
May-21					0.08										0.08		0.09		0.09		
Jun-21	0.05		0.12		0.14		0.09		0.09		0.14		0.07		0.10		0.08		0.08		0.10
Jul-21					0.12										0.05		0.05		0.04		
Aug-21	0.09		0.08		0.19		0.15		0.20		0.20		0.06		0.08		0.07		0.02		0.16
Sep-21					0.14										0.06		0.06		0.04		
Oct-21	0.16		0.13		0.13		0.11		0.11				0.06		0.07		0.05		0.12		0.08
Nov-21					0.07						0.16				0.09		0.04		0.05		
Dec-21																			0.04		
Jan-22					0.04										0.12		0.04		0.04		
Feb-22	0.04		0.05				0.66		0.66				0.04		0.11		0.04		0.03		0.03
Mar-22					0.04						0.05				0.04		0.04		0.04		
Apr-22					0.07										<0.03		<0.03		0.05		
May-22					0.11																
Jun-22	0.06		0.07		0.08		0.07		0.07		0.10		0.06		0.07		0.07		0.04		0.05
Jul-22	0.05		0.06		0.07		0.06		0.06				0.06		0.07		0.07		0.07		0.06
Aug-22					0.17						0.26				0.14		0.08		0.10		
Sep-22					0.09										0.07		0.05		0.05		
Oct-22	0.04		0.08		0.07		0.08		0.08		0.08		0.07		0.09		0.06		0.04		0.06
Nov-22					0.05										0.04		0.03		0.04		
Dec-22																					

Table 17b: Methyl Mercury - Nayshkootayaow and Attawapiskat Rivers (Filtered) (concentrations in ng/L)

Date	Nayshkootayaow River Upstream N-1 (Naysh Riv UP)	Nayshkootayaow River Middle N-2 (Naysh Riv DN)	Nayshkootayaow River Downstream of NGC SGC Confluence (Naysh DN Conf)	Nayshkootayaow River Downstream N-3 (Naysh Riv UP Att Riv)	Monument Channel (Naysh Riv Control)	Attawapiskat River A-1 (Att Riv UP 2)	Attawapiskat River A-2 (Att Riv UP A2-1)	Attawapiskat River A-5 (Att Riv DN 500(40))	Attawapiskat River A-3 (Att Riv DN A3-1)	Attawapiskat River A-4 (Att Riv DN Naysh Riv)
Draft USEPA Criteria: 0.05 ng/L										
Feb-08	0.03	0.02	-	0.03	0.03	0.04	0.05	-	0.03	0.04
May-08	<0.02	0.03	-	0.02	0.06	<0.02	0.03	-	0.02	0.03
Aug-08	0.05	0.05	-	0.06	0.10	0.04	0.02	-	0.03	0.03
Oct-08	0.03	0.02	-	0.03	0.04	0.03	0.02	-	0.02	0.02
Jan-09	0.03	0.03	-	0.03	0.02	0.02	0.02	-	0.02	0.02
Feb-09	-	-	-	-	-	-	-	-	-	-
Mar-09	-	-	-	-	-	-	-	-	-	-
Apr-09	-	<0.02	-	<0.02	<0.02	0.02	0.02	-	0.03	<0.02
May-09	0.09	-	-	-	-	-	0.03	-	0.03	-
Jun-09	-	-	-	-	-	-	0.03	-	0.03	-
Jul-09	0.04	0.10	-	0.11	0.07	0.15	0.03	-	0.02	0.03
Aug-09	-	-	-	-	-	-	0.05	-	0.03	-
Sep-09	-	-	-	-	-	-	-	-	-	-
Oct-09	0.07	0.04	-	0.06	0.04	0.04	0.05	-	0.06	0.07
Nov-09	-	-	-	-	-	-	0.03	-	0.15	-
Dec-09	-	-	-	-	-	-	0.08	-	0.09	-
Jan-10	-	-	-	-	-	-	<0.02	-	0.04	-
Feb-10	<0.02	0.05	-	0.09	0.03	0.04	0.07	-	0.05	0.04
Mar-10	-	-	-	-	-	-	0.05	-	0.03	-
Apr-10	-	-	-	-	0.05	-	0.04	-	0.03	-
May-10	0.04	0.12	-	0.04	-	0.05	0.03	-	0.04	0.05
Jun-10	-	-	-	-	-	-	<0.02	-	<0.02	-
Jul-10	0.05	0.06	-	0.03	0.07	<0.02	0.03	-	0.04	0.04
Aug-10	-	-	-	-	-	-	0.04	-	0.05	-
Sep-10	-	-	-	-	-	-	0.03	-	<0.02	-
Oct-10	0.05	0.04	-	0.05	0.10	0.04	0.03	-	0.04	0.03
Nov-10	-	-	-	-	-	-	0.02	-	<0.02	-
Dec-10	-	-	-	-	-	-	0.04	-	0.02	-
Jan-11	<0.02	<0.02	-	<0.02	0.03	0.02	<0.02	-	0.02	<0.02
Feb-11	-	-	-	-	-	-	<0.02	-	<0.02	-
Mar-11	-	-	-	-	-	-	<0.02	-	<0.02	-
Apr-11	-	-	-	-	-	-	<0.02	-	<0.02	-
May-11	-	-	-	-	-	-	0.02	-	<0.02	-
Jun-11	-	-	-	-	-	-	<0.02	-	0.02	-
Jul-11	0.04	0.05	-	0.05	0.03	0.02	0.02	-	0.02	0.03
Aug-11	-	-	-	-	-	-	0.07	-	0.07	-
Sep-11*	-	-	-	-	-	-	-	-	-	-
Oct-11	0.06	0.06	-	0.07	0.11	0.05	0.06	-	0.04	0.04
Nov-11	-	-	-	-	-	-	0.04	-	0.04	-
Dec-11	-	-	-	-	-	-	<0.02	-	0.03	-
Jan-12	<0.02	0.02	-	0.04	0.08	<0.02	0.04	-	0.05	0.02
Feb-12	-	-	-	-	-	-	0.05	-	<0.02	-
Mar-12	-	-	-	-	-	-	<0.02	-	0.03	-
Apr-12	-	-	-	-	-	-	US	-	US	-
May-12	0.04	0.02	-	0.04	0.08	0.03	0.04	-	0.02	0.02
Jun-12	-	-	-	-	-	-	<0.02	-	0.04	-
Jul-12	0.04	0.05	-	0.05	0.09	0.03	0.05	-	0.02	0.02
Aug-12	-	-	-	-	-	-	0.04	-	0.03	-
Sep-12	-	-	-	-	-	-	0.03	-	0.03	-
Oct-12	0.02	0.02	-	0.04	0.04	<0.02	0.03	-	<0.02	<0.02
Nov-12	-	-	-	-	-	-	US	-	US	-
Dec-12	-	-	-	-	-	-	0.06	-	0.04	-
Jan-13	0.06	0.04	-	0.02	0.02	<0.02	0.03	-	0.03	-
Feb-13	-	-	-	-	-	-	0.04	-	0.02	-
Mar-13	-	-	-	-	-	-	<0.02	-	<0.02	<0.02
Apr-13	<0.02	<0.02	-	<0.02	0.04	0.02	0.04	-	<0.02	<0.02
May-13	-	-	-	-	-	-	0.03	-	0.04	-
Jun-13	-	-	-	-	-	-	<0.02	-	0.03	-
Jul-13	<0.02	<0.02	-	0.04	<0.02	<0.02	<0.02	0.03	0.02	<0.02
Aug-13	-	-	-	-	-	-	0.18	<0.02	<0.02	-
Sep-13	-	-	-	-	-	-	0.06	0.02	0.04	-
Oct-13	0.03	0.05	-	0.04	0.04	<0.02	0.04	<0.02	<0.02	<0.02
Nov-13	-	-	-	-	-	-	<0.02	US	<0.02	-
Dec-13	-	-	-	-	-	-	<0.02	US	<0.02	-
Jan-14	-	0.03	-	0.04	0.03	0.03	0.03	US	<0.02	<0.02
Feb-14	-	-	-	-	-	-	<0.02	US	<0.02	-
Mar-14	0.02	-	-	-	-	-	<0.02	US	<0.02	-
Apr-14	0.02	0.02	-	0.03	<0.02	0.02	<0.02	US	0.02	<0.02
May-14	-	-	-	-	-	-	0.03	0.03	0.03	-
Jun-14	-	-	-	-	-	-	0.04	0.04	0.04	-
Jul-14	<0.02	0.03	-	0.07	0.11	0.04	0.03	0.03	0.03	0.03
Aug-14	-	-	-	-	-	-	0.04	0.03	0.03	-
Sep-14	-	-	-	-	-	-	0.05	0.05	0.03	-
Oct-14	0.03	0.03	-	0.03	0.04	0.04	0.03	0.02	<0.02	<0.02
Nov-14	-	-	-	-	-	-	0.03	US	0.03	-
Dec-14	-	-	-	-	-	-	0.04	US	US	-
Jan-15	-	-	-	-	0.04	-	0.03	US	ND	-
Feb-15	0.04	0.04	-	0.03	-	0.05	0.03	US	0.03	0.05
Mar-15	-	-	-	-	-	-	0.05	US	0.04	-
Apr-15	-	<0.02	-	0.03	<0.02	0.04	<0.02	US	0.03	0.02
May-15	0.02	-	-	-	-	-	0.03	0.02	0.03	-
Jun-15	-	-	-	-	-	-	0.03	0.02	0.05	-
Jul-15	0.02	0.03	-	0.05	-	0.06	<0.02	0.02	<0.02	<0.02
Aug-15	-	-	-	-	-	-	0.05	0.05	0.04	-
Sep-15	-	-	-	-	0.07	-	0.04	0.04	0.04	-
Oct-15	0.04	0.04	-	0.05	-	0.03	0.06	0.03	0.03	0.02
Nov-15	-	-	-	-	0.05	-	0.03	US	0.03	-
Dec-15	-	-	-	-	-	-	US	US	US	-
Jan-16	0.03	0.03	-	0.04	-	0.03	0.04	US	US	0.03
Feb-16	-	-	-	-	<0.02	-	0.03	US	0.03	-
Mar-16	-	-	-	-	-	-	0.03	US	0.03	-
Apr-16	0.03	<0.02	-	<0.02	-	0.02	<0.02	US	0.02	<0.02
May-16	-	-	-	-	0.04	-	0.03	0.02	0.03	-
Jun-16	-	-	-	-	-	-	0.03	0.04	0.03	-
Jul-16	0.03	0.03	-	0.05	<0.02	0.03	0.03	0.02	0.03	0.03
Aug-16	-	-	-	-	-	-	0.03	0.02	0.03	-
Sep-16	-	-	-	-	-	-	0.03	0.03	0.03	-
Oct-16	0.02	0.03	-	0.04	-	0.03	0.03	0.03	0.02	0.03
Nov-16	-	-	-	-	0.05	-	0.03	<0.02	0.03	-
Dec-16	-	-	-	-	-	-	US	US	US	-



Table 17b: Methyl Mercury - Nayshkootayaow and Attawapiskat Rivers (Filtered) (concentrations in ng/L)

Date	Nayshkootayaow River Upstream N-1 (Naysh Riv UP)		Nayshkootayaow River Middle N-2 (Naysh Riv DN)		Nayshkootayaow River Downstream of NGC SGC Confluence (Naysh DN Conf)		Nayshkootayaow River Downstream N-3 (Naysh Riv UP Att Riv)		Monument Channel (Naysh Riv Control)		Attawapiskat River A-1 (Att Riv UP 2)		Attawapiskat River A-2 (Att Riv UP A2-1)		Attawapiskat River A-5 (Att Riv DN 500(40))		Attawapiskat River A-3 (Att Riv DN A3-1)		Attawapiskat River A-4 (Att Riv DN Naysh Riv)	
	Draft USEPA Criteria: 0.05 ng/L																			
Jan-17	US		<0.02		-		0.03		-		<0.02		US		US		US		<0.02	
Feb-17	-		-		-		-		-		-		0.03		US		0.03		-	
Mar-17	US		-		-		-		<0.02		-		<0.02		US		0.03		-	
Apr-17	-		-		-		-		-		-		US		US		US		-	
May-17	-		-		0.03		-		-		-		US		US		US		-	
Jun-17	0.05		0.03		0.04		0.06		0.08		0.04		0.03		0.02		0.03		0.03	
Jul-17	0.05		0.04		0.08		0.07		-		0.03		0.03		US		0.02		0.03	
Aug-17	-		-		0.03		-		0.04		-		<0.02		US		<0.02		-	
Sep-17	-		-		0.12		-		-		-		<0.02		US		<0.02		-	
Oct-17	0.03		0.04		0.06		0.06		-		0.03		<0.02		<0.02		0.02		<0.02	
Nov-17	-		-		0.04		-		0.05		-		0.03		US		<0.02		-	
Dec-17	-		-		0.04		-		-		-		<0.02		US		0.03		-	
Jan-18	0.04		0.03		0.04		0.03		-		0.47		0.02		US		0.02		<0.02	
Feb-18	-		-		0.03		-		0.03		-		0.02		US		0.02		-	
Mar-18	-		-		0.03		-		-		-		0.03		US		<0.02		-	
Apr-18	<0.02		0.05		0.04		0.03		-		<0.02		<0.02		US		<0.02		<0.02	
May-18	-		-		0.03		-		-		-		0.03		0.03		0.02		-	
Jun-18	-		-		0.04		-		0.08		-		0.04		0.03		0.05		-	
Jul-18	0.12		0.05		0.08		0.08		-		0.04		0.03		0.03		0.03		0.05	
Aug-18	-		-		0.05		-		-		-		0.05		<0.02		0.04		-	
Sep-18	-		-		0.06		-		0.07		-		<0.02		<0.02		<0.02		-	
Oct-18	-		-		<0.02		-		0.06		-		<0.02		0.03		<0.02		-	
Nov-18	-		-		0.08		-		-		-		0.05		<0.02		<0.02		-	
Dec-18	0.03		0.02		0.03		0.03		-		0.03		0.04		US		US		0.03	
Jan-19	US				0.04		0.03				0.04		0.04		US		0.04		0.03	
Feb-19			0.03		0.03				<0.02				0.04		US		0.05			
Mar-19					0.03								<0.02		US		0.03			
Apr-19	<0.02		<0.02		0.03		0.06				<0.02		0.04		US		0.03		0.04	
May-19					0.03				0.03				0.03		0.03		0.03			
Jun-19					0.05								0.03		US		0.03			
Jul-19	0.06		0.05		0.10		0.08				0.05		0.05		0.05		0.05		0.07	
Aug-19					0.14				0.09				0.04		0.04		0.04			
Sep-19					0.09								<0.02		<0.02		<0.02			
Oct-19	0.04		0.05		0.05		0.05		0.04		0.03		<0.02		0.03		<0.02		0.04	
Nov-19					0.03								<0.02		US		<0.02			
Dec-19					0.03								US		US		0.03			
Jan-20	0.03		0.03		< 0.02		0.04		0.04		0.04		0.03		0.03		0.03		0.05	
Feb-20					< 0.02								0.04		0.03		0.03			
Mar-20					0.02								0.03				0.02			
Apr-20					0.03								0.03				0.03			
May-20					0.03				0.08						0.03		0.02			
Jun-20	0.05		0.05		0.05		0.08				0.04		0.03		0.05		0.07		0.04	
Jul-20					0.08								0.04		0.04		0.05			
Aug-20	0.08		0.04		0.14		0.09		0.08		0.02		0.02		0.05		0.02		0.04	
Sep-20					0.05								0.04		0.04		0.03			
Oct-20	0.07		0.05		0.07		0.07		0.05		0.05		0.03		0.03		0.02		0.08	
Nov-20					0.05															
Dec-20					0.03												0.04			
Jan-21					<0.02								0.06		0.06		0.04			
Feb-21					<0.02								0.05		0.05		0.05			
Mar-21	0.08		0.09		0.06		0.02		0.09		0.04		0.06		0.03		0.07		0.04	
Apr-21																				
May-21					0.08								0.04		0.04		0.06			
Jun-21	0.03		0.10		0.10		0.05		0.11		0.02		0.02		0.08		0.05		0.05	
Jul-21					0.09								0.03		0.05		0.02			
Aug-21	0.02		0.05		0.11		0.10		0.12		0.04		0.03		0.03		0.02		0.11	
Sep-21					0.09								0.04		0.03		0.03			
Oct-21	0.05		0.05		0.07		0.06				0.03		0.04		0.03		0.08		0.04	
Nov-21					0.04				0.07				0.04		0.03		0.03			
Dec-21																	0.03			
Jan-22					<0.02								0.02		<0.02		<0.02			
Feb-22	<0.02		0.03				0.04				0.02		<0.02		0.03		0.02		0.02	
Mar-22					<0.02				<0.02				0.02		0.05		<0.02			
Apr-22					0.04								<0.03		0.03		<0.03			
May-22					<0.03															
Jun-22	0.04		0.06		0.06		0.04		0.07		0.03		0.05		0.06		0.05		0.04	
Jul-22	0.03		0.05		0.05		0.05				0.03		0.05		0.05		<0.03		<0.03	
Aug-22					0.07				0.13				0.05		0.03		0.04			
Sep-22					0.09								0.05		0.03		0.05			
Oct-22	<0.03		<0.03		<0.03		0.05		0.06		0.04		0.05		<0.03		0.03		0.04	
Nov-22					0.07								<0.03		0.04		0.03			
Dec-22					0.03												0.03			
Average / Standard Deviation 2009	0.06	0.03	<0.05	<0.04	-	-	<0.05	<0.04	<0.04	<0.02										

Table 18: Species-Specific Catch per Unit Effort for Seine Netting by Location

Watercourse / Waterbody	Sample ID	Seine Date	No. Hauls	Brook Stickleback	Finescale Dace	Northern Pearl Dace	Site CPUE Total	Site Catch Total (n)
		(dd/mm/yyyy)						
Tributary 5a	ST5A-SN1	23/08/2022	3	1	6	2	3.0	9
	ST5A-SN2	26/08/2022	3	0	0	7	2.3	7
Species Catch Total (n)				1	6	9	-	16

Note: Catch per unit effort (CPUE) is expressed as the total catch per seine haul (# Fish/ Haul)

Table 19: Species-Specific Catch per Unit Effort for Fyke Netting by Location

Watercourse / Waterbody	Sample ID	Lift Date (dd/mm/yy)	Duration (hr)	# of Nets	Total Effort (hr)	Brook Stickleback	Lake Chub	Northern Pearl Dace	Northern Pike	Northern Redbelly Dace	White Sucker	Site CPUE Total	Site Catch Total (n)
North Granny Creek	NGC-EXP-MFN1	14/08/22	24.0	1	24.0	2	6	10	0	0	0	0.750	18
	NGC-EXP-MFN2	14/08/22	24.0	1	24.0	5	8	43	0	0	0	2.333	56
	NGC-REF-MFN1	16/08/22	24.5	1	24.5	1	0	13	8	6	1	1.184	29
	NGC-REF-MFN2	16/08/22	24.5	1	24.5	4	0	3	0	0	2	0.367	9
Species Catch Total (n)						12	14	69	8	6	3	4.634	112

Note: Catch per unit effort (CPUE) is expressed as the total catch per fyke netting hour (# Fish/hour)

Table 20: Species-Specific Catch per Unit Effort for Minnow Traps by Location

Watercourse / Waterbody	Sample ID	Lift Date (dd/mm/yy)	Duration (hr)	# of Traps	Total Effort (hr)	Brook Stickleback	Fathead Minnow	Finescale Dace	Iowa Darter	Johnny Darter	Lake Chub	Northern Pearl Dace	Northern Redbelly Dace	White Sucker	Site CPUE Total	Site Catch Total (n)
North Granny Creek	NGC-EXP-MT1	13/08/22	24.0	32	768.0	4	0	0	1	0	7	31	0	1	0.057	44
	NGC-EXP-MT2	14/08/22	25.5	32	816.0	12	0	0	0	0	0	30	0	12	0.066	54
	NGC-REF-MT1	15/08/22	22.5	30	675.0	21	0	0	0	0	0	9	0	0	0.044	30
	NGC-REF-MT2	16/08/22	23.0	30	690.0	23	0	0	0	0	0	10	5	0	0.055	38
	NGC-REF-MT3	18/08/22	23.0	30	690.0	0	0	0	0	0	0	28	0	0	0.041	28
South Granny Creek	SGC-EXP-MT1	18/08/22	24.0	30	720.0	6	0	17	0	3	28	11	0	3	0.094	68
	SGC-EXP-MT2	27/08/22	24.0	30	720.0	NO CATCH									0.000	0
	SGC-EXP-MT3	30/08/22	30.0	24	720.0	0	0	0	0	0	0	31	0	0	0.043	31
	SGC-REF-MT1	20/08/22	43.0	56	2408.0	79	4	0	8	0	0	726	760	178	0.729	1755
Tributary 5a	ST5a-MT1	22/08/22	48.5	56	2716.0	4	0	25	0	0	25	66	0	0	0.044	120
	ST5a-MT2	23/08/22	43.0	36	1548.0	4	0	0	0	1	0	16	1	0	0.014	22
Species Catch Total (n)						153	4	42	9	4	60	958	766	194	4.634	2190

Note: Catch per unit effort (CPUE) is expressed as the total catch per minnow trap hour (# Fish/hour)

Table 21: Species-Specific Catch per Unit Effort for Dip Netting by Location

Watercourse / Waterbody	Sample ID	Date (dd/mm/yy)	Duration (hr)	# of Nets	Total Effort (hr)	Finescale Dace	Northern Pearl Dace	Northern Redbelly Dace	White Sucker	Site CPUE Total	Site Catch Total (n)
North Granny Creek	NGC-EXP-DN1	13/08/22	0.5	2	1.0	0	1	0	0	1	1
	NGC-EXP-DN2	13/08/22	0.5	1	0.5	0	7	0	0	14	7
	NGC-REF-DN1	15/08/22	0.2	1	0.2	7	3	16	0	130	26
	NGC-REF-DN2	16/08/22	0.5	2	1.0	0	11	0	0	11	11
	NGC-REF-DN3	18/08/22	0.5	1	0.5	0	18	130	0	296	148
South Granny Creek	SGC-EXP-DN1	16/08/22	0.5	1	0.5	0	3	0	0	6	3
	SGC-NF-DN1	16/08/22	0.5	1	0.5	0	17	0	0	34	17
	SGC-REF-DN1	23/08/22	1.0	2	2.0	0	6	0	1	3.5	7
	SGC-REF-DN2	23/08/22	1.0	2	2.0	0	2	0	0	1	2
Tributary 5a	ST5a-DN1	26/08/22	0.2	1	0.2	NO CATCH				0	0
Species Catch Total (n)						7	68	146	1	496.5	222

Note: Catch per unit effort (CPUE) is expressed as the total catch per dip net hour (# Fish/hour)

Table 22: Species-Specific Catch per Unit Effort for Electrofishing by Location

Watercourse / Waterbody	Sample ID	Date (dd/mm/yy)	Duration (mn)	Total Effort (sec)	Brook Trout	Burbot	Johnny Darter	Lake Chub	Mottled Sculpin	Northern Pearl Dace	Northern Pike	Shorthead Redhorse	Spottail Shiner	Trout Perch	Walleye	White Sucker	Yellow Perch	Site CPUE Total	Site Catch Total (n)
Attawapiskat River	ATT-FF-EF1	15/08/22	75.0	4500	0	0	0	0	5	0	4	3	12	82	10	0	28	0.032	144
	ATT-FF-EF2	16/08/22	75.0	4500	0	0	0	16	2	0	4	2	3	16	1	0	36	0.018	80
	ATT-NF-EF1	12/8/2022	90.0	5400	0	0	0	0	15	0	2	0	0	70	0	4	0	0.017	91
	ATT-NF-EF2	13/08/22	105.0	6300	0	0	0	3	2	0	1	3	4	17	5	1	11	0.007	47
	ATT-NF-EF3	14/08/22	80.0	4800	0	0	3	0	6	0	1	2	3	8	5	0	0	0.006	28
	ATT-REF2-EF1	13/08/22	120.0	7200	0	3	0	3	11	0	2	0	4	39	4	0	0	0.009	66
	ATT-REF2-EF2	14/08/22	105.0	6300	0	0	0	0	15	0	1	0	0	30	0	0	0	0.007	46
	ATT-REF2-EF3	27/08/22	60.0	3600	0	0	0	0	0	0	0	0	0	2	0	0	0	0.001	2
	ATT-REF2-EF4	28/08/22	60.0	3600	0	0	0	0	0	0	0	0	0	16	0	0	0	0.004	16
Nayshkootayaow River	ATT-US-EF1	14/08/22	150.0	9000	0	0	0	0	2	0	0	0	5	93	3	0	0	0.011	103
	NAY-DS6-EF1	18/08/22	260.0	15600	0	0	0	0	7	0	1	0	0	29	1	4	0	0.003	42
	NAY-DS6-EF2	18/08/22	255.0	15300	0	0	0	0	3	0	2	0	0	19	1	3	0	0.002	28
	NAY-US3-EF1	18/08/22	225.0	13500	0	0	0	0	6	0	0	0	0	19	0	0	0	0.002	25
	NAY-US3-EF2	19/08/22	110.0	6600	0	0	0	0	6	0	0	0	0	17	0	0	0	0.003	23
South Granny Creek	SGC-EXP-EF1	29/08/22	105.0	6300	0	0	0	0	0	8	0	0	0	0	0	0	0	0.001	8
	SGC-FF-EF1	25/08/22	205.0	12300	0	0	0	0	0	0	16	0	0	0	0	19	0	0.003	35
	SGC-FF-EF2	26/08/22	105.0	6300	0	0	0	0	0	0	9	0	0	0	0	6	0	0.002	15
	SGC-NF-EF1	20/08/22	135.0	8100	0	0	0	0	0	4	0	0	0	0	0	12	0	0.002	16
	SGC-NF-EF2	21/08/22	218.0	13080	0	0	0	0	0	14	0	0	0	0	0	10	0	0.002	24
	SGC-NF-EF3	22/08/22	225.0	13500	0	0	0	0	0	21	0	0	0	0	0	6	0	0.002	27
	SGC-REF-EF1	23/08/22	80.0	4800	0	0	0	0	0	46	0	0	0	0	0	37	0	0.017	83
	SGC-REF-EF2	24/08/22	105.0	6300	0	0	0	0	0	3	0	0	0	0	0	12	0	0.002	15
	SGC-REF-EF3	29/08/22	79.0	4740	7	0	0	13	0	8	0	0	0	0	0	36	0	0.014	64
Species Catch Total (n)					7	3	3	35	80	104	43	10	31	457	30	150	75	0	1028

Note: Catch per unit effort (CPUE) is expressed as the total catch per electrofishing second (# Fish/sec)

Table 23: Species-Specific Catch per Unit Effort for Angling by Location

Watercourse / Waterbody	Sample ID	Date (dd/mm/yy)	Duration (hr)	# of Rods	Total Effort (hr)	Northern Pike	Walleye	Site CPUE Total	Site Catch Total (n)
Attawapiskat River	ATT-DSNAY-AN1	26/08/22	0.3	1.0	0.3	1	0	4.00	1
	ATT-DSNAY-AN2	28/08/22	0.3	1.0	0.3	NO CATCH		0.00	0
	ATT-DSNAY-AN3	29/08/22	0.3	1.0	0.3	NO CATCH		0.00	0
	ATT-NF-AN1	12/8/2022	0.5	2.0	1.0	NO CATCH		0.00	0
	ATT-NF-AN2	13/08/22	0.5	2.0	1.0	NO CATCH		0.00	0
	ATT-NF-AN3	14/08/22	0.5	2.0	1.0	NO CATCH		0.00	0
	ATT-US-AN1	15/08/22	0.3	1.0	0.3	1	0	4.00	1
	ATT-US-AN2	15/08/22	0.3	1.0	0.3	NO CATCH		0.00	0
	ATT-US-AN3	15/08/22	0.3	1.0	0.3	NO CATCH		0.00	0
	ATT-US-AN4	16/08/22	0.3	1.0	0.3	NO CATCH		0.00	0
Nayshkootayaow River	ATT-US-AN5	16/08/22	0.3	1.0	0.3	1	0	4.00	1
	ATT-US-AN6	16/08/22	0.3	1.0	0.3	1	0	4.00	1
	NAY-MOUTH-AN1	20/08/22	1.0	2.0	2.0	1	0	0.50	1
	NAY-MOUTH-AN2	21/08/22	0.2	1.0	0.2	NO CATCH		0.00	0
	NAY-MOUTH-AN3	21/08/22	0.2	1.0	0.2	NO CATCH		0.00	0
	NAY-MOUTH-AN4	21/08/22	0.2	1.0	0.2	NO CATCH		0.00	0
	NAY-MOUTH-AN5	21/08/22	0.2	1.0	0.2	NO CATCH		0.00	0
	NAY-MOUTH-AN6	21/08/22	0.2	1.0	0.2	NO CATCH		0.00	0
	NAY-MOUTH-AN7	21/08/22	0.2	1.0	0.2	NO CATCH		0.00	0
	NAY-MOUTH-AN8	21/08/22	0.2	1.0	0.2	NO CATCH		0.00	0
	NAY-MOUTH-AN9	21/08/22	0.2	1.0	0.2	NO CATCH		0.00	0
	NAY-MOUTH-AN10	21/08/22	0.2	1.0	0.2	NO CATCH		0.00	0
	NAY-MS-AN2	29/08/22	0.2	1.0	0.2	1	0	5.88	1
	NAY-MS-AN11	23/08/22	0.2	1.0	0.2	NO CATCH		0.00	0
	NAY-MS-AN12	23/08/22	0.2	1.0	0.2	NO CATCH		0.00	0
	NAY-MS-AN13	23/08/22	0.2	1.0	0.2	NO CATCH		0.00	0
Monument Channel	NAY-MS-AN14	23/08/22	0.2	1.0	0.2	NO CATCH		0.00	0
	NAY-MS-AN15	23/08/22	0.2	1.0	0.2	1	0	5.88	1
	NAY-MS-AN16	28/08/22	1.5	2.0	3.0	4	2	2.00	6
	MC-AN1	24/08/22	2.0	2.0	4.0	0	1	0.25	1
	MC-AN2	26/08/22	0.2	1.0	0.2	1	0	5.00	1
	MC-AN3	27/08/22	0.5	2.0	1.0	NO CATCH		0.00	0
	MC-AN4	28/08/22	1.0	2.0	2.0	NO CATCH		0.00	0
Species Catch Total (n)						12	3	36	15

Note: Catch per unit effort (CPUE) is expressed as the total catch per angling hour (# Fish/hr)

Table 24: Species-Specific Catch per Unit Effort for Gillnetting by Location

Watercourse / Waterbody	Sample ID	Lift Date (dd/mm/yy)	Duration (hr)	Total Effort (hr)	Lake Sturgeon	Lake Whitefish	Northern Pike	Shorthead Redhorse	Walleye	White Sucker	Site CPUE Total	Site Catch Total (n)
Attawapiskat River	ATT-DSNAY-GN1	27/08/22	24.0	24.0	5	0	0	1	3	3	0.50	12
	ATT-DSNAY-GN2	27/08/22	24.0	24.0	0	0	0	0	6	0	0.25	6
	ATT-DSNAY-GN3	28/08/22	17.5	17.5	1	0	2	2	3	4	0.69	12
	ATT-DSNAY-GN4	28/08/22	17.5	17.5	2	0	0	2	1	1	0.34	6
	ATT-DSNAY-GN5	29/08/22	24.0	24.0	3	0	0	0	3	2	0.33	8
	ATT-DSNAY-GN6	29/08/22	24.0	24.0	NO CATCH						0.00	0
	ATT-DSNAY-GN7	29/08/22	24.0	24.0	3	0	0	1	1	0	0.21	5
	ATT-DSNAY-GN8	29/08/22	24.0	24.0	0	0	0	0	4	5	0.38	9
	ATT-DSNAY-GN9	29/08/22	24.0	24.0	0	0	1	1	2	2	0.25	6
	ATT-DSNAY-GN10	29/08/22	24.0	24.0	NO CATCH						0.00	0
	ATT-DSNAY-GN11	29/08/22	24.0	24.0	4	0	0	0	3	3	0.42	10
	ATT-DSNAY-GN12	29/08/22	24.0	24.0	0	0	0	0	1	0	0.04	1
	ATT-DSNAY-GN13	29/08/22	24.0	24.0	NO CATCH						0.00	0
	ATT-DSNAY-GN14	29/08/22	24.0	24.0	0	0	2	0	0	0	0.08	2
	ATT-NF-GN1	13/08/22	22.2	22.2	1	0	8	2	1	0	0.54	12
	ATT-NF-GN2	13/08/22	22.2	22.2	0	0	0	3	5	1	0.41	9
	ATT-NF-GN3	13/08/22	22.2	22.2	0	0	0	2	2	0	0.18	4
	ATT-NF-GN4	14/08/22	23.0	23.0	0	0	3	2	5	0	0.43	10
	ATT-NF-GN5	14/08/22	23.0	23.0	0	0	4	2	1	0	0.30	7
	ATT-NF-GN6	14/08/22	23.0	23.0	0	0	0	2	2	0	0.17	4
	ATT-NF-GN7	24/08/22	24.0	24.0	1	1	3	3	12	1	0.88	21
	ATT-NF-GN8	24/08/22	24.0	24.0	0	0	2	0	4	0	0.25	6
	ATT-US-GN1	15/08/22	25.0	25.0	0	0	2	0	2	0	0.16	4
	ATT-US-GN2	15/08/22	25.0	25.0	0	0	1	0	10	0	0.44	11
	ATT-US-GN3	15/08/22	25.0	25.0	0	0	0	0	3	4	0.28	7
	ATT-US-GN4	16/08/22	25.0	25.0	6	0	0	6	1	0	0.52	13
	ATT-US-GN5	16/08/22	25.0	25.0	2	0	0	3	2	0	0.28	7
	ATT-US-GN6	16/08/22	25.0	25.0	0	0	5	0	3	0	0.32	8
	ATT-US-GN7	19/08/22	23.5	23.5	0	0	3	0	0	0	0.13	3
	ATT-US-GN8	19/08/22	23.5	23.5	0	0	3	0	1	4	0.34	8
	ATT-US-GN9	19/08/22	23.5	23.5	0	0	0	0	7	0	0.30	7
	ATT-US-GN10	19/08/22	23.5	23.5	0	0	3	0	0	0	0.13	3
	ATT-US-GN11	19/08/22	23.5	23.5	0	0	1	0	0	0	0.04	1
Monument Channel	MC-GN1	25/08/22	24.0	24.0	0	0	0	0	1	2	0.13	3
	MC-GN2	25/08/22	24.0	24.0	0	0	0	0	0	1	0.04	1
	MC-GN3	25/08/22	24.0	24.0	0	0	1	0	0	5	0.25	6
	MC-GN4	25/08/22	24.0	24.0	0	0	0	0	1	0	0.04	1
	MC-GN5	25/08/22	24.0	24.0	0	0	0	0	1	4	0.21	5
	MC-GN6	25/08/22	24.0	24.0	NO CATCH						0.00	0
	MC-GN7	25/08/22	24.0	24.0	0	0	5	0	0	2	0.29	7
	MC-GN8	25/08/22	24.0	24.0	0	0	1	0	0	0	0.04	1
	MC-GN9	25/08/22	24.0	24.0	NO CATCH						0.00	0
	MC-GN10	25/08/22	24.0	24.0	NO CATCH						0.00	0
	MC-GN11	25/08/22	24.0	24.0	0	0	2	0	1	3	0.25	6
	MC-GN12	25/08/22	24.0	24.0	0	0	0	0	2	4	0.25	6
	MC-GN13	26/08/22	24.0	24.0	NO CATCH						0.00	0
	MC-GN14	26/08/22	24.0	24.0	NO CATCH						0.00	0
	MC-GN15	26/08/22	24.0	24.0	0	0	0	0	0	2	0.08	2
	MC-GN16	26/08/22	24.0	24.0	NO CATCH						0.00	0
	MC-GN17	26/08/22	24.0	24.0	0	0	0	0	0	1	0.04	1
	MC-GN18	26/08/22	24.0	24.0	0	1	0	0	0	2	0.13	3
	MC-GN19	26/08/22	24.0	24.0	0	1	3	0	2	2	0.33	8
	MC-GN20	26/08/22	24.0	24.0	0	0	0	0	0	2	0.08	2
	MC-GN21	26/08/22	24.0	24.0	0	0	0	0	2	7	0.38	9
	MC-GN22	26/08/22	24.0	24.0	NO CATCH						0.00	0
	MC-GN23	26/08/22	24.0	24.0	0	0	1	0	0	0	0.04	1
	MC-GN24	26/08/22	24.0	24.0	0	1	0	0	0	1	0.08	2
	MC-GN25	27/08/22	23.0	23.0	0	0	0	0	1	1	0.09	2
	MC-GN26	27/08/22	23.0	23.0	0	0	1	0	0	4	0.22	5
	MC-GN27	27/08/22	23.0	23.0	0	0	0	0	0	2	0.09	2
	MC-GN28	27/08/22	23.0	23.0	0	0	1	0	0	5	0.26	6
	MC-GN29	27/08/22	23.0	23.0	NO CATCH						0.00	0
	MC-GN30	27/08/22	23.0	23.0	0	0	2	0	0	1	0.13	3
	MC-GN31	27/08/22	23.0	23.0	0	0	0	0	0	2	0.09	2
	MC-GN32	27/08/22	23.0	23.0	NO CATCH						0.00	0
	MC-GN33	27/08/22	23.0	23.0	NO CATCH						0.00	0
	MC-GN34	27/08/22	23.0	23.0	0	0	0	0	0	2	0.09	2
	MC-GN35	27/08/22	23.0	23.0	0	0	0	0	1	0	0.04	1
	MC-GN36	27/08/22	23.0	23.0	0	0	1	0	1	5	0.30	7
Nayshkootayaow River	NAY-MOUTH-GN1	21/08/22	24.3	24.3	0	0	0	2	0	1	0.12	3
	NAY-MOUTH-GN2	21/08/22	24.3	24.3	0	1	0	0	0	1	0.08	2
	NAY-MOUTH-GN3	21/08/22	24.3	24.3	0	0	4	0	3	2	0.37	9
	NAY-MOUTH-GN4	21/08/22	24.3	24.3	0	3	1	1	1	7	0.54	13
	NAY-MOUTH-GN5	21/08/22	24.3	24.3	0	0	1	0	1	7	0.37	9
	NAY-MOUTH-GN6	22/08/22	21.5	21.5	2	0	1	0	4	2	0.42	9
	NAY-MOUTH-GN7	22/08/22	21.5	21.5	0	0	1	0	2	2	0.23	5
	NAY-MOUTH-GN8	22/08/22	21.5	21.5	0	1	1	0	0	7	0.42	9
	NAY-MOUTH-GN9	22/08/22	21.5	21.5	0	3	0	0	0	0	0.14	3
	NAY-MOUTH-GN10	22/08/22	21.5	21.5	1	3	1	6	3	8	1.02	22
	NAY-MS-GN1	23/08/22	23.5	23.5	0	0	1	0	0	0	0.04	1
	NAY-MS-GN11	23/08/22	17.8	17.8	0	0	0	0	1	1	0.11	2
	NAY-MS-GN12	23/08/22	17.8	17.8	NO CATCH						0.00	0
	NAY-MS-GN13	23/08/22	17.8	17.8	NO CATCH						0.00	0
	NAY-MS-GN14	23/08/22	17.8	17.8	0	0	1	2	1	4	0.45	8
	NAY-MS-GN15	23/08/22	17.8	17.8	NO CATCH						0.00	0
Species Catch Total (n)					31	15	73	43	117	132	18	411

Note: Catch per unit effort (CPUE) is expressed as the total catch per gillnetting hour (# Fish/hour)

Table 25: Results of two-way and one-way ANOVA tests for Total Mercury in Northern Pearl Dace from the Granny Creek System and Tributary 5A

2 Way ANOVA ¹						
	SS	df	MS	F	P-value	p<0.05
Location	329.70	4	82.43	443.06	>0.001	Yes
Ageclass	8.30	1	8.35	44.87	>0.001	Yes
Location:Ageclass	26.60	4	6.64	35.68	>0.001	Yes
Residuals	91.70	493	0.19			
1 Way ANOVA (YOY)						
Source of Variation	SS	df	MS	F	P-value	p<0.05
Between Groups	196.22	4	49.06	329.12	>0.001	Yes
Error	28.62	192	0.15			
1 Way ANOVA (Age 1+)						
Source of Variation	SS	df	MS	F	P-value	p<0.05
Between Groups	168.01	4	42.00	199.78	>0.001	Yes
Error	63.07	300	0.21			

Notes:

SS' represents sum of squares

MS' represents mean square

df' represents degrees of freedom

F' is an estimate of between group variability / within group variability

P-value' is the level of marginal significance within a statistical hypothesis test; probability of the occurrence of a given event

p<0.05' indicates significance of test for null-hypothesis (equal means) at an alpha of 0.05

*' represents significance based on Tukey HSD and Dunn Test at alpha of 0.05; only significant comparisons between reference and exposure locations are shown

Total mercury was log transformed in all models to meet assumptions of ANOVA test

¹ 2 way ANOVA run with YOY and age 1+ ageclasses

Table 26: Results of ANCOVA for Total Mercury Adjusted for Total Length and Age in Northern Pearl Dace from the Granny Creek System and Tributary 5A

Adjusted For (Covariate)	Age 1+						Significant post-hoc comparisons*
	Area	NGC-REF	NGC-EXP	SGC-REF	SGC-EXP	ST-5A	
Total Length (mm)	LS Mean	0.216	0.558	0.172	0.457	0.085	NGC-EXP>NGC-REF
	SE	0.015	0.018	0.015	0.016	0.024	NGC-EXP>ST-5A
							SGC-EXP>SGC-REF
							SGC-EXP>ST-5A
Age (years)	Area	NGC-REF	NGC-EXP	SGC-REF	SGC-EXP	ST-5A	Significant post-hoc comparisons*
	LS Mean	0.211	0.614	0.164	0.427	0.080	NGC-EXP>NGC-REF
	SE	0.015	0.018	0.016	0.017	0.016	NGC-EXP>ST-5A
							SGC-EXP>SGC-REF
							SGC-EXP>ST-5A
Total Length (mm)	YOY						Significant post-hoc comparisons*
	Area	NGC-REF	NGC-EXP	SGC-REF	SGC-EXP	ST-5A	
	LS Mean	0.081	0.906	0.152	0.199	0.039	NGC-EXP>NGC-REF
	SE	0.036	0.019	0.026	0.023	0.038	NGC-EXP>ST-5A
							SGC-EXP>ST-5A

Notes:

* represents significance based on post-hoc pairwise comparison at alpha of 0.05; only significant comparisons between reference and exposure locations are shown

LS' represents least mean square

SE' represents standard error of the mean

Assumptions of homogeneity of regression slopes for ANCOVA were met for all models; Slopes of regression lines in ANCOVA are considered parallel at an alpha of 0.05

Table 27: Before-After-Control-Impact (BACI) Design ANCOVA Results for 2009 Versus 2022 Control Versus Impact Sites for Northern Pearl Dace from the Granny Creek System and Tributary 5A

Comparison (Period*Site)	Species	n	F-value ¹	P-value ¹	Significant Difference ²	*Significant Pairwise Comparisons
2009*NGC-EXP 2009*SGC-EXP 2009* ST5A 2022*NGC-EXP 2022*SGC-EXP 2022*ST5A	Northern Pearl Dace	368	104.5	<0.001	Yes	
						NGC-EXP*2009 vs. NGC-EXP*2022
						SGC-EXP*2009 vs. SGC-EXP*2022
						SGC-EXP*2009 vs. ST-5A*2009

Notes:

*¹ represents significance based on post-hoc pairwise comparison at alpha of 0.05; only significant comparisons between reference and exposure locations are shown

¹ F-value and P-value are specific to the interaction term of Year*Location

² Significance of Interaction term based on $\alpha = 0.05$

Sampling year 2009 was used as baseline; sample size at SGC in 2008 was too small for analysis (n=5)

SGC-REF and NGC-REF were not sampled until 2017 and were excluded from analysis

Analysis is inclusive of all ageclasses to increase sample size

Table 28: Results of two-way and one-way ANOVA tests for Total Mercury in Trout Perch from the Attawapiskat River

2 Way ANOVA ¹								
	SS	df	MS	F	P-value	p<0.05		
Location	4.44	3	1.48	28.51	>0.001	Yes		
Ageclass	4.84	1	4.84	93.33	>0.001	Yes		
Location:Ageclass	0.54	3	0.18	3.46	0.017	Yes		
Residuals	18.88	364	0.05					
1 Way ANOVA (YOY)								*Significant post-hoc
Source of Variation	SS	df	MS	F	P-value	p<0.05	Power	ATT-REF2>ATT-NF
Between Groups	3.42	3	1.14	29.41	>0.001	Yes	0.9	ATT-REF2>ATT-FF
Error	6.51	168	0.04					ATT-REF2>ATT-US
							ATT-US>ATT-FF	
							ATT-NF>ATT-FF	
1 Way ANOVA (Age 1+)								*Significant post-hoc
Source of Variation	SS	df	MS	F	P-value	p<0.05	Power	ATT-REF2>ATT-FF
Between Groups	1.64	3	0.55	8.65	>0.001	Yes	0.9	ATT-NF>ATT-US
Error	12.37	196	0.06					ATT-REF2>ATT-US

Notes:

SS' represents sum of squares

MS' represents mean square

df' represents degrees of freedom

F' is an estimate of between group variability / within group variability

P-value' is the level of marginal significance within a statistical hypothesis test; probability of the occurrence of a given event

p<0.05' indicates significance of test for null-hypothesis (equal means) at an alpha of 0.05

*' represents significance based on Tukey HSD and Dunn Test at alpha of 0.05; only significant comparisons between reference and exposure locations are shown

Total mercury was log transformed in all models to meet assumptions of ANOVA test

¹ 2 way ANOVA run with YOY and age 1+ ageclasses

Table 29: Results of ANCOVA for Total Mercury Adjusted for Total Length and Age in Trout Perch from the Attawapiskat River

Adjusted For (Covariate)	Age 1+					Significant post-hoc comparisons*
	Area	ATT-NF	ATT-FF	ATT-US	ATT-REF2	
Total Length (mm)	LS Mean	0.087	0.079	0.082	0.100	ATT-REF2>ATT-NF
	SE	0.003	0.003	0.003	0.003	ATT-REF2>ATT-FF
						ATT-REF2>ATT-US
Age (years)	Area	ATT-NF	ATT-FF	ATT-US	ATT-REF2	Significant post-hoc comparisons*
	LS Mean	0.089	0.080	0.078	0.099	ATT-REF2>ATT-FF
	SE	0.003	0.003	0.003	0.003	ATT-REF2>ATT-US
						ATT-NF>ATT-US
Total Length (mm)	YOY					Significant post-hoc comparisons*
	Area	ATT-NF	ATT-FF	ATT-US	ATT-REF2	
	LS Mean	0.066	0.058	0.063	0.085	ATT-REF2>ATT-NF
	SE	0.002	0.002	0.004	0.003	ATT-REF2>ATT-FF
						ATT-REF2>ATT-US

Notes:

* represents significance based on post-hoc pairwise comparison at alpha of 0.05; only significant comparisons between reference and exposure locations are shown

LS' represents least mean square

SE' represents standard error of the mean

Assumptions of homogeneity of regression slopes for ANCOVA were met for all models; Slopes of regression lines in ANCOVA are considered parallel at an alpha of 0.05

Table 30: Before-After-Control-Impact (BACI) Design ANCOVA Results for 2009 Versus 2022 Control Versus Impact Sites for Trout Perch from the Attawapiskat River

Comparison (Period*Site)	Species	n	F-value ¹	P-value ¹	Significant Difference ²	*Significant Pairwise Comparisons
2009*ATT-NF 2009*ATT-FF 2009* ATT-US 2022*ATT-NF 2022*ATT-FF 2022*ATT-US	Trout Perch	372	12.71	<0.001	Yes	
						ATT-NF*2009 vs. ATT-NF*2022
						ATT-NF*2009 vs. ATT-US*2022
						ATT-US*2009 vs. ATT-NF*2022

Notes:

*¹ represents significance based on post-hoc pairwise comparison at alpha of 0.05; only significant comparisons between reference and exposure locations are shown

¹ F-value and P-value are specific to the interaction term of Year*Location

² Significance of Interaction term based on $\alpha = 0.05$

ATT-REF2 was not sampled until 2014 and was therefore excluded from analysis

Analysis is inclusive of all ageclasses to increase sample size

Table 31: Results of ANCOVA for Total Mercury Adjusted for Total Length and Age in Trout Perch from the Nayshkootayaow River

Adjusted For (Covariate)	Age 1+			Significant pairwise comparisons*
	Area	NAY-DS6	NAY-US3	
Total Length (mm)	LS Mean	0.110	0.072	NAY-DS6>NAY-US3
	SE	0.004	0.005	
Age (years)	Area	NAY-DS6	NAY-US3	Significant pairwise comparisons*
	LS Mean	0.114	0.004	NAY-DS6>NAY-US3
	SE	0.075	0.004	

Notes:

* represents significance based on post-hoc pairwise comparison at alpha of 0.05; only significant comparisons between reference and exposure locations are shown

LS' represents least mean square

SE' represents standard error of the mean

Assumptions of homogeneity of regression slopes for ANCOVA were met for all models; Slopes of regression lines in ANCOVA are considered parallel at an alpha of 0.05

Table 32: Before-After-Control-Impact (BACI) Design ANCOVA Results for 2012 Versus 2022 Control Versus Impact Sites for Trout Perch from the Nayshkootayaow River

Comparison (Period*Site)	Species	n	F-value ¹	P-value ¹	Significant Difference ²	*Significant Pairwise Comparisons
2012*NAY-DS6 2012*NAY-US3 2022* NAY-DS6 2022*NAY-US3	Trout Perch	194	10.32	0.002	Yes	2012*NAY-US3 vs. 2022*NAY-US3

Notes:

* represents significance based on post-hoc pairwise comparison at alpha of 0.05; only significant comparisons between reference and exposure locations are shown

¹ F-value and P-value are specific to the interaction term of Year*Location

² Significance of Interaction term based on $\alpha = 0.05$

Analysis is inclusive of all ageclasses to increase sample size

Table 33: Results of ANCOVA for Total Mercury Adjusted for Total Length and Age in Age 1+ Mottled Sculpin from the Attawapiskat River and Nayshkootayaow River

Adjusted For (Covariate)	Nayshkootayaow River			
	Area	NAY-DS6	NAY-US3	Significant pairwise comparisons*
Total Length (mm)	LS Mean	0.077	0.053	NAY-DS6>NAY-US3
	SE	0.006	0.006	
Age (years)	Area	NAY-DS6	NAY-US3	Significant pairwise comparisons*
	LS Mean	0.077	0.052	NAY-DS6>NAY-US3
	SE	0.006	0.005	
Attawapiskat River				
Total Length (mm)	Area	ATT-NF	ATT-REF2	Significant pairwise comparisons*
	LS Mean	0.056	0.066	
	SE	0.003	0.003	
Age (years)	Area	ATT-NF	ATT-REF2	Significant pairwise comparisons*
	LS Mean	0.056	0.064	
	SE	0.003	0.003	

Notes:

* represents significance based on post-hoc pairwise comparison at alpha of 0.05; only significant comparisons between reference and exposure locations are shown

LS' represents least mean square

SE' represents standard error of the mean

Assumptions of homogeneity of regression slopes for ANCOVA were met for all models; Slopes of regression lines in ANCOVA are considered parallel at an alpha of 0.05

Sample size at ATT-FF in 2022 was insufficient for statistical analysis (n=5)

Table 34: Results of ANCOVA for Total Mercury Adjusted for Total Length and Within and Between Year Statistical Comparisons for Northern Pike from the Attawapiskat River and Nayshkootayaow River

Waterbody	Comparison (Year*Site)	n	LS mean ¹	Significant Pairwise Comparisons ²
Attawapiskat River	2022*ATT-NF	24	0.445	2022*ATT-NF>2022*ATT-US
	2022*ATT-US	21	0.228	2022*ATT-NF>2007/08*ATT-NF
	2022*ATT-DSNAY ³	6	0.343	2022*US<2019*ATT-US
	2019*ATT-NF	20	0.618	
	2019*ATT-US	45	0.551	
	2007/08*ATT-NF	42	0.293	
	2007/08*ATT-US	25	0.226	
Nayshkootayaow River	2022*NAY	22	0.423	2022*NAY>2022*MC
	2022*MC	19	0.276	2022*NAY>2007/08*NAY
	2019*NAY	16	0.37	
	2019*MC	14	0.332	
	2007/08*NAY	23	0.237	
	2007/08*MC	52	0.198	

Notes:

¹ LS represents least square mean of total mercury adjusted for total length

² represents significance based on post-hoc pairwise comparison at alpha of 0.05; only significant comparisons between reference and exposure locations are shown

³ Sampling location ATT-DSNAY was introduced as a sampling location in 2022

SE' represents standard error of the mean

Assumptions of homogeneity of regression slopes for ANCOVA were met for all models; Slopes of regression lines in ANCOVA are considered parallel at an alpha of 0.05

A before-after-control-impact ANCOVA model was used for statistical comparisons made between sampling years

Table 35: Results of ANCOVA for Total Mercury Adjusted for Total Length and Within and Between Year Statistical Comparisons for Walleye from the Attawapiskat River and Nayshkootayaow River

Waterbody	Comparison (Year*Site)	n	LS mean ¹	Significant Pairwise Comparisons ²
Attawapiskat River	2022*ATT-NF	32	0.618	
	2022*ATT-US	30	0.568	
	2022*ATT-DSNAY ³	27	0.696	
	2019*ATT-NF	24	0.567	
	2019*ATT-US	25	0.565	
	2007/08*ATT-NF	19	0.507	
	2007/08*ATT-US	12	0.559	
Nayshkootayaow River	2022*NAY	21	0.575	2022*NAY>2022*MC
	2022*MC	13	0.447	
	2019*NAY	19	0.680	
	2019*MC	10	0.470	
	2007/08*NAY	26	0.519	
	2007/08*MC	2	0.330	

Notes:

¹ LS represents least square mean of total mercury adjusted for total length

² represents significance based on post-hoc pairwise comparison at alpha of 0.05; only significant comparisons between reference and exposure locations are shown

³ Sampling location ATT-DSNAY was introduced as a sampling location in 2022

SE' represents standard error of the mean

Assumptions of homogeneity of regression slopes for ANCOVA were met for all models; Slopes of regression lines in ANCOVA are considered parallel at an alpha of 0.05

A before-after-control-impact ANCOVA model was used for statistical comparisons made between sampling years

Table 36: Results of ANCOVA for Total Mercury Adjusted for Total Length and Within and Between Year Statistical Comparisons for White Sucker from the Attawapiskat River and Nayshkootayaow River

Waterbody	Comparison (Year*Site)	n	LS mean ¹	Significant Pairwise Comparisons ²
Attawapiskat River	2022*ATT-NF	9	0.126	
	2022*ATT-US	8	0.099	
	2022*ATT-DSNAY ³	18	0.124	
	2019*ATT-NF	5	0.142	
	2019*ATT-US	14	0.113	
	2007/08*ATT-NF	6	0.088	
	2007/08*ATT-US	0	N/A	
Nayshkootayaow River	2022*NAY	32	0.199	2022*NAY>2022*MC
	2022*MC	30	0.156	
	2019*NAY	16	0.155	
	2019*MC	25	0.147	
	2007/08*NAY	20	0.150	
	2007/08*MC	13	0.153	

Notes:

¹ LS represents least square mean of total mercury adjusted for total length

² represents significance based on post-hoc pairwise comparison at alpha of 0.05; only significant comparisons between reference and exposure locations are shown

³ Sampling location ATT-DSNAY was introduced as a sampling location in 2022

SE' represents standard error of the mean

Assumptions of homogeneity of regression slopes for ANCOVA were met for all models; Slopes of regression lines in ANCOVA are considered parallel at an alpha of 0.05

A before-after-control-impact ANCOVA model was used for statistical comparisons made between sampling years

Table 37a: Muskeg Monitoring Program - Statistical Analysis of Cluster Peat Horizon Mercury Pore Waters Annual Sampling Program 2022 Results - Cluster S-1

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
MS-1	Peat - Domed Bog	MS-1-D	0.54	<0.03
	Peat - Flat Bog	MS-1-F	1.70	0.05
	Peat - Horizontal Fen	MS-1-H	0.63	<0.03
	Peat - Ribbed Fen	MS-1-R	-	-
MS-2	Peat - Domed Bog	MS-2-D	2.27	0.09
	Peat - Flat Bog	MS-2-F	-	-
	Peat - Ribbed Fen	MS-2-R	1.18	0.06
MS-7	Peat - Domed Bog	MS-7-D	0.68	<0.03
	Peat - Flat Bog	MS-7-F	1.33	<0.03
	Peat - Horizontal Fen	MS-7-H	2.09	0.05
	Peat - Ribbed Fen	MS-7-R	0.47	<0.03
MS-8	Peat - Domed Bog	MS-8-D	1.67	0.06
	Peat - Flat Bog	MS-8-F	3.58	0.14
	Peat - Horizontal Fen	MS-8-H	0.29	0.08
	Peat - Ribbed Fen	MS-8-R	1.39	0.13
MS-9(1)	Peat - Domed Bog	MS-9(1)-D	1.22	0.07
	Peat - Flat Bog	MS-9(1)-F	1.34	0.09
	Peat - Horizontal Fen	MS-9(1)-H	3.40	< 0.03
	Peat - Ribbed Fen	MS-9(1)-R	0.73	<0.03
MS-9(2)	Peat - Domed Bog	MS-9(2)-D	1.80	0.04
	Peat - Flat Bog	MS-9(2)-F	2.56	0.06
	Peat - Horizontal Fen	MS-9(2)-H	0.17	<0.03
	Peat - Ribbed Fen	MS-9(2)-R	0.36	<0.03
MS-13	Peat - Domed Bog	MS-13-D	3.55	0.07
	Peat - Flat Bog	MS-13-F	2.37	0.08
	Peat - Horizontal Fen	MS-13-H	0.47	0.07
	Peat - Ribbed Fen	MS-13-R	0.58	<0.03
MS-15	Peat - Domed Bog	MS-15-D	0.51	<0.03
	Peat - Flat Bog	MS-15-F	2.13	0.06
	Peat - Horizontal Fen	MS-15-H	0.17	<0.03
	Peat - Ribbed Fen	MS-15-R	0.27	0.03
MS-V(1)	Peat - Domed Bog	MS-V(1)-D	-	-
	Peat - Ribbed Fen	MS-V(1)-R	-	-
MS-V(2)	Peat - Domed Bog	MS-V(2)-D	1.13	0.08
	Peat - Ribbed Fen	MS-V(2)-R	1.41	0.07
MS-V(3)	Peat - Domed Bog	MS-V(3)-D	1.69	<0.03
	Peat - Ribbed Fen	MS-V(3)-R	0.73	<0.03

 Clusters used for statistical analysis

MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury and 0.1 ng/L for total mercury), as per Section 1.

Blank cells indicate concentration was not determined.

Due to missing data the analysis was not performed

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-1	Sum r.
D. Bog			
F. Bog			
H. Fen			
R. Fen			
Sum c.			

Total SS	
Treat SS	
Block SS	
Error SS	

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total					
Treatment					
Block					
Error					

Analysis not completed due to missing data

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-1	Sum r.
D. Bog			
F. Bog			
H. Fen			
R. Fen			
Sum c.			

Total SS	
Treat SS	
Block SS	
Error SS	

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total					
Treatment					
Block					
Error					

Analysis not completed due to missing data

Table 37b: Muskeg Monitoring Program - Statistical Analysis of Cluster Peat Horizon Mercury Pore Waters Annual Sampling Program 2022 Results - Cluster S-2

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
MS-1	Peat - Domed Bog	MS-1-D	0.54	<0.03
	Peat - Flat Bog	MS-1-F	1.70	0.05
	Peat - Horizontal Fen	MS-1-H	0.63	<0.03
	Peat - Ribbed Fen	MS-1-R	-	-
MS-2	Peat - Domed Bog	MS-2-D	2.27	0.09
	Peat - Flat Bog	MS-2-F	-	-
	Peat - Ribbed Fen	MS-2-R	1.18	0.06
MS-7	Peat - Domed Bog	MS-7-D	0.68	<0.03
	Peat - Flat Bog	MS-7-F	1.33	<0.03
	Peat - Horizontal Fen	MS-7-H	2.09	0.05
	Peat - Ribbed Fen	MS-7-R	0.47	<0.03
MS-8	Peat - Domed Bog	MS-8-D	1.67	0.06
	Peat - Flat Bog	MS-8-F	3.58	0.14
	Peat - Horizontal Fen	MS-8-H	0.29	0.08
	Peat - Ribbed Fen	MS-8-R	1.39	0.13
MS-9(1)	Peat - Domed Bog	MS-9(1)-D	1.22	0.07
	Peat - Flat Bog	MS-9(1)-F	1.34	0.09
	Peat - Horizontal Fen	MS-9(1)-H	3.40	< 0.03
	Peat - Ribbed Fen	MS-9(1)-R	0.73	<0.03
MS-9(2)	Peat - Domed Bog	MS-9(2)-D	1.80	0.04
	Peat - Flat Bog	MS-9(2)-F	2.56	0.06
	Peat - Horizontal Fen	MS-9(2)-H	0.17	<0.03
	Peat - Ribbed Fen	MS-9(2)-R	0.36	<0.03
MS-13	Peat - Domed Bog	MS-13-D	3.55	0.07
	Peat - Flat Bog	MS-13-F	2.37	0.08
	Peat - Horizontal Fen	MS-13-H	0.47	0.07
	Peat - Ribbed Fen	MS-13-R	0.58	<0.03
MS-15	Peat - Domed Bog	MS-15-D	0.51	<0.03
	Peat - Flat Bog	MS-15-F	2.13	< 0.06
	Peat - Horizontal Fen	MS-15-H	0.17	<0.03
	Peat - Ribbed Fen	MS-15-R	0.27	0.03
MS-V(1)	Peat - Domed Bog	MS-V(1)-D	-	-
	Peat - Ribbed Fen	MS-V(1)-R	-	-
MS-V(2)	Peat - Domed Bog	MS-V(2)-D	1.13	0.08
	Peat - Ribbed Fen	MS-V(2)-R	1.41	0.07
MS-V(3)	Peat - Domed Bog	MS-V(3)-D	1.69	<0.03
	Peat - Ribbed Fen	MS-V(3)-R	0.73	<0.03

Clusters used for statistical analysis

MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury and 0.1 ng/L for total mercury), as per Section 1.

Blank cells indicate concentration was not determined.

Due to missing data the analysis was not performed

De Beers Canada Inc., Victor Mine
 Mercury Performance Monitoring, 2022 Annual Report
 per Certificate of Approval #3960-7Q4K2G, Conditions 7(5) and 7(6)
 June 2023

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-2	Sum r.
D. Bog			
F. Bog			
R. Fen			
Sum c.			

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total					
Treatment					
Block					
Error					

Analysis not completed due to missing data

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-2	Sum r.
D. Bog			
F. Bog			
R. Fen			
Sum c.			

Total SS	
Treat SS	
Block SS	
Error SS	

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total					
Treatment					
Block					
Error					

Analysis not completed due to missing data

Table 37c: Muskeg Monitoring Program - Statistical Analysis of Cluster Peat Horizon Mercury Pore Waters Annual Sampling Program 2022 Results - Cluster S-7

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
MS-1	Peat - Domed Bog	MS-1-D	0.54	<0.03
	Peat - Flat Bog	MS-1-F	1.70	0.05
	Peat - Horizontal Fen	MS-1-H	0.63	<0.03
	Peat - Ribbed Fen	MS-1-R	-	-
MS-2	Peat - Domed Bog	MS-2-D	2.27	0.09
	Peat - Flat Bog	MS-2-F	-	-
	Peat - Ribbed Fen	MS-2-R	1.18	0.06
MS-7	Peat - Domed Bog	MS-7-D	0.68	<0.03
	Peat - Flat Bog	MS-7-F	1.33	<0.03
	Peat - Horizontal Fen	MS-7-H	2.09	0.045
	Peat - Ribbed Fen	MS-7-R	0.47	<0.03
MS-8	Peat - Domed Bog	MS-8-D	1.67	0.06
	Peat - Flat Bog	MS-8-F	3.58	0.14
	Peat - Horizontal Fen	MS-8-H	0.29	0.08
	Peat - Ribbed Fen	MS-8-R	1.39	0.13
MS-9(1)	Peat - Domed Bog	MS-9(1)-D	1.22	0.07
	Peat - Flat Bog	MS-9(1)-F	1.34	0.09
	Peat - Horizontal Fen	MS-9(1)-H	3.40	< 0.03
	Peat - Ribbed Fen	MS-9(1)-R	0.73	<0.03
MS-9(2)	Peat - Domed Bog	MS-9(2)-D	1.80	0.04
	Peat - Flat Bog	MS-9(2)-F	2.56	0.06
	Peat - Horizontal Fen	MS-9(2)-H	0.17	<0.03
	Peat - Ribbed Fen	MS-9(2)-R	0.36	<0.03
MS-13	Peat - Domed Bog	MS-13-D	3.55	0.07
	Peat - Flat Bog	MS-13-F	2.37	0.08
	Peat - Horizontal Fen	MS-13-H	0.47	0.07
	Peat - Ribbed Fen	MS-13-R	0.58	<0.03
MS-15	Peat - Domed Bog	MS-15-D	0.51	<0.03
	Peat - Flat Bog	MS-15-F	2.13	0.06
	Peat - Horizontal Fen	MS-15-H	0.17	<0.03
	Peat - Ribbed Fen	MS-15-R	0.27	0.03
MS-V(1)	Peat - Domed Bog	MS-V(1)-D	-	-
	Peat - Ribbed Fen	MS-V(1)-R	-	-
MS-V(2)	Peat - Domed Bog	MS-V(2)-D	1.13	0.08
	Peat - Ribbed Fen	MS-V(2)-R	1.41	0.07
MS-V(3)	Peat - Domed Bog	MS-V(3)-D	1.69	<0.03
	Peat - Ribbed Fen	MS-V(3)-R	0.73	<0.03

Clusters used for statistical analysis

MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury and 0.1 ng/L for total mercury), as per Section 1.

Blank cells indicate concentration was not determined.

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-7	Sum r.
D. Bog	2.03	0.68	2.704
F. Bog	2.25	1.33	3.578
H. Fen	0.32	2.09	2.408
R. Fen	0.42	0.47	0.890
Sum c.	5.02	4.558	9.579

Total SS	4.781
Treat SS	0.027
Block SS	1.879
Error SS	2.875

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	7	4.781	-		
Treatment	1	0.027	0.027	0.03	10.1
Block	3	1.879	0.626	0.65	9.28
Error	3	2.875	0.958		

Treatment Effect (i.e., difference between Control and S-7) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-7	Sum r.
D. Bog	0.050	0.030	0.080
F. Bog	0.072	0.030	0.102
H. Fen	0.049	0.045	0.094
R. Fen	0.031	0.030	0.061
Sum c.	0.20	0.135	0.336

Total SS	0.002
Treat SS	0.001
Block SS	0.000
Error SS	0.001

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	7	0.002	-		
Treatment	1	0.0005	0.001	3.11	10.1
Block	3	0.0005	0.000	0.93	9.28
Error	3	0.001	0.000		

Treatment Effect (i.e., difference between Control and S-7) **Not Significant**

Table 37d: Muskeg Monitoring Program - Statistical Analysis of Cluster Peat Horizon Mercury Pore Waters Annual Sampling Program 2022 Results - Cluster S-8

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
MS-1	Peat - Domed Bog	MS-1-D	0.54	<0.03
	Peat - Flat Bog	MS-1-F	1.70	0.05
	Peat - Horizontal Fen	MS-1-H	0.63	<0.03
	Peat - Ribbed Fen	MS-1-R	-	-
MS-2	Peat - Domed Bog	MS-2-D	2.27	0.09
	Peat - Flat Bog	MS-2-F	-	-
	Peat - Ribbed Fen	MS-2-R	1.18	0.06
MS-7	Peat - Domed Bog	MS-7-D	0.68	<0.03
	Peat - Flat Bog	MS-7-F	1.33	<0.03
	Peat - Horizontal Fen	MS-7-H	2.09	0.05
	Peat - Ribbed Fen	MS-7-R	0.47	<0.03
MS-8	Peat - Domed Bog	MS-8-D	1.67	0.06
	Peat - Flat Bog	MS-8-F	3.58	0.14
	Peat - Horizontal Fen	MS-8-H	0.29	0.08
	Peat - Ribbed Fen	MS-8-R	1.39	0.13
MS-9(1)	Peat - Domed Bog	MS-9(1)-D	1.22	0.07
	Peat - Flat Bog	MS-9(1)-F	1.34	0.09
	Peat - Horizontal Fen	MS-9(1)-H	3.40	< 0.03
	Peat - Ribbed Fen	MS-9(1)-R	0.73	<0.03
MS-9(2)	Peat - Domed Bog	MS-9(2)-D	1.80	0.04
	Peat - Flat Bog	MS-9(2)-F	2.56	0.06
	Peat - Horizontal Fen	MS-9(2)-H	0.17	<0.03
	Peat - Ribbed Fen	MS-9(2)-R	0.36	<0.03
MS-13	Peat - Domed Bog	MS-13-D	3.55	0.07
	Peat - Flat Bog	MS-13-F	2.37	0.08
	Peat - Horizontal Fen	MS-13-H	0.47	0.07
	Peat - Ribbed Fen	MS-13-R	0.58	<0.03
MS-15	Peat - Domed Bog	MS-15-D	0.51	<0.03
	Peat - Flat Bog	MS-15-F	2.13	0.06
	Peat - Horizontal Fen	MS-15-H	0.17	<0.03
	Peat - Ribbed Fen	MS-15-R	0.27	0.03
MS-V(1)	Peat - Domed Bog	MS-V(1)-D	-	-
	Peat - Ribbed Fen	MS-V(1)-R	-	-
MS-V(2)	Peat - Domed Bog	MS-V(2)-D	1.13	0.08
	Peat - Ribbed Fen	MS-V(2)-R	1.41	0.07
MS-V(3)	Peat - Domed Bog	MS-V(3)-D	1.69	<0.03
	Peat - Ribbed Fen	MS-V(3)-R	0.73	<0.03

Clusters used for statistical analysis

MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury and 0.1 ng/L for total mercury), as per Section 1.

Blank cells indicate concentration was not determined.

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-8	Sum r.
D. Bog	2.03	1.67	3.696
F. Bog	2.25	3.58	5.833
H. Fen	0.32	0.29	0.610
R. Fen	0.42	1.39	1.817
Sum c.	5.021	6.934	11.955

Total SS	9.233
Treat SS	0.457
Block SS	7.809
Error SS	0.966

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	7	9.233	-		
Treatment	1	0.457	0.457	1.42	10.1
Block	3	7.809	2.603	8.08	9.28
Error	3	0.966	0.322		

Treatment Effect (i.e., difference between Control and S-8) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-8	Sum r.
D. Bog	0.05	0.06	0.109
F. Bog	0.07	0.14	0.209
H. Fen	0.05	0.08	0.131
R. Fen	0.03	0.13	0.156
Sum c.	0.20	0.403	0.604

Total SS	0.010
Treat SS	0.005
Block SS	0.003
Error SS	0.002

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	7	0.010	-		
Treatment	1	0.005	0.005	7.30	10.1
Block	3	0.003	0.001	1.31	9.28
Error	3	0.002	0.001		

Treatment Effect (i.e., difference between Control and S-8) **Not Significant**

Table 37e: Muskeg Monitoring Program - Statistical Analysis of Cluster Peat Horizon Mercury Pore Waters Annual Sampling Program 2022 Results - Cluster S-9(1)

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
MS-1	Peat - Domed Bog	MS-1-D	0.54	<0.03
	Peat - Flat Bog	MS-1-F	1.70	0.05
	Peat - Horizontal Fen	MS-1-H	0.63	<0.03
	Peat - Ribbed Fen	MS-1-R	-	-
MS-2	Peat - Domed Bog	MS-2-D	2.27	0.09
	Peat - Flat Bog	MS-2-F	-	-
	Peat - Ribbed Fen	MS-2-R	1.18	0.06
MS-7	Peat - Domed Bog	MS-7-D	0.68	<0.03
	Peat - Flat Bog	MS-7-F	1.33	<0.03
	Peat - Horizontal Fen	MS-7-H	2.09	0.05
	Peat - Ribbed Fen	MS-7-R	0.47	<0.03
MS-8	Peat - Domed Bog	MS-8-D	1.67	0.06
	Peat - Flat Bog	MS-8-F	3.58	0.14
	Peat - Horizontal Fen	MS-8-H	0.29	0.08
	Peat - Ribbed Fen	MS-8-R	1.39	0.13
MS-9(1)	Peat - Domed Bog	MS-9(1)-D	1.22	0.07
	Peat - Flat Bog	MS-9(1)-F	1.34	0.09
	Peat - Horizontal Fen	MS-9(1)-H	3.40	< 0.03
	Peat - Ribbed Fen	MS-9(1)-R	0.73	<0.03
MS-9(2)	Peat - Domed Bog	MS-9(2)-D	1.80	0.04
	Peat - Flat Bog	MS-9(2)-F	2.56	0.06
	Peat - Horizontal Fen	MS-9(2)-H	0.17	<0.03
	Peat - Ribbed Fen	MS-9(2)-R	0.36	<0.03
MS-13	Peat - Domed Bog	MS-13-D	3.55	0.07
	Peat - Flat Bog	MS-13-F	2.37	0.08
	Peat - Horizontal Fen	MS-13-H	0.47	0.07
	Peat - Ribbed Fen	MS-13-R	0.58	<0.03
MS-15	Peat - Domed Bog	MS-15-D	0.51	<0.03
	Peat - Flat Bog	MS-15-F	2.13	0.06
	Peat - Horizontal Fen	MS-15-H	0.17	<0.03
	Peat - Ribbed Fen	MS-15-R	0.27	0.03
MS-V(1)	Peat - Domed Bog	MS-V(1)-D	-	-
	Peat - Ribbed Fen	MS-V(1)-R	-	-
MS-V(2)	Peat - Domed Bog	MS-V(2)-D	1.13	0.08
	Peat - Ribbed Fen	MS-V(2)-R	1.41	0.07
MS-V(3)	Peat - Domed Bog	MS-V(3)-D	1.69	<0.03
	Peat - Ribbed Fen	MS-V(3)-R	0.73	<0.03

Clusters used for statistical analysis

MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury and 0.1 ng/L for total mercury), as per Section 1.

Blank cells indicate concentration was not determined.

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-9(1)	Sum r.
D. Bog	2.03	1.22	3.243
F. Bog	2.25	1.34	3.587
H. Fen	0.32	3.40	3.715
R. Fen	0.42	0.73	1.158
Sum c.	5.021	6.681	11.702

Total SS	7.665
Treat SS	0.344
Block SS	2.142
Error SS	5.178

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	7	7.665	-		
Treatment	1	0.344	0.344	0.20	10.1
Block	3	2.142	0.714	0.41	9.28
Error	3	5.178	1.726		

Treatment Effect (i.e., difference between Control and S-9(1)) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-9(1)	Sum r.
D. Bog	0.05	0.07	0.119
F. Bog	0.07	0.09	0.161
H. Fen	0.05	0.03	0.080
R. Fen	0.03	0.03	0.060
Sum c.	0.20	0.218	0.419

Total SS	0.003
Treat SS	0.000
Block SS	0.003
Error SS	0.000

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	7	0.003	-		
Treatment	1	0.000	0.000	0.24	10.1
Block	3	0.003	0.001	6.48	9.28
Error	3	0.000	0.000		

Treatment Effect (i.e., difference between Control and S-9(1)) **Not Significant**

Table 37f: Muskeg Monitoring Program - Statistical Analysis of Cluster Peat Horizon Mercury Pore Waters Annual Sampling Program 2022 Results - Cluster S-9(2)

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
MS-1	Peat - Domed Bog	MS-1-D	0.54	<0.03
	Peat - Flat Bog	MS-1-F	1.70	0.05
	Peat - Horizontal Fen	MS-1-H	0.63	<0.03
	Peat - Ribbed Fen	MS-1-R	-	-
MS-2	Peat - Domed Bog	MS-2-D	2.27	0.09
	Peat - Flat Bog	MS-2-F	-	-
	Peat - Ribbed Fen	MS-2-R	1.18	0.06
MS-7	Peat - Domed Bog	MS-7-D	0.68	<0.03
	Peat - Flat Bog	MS-7-F	1.33	<0.03
	Peat - Horizontal Fen	MS-7-H	2.09	0.05
	Peat - Ribbed Fen	MS-7-R	0.47	<0.03
MS-8	Peat - Domed Bog	MS-8-D	1.67	0.06
	Peat - Flat Bog	MS-8-F	3.58	0.14
	Peat - Horizontal Fen	MS-8-H	0.29	0.08
	Peat - Ribbed Fen	MS-8-R	1.39	0.13
MS-9(1)	Peat - Domed Bog	MS-9(1)-D	1.22	0.07
	Peat - Flat Bog	MS-9(1)-F	1.34	0.09
	Peat - Horizontal Fen	MS-9(1)-H	3.40	< 0.03
	Peat - Ribbed Fen	MS-9(1)-R	0.73	<0.03
MS-9(2)	Peat - Domed Bog	MS-9(2)-D	1.80	0.039
	Peat - Flat Bog	MS-9(2)-F	2.56	0.063
	Peat - Horizontal Fen	MS-9(2)-H	0.17	<0.03
	Peat - Ribbed Fen	MS-9(2)-R	0.36	<0.03
MS-13	Peat - Domed Bog	MS-13-D	3.55	0.07
	Peat - Flat Bog	MS-13-F	2.37	0.08
	Peat - Horizontal Fen	MS-13-H	0.47	0.07
	Peat - Ribbed Fen	MS-13-R	0.58	<0.03
MS-15	Peat - Domed Bog	MS-15-D	0.51	<0.03
	Peat - Flat Bog	MS-15-F	2.13	0.06
	Peat - Horizontal Fen	MS-15-H	0.17	<0.03
	Peat - Ribbed Fen	MS-15-R	0.27	0.03
MS-V(1)	Peat - Domed Bog	MS-V(1)-D	-	-
	Peat - Ribbed Fen	MS-V(1)-R	-	-
MS-V(2)	Peat - Domed Bog	MS-V(2)-D	1.13	0.08
	Peat - Ribbed Fen	MS-V(2)-R	1.41	0.07
MS-V(3)	Peat - Domed Bog	MS-V(3)-D	1.69	<0.03
	Peat - Ribbed Fen	MS-V(3)-R	0.73	<0.03

TOTAL MERCURY

Habitat	Control Mean (S13+S15)	S-9(2)	Sum r.
D. Bog	2.03	1.80	3.823
F. Bog	2.25	2.56	4.808
H. Fen	0.32	0.17	0.486
R. Fen	0.42	0.36	0.782
Sum c.	5.021	4.877	9.898

Total SS	7.128
Treat SS	0.003
Block SS	7.039
Error SS	0.086

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	7	7.128	-		
Treatment	1	0.003	0.003	0.09	10.1
Block	3	7.039	2.346	81.80	9.28
Error	3	0.086	0.029		

Treatment Effect (i.e., difference between Control and S-9(2)) **Not Significant**

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-9(2)	Sum r.
D. Bog	0.05	0.04	0.089
F. Bog	0.07	0.06	0.135
H. Fen	0.05	0.03	0.079
R. Fen	0.03	0.03	0.061
Sum c.	0.201	0.162	0.363

Total SS	0.002
Treat SS	0.000
Block SS	0.001
Error SS	0.000

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	7	0.002	-		
Treatment	1	0.000	0.000	6.55	10.1
Block	3	0.001	0.000	17.05	9.28
Error	3	0.000	0.000		

Treatment Effect (i.e., difference between Control and S-9(2)) **Not Significant**

Clusters used for statistical analysis

MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury and 0.1 ng/L for total mercury), as per Section 1.

Blank cells indicate concentration was not determined.

Table 37g: Muskeg Monitoring Program - Statistical Analysis of Cluster Peat Horizon Mercury Pore Waters Annual Sampling Program 2022 Results - Cluster S-V Series

TWO-WAY ANALYSIS OF VARIANCE TABLES

TOTAL AND METHYL MERCURY PORE WATER CONCENTRATIONS (ng/L)

TOTAL MERCURY

Cluster Location	Substrate/Condition	Well Name	Total Mercury (Filtered)	Methyl Mercury (Filtered)
MS-1	Peat - Domed Bog	MS-1-D	0.54	<0.03
	Peat - Flat Bog	MS-1-F	1.70	0.05
	Peat - Horizontal Fen	MS-1-H	0.63	<0.03
	Peat - Ribbed Fen	MS-1-R	-	-
MS-2	Peat - Domed Bog	MS-2-D	2.27	0.09
	Peat - Flat Bog	MS-2-F	-	-
	Peat - Ribbed Fen	MS-2-R	1.18	0.06
MS-7	Peat - Domed Bog	MS-7-D	0.68	<0.03
	Peat - Flat Bog	MS-7-F	1.33	<0.03
	Peat - Horizontal Fen	MS-7-H	2.09	0.05
	Peat - Ribbed Fen	MS-7-R	0.47	<0.03
MS-8	Peat - Domed Bog	MS-8-D	1.67	0.06
	Peat - Flat Bog	MS-8-F	3.58	0.14
	Peat - Horizontal Fen	MS-8-H	0.29	0.08
	Peat - Ribbed Fen	MS-8-R	1.39	0.13
MS-9(1)	Peat - Domed Bog	MS-9(1)-D	1.22	0.07
	Peat - Flat Bog	MS-9(1)-F	1.34	0.09
	Peat - Horizontal Fen	MS-9(1)-H	3.40	< 0.03
	Peat - Ribbed Fen	MS-9(1)-R	0.73	<0.03
MS-9(2)	Peat - Domed Bog	MS-9(2)-D	1.80	0.04
	Peat - Flat Bog	MS-9(2)-F	2.56	0.06
	Peat - Horizontal Fen	MS-9(2)-H	0.17	<0.03
	Peat - Ribbed Fen	MS-9(2)-R	0.36	<0.03
MS-13	Peat - Domed Bog	MS-13-D	3.55	0.07
	Peat - Flat Bog	MS-13-F	2.37	0.08
	Peat - Horizontal Fen	MS-13-H	0.47	< 0.07
	Peat - Ribbed Fen	MS-13-R	0.58	<0.03
MS-15	Peat - Domed Bog	MS-15-D	0.51	<0.03
	Peat - Flat Bog	MS-15-F	2.13	< 0.06
	Peat - Horizontal Fen	MS-15-H	0.17	<0.03
	Peat - Ribbed Fen	MS-15-R	0.27	< 0.03
MS-V(1)	Peat - Domed Bog	MS-V(1)-D	-	-
	Peat - Ribbed Fen	MS-V(1)-R	-	-
MS-V(2)	Peat - Domed Bog	MS-V(2)-D	1.13	0.08
	Peat - Ribbed Fen	MS-V(2)-R	1.41	0.07
MS-V(3)	Peat - Domed Bog	MS-V(3)-D	1.69	<0.03
	Peat - Ribbed Fen	MS-V(3)-R	0.73	<0.03

Habitat	Control Mean (S13+S15)	S-V1	S-V2	S-V3	Sum r.
D. Bog					
R. Fen					
Sum c.					

Total SS	
Treat SS	
Block SS	
Error SS	

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total					
Treatment					
Block					
Error					

Analysis not completed due to missing data

METHYL MERCURY

Habitat	Control Mean (S13+S15)	S-V1	S-V2	S-V3	Sum r.
D. Bog					
R. Fen					
Sum c.					

Total SS	
Treat SS	
Block SS	
Error SS	

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total					
Treatment					
Block					
Error					

Analysis not completed due to missing data

Clusters used for statistical analysis

MDLs have been adjusted for all years for uniformity (0.02 ng/L for methyl mercury and 0.1 ng/L for total mercury), as per Section 1.

Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.

Due to missing data the analysis was not performed

Table 38a: Muskeg Cluster Peat Horizon Methyl Mercury Pore Water Annual Sampling Cluster S8 vs S13/S15 - Average Values Across all Muskeg Types for all Years

Year	Cluster	
	S8	Control Mean S13-S15
2008	0.028	0.064
2009	0.133	0.261
2010	0.114	0.040
2011	0.075	0.070
2012	0.051	0.050
2013	0.105	0.067
2014	0.078	0.071
2015	0.090	0.045
2016	0.084	0.038
2017	0.094	0.048
2018	0.131	0.055
2019	0.142	0.049
2020	0.134	0.048
2021	0.125	0.073
2022	0.101	0.078
Average	0.099	0.070

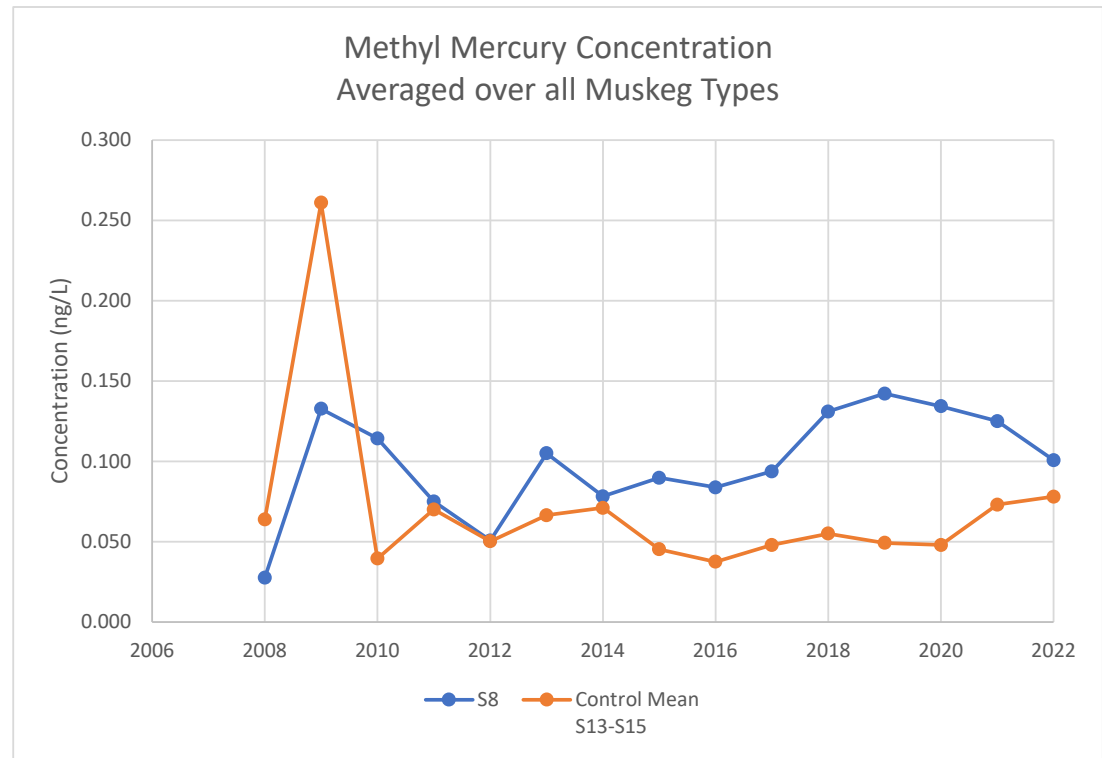


Table 38b: Muskeg Monitoring S-8 Long-term Analysis - Methyl Mercury (concentrations in ng/L)

S8 vs S13 / S15 Methyl Mercury Analysis - 2 Way ANOVA

Date	S8	S13 / S15 Average	Sum r.
2008	0.028	0.064	0.091
2009	0.133	0.261	0.394
2010	0.114	0.040	0.154
2011	0.075	0.070	0.145
2012	0.051	0.050	0.101
2013	0.105	0.067	0.172
2014	0.078	0.071	0.149
2015	0.090	0.045	0.135
2016	0.084	0.038	0.121
2017	0.094	0.048	0.142
2018	0.131	0.055	0.186
2019	0.128	0.049	0.177
2020	0.134	0.048	0.182
2021	0.125	0.073	0.198
2022	0.101	0.078	0.179
Sum c.	1.47	1.06	2.525

Total SS	0.061
Treat SS	0.00570
Block SS	0.034
Error SS	0.021

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	29	0.061	-		
Treatment	1	0.006	0.006	3.77	4.60
Block	14	0.034	0.002	1.61	2.48
Error	14	0.021	0.002		

Treatment Effect (i.e., difference between S8 and S13/S15)

Not Significant

Notes: r. - rows; c. - columns

Annual data set exceeds comparison data set by >25%

Table 39a: North Granny Creek - Statistical Analysis - Mercury - 2022 (Unfiltered) (concentrations in ng/L)

TOTAL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Date	UP SUPP (G-0)	UP NWF (G-1)	DN NWF (G-2)	DN NEF (G-3)	UP CONF (G-4)	Conf (G8)	Sum r.
Feb	4.37	1.86	1.91	1.99	1.96	2.04	14.13
Mar	4.65	1.78	1.67	1.71	1.55	1.50	12.86
Apr	4.80	1.85	1.70	1.54	1.47	2.04	13.40
May	4.36	6.65	5.27	6.31	5.02	7.18	34.79
Jun	3.61	4.67	4.86	4.63	4.05	4.49	26.32
Jul	4.94	2.99	3.18	6.32	3.63	4.25	25.31
Aug	4.06	3.61	3.21	3.89	3.73	3.44	21.93
Sept	1.97	1.65	2.57	1.96	1.98	2.22	12.35
Oct	1.98	1.70	2.30	2.03	2.30	1.83	12.14
Nov	3.22	4.80	3.20	4.30	3.11	2.54	21.17
Dec	2.54	2.40	2.73	2.91	2.01	3.21	15.80
Sum c.	40.48	33.96	32.62	37.59	30.80	34.74	210.19

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Block	91.66765	10	9.167	12.907	0.0000000	2.026
Treatment	5.56444	5	1.113	1.567	0.187	2.400
Error	35.5119	50	0.710			
Total	132.744	65				

Treatment Effect (i.e., difference between US and DS)
Not Significant

UP NWF - Upstream Northwest Fen; DN NWF - Downstream Northwest Fen; DN NEF - Downstream Northeast Fen; UP CONF - Upstream Confluence
r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 26ng/L

MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.

METHYL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Date	UP SUPP (G-0)	UP NWF (G-1)	DN NWF (G-2)	DN NEF (G-3)	UP CONF (G-4)	Conf (G8)	Sum r.
Feb	0.50	0.03	0.04	0.08	0.09	0.09	0.83
Mar	0.14	0.04	0.05	0.08	0.13	0.07	0.52
Apr	0.37	0.05	0.06	0.08	0.09	0.15	0.80
May	0.45	0.11	0.12	0.62	0.16	0.16	1.61
Jun	0.07	0.15	0.14	0.30	0.21	0.33	1.20
Jul	0.10	0.11	0.14	0.44	0.38	0.45	1.62
Aug	0.08	0.13	0.29	1.08	0.96	1.27	3.81
Sept	0.24	0.15	0.27	0.88	0.99	0.79	3.31
Oct	0.12	0.11	0.25	0.36	0.23	0.29	1.35
Nov	0.07	0.14	0.14	0.31	0.23	0.23	1.11
Dec	0.10	0.09	0.30	0.22	0.17	0.23	1.09
Sum c.	2.25	1.10	1.79	4.44	3.62	4.05	17.23

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Block	1.82272	10	0.182	4.486	0.00016	2.026
Treatment	0.827981	5	0.166	4.076	0.00351	2.400
Error	2.031502	50	0.041			
Total	4.682202	65				

Treatment Effect (i.e., difference between US and DS)
Significant

UP NWF - Upstream Northwest Fen; DN NWF - Downstream Northwest Fen; DN NEF - Downstream Northeast Fen; UP CONF - Upstream Confluence
r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 4ng/L

MDLs have been adjusted for all years for uniformity (0.02 ng/L for total mercury), as per Section 1.

Table 39b: North Granny Creek - Statistical Analysis - Mercury - 2022 (Filtered) (concentrations in ng/L)

TOTAL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Date	UP SUPP (G-0)	UP NWF (G-1)	DN NWF (G-2)	DN NEF (G-3)	UP CONF (G-4)	Conf (G8)	Sum r.
Feb	1.12	1.08	1.04	0.86	0.87	0.88	5.85
Mar	0.82	1.07	0.94	0.76	0.86	0.74	5.18
Apr	0.90	1.10	0.85	0.88	0.84	1.13	5.70
May	3.01	2.35	2.09	2.20	2.74	2.64	15.03
Jun	3.80	2.89	2.96	2.83	3.04	2.68	18.19
Jul	2.76	2.54	2.50	2.42	2.50	3.41	16.12
Aug	1.85	1.90	3.01	2.28	2.27	2.75	14.06
Sept	2.07	1.72	1.75	2.06	2.03	1.42	11.05
Oct	1.23	1.14	1.20	1.21	1.70	1.42	7.90
Nov	2.34	2.41	2.35	1.97	2.10	1.85	13.02
Dec	1.43	1.29	1.33	1.30	1.00	1.26	7.62
Sum c.	21.32	19.47	20.01	18.76	19.95	20.18	119.71

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Block	36.16518	10	3.617	45.270	1.39E-21	2.026
Treatment	0.32549	5	0.065	0.815	0.545	2.400
Error	3.994378	50	0.080			
Total	40.48505	65				

Treatment Effect (i.e., difference between US and DS)
Not Significant

UP NWF - Upstream Northwest Fen; DN NWF - Downstream Northwest Fen; DN NEF - Downstream Northeast Fen; UP CONF - Upstream Confluence

r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 26ng/L

MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.

METHYL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Date	UP SUPP (G-0)	UP NWF (G-1)	DN NWF (G-2)	DN NEF (G-3)	UP CONF (G-4)	Conf (G8)	Sum r.
Feb	0.08	0.02	0.03	0.04	0.05	0.14	0.37
Mar	0.12	0.02	0.02	0.03	0.04	0.06	0.29
Apr	0.14	0.03	0.03	0.04	0.04	0.05	0.32
May	0.05	0.03	0.03	0.26	0.08	0.09	0.54
Jun	0.09	0.10	0.13	0.23	0.18	0.07	0.80
Jul	0.10	0.09	0.11	0.35	0.30	0.28	1.22
Aug	0.07	0.11	0.19	0.88	0.84	0.38	2.47
Sept	0.11	0.09	0.20	0.67	0.79	0.76	2.61
Oct	0.06	0.09	0.16	0.31	0.17	0.67	1.46
Nov	0.11	0.07	0.13	0.14	0.20	0.27	0.91
Dec	0.05	0.06	0.20	0.18	0.11	0.13	0.73
Sum c.	0.97	0.71	1.21	3.12	2.79	2.91	11.71

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Rows	1.111994	10	0.111	4.901	6.41E-05	2.026
Columns	0.548264	5	0.110	4.833	0.0011	2.400
Error	1.134466	50	0.023			
Total	2.794724	65				

Treatment Effect (i.e., difference between US and DS)
Significant

UP NWF - Upstream Northwest Fen; DN NWF - Downstream Northwest Fen; DN NEF - Downstream Northeast Fen; UP CONF - Upstream Confluence

r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 4ng/L

MDLs have been adjusted for all years for uniformity (0.02 ng/L for total mercury), as per Section 1.

Table 39c: South Granny Creek - Statistical Analysis - Mercury - 2022 (Unfiltered) (concentrations in ng/L)

TOTAL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Date	UP SWF (G-5)	DN SWF (G-6)	UP CONF (G-7)	Conf (G-8)	Sum r.
Feb	47.29	2.34	1.83	2.04	53.50
Mar	132.20	2.15	1.84	1.50	137.69
Apr	32.98	2.28	2.56	2.04	39.87
May	4.80	4.19	3.44	7.18	19.61
Jun	3.30	2.75	3.44	4.49	13.98
Jul	2.88	3.38	3.09	4.25	13.60
Aug	2.88	3.29	3.47	3.44	13.09
Sep	2.16	1.92	2.15	2.22	8.45
Oct	2.70	2.70	1.79	1.83	9.02
Nov	2.52	3.67	2.42	2.54	11.15
Dec	2.52	2.49	2.14	3.21	10.36
Sum c.	236.25	31.17	28.16	34.74	330.31

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Block	3702.8503	10	370.285	0.915	0.532	2.165
Treatment	2864.396	3	954.799	2.360	0.091	2.922
Error	12137.69	30	404.590			
Total	18704.936	43				

Treatment Effect (i.e., difference between US and DS)
Not Significant

UP SWF - Upstream Southwest Fen; DN SWF - Downstream Southwest Fen; UP CONF - Upstream Confluence
r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 26ng/L

MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.

METHYL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Date	UP SWF (G-5)	DN SWF (G-6)	UP CONF (G-7)	Conf (G-8)	Sum r.
Feb	0.98	0.07	0.14	0.09	1.28
Mar	3.78	0.11	0.11	0.07	4.07
Apr	0.69	0.15	0.26	0.15	1.24
May	0.07	0.12	0.21	0.16	0.57
Jun	0.07	0.25	0.21	0.33	0.86
Jul	0.11	0.36	0.42	0.45	1.34
Aug	0.11	1.05	1.29	1.27	3.71
Sep	0.07	0.61	0.96	0.79	2.43
Oct	0.41	0.41	0.28	0.29	1.39
Nov	0.05	0.23	0.20	0.23	0.71
Dec*	0.07	0.29	0.24	0.23	0.83
Sum c.	6.41	3.66	4.32	4.05	18.44

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Block	3.6386376	10	0.364	0.903	0.542	2.165
Treatment	0.4121049	3	0.137	0.341	0.796	2.922
Error	12.088969	30	0.403			
Total	16.139712	43				

Treatment Effect (i.e., difference between US and DS)
Not Significant

UP SWF - Upstream Southwest Fen; DN SWF - Downstream Southwest Fen; UP CONF - Upstream Confluence
r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 4ng/L

MDLs have been adjusted for all years for uniformity (0.02 ng/L for total mercury), as per Section 1.

Table 39d: South Granny Creek - Statistical Analysis - Mercury - 2022 (Filtered) (concentrations in ng/L)

TOTAL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Date	UP SWF (G-5)	DS SWF (G-6)	UP CONF (G-7)	Conf (G-8)	Sum r.
Feb	1.36	1.08	0.95	0.88	4.27
Mar	0.81	1.01	1.07	0.74	3.64
Apr	0.63	0.97	1.27	1.13	4.00
May	2.85	2.36	2.32	2.64	10.16
Jun	3.19	2.52	2.32	2.68	10.70
Jul	1.99	1.84	2.02	3.41	9.25
Aug	1.99	2.42	2.18	2.75	9.34
Sep	1.36	1.84	1.49	1.42	6.11
Oct	1.11	1.11	1.29	1.42	4.94
Nov	1.88	1.34	1.47	1.85	6.54
Dec	1.47	1.36	1.17	1.26	5.26
Sum c.	18.65	17.84	17.53	20.18	74.20

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Block	17.382033	10	1.738	16.908	9.89E-10	2.165
Treatment	0.382857	3	0.128	1.241	0.312	2.922
Error	3.0840368	30	0.103			
Total	20.848927	43				

Treatment Effect (i.e., difference between US and DS)
Not Significant

UP SWF - Upstream Southwest Fen; DN SWF - Downstream Southwest Fen; UP CONF - Upstream Confluence
r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 26ng/L

MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.

METHYL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Date	UP SWF (G-5)	DN SWF (G-6)	UP CONF (G-7)	Conf (G-8)	Sum r.
Feb	0.03	0.05	0.09	0.06	0.23
Mar	0.02	0.03	0.07	0.05	0.17
Apr	0.03	0.11	0.10	0.09	0.33
May	0.03	0.07	0.17	0.07	0.34
Jun	0.05	0.19	0.17	0.28	0.69
Jul	0.06	0.29	0.39	0.38	1.12
Aug	0.06	0.53	0.97	0.76	2.32
Sep	0.07	0.57	0.81	0.67	2.12
Oct	0.20	0.20	0.20	0.27	0.87
Nov	0.05	0.11	0.17	0.13	0.46
Dec*	0.08	0.16	0.15	0.15	0.53
Sum c.	0.66	2.31	3.29	2.91	9.17

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Block	1.3753982	10	0.138	7.627	6.55E-06	2.16
Treatment	0.3688445	3	0.123	6.818	0.001	2.92
Error	0.5410075	30	0.018			
Total	2.2852502	43				

Treatment Effect (i.e., difference between US and DS)
Significant

UP SWF - Upstream Southwest Fen; DN SWF - Downstream Southwest Fen; UP CONF - Upstream Confluence
r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 4ng/L

MDLs have been adjusted for all years for uniformity (0.02 ng/L for total mercury), as per Section 1.

Table 39e: Nayshkootayaow River - Statistical Analysis - Mercury - 2022 (Unfiltered) (concentrations in ng/L)

TOTAL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Naysh R. UP (N-1)	Naysh R. M (N-2)	Naysh R. DN Conf.	Naysh R. DN (N-3)	Sum r.
Jun	2.71	3.91	2.94	3.17	12.73
Jul	2.01	2.08	2.19	2.83	9.10
Oct	1.33	1.98	1.42	1.41	6.14
Sum c.	6.04	7.98	6.54	7.41	27.97

Total SS	6.966
Treat SS	0.750
Block SS	5.450
Error SS	0.767

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	11	6.966	-		
Treatment	3	0.750	0.250	1.95	4.76
Block	2	5.450	2.725	21.32	5.14
Error	6	0.767	0.128		

UP - Upstream; M - Middle; DN - Downstream

r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 26 ng/L

MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.

Treatment Effect (i.e., difference between US and DS)
Not Significant

METHYL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Naysh R. UP (N-1)	Naysh R. M (N-2)	Naysh R. DN Conf.	Naysh R. DN (N-3)	Sum r.
Jun	0.063	0.073	0.079	0.069	0.284
Jul	0.054	0.060	0.069	0.062	0.245
Oct	0.044	0.076	0.068	0.081	0.269
Sum c.	0.161	0.209	0.216	0.212	0.798

Total SS	0.0013
Treat SS	0.0007
Block SS	0.0002
Error SS	0.0004

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	11	0.0013	-		
Treatment	3	0.0007	0.0002	3.42	4.76
Block	2	0.0002	0.0001	1.49	5.14
Error	6	0.0004	0.0001		

UP - Upstream; M - Middle; DN - Downstream

r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 4ng/L

MDLs have been adjusted for all years for uniformity (0.02 ng/L for total mercury), as per Section 1.

Treatment Effect (i.e., difference between US and DS)
Not Significant

Table 39f: Nayshkootayaow River - Statistical Analysis - Mercury - 2022 (Filtered) (concentrations in ng/L)

TOTAL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Naysh R. UP (N-1)	Naysh R. M (N-2)	Naysh R. DN Conf.	Naysh R. DN (N-3)	Sum r.
Jun	1.79	1.54	1.87	1.65	6.85
Jul	1.45	1.63	2.36	1.32	6.77
Oct	0.98	1.13	0.98	1.16	4.24
Sum c.	4.22	4.30	5.21	4.13	17.86

Total SS	1.844
Treat SS	0.252
Block SS	1.101
Error SS	0.491

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	11	1.844	-		
Treatment	3	0.252	0.084	1.03	4.76
Block	2	1.101	0.551	6.73	5.14
Error	6	0.491	0.082		

UP - Upstream; M - Middle; DN - Downstream

r. - rows; c. - columns

MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.

Treatment Effect (i.e., difference between US and DS)

Not Significant

METHYL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Naysh R. UP (N-1)	Naysh R. M (N-2)	Naysh R. DN Conf.	Naysh R. DN (N-3)	Sum r.
Jun	0.041	0.055	0.058	0.039	0.193
Jul	0.032	0.046	0.054	0.049	0.181
Oct	0.029	0.029	0.029	0.048	0.135
Sum c.	0.102	0.130	0.141	0.136	0.509

Total SS	0.0013
Treat SS	0.0003
Block SS	0.0005
Error SS	0.0005

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	11	0.0013	-		
Treatment	3	0.0003	0.0001	1.18	4.76
Block	2	0.0005	0.0002	2.74	5.14
Error	6	0.0005	0.00009		

UP - Upstream; M - Middle; DN - Downstream

r. - rows; c. - columns

Draft USEPA Criteria: 0.05 ng/L

MDLs have been adjusted for all years for uniformity (0.02 ng/L for total mercury), as per Section 1.

Treatment Effect (i.e., difference between US and DS)

Not Significant

Table 39g: Attawapiskat River - Statistical Analysis - Mercury - 2022 (Unfiltered) (concentrations in ng/L)

TOTAL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Att R. (A-1)	Att R. (A-2)	Att R. (A-3)	Att R. (A-4)	Sum r.
Feb	2.77	11.85	3.33	1.69	19.63
Jun	3.57	4.65	3.47	3.36	15.05
Jul	2.88	2.78	2.88	3.97	12.50
Oct	1.97	3.94	1.49	2.03	9.43
Sum c.	11.18	23.22	11.16	11.05	56.61

Total SS	85.128
Treat SS	27.389
Block SS	13.963
Error SS	43.776

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	15	85.128	-		
Treatment	3	27.389	9.130	1.88	3.86
Block	3	13.963	4.654	0.96	3.86
Error	9	43.776	4.864		

r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 26ng/L

MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.

Treatment Effect (i.e., difference between US and DS)
Not Significant

METHYL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Att R. (A-1)	Att R. (A-2)	Att R. (A-3)	Att R. (A-4)	Sum r.
Feb	0.043	0.114	0.032	0.025	0.214
Jun	0.055	0.071	0.041	0.047	0.214
Jul	0.056	0.069	0.071	0.060	0.256
Oct	0.067	0.093	0.037	0.058	0.255
Sum c.	0.221	0.347	0.181	0.190	0.939

Total SS	0.008
Treat SS	0.004
Block SS	0.000
Error SS	0.003

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	15	0.008	-		
Treatment	3	0.004	0.001	4.57	3.86
Block	3	0.000	0.000	0.45	3.86
Error	9	0.003	0.000		

r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 4ng/L

MDLs have been adjusted for all years for uniformity (0.02 ng/L for total mercury), as per Section 1.

Treatment Effect (i.e., difference between US and DS)
Significant

Table 39h: Attawapiskat River - Statistical Analysis - Mercury - 2022 (Filtered) (concentrations in ng/L)

TOTAL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Att R. (A-1)	Att R. (A-2)	Att R. (A-3)	Att R. (A-4)	Sum r.
Feb	1.30	1.30	1.20	1.11	4.90
Jun	2.53	2.17	2.34	2.37	9.41
Jul	2.06	2.87	2.63	1.99	9.55
Oct	1.53	1.18	1.17	1.36	5.23
Sum c.	7.42	7.52	7.33	6.82	29.09

Total SS	5.614
Treat SS	0.072
Block SS	4.883
Error SS	0.658

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	15	5.614	-		
Treatment	3	0.072	0.024	0.33	3.86
Block	3	4.883	1.628	22.25	3.86
Error	9	0.658	0.073		

r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 26ng/L

MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.

Treatment Effect (i.e., difference between US and DS)
Not Significant

METHYL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES

Habitat	Att R. (A-1)	Att R. (A-2)	Att R. (A-3)	Att R. (A-4)	Sum r.
Feb	0.024	0.022	0.024	0.023	0.093
Jun	0.029	0.050	0.048	0.041	0.168
Jul	0.034	0.047	0.029	0.029	0.139
Oct	0.036	0.045	0.031	0.035	0.147
Sum c.	0.123	0.164	0.132	0.128	0.547

Total SS	0.00134
Treat SS	0.00026
Block SS	0.00075
Error SS	0.00034

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	15	0.00134	-		
Treatment	3	0.00026	0.00009	2.30	3.86
Block	3	0.00075	0.00025	6.69	3.86
Error	9	0.00034	0.00004		

r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 4ng/L

MDLs have been adjusted for all years for uniformity (0.02 ng/L for total mercury), as per Section 1.

Treatment Effect (i.e., difference between US and DS)
Not Significant

Table 40: Granny Creek Confluence and Trib 5A - Statistical Analysis - Mercury - Averages All Years (concentrations in ng/L)

TOTAL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES (Unfiltered)

Date	Granny Cr Confluence (G-8)	Trib 5A	Sum r.
2009	2.05	1.09	3.14
2010	1.30	1.01	2.31
2011	1.69	1.34	3.03
2012	2.35	1.48	3.83
2013	1.66	0.90	2.56
2014	1.53	1.86	3.39
2015	1.85	1.13	2.98
2016	3.38	1.76	5.14
2017	2.09	1.18	3.27
2018	2.24	2.71	4.95
2019	2.83	1.42	4.25
2020	2.91	1.66	4.57
2021	3.30	1.87	5.16
2022	3.07	1.70	4.76
Sum c.	32.25	21.10	53.35

Total SS	13.433
Treat SS	4.439
Block SS	6.306
Error SS	2.687

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	27	12.078	-		
Treatment	1	4.439	4.439	21.47	4.67
Block	13	6.306	0.485	2.35	2.58
Error	13	2.687	0.207		

Treatment Effect (i.e., difference between G-8 and Trib 5A)
Significant

r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 26ng/L

MDLs have been adjusted for all years for uniformity (0.1 ng/L for total mercury), as per Section 1.

TOTAL MERCURY DATA AND TWO-WAY ANALYSIS OF VARIANCE TABLES (Filtered)

Date	Granny Cr Confluence (G-8)	Trib 5A	Sum r.
2009	1.47	0.82	2.29
2010	0.89	0.58	1.47
2011	1.24	1.04	2.28
2012	1.44	0.96	2.40
2013	1.02	0.61	1.63
2014	1.00	1.27	2.27
2015	1.24	0.81	2.05
2016	1.53	1.12	2.65
2017	1.25	0.82	2.07
2018	1.50	1.23	2.73
2019	1.85	1.04	2.89
2020	1.89	1.24	3.13
2021	2.08	1.31	3.40
2022	1.75	1.10	2.85
Sum c.	20.16	13.95	34.11

Total SS	3.797
Treat SS	1.377
Block SS	1.925
Error SS	0.495

ANOVA Table					
Source V.	d.f.	SS	MS	F _{cal}	F _{tab} 0.05
Total	27	3.797	-		
Treatment	1	1.377	1.377	36.15	4.67
Block	13	1.925	0.148	3.89	2.58
Error	13	0.495	0.038		

Treatment Effect (i.e., difference between G-8 and Trib 5A)
Significant

r. - rows; c. - columns

CEQG for Protection of Aquatic Life: 4ng/L

MDLs have been adjusted for all years for uniformity (0.02 ng/L for total mercury), as per Section 1.

Table 41a: Sulphate Trends Over Time (average values)

Location	Year													Average
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
LG Pond 2					13.1	157.8	181	211	189.5	292.4	259.0	216.3	107.2	180.8
LG Pond 3					10.1	50.4	-	-	-	-	-	-	-	30.3
LG Pond 4					23.8		-	-	-	-	-	-	-	23.8
E House P1					54.7	36.5	52.9	78.9	77.3	63.1	57.2	58.5	34.3	57.0
NEF – M	23.3	186.5	115.3	177.2	120	155.2	220	287.3	202.5	199.3	137.6	222.2	203.4	173.1
NEF – M ²	17.5	58.7	87.9	35.9	44.9	55.6	69.2	48.8	58	87.1	66.7	93.5	93.3	62.9
NEF – F	30.6	59.7	97.5	74.5	60.2	72.6	84.9	71.9	73.5	70.3	71.3	99.9	89.5	73.6
Phase 1 Ditch	39.4	70	80.6	73.6	70.8	72	75.5	71	58.4	64.8	-	-	-	67.6
LF 3	143.5	141.6	137.8	168.5	151.7	140.6	134.5	197.7	226.7	250.6	183.1	231.3	178.8	175.9
LF 4A	6.9	<2.1	1.7	<7.9	1.7	<2.2	<1	<5	1.9	<1.5	<1.8	<7.2	<5.2	3.7
LF 4B	<1.0	<1.9	<2.5	<23.9	31.8	<7.3	-	-	-	-	-	-	-	11.4
LF 5		<3.1	<2.3	<3.2	<1.5	<3.6	8.6	15	11.4	<1.2	2.2	7.3	4.9	5.7
LF 6			17.5	10.2	<14.4	<3.8	7.1	3	1.7	<2.0	<6.0	7.6	27.0	10.3
LF 7						11.3	35.2	16.4	26.8	<5.6	<4.3	4.9	2.6	16.2
WR-North						90.6	93.5	110.1	115.9	69.8	114.8	44.0	57.0	87.0
WR-Centre						378.3	425	425.4	400	378.3	363.0	320.7	365.3	382.0
WR-East						402.8	431.6	388.6	304.6	404.9	363.4	376.1	374.6	380.8
WR-A						<3.8	90.2	1	<1	<1	1.2	1.6	0.7	12.6
WR-B						369.5	394	500	469.7	376.4	410.0	304.5	325.3	393.7
WR-C						342.7	446	355.7	327.1	274.5	230.7	222.6	318.2	314.7
LG-South						121.6	85.7	11.6	116.26	234.5	311.5	242.5	317.1	180.1
Graphed values														

Where cells are blank or contain "-", this indicates that the sample was not required to be collected or data was unavailable.

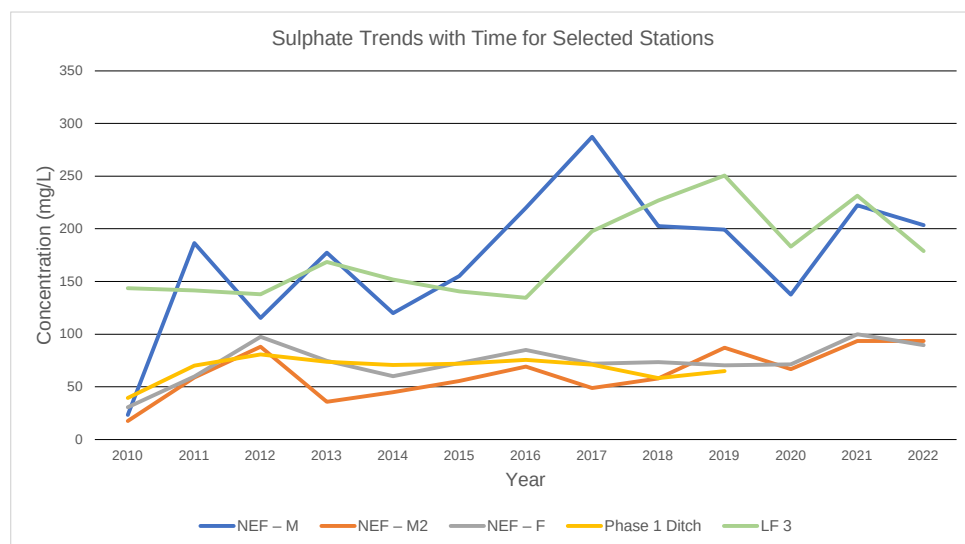
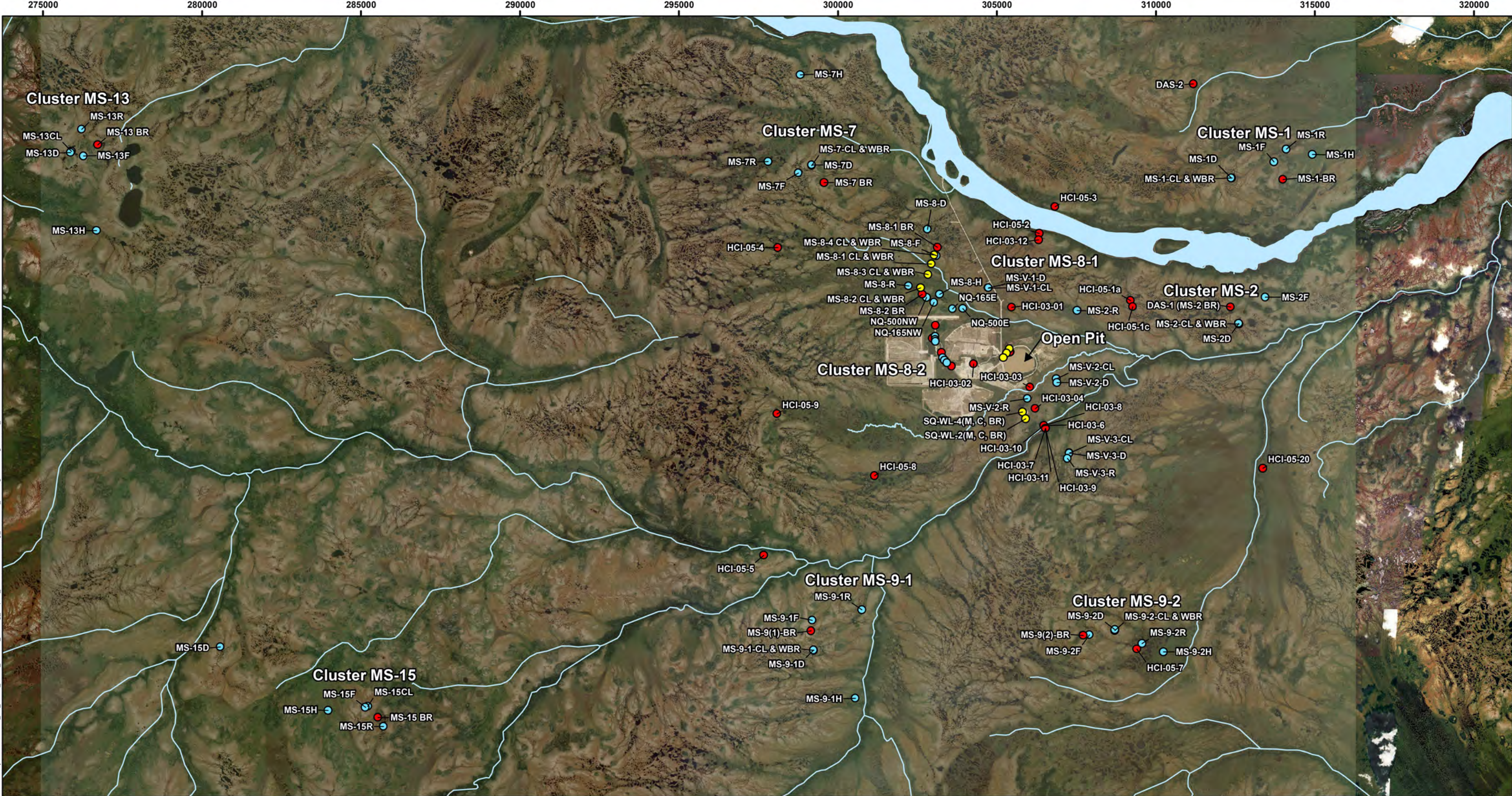


Table 41b: 2022 Sulphate Investigation Results (mg/L)

Location	Count	Minimum	Maximum	Average	75th Percentile	Period
LG Pond 2	9	37.4	438	107.2	63.45	January - December
LG Pond 3	-	-	-	-	-	-
LG Pond 4	-	-	-	-	-	-
E House P1	5	20.1	46.3	34.3	121.9	January - December
NEF – M	158	21.3	371	203.4	241	January - December
NEF – M2	28		140	93.3	193.5	May - October
NEF – F	47	40.7	163	89.5	225.5	January - December
Phase 1 Ditch	-	-	-	-	-	January - November
LF 3	53	6.8	376	178.8	221	January – December
LF 4A	7	1.6	12.6	5.2	79.8	February– December
LF 4B	-	-	-	-	-	-
LF 5	7	0.7	17.3	4.9	284.5	June - December
LF 6	7	5.6	83.5	27.0	384	June - November
LF 7	7	1.4	3.2	2.6	106.5	January - November
WR-North	12	11.8	72.7	57.0	338.75	January - December
WR-Centre	12	290	443	365.3	146.5	January - December
WR-East	12	328	411	374.6	133.75	January - December
WR-A	7	0.5	0.9	0.7	130	April - November
WR-B	6	250	390	325.3	110.05	May - October
WR-C	6	269	375	318.2	86.4	May - October
LG-South	8	198	473	317.1	84.55	January - December

Sample locations are shown in Figure 28

LG – low grade PK stockpile; NEF – Northeast Fen; LF – landfill; WR – Waste rock pile



LEGEND

Muskeg Monitoring Stations

Bedrock Monitoring Well

Clay/Peat/Bedrock Piezometer

Clay/Peat Piezometer

NOTES:

- Aerial imagery current as of September 2022.

Datum: NAD83

Projection: UTM Zone 17N

N

W

E

S

DE BEERS

GROUP OF COMPANIES

VICTOR DIAMOND MINE

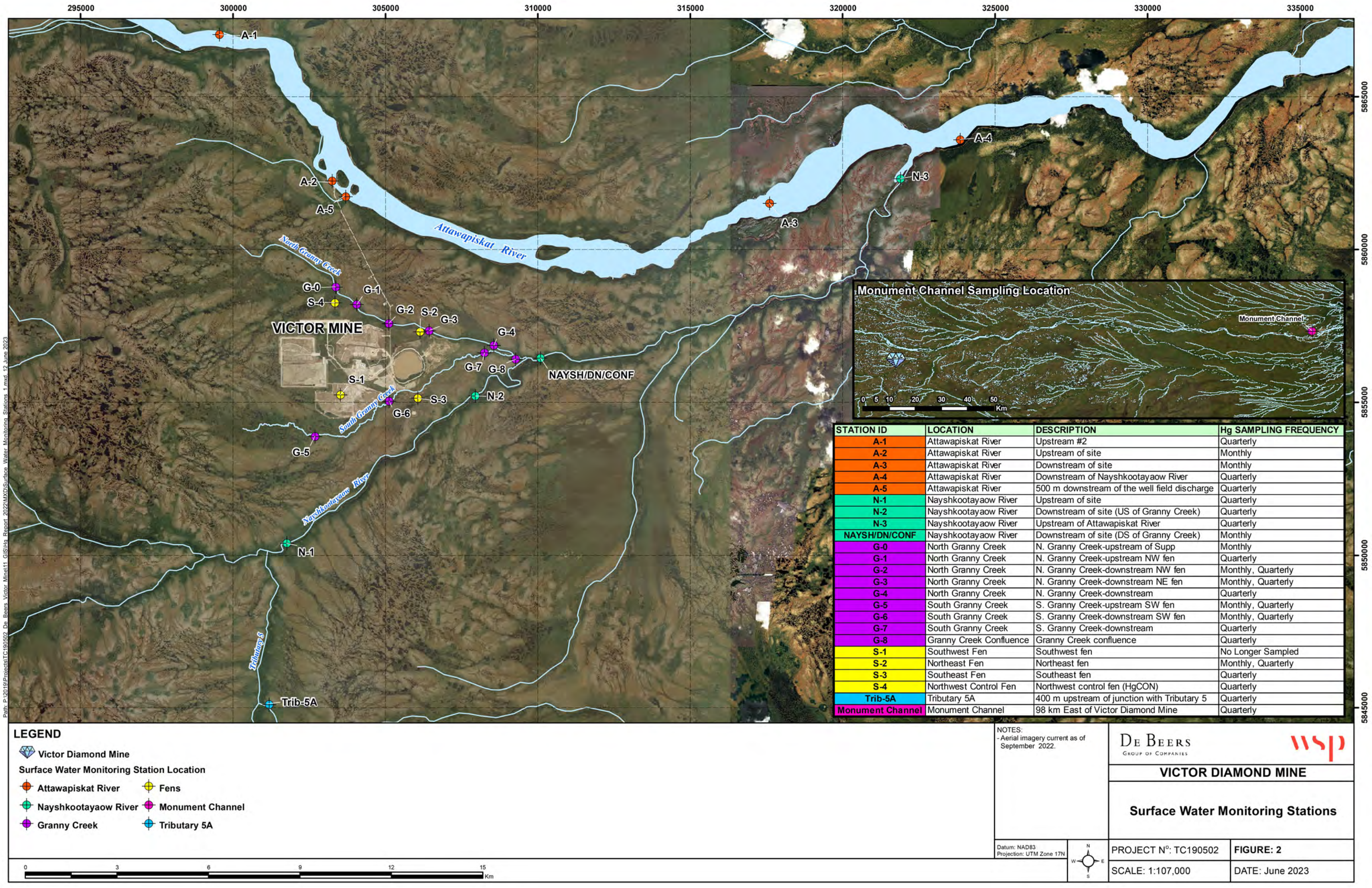
Muskeg Monitoring Locations

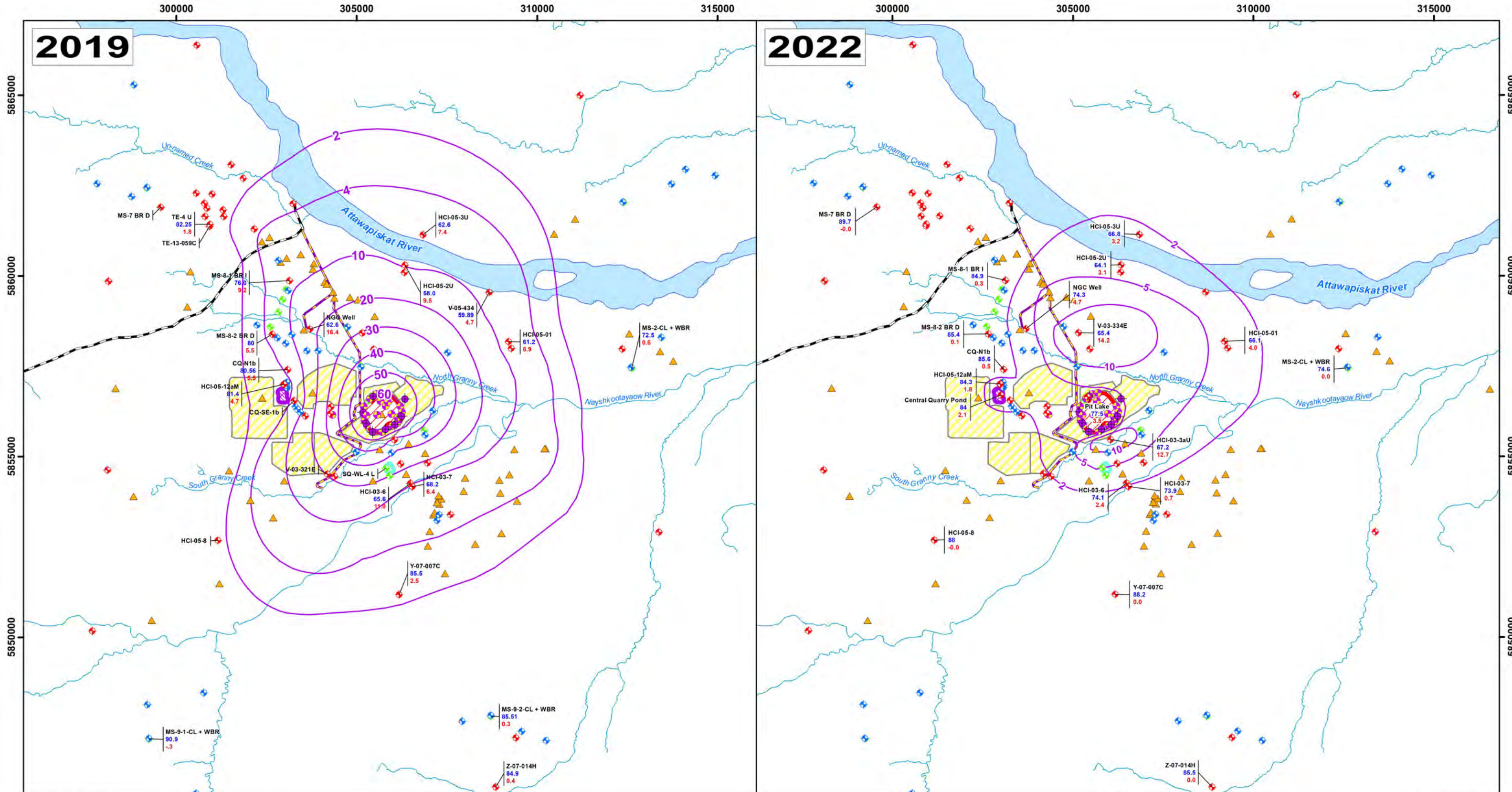
PROJECT N^o: TC190502

FIGURE: 1

SCALE: 1:115,000

DATE: June 2023





LEGEND

- | | | |
|------------------------------|-----------------------------|---|
| Well Type/Description | VDM Open Pit | Drawdown in Upper Limestone Aquifer Unit (2m or 10m Contour Interval) |
| Bedrock Monitoring Well | South Quarry | Granny Creek Pipeline |
| Clay/Peat Piezometer | Central Quarry | Nayshkootayaow River Pipeline |
| Clay/Peat/Bedrock Piezometer | Stockpile Areas/PK Facility | Watercourse |
| Non-Permit Well | Attawapiskat River | |
| Pumping Wells | | |
| Dry Ponds | | |

NOTES:
- Only wells included in drawdown surface are labeled with groundwater elevation (blue - mASL) and drawdown (red - meters)

VICTOR DIAMOND MINE

**Interpreted Drawdown Contours (m)
in Upper Limestone Aquifer
(March 2019 and August 2022)**

Datum: NAD83 Projection: UTM Zone 17N		PROJECT N ^o : TC190502	FIGURE: 3
SCALE: 1:100,000		DATE: June 2023	

**Figure 4a: Ribbed Fen Surface Water Average Methyl Mercury Concentration (Filtered)
as a Function of DOC**

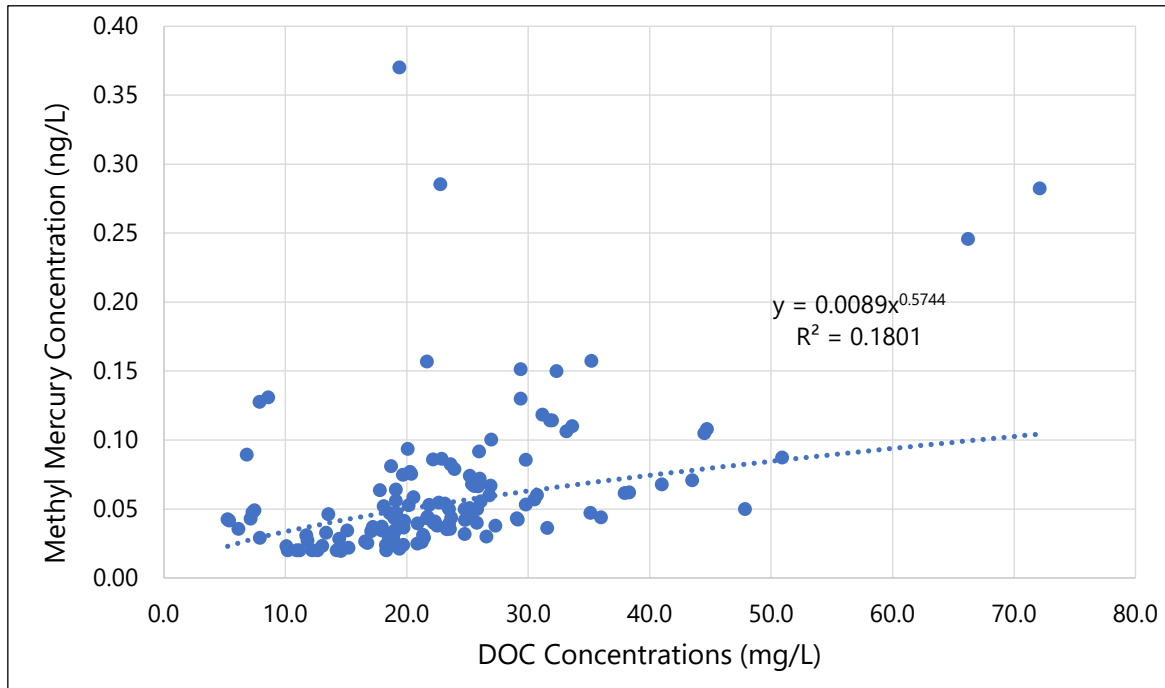


**Figure 4b: Ribbed Fen Surface Water Average Methyl Mercury Concentration (Filtered)
as a Function of pH**

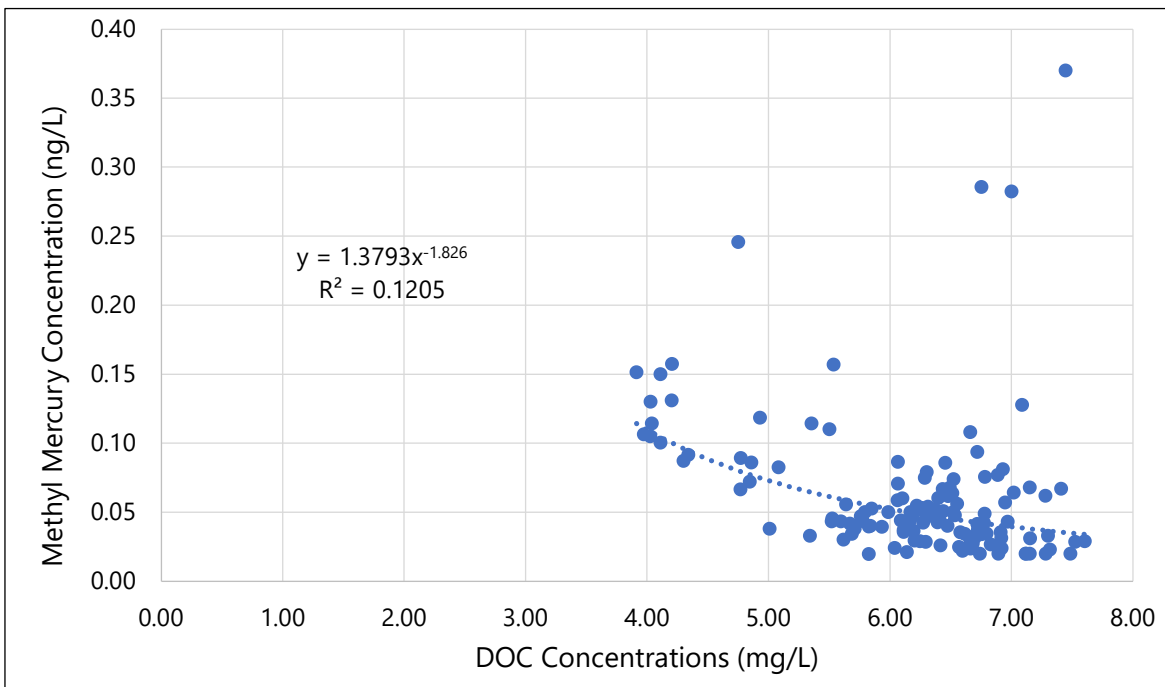


Figure 5a: Nayshkootayaow River Total and Methyl Mercury Trends (Filtered and Unfiltered)

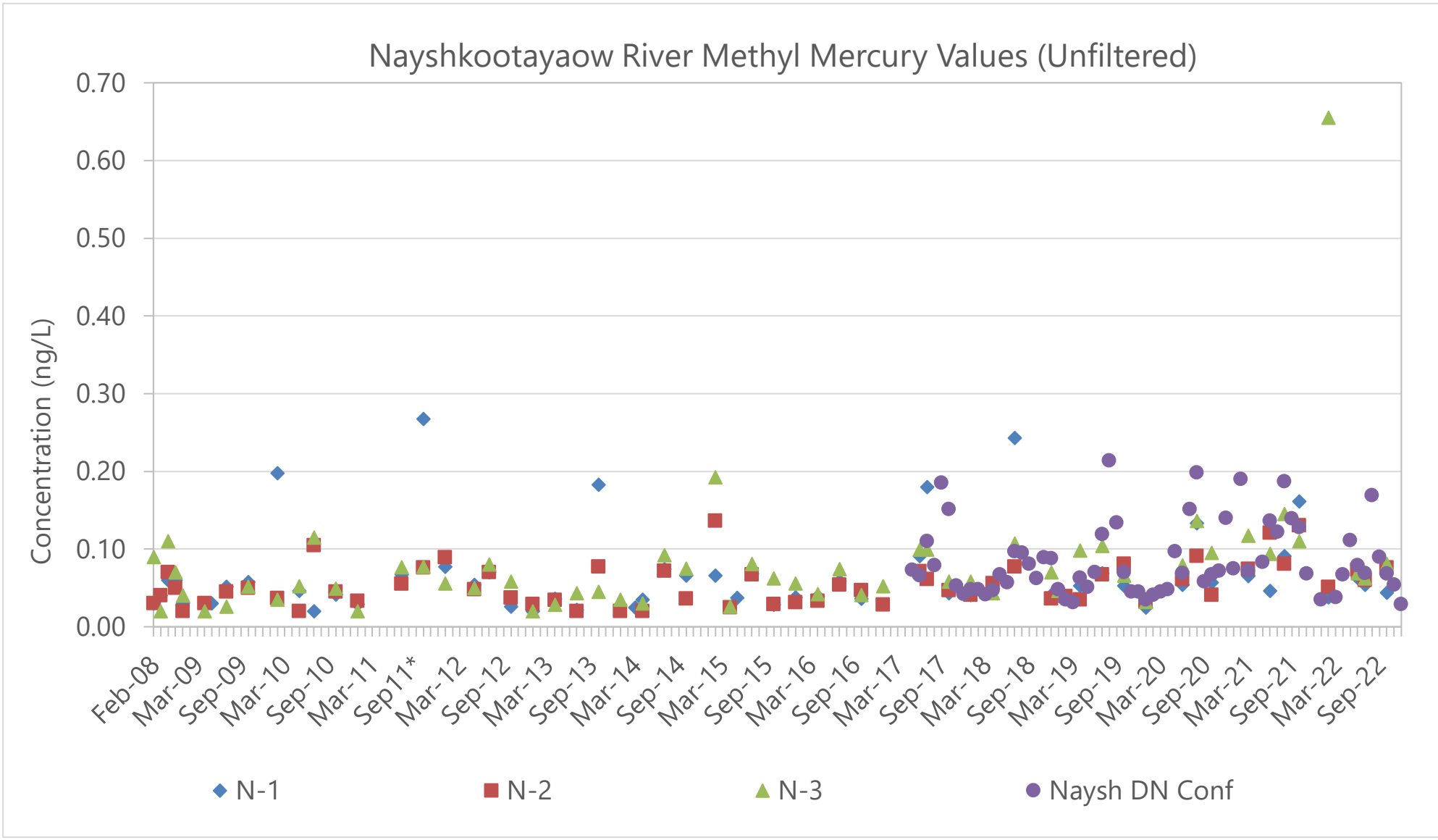
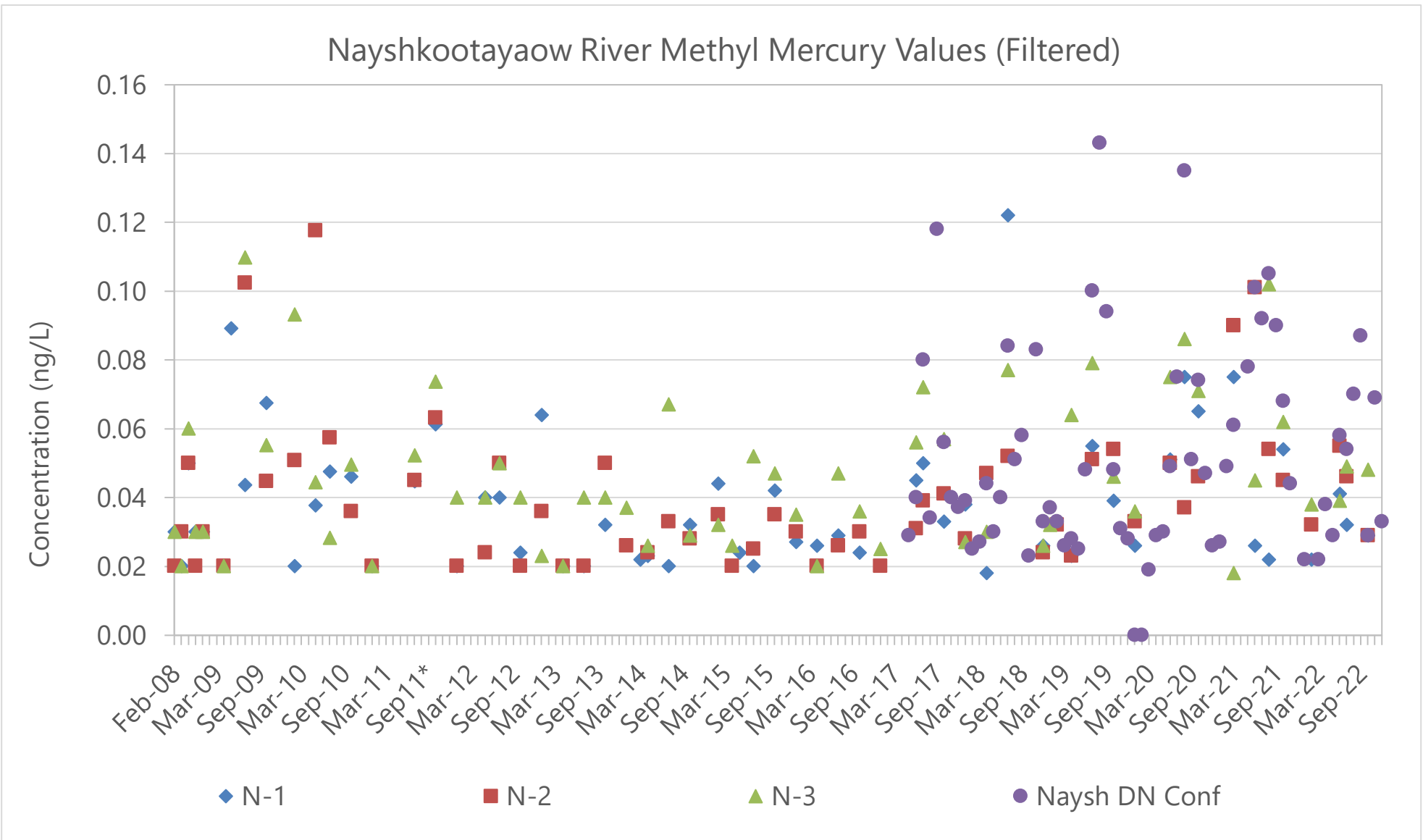
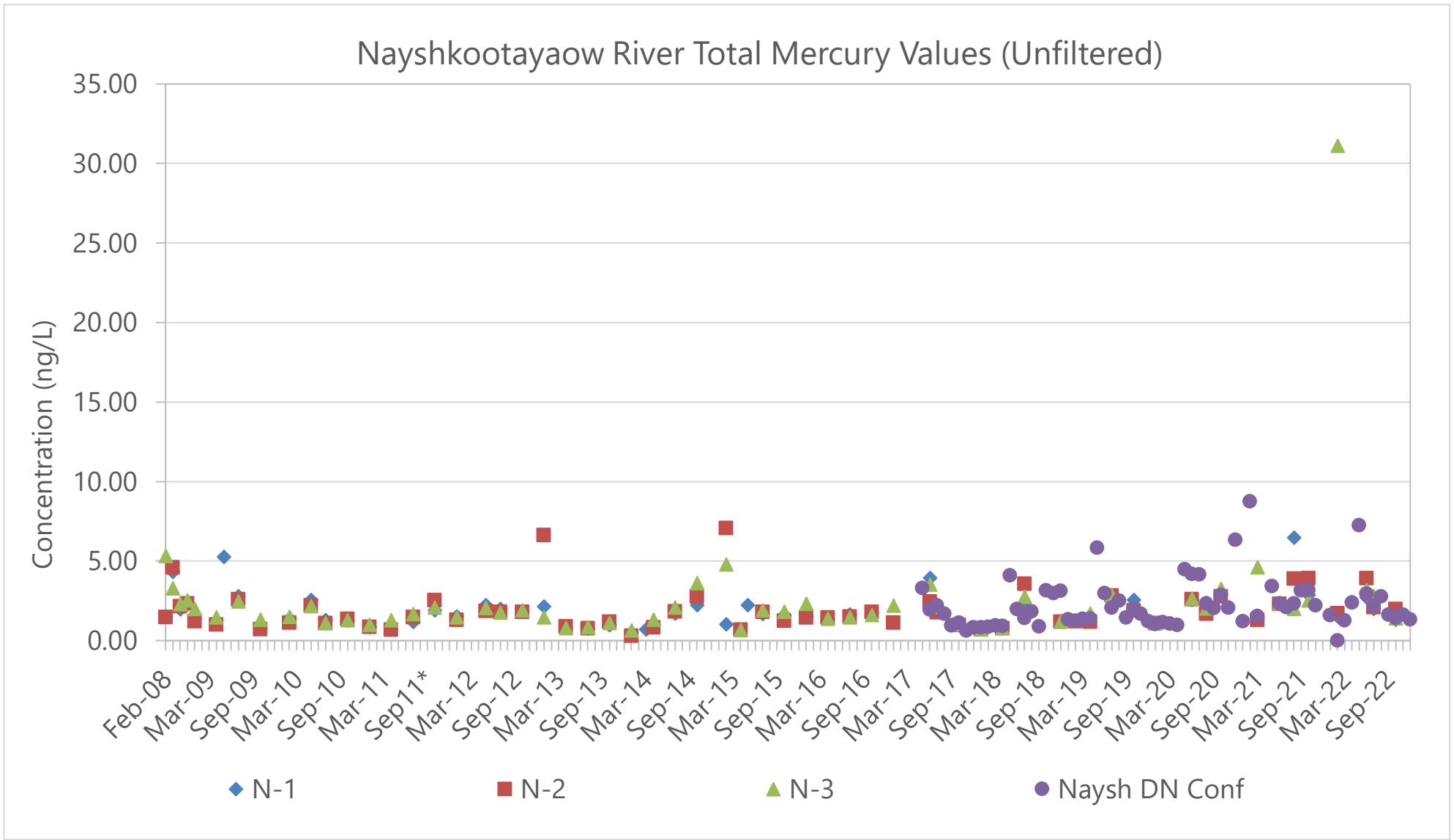
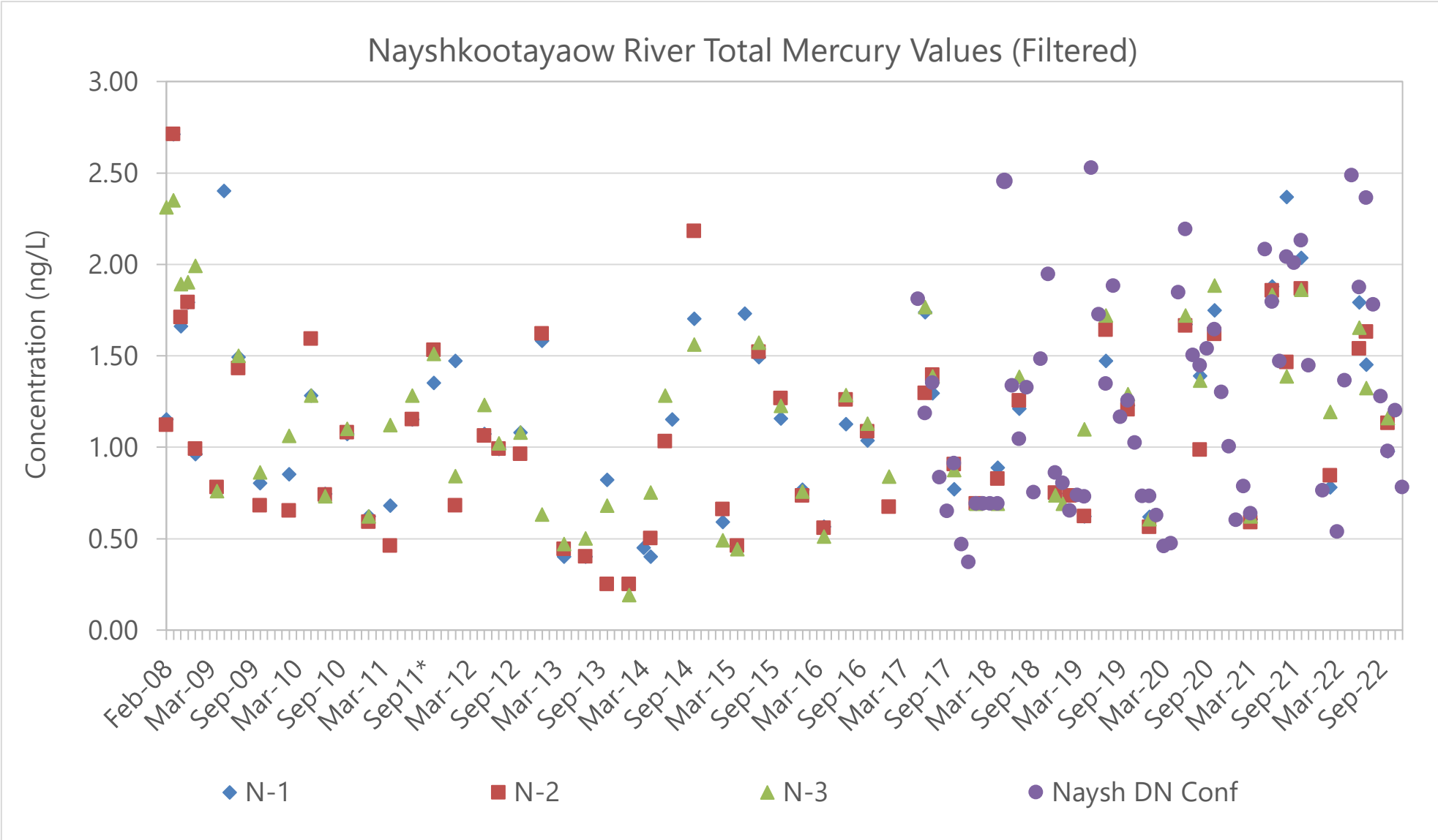
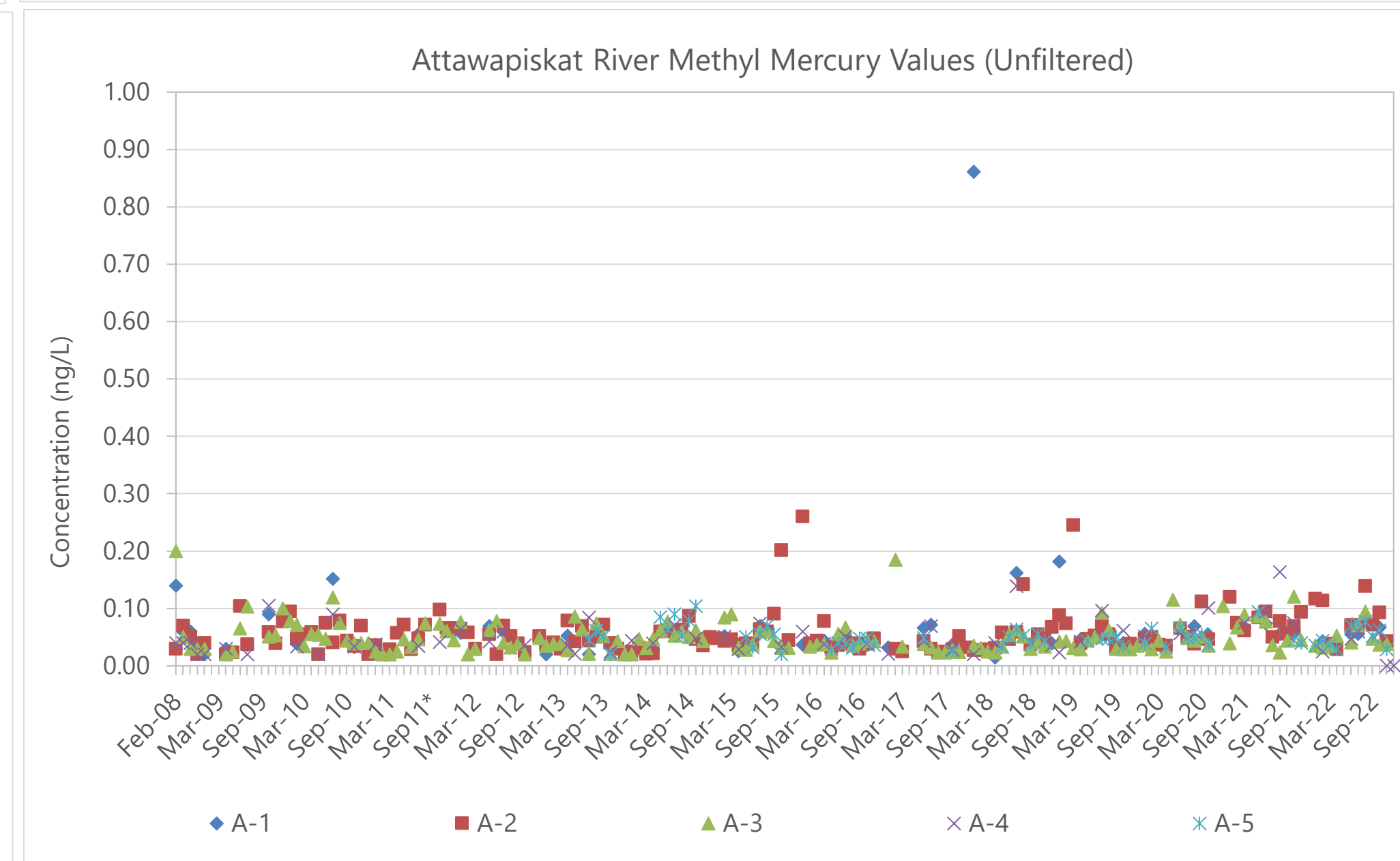
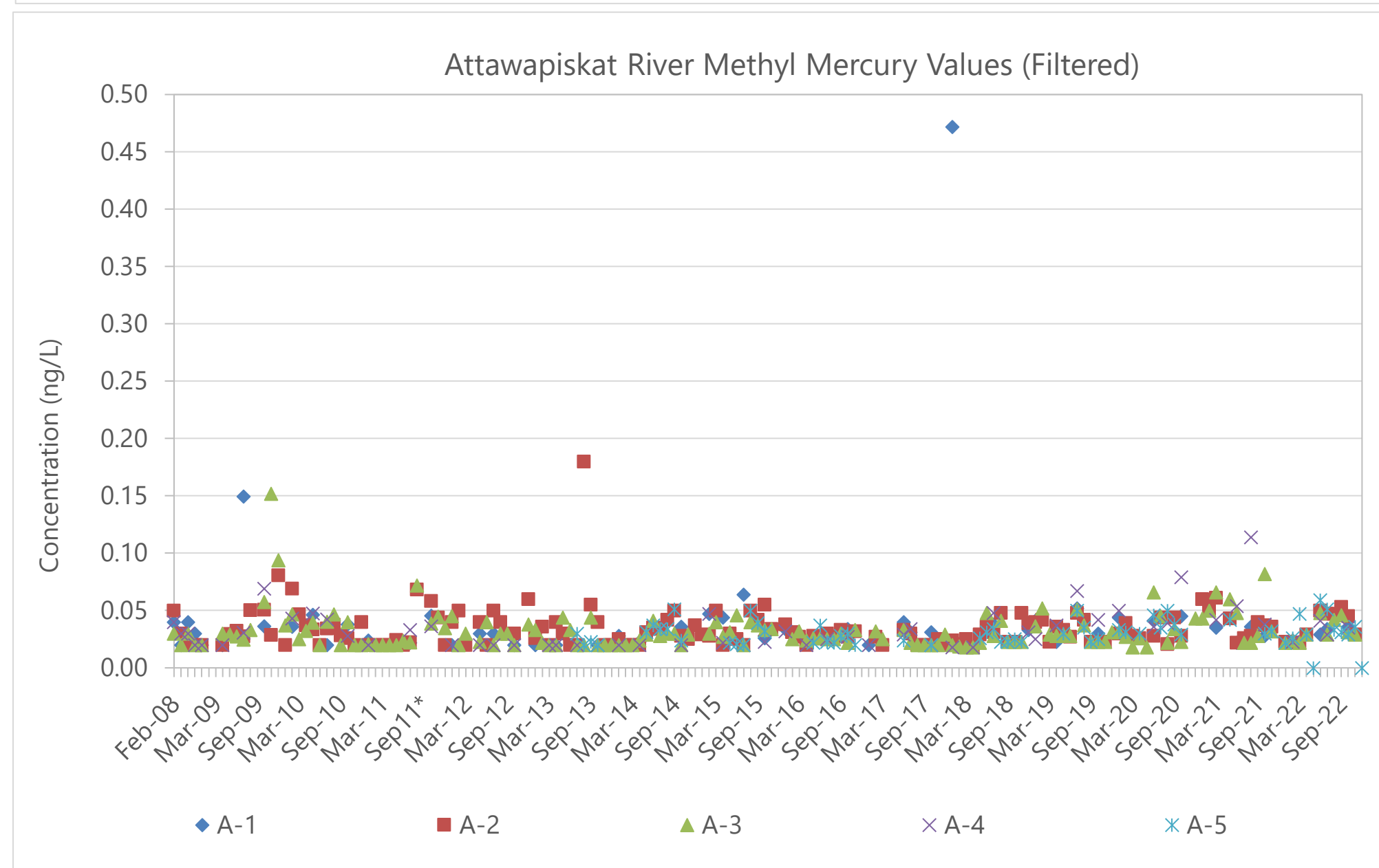
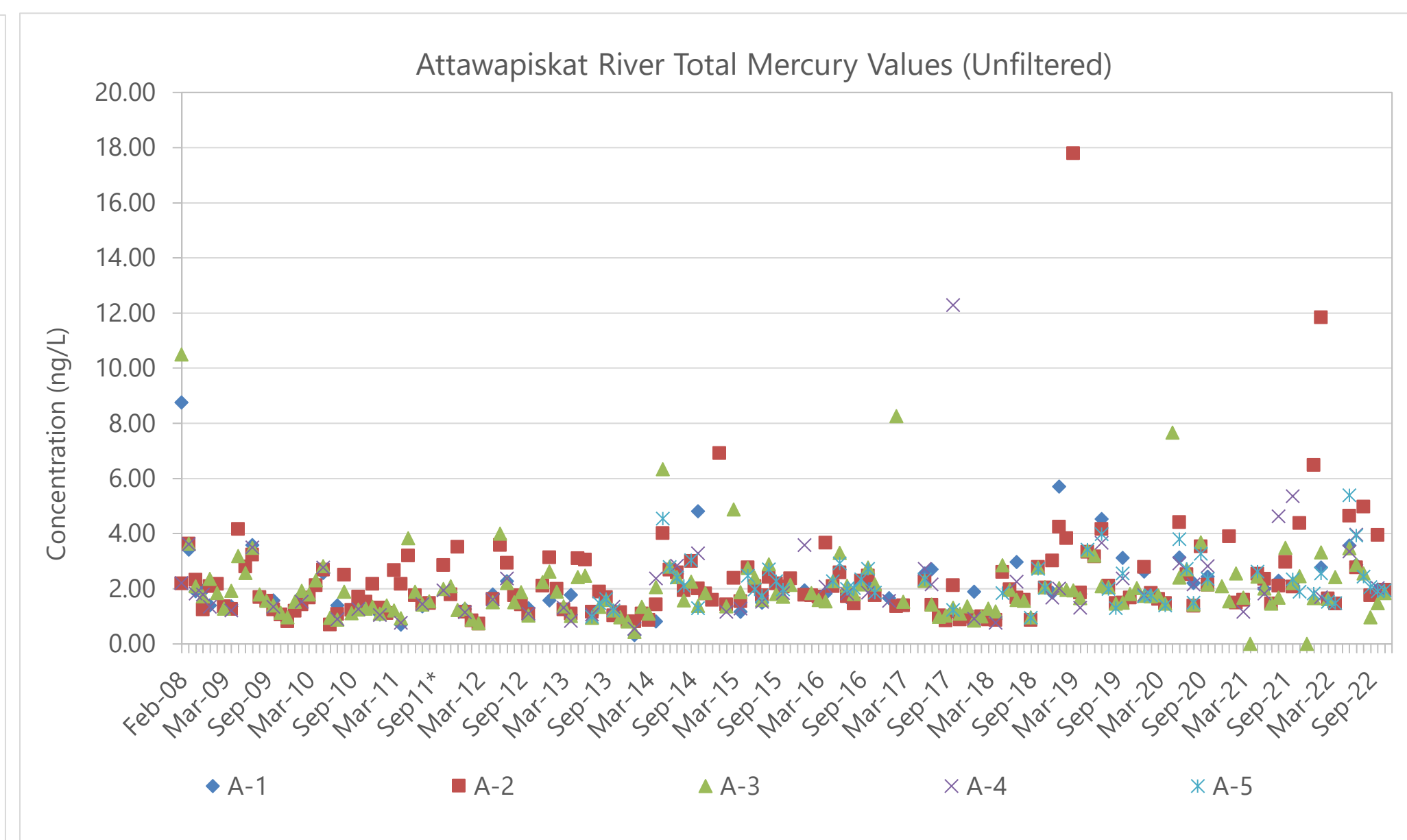
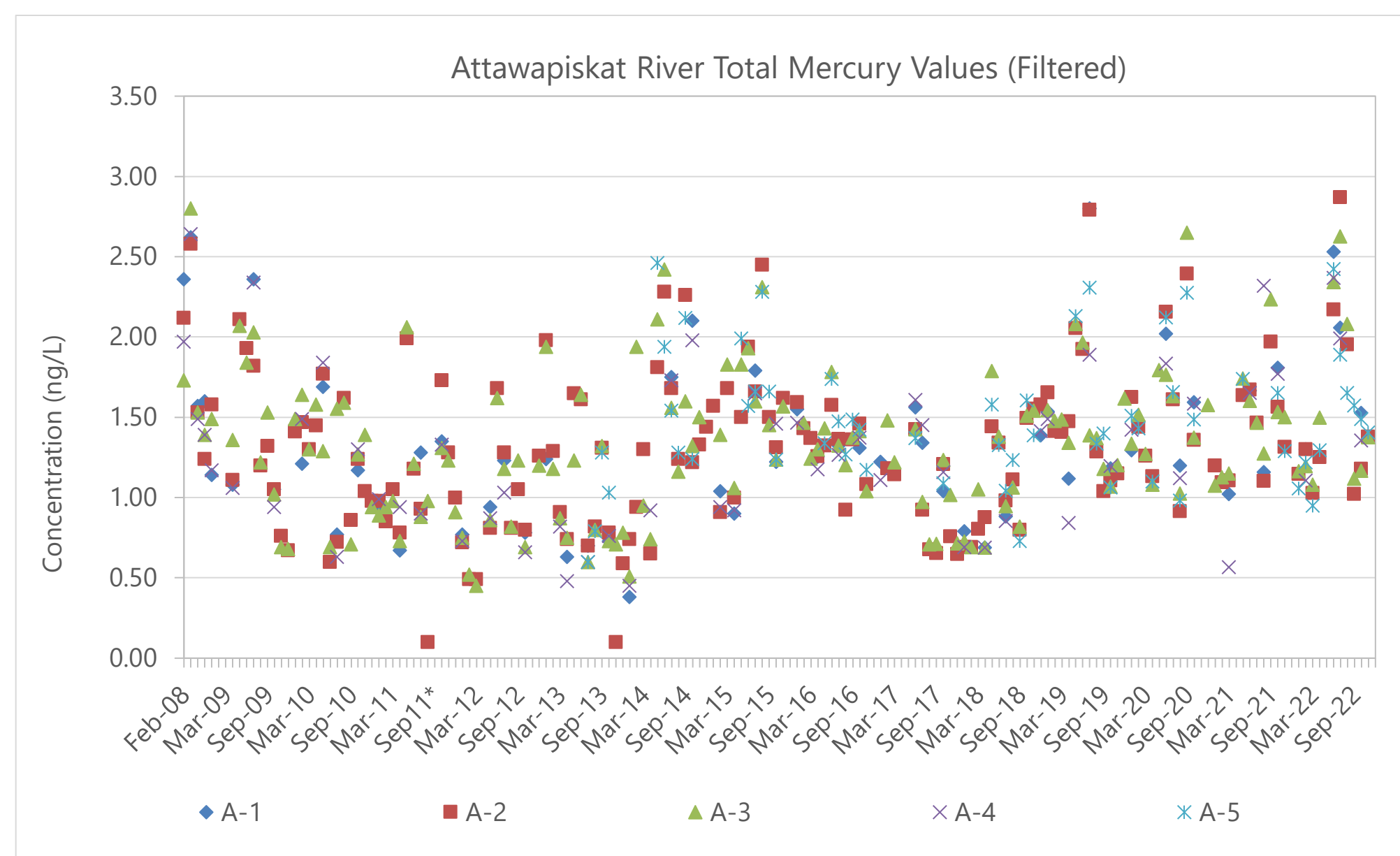


Figure 5b: Attawapiskat River Total and Methyl Mercury Trends (Filtered and Unfiltered)

Path: P:\2019\Projects\TC190502_DeBeers_Victor_Mine\11_GIS\Hg_Report_2022\MXD\Fish_Sampling_Mercury_2.mxd

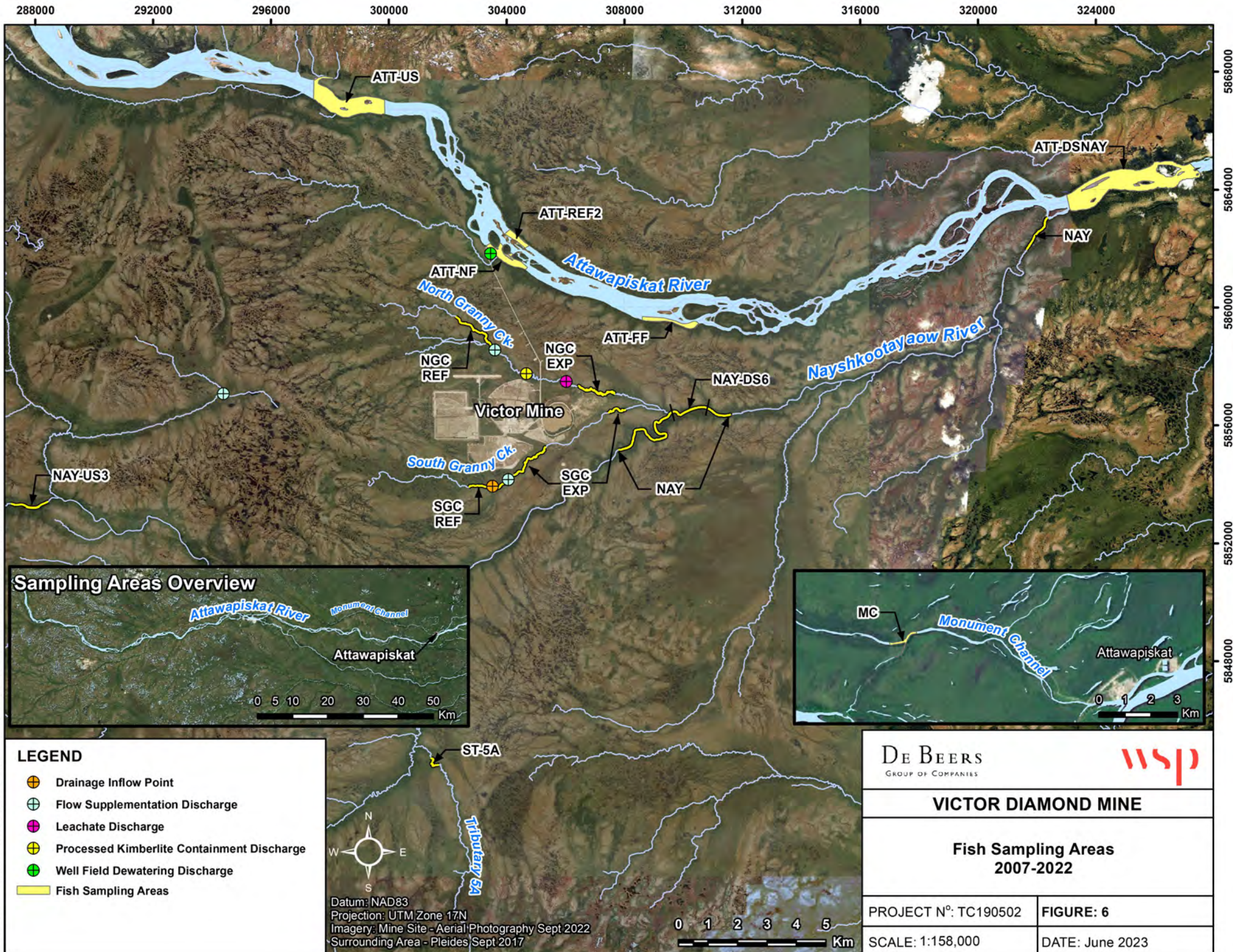
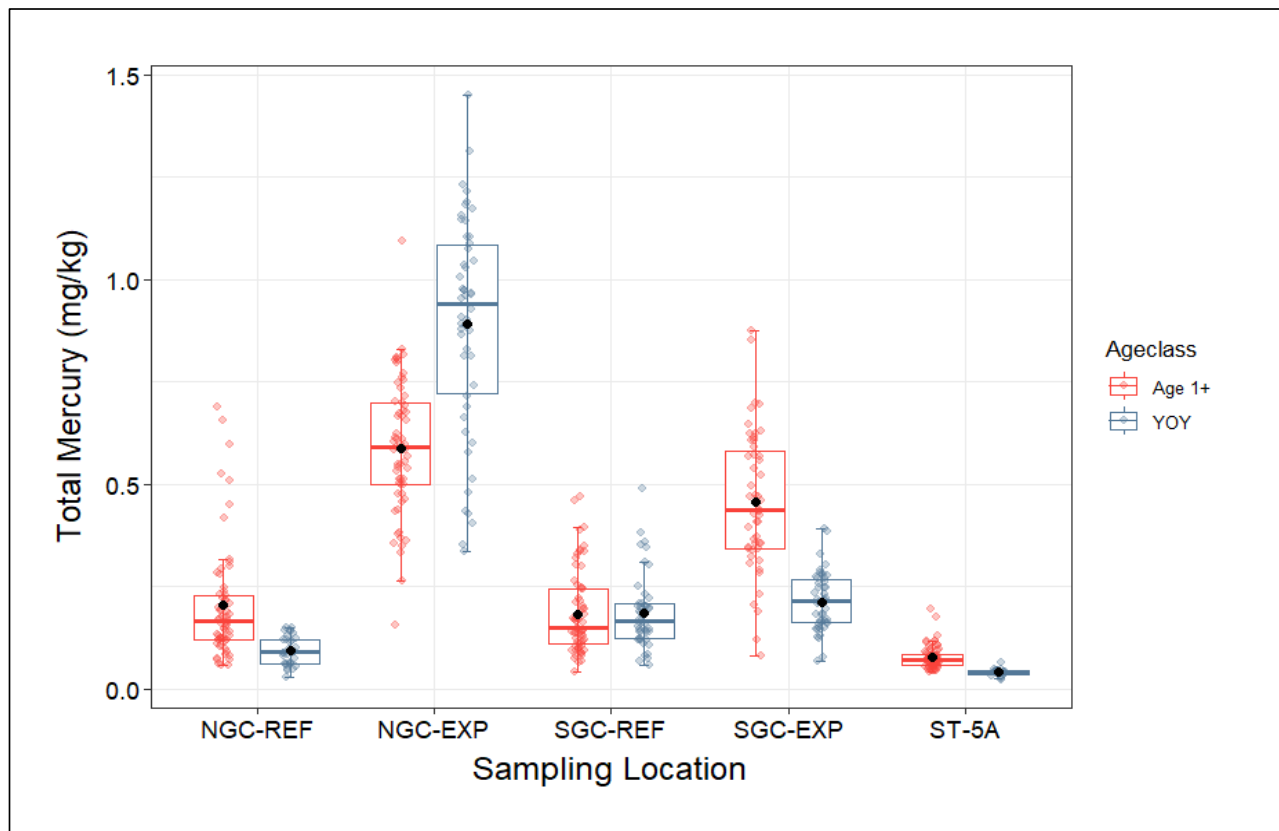
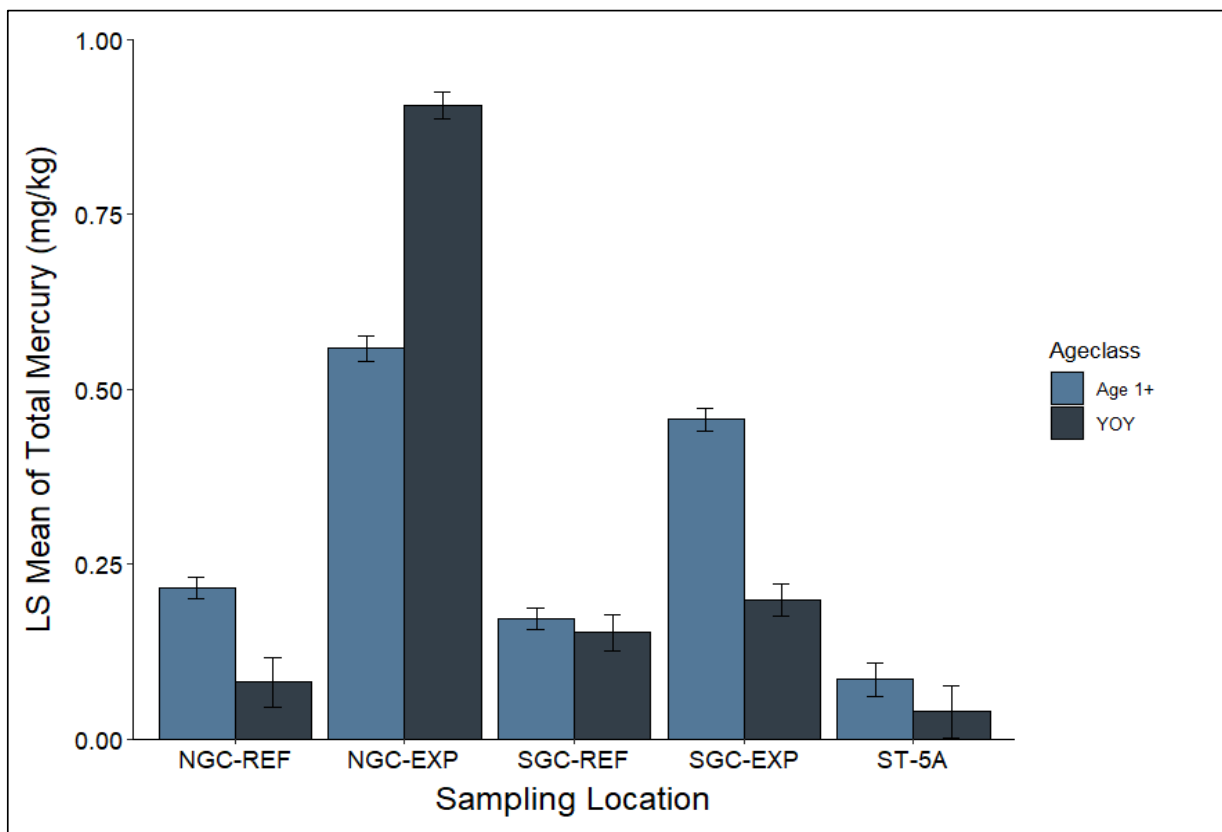


Figure 7: Total Mercury for Northern Pearl Dace in the Granny Creek System and Tributary 5A in 2022



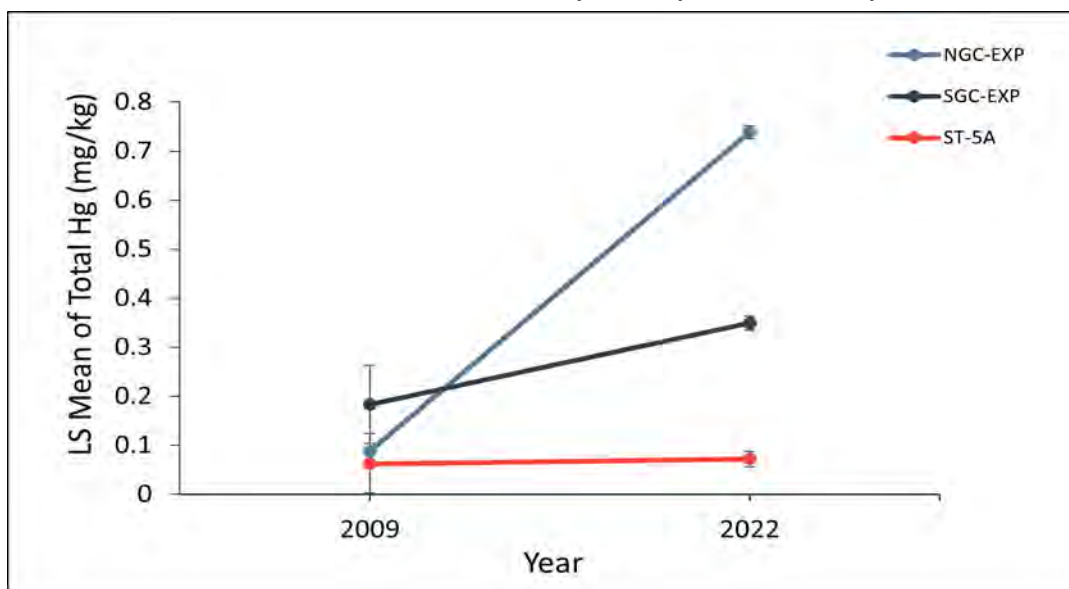
Comparison of total mercury levels (mg/kg) for YOY and age 1+ Northern Pearl Dace from the Granny Creek System and Tributary 5A sampling locations. Each box shows the first quartile, median and third quartile. Whiskers show minimum and maximum values. Black dots represent average total mercury values.

Figure 8: Histogram of Total Mercury Adjusted for Total Length in Northern Pearl Dace from the Granny Creek System and Tributary 5A



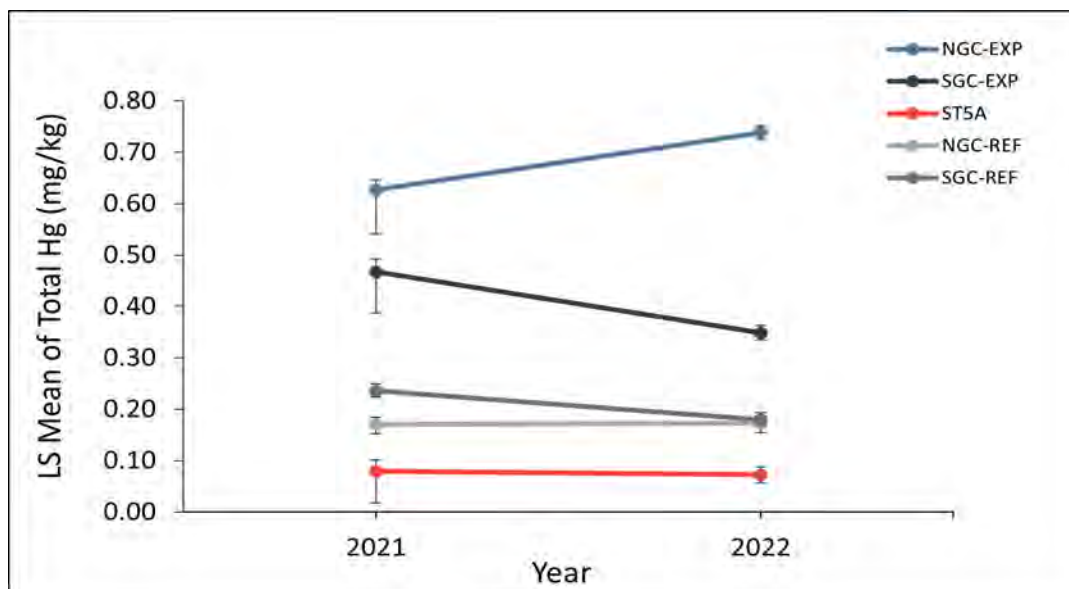
Histogram of least square means and standard error for total mercury adjusted for total length in YOY and age 1+ Northern Pearl Dace from the Granny Creek System and Tributary 5A in 2022

Figure 9 : Plot of Total Mercury Concentrations Adjusted for Total Length in 2009 and 2022
Northern Pearl Dace from the Granny Creek System and Tributary 5A



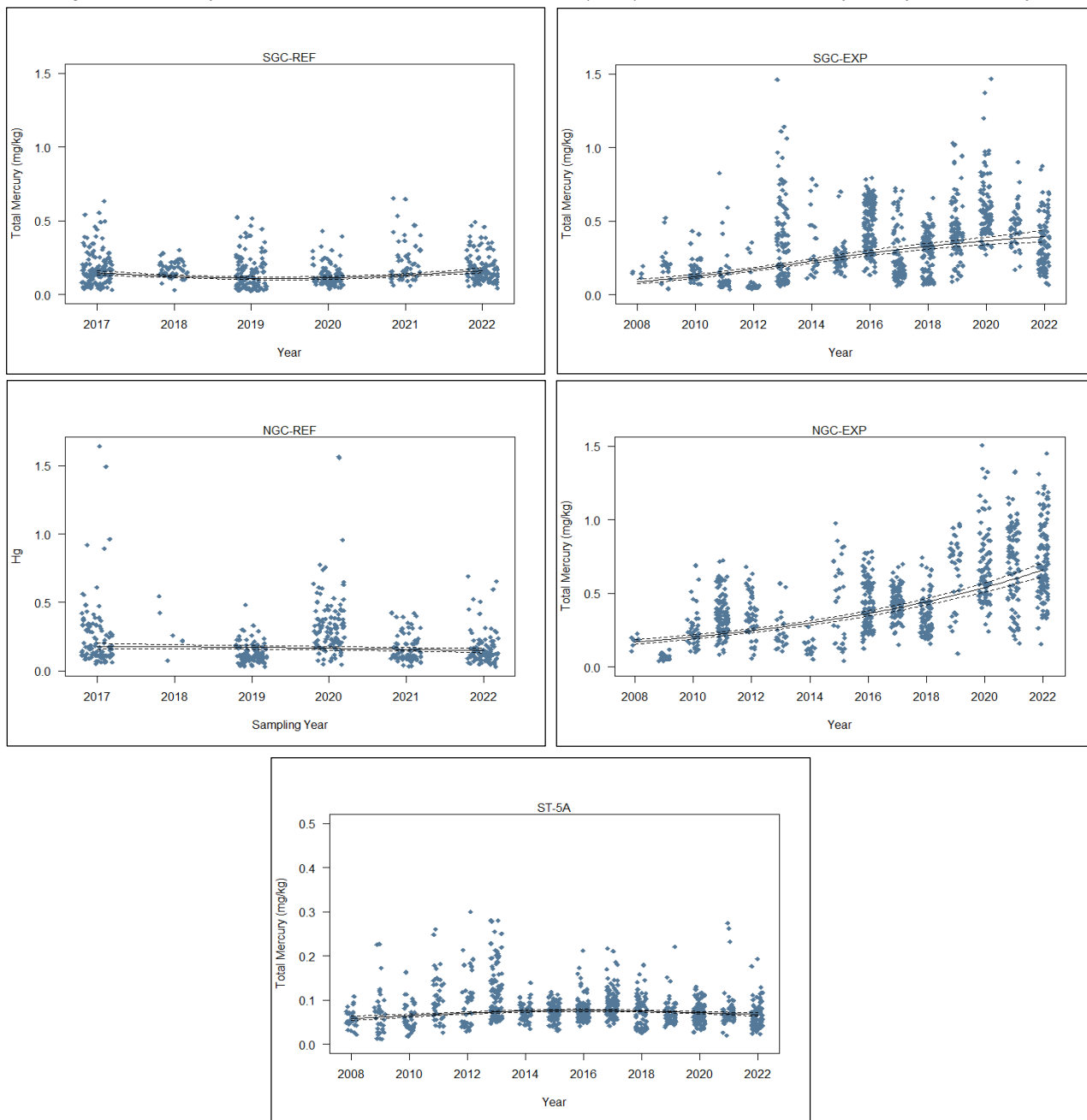
Plot of least square means of total mercury (mg/kg) adjusted for total length and area comparisons for Northern Pearl Dace in 2009 and 2022 from the Granny Creek System and Tributary 5A. Figure includes Northern Pearl Dace of all age classes captured in both years; model corrects for differences in total length. The 2009 Sampling year was used as baseline as sample size at SGC in 2008 was too small for analysis (n=5). Figure includes fish captured from exposure sampling locations only.

Figure 10 : Plot of Total Mercury Concentrations Adjusted for Total Length in 2021 and 2022
Northern Pearl Dace from the Granny Creek System and Tributary 5A



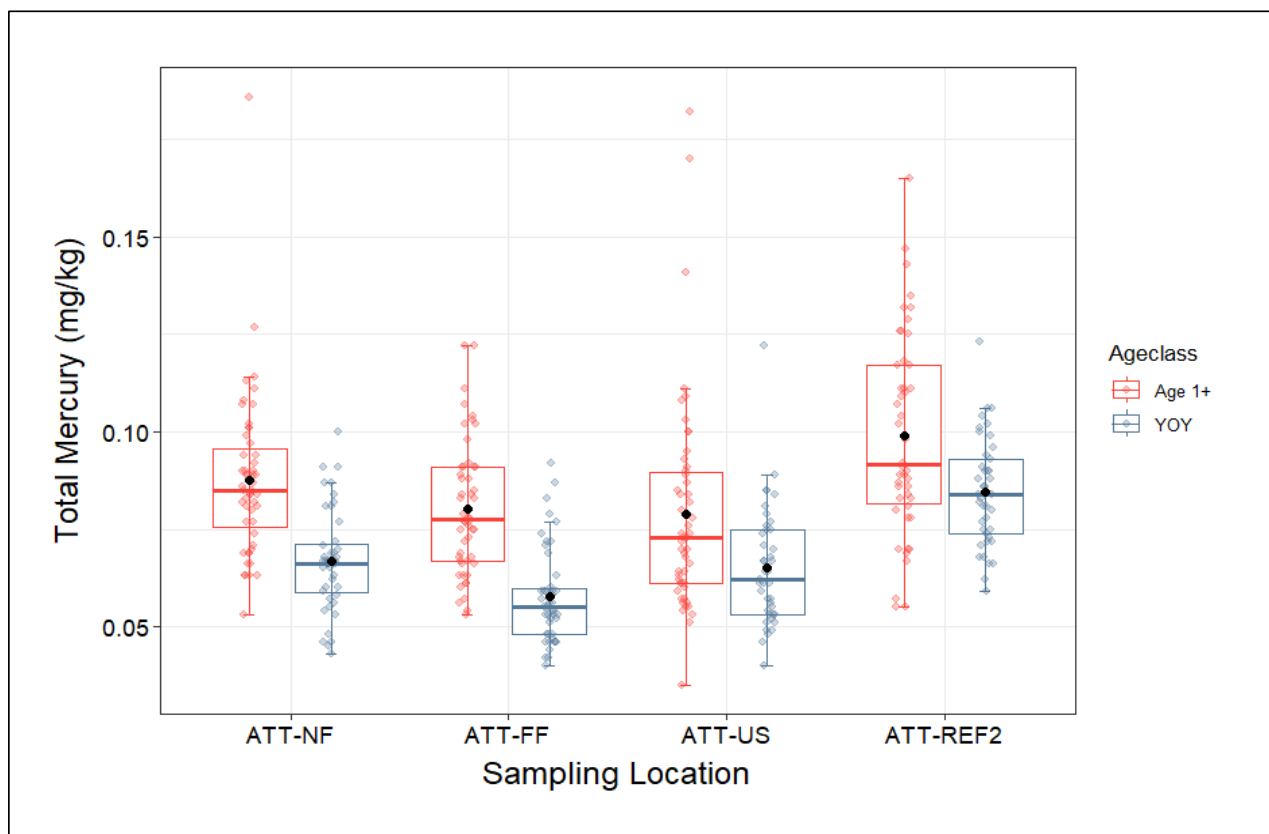
Plot of least square means of total mercury (mg/kg) adjusted for total length and area comparisons for Northern Pearl Dace in 2021 and 2022 from the Granny Creek System and Tributary 5A. Figure includes Northern Pearl Dace of all age classes captured in both years; model corrects for differences in total length.

Figure 11: Total Mercury Additive Model for Northern Pearl Dace of Standard Size (60 mm) from 2008 to 2022 in the Granny Creek System and Tributary 5A



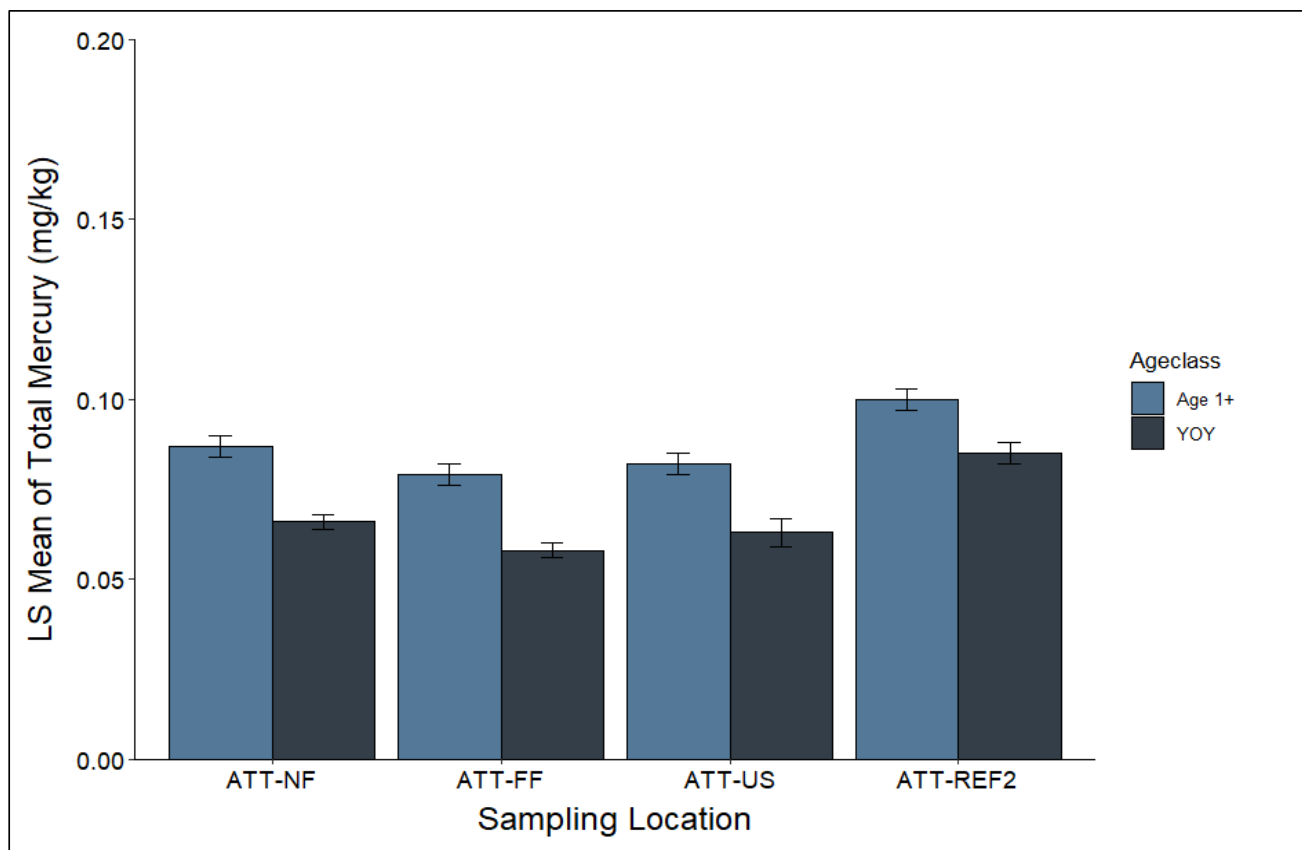
General additive model plot of total mercury with smoothers of year and total length (standard 60 mm) for Northern Pearl Dace from the Granny Creek System and Tributary 5A. A reference location in North Granny Creek and South Granny Creek was added in 2017.

Figure 12: Total Mercury for Trout Perch from the Attawapiskat River in 2022



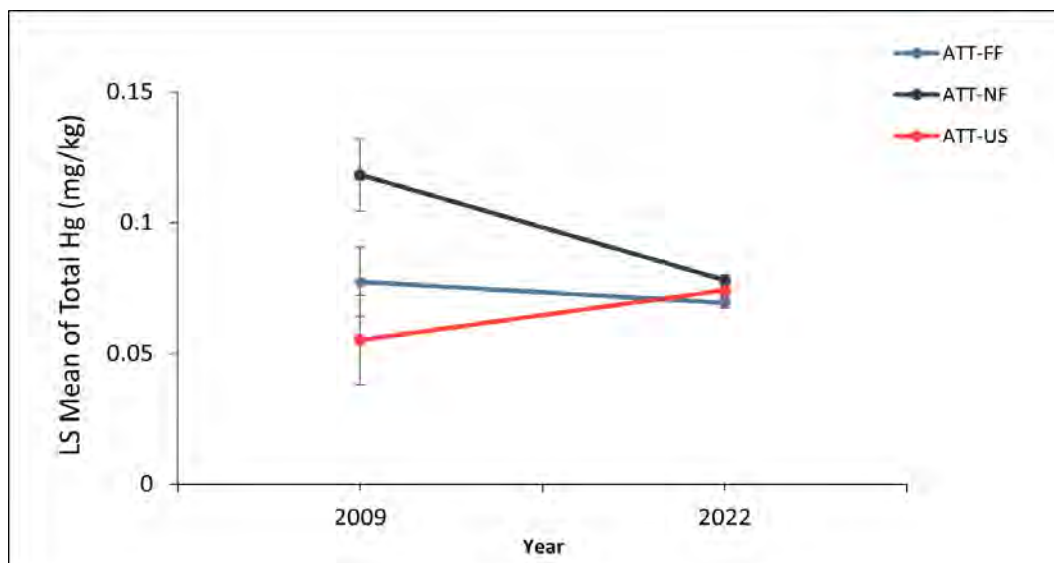
Comparison of total mercury levels (mg/kg) for YOY and age 1+ Trout Perch from the Attawapiskat River sampling locations. Each box shows the first quartile, median and third quartile. Whiskers show minimum and maximum values. Black dots represent average total mercury values.

Figure 13: Histogram of Total Mercury Adjusted for Total Length in Trout Perch from the Attawapiskat River



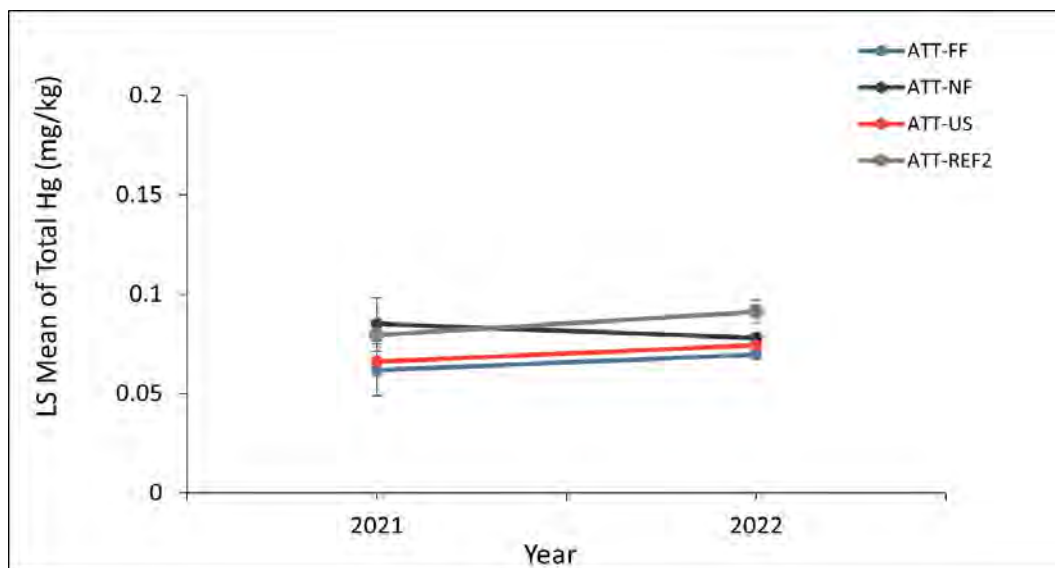
Histogram of least square means and standard error for total mercury adjusted for total length in YOY and age 1+ Trout Perch from Attawapiskat River in 2022

Figure 14: Plot of Total Mercury Concentrations Adjusted for Total Length in 2009 and 2022 in Trout Perch from the Attawapiskat River



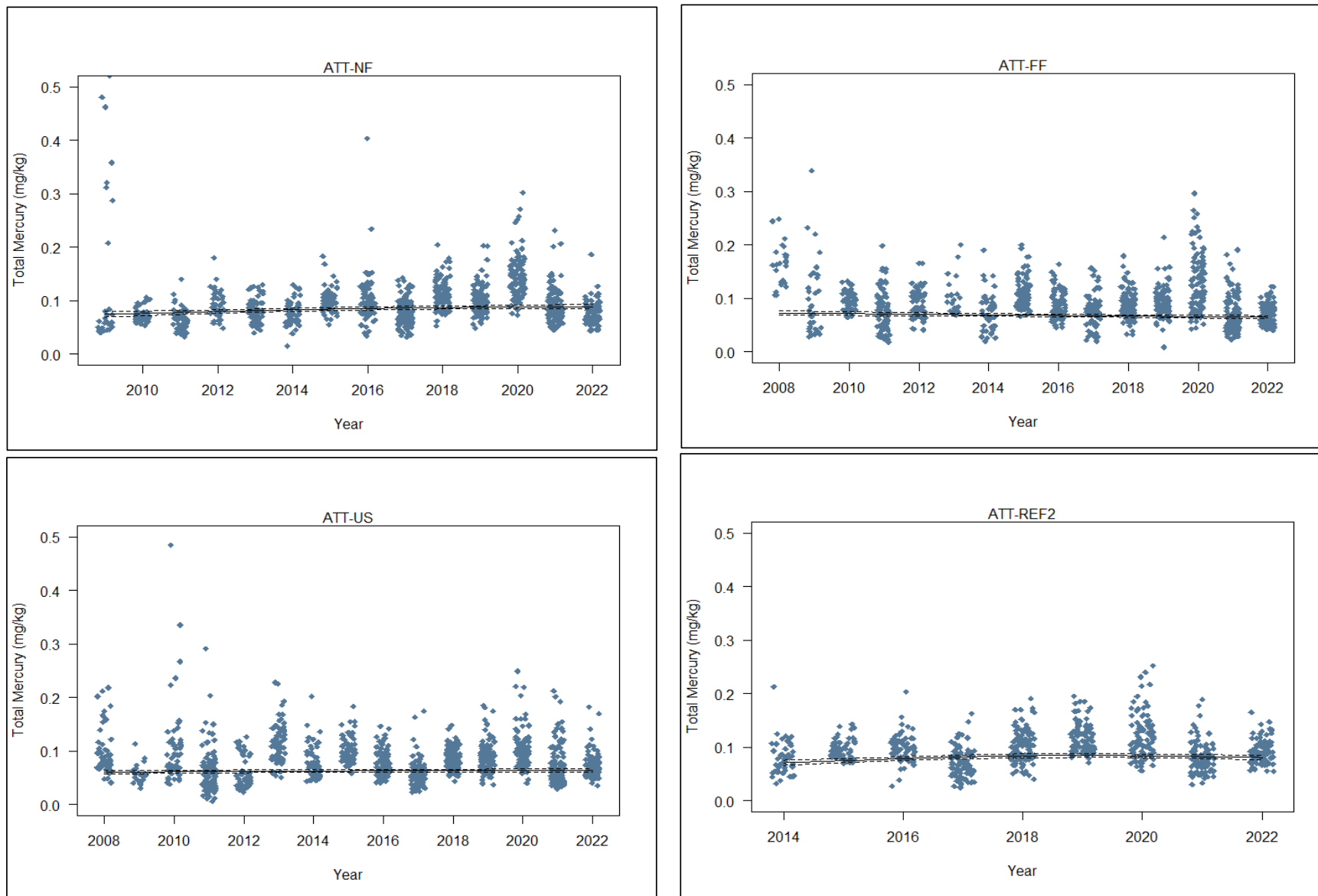
Plot of least square means of total mercury (mg/kg) adjusted for total length and area comparisons for Trout Perch in 2009 and 2022 from the Attawapiskat River. Figure includes Trout Perch of all age classes captured in both years; model corrects for differences in total length. ATT-REF2 was not sampled until 2014 and was therefore excluded from figure.

Figure 15: Plot of Total Mercury Concentrations Adjusted for Total Length in 2021 and 2022 in Trout Perch from the Attawapiskat River



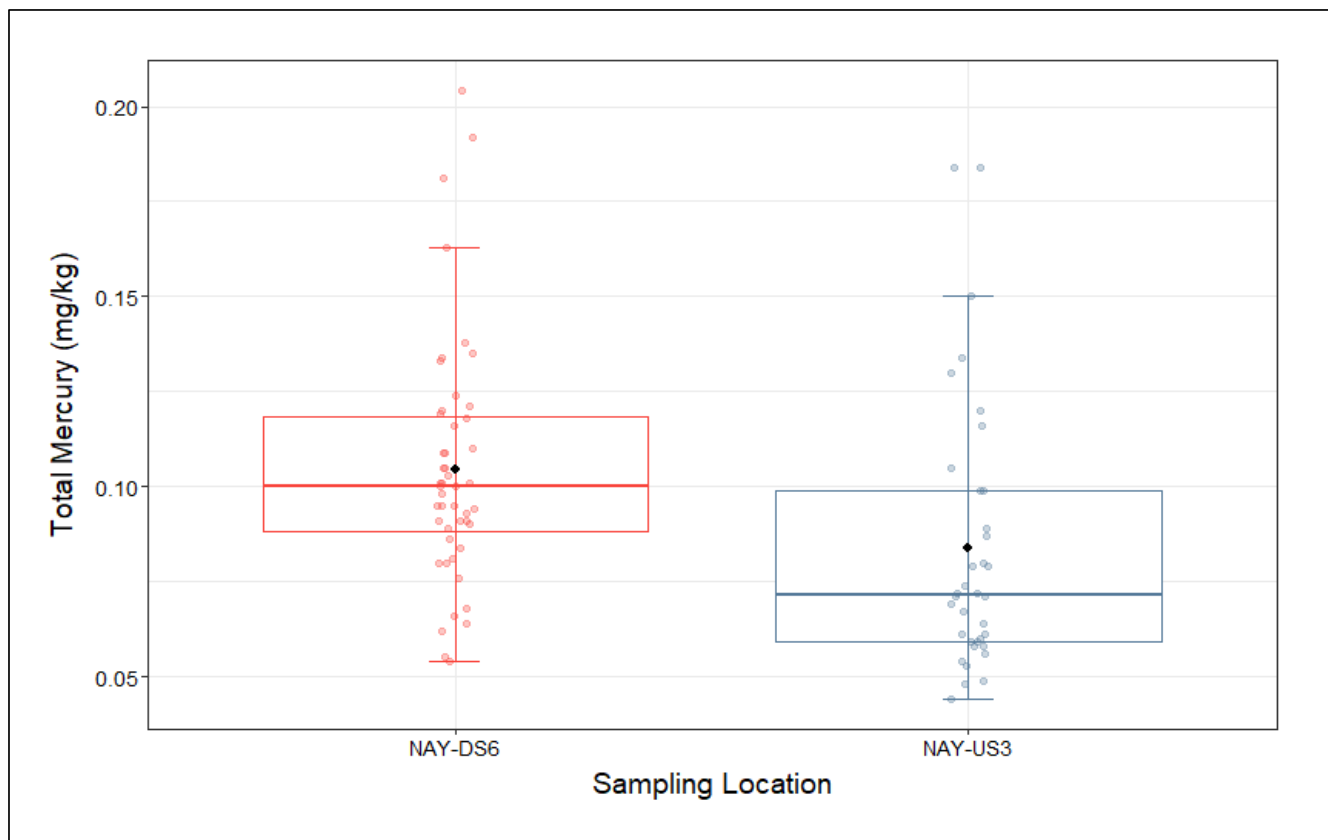
Plot of least square means of total mercury (mg/kg) adjusted for total length and area comparisons for Trout Perch in 2021 and 2022 from the Attawapiskat River. Figure includes Trout Perch of all age classes captured in both years; model corrects for differences in total length.

Figure 16: Total Mercury Additive Model for Trout Perch of Standard Size (50 mm) from 2008 to 2022 in Attawapiskat River



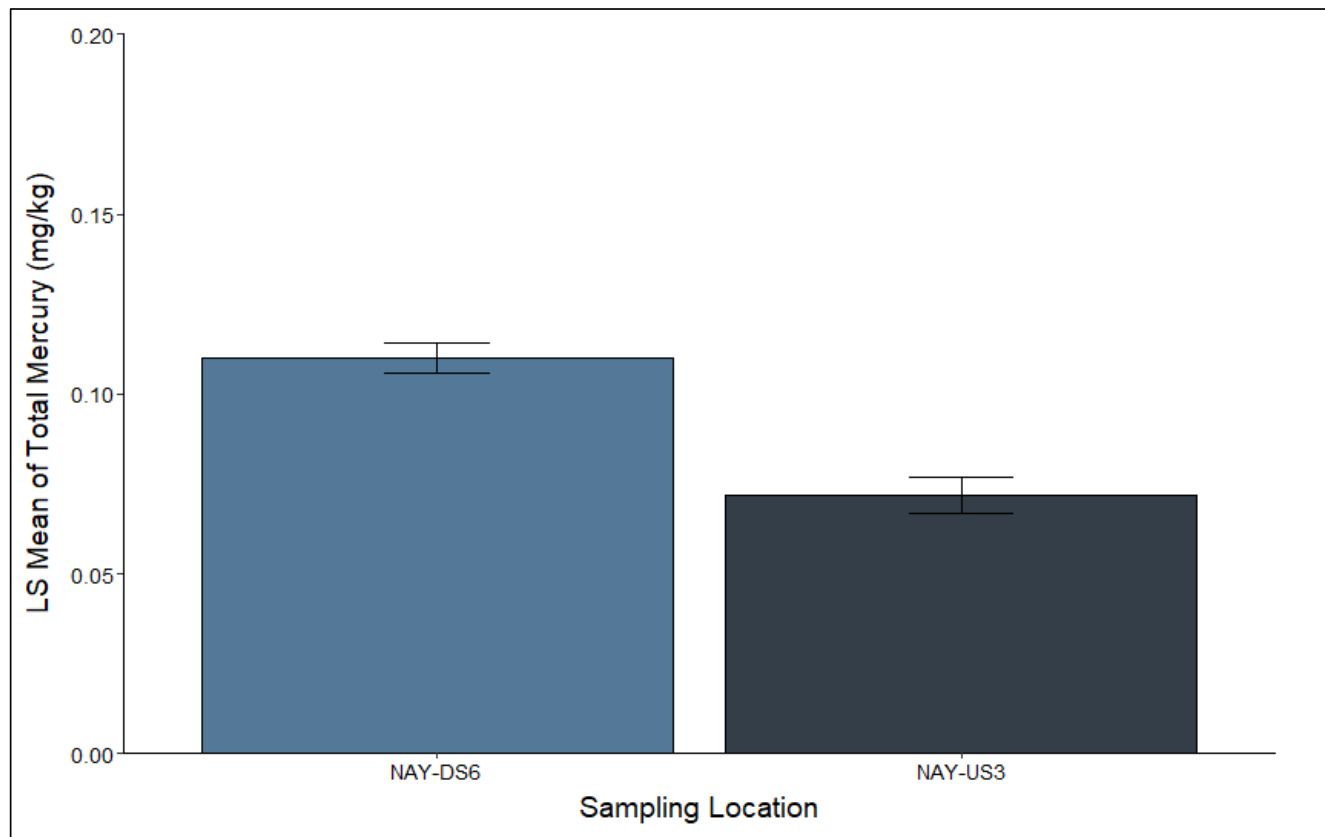
General additive model plot of total mercury with smoothers of year and total length (standard 50 mm) for Trout Perch from the Attawapiskat River. ATT-REF2 was added as a secondart reference location in 2014.
De Beers Canada Inc., Victor Mine
Mercury Performance Monitoring, 2022 Annual Report
per Certificate of Approval #3960-7Q4K2G, Conditions 7(5) and 7(6)
June 2023

Figure 17: Total Mercury for Age 1+ Trout Perch from the Nayshkootayaow River in 2022



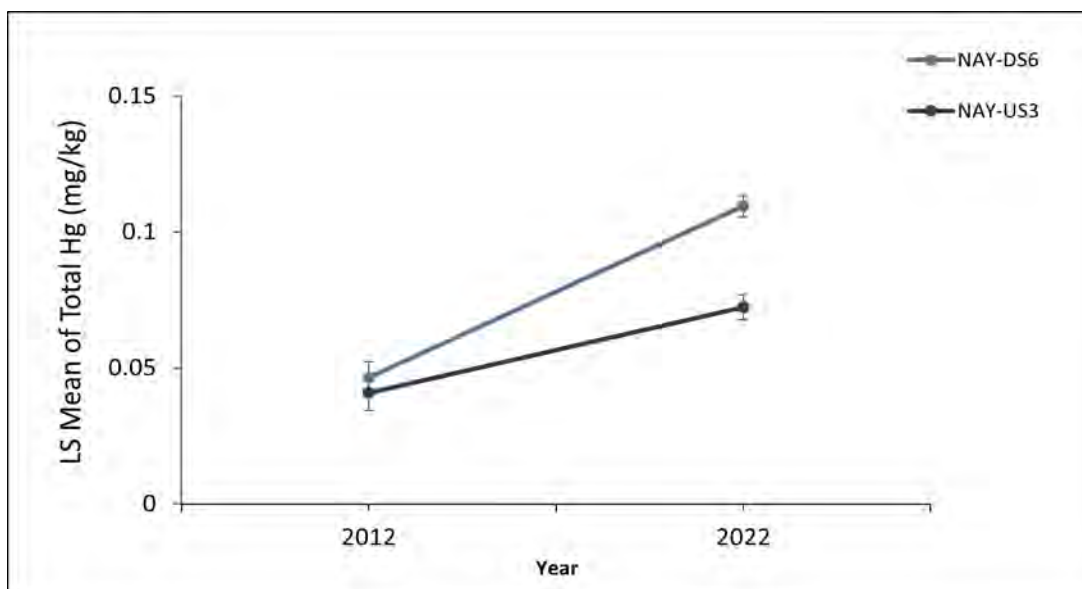
Comparison of total mercury levels (mg/kg) for age 1+ Trout Perch from the Nayshkootayaow River sampling locations. Each box shows the first quartile, median and third quartile. Whiskers show minimum and maximum values. Black dots represent average total mercury values. YOY Trout Perch were not captured within the Nayshkootayaow River sampling locations in 2022.

Figure 18: Histogram of Total Mercury Adjusted for Total Length in Trout Perch from the Nayshkootayaow River



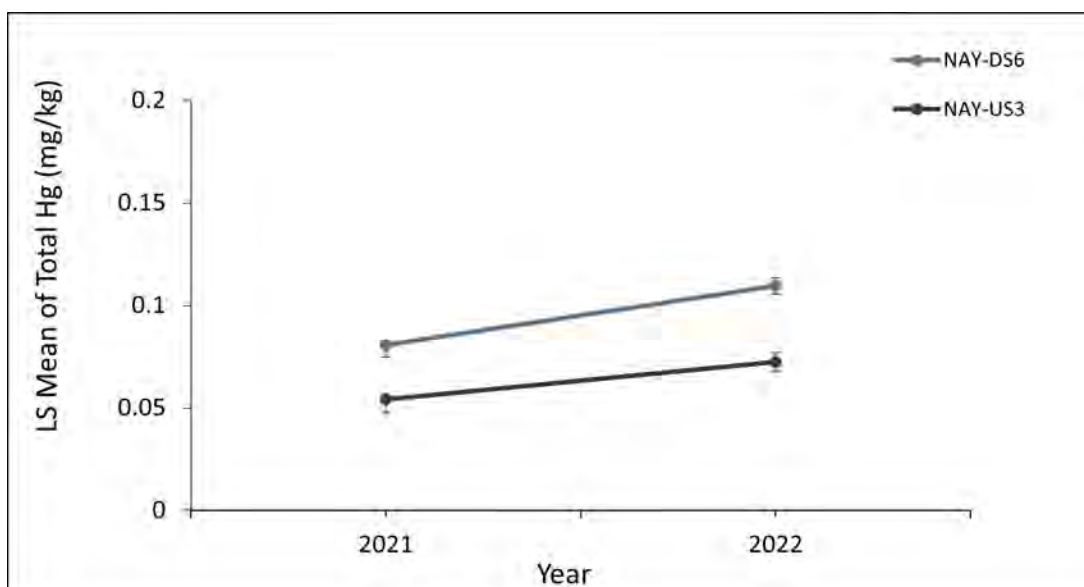
Histogram of least square means and standard error for total mercury adjusted for total length in age 1+ Trout Perch from the Nayshkootayaow River in 2022. YOY Trout Perch were not captured within the Nayshkootayaow River sampling locations in 2022.

Figure 19: Plot of Total Mercury Concentrations Adjusted for Total Length in 2012 and 2022 in Trout Perch from the Nayshkootayaow River



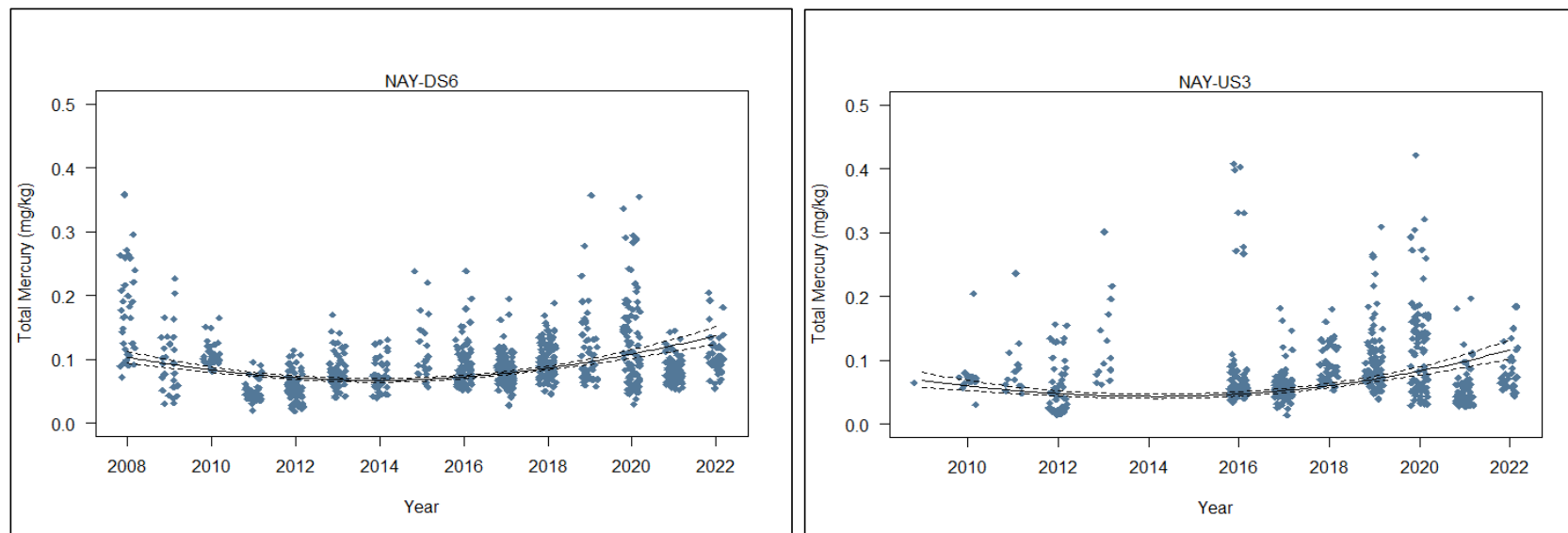
Plot of least square means of total mercury (mg/kg) adjusted for total length and area comparisons for Trout Perch in 2012 and 2022 from the Nayshkootayaow River. Figure includes Trout Perch of age 1+ captured in both years; model corrects for differences in total length. Sample sizes prior to 2012 were too small for LS mean statistical analysis.

Figure 20: Plot of Total Mercury Concentrations Adjusted for Total Length in 2021 and 2022 in Trout Perch from the Nayshkootayaow River



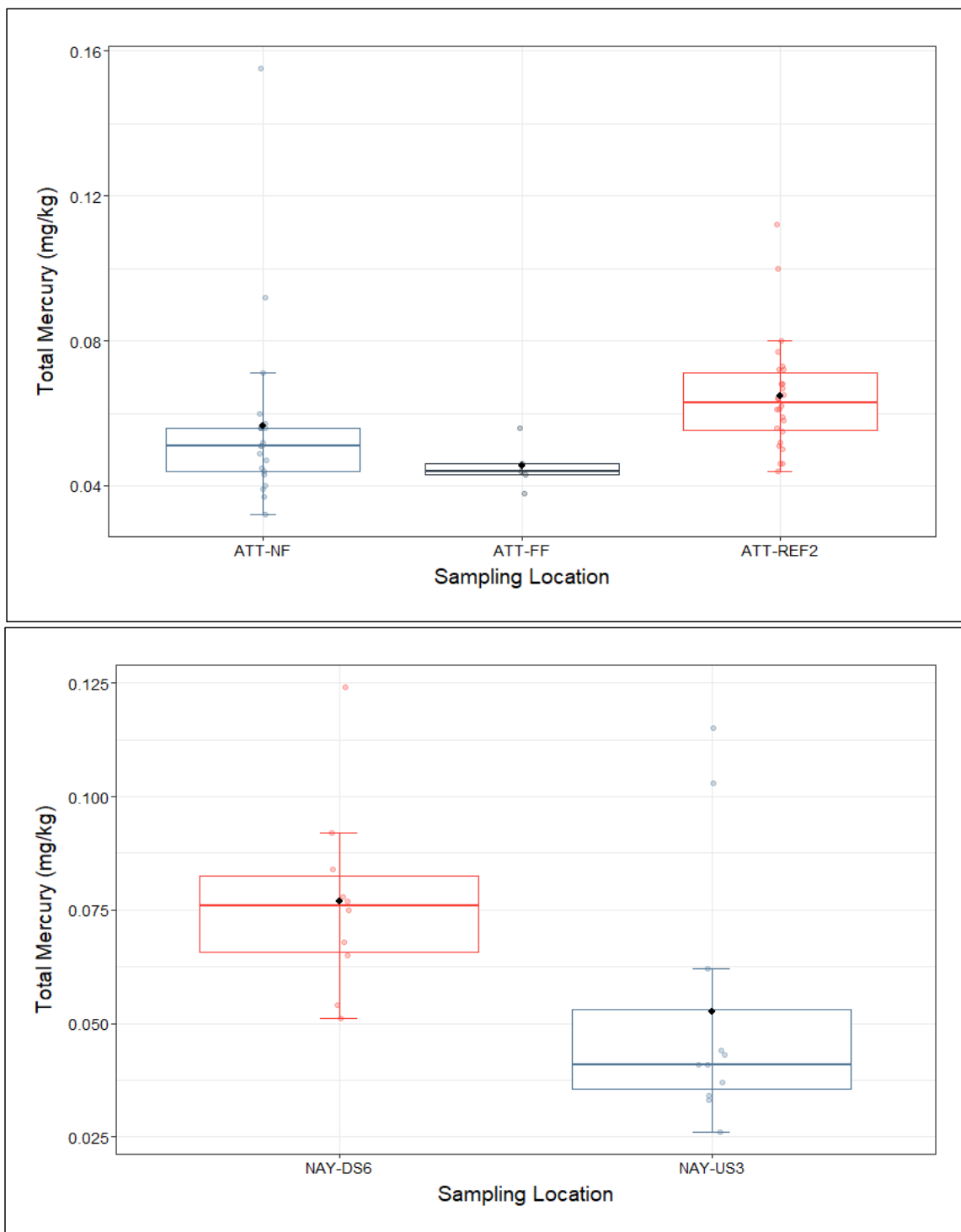
Plot of least square means of total mercury (mg/kg) adjusted for total length and area comparisons for Trout Perch in 2021 and 2022 from the Nayshkootayaow River. Figure includes Trout Perch of age 1+ captured in both years; model corrects for differences in total length.

Figure 21: Total Mercury Additive Model for Trout Perch of Standard Size (50 mm) from 2008 to 2022 in Nayshkootayaow River



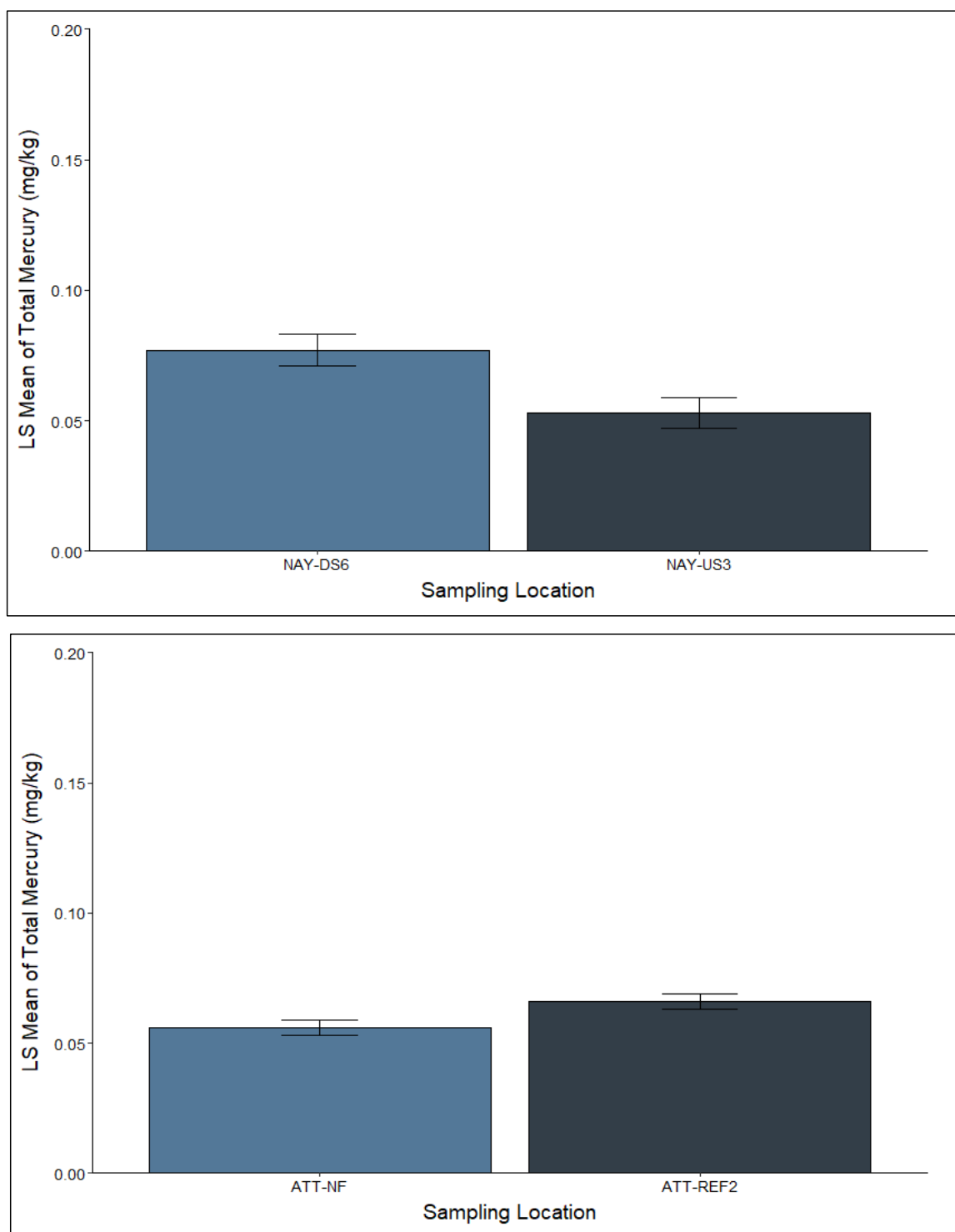
General additive model plot of total mercury with smoothers of year and total length (standard 50 mm) for Trout Perch from the Nayshkootayaow River. Trout Perch were not successfully captured from NAY-US3 in all sampling years.

Figure 22: Total Mercury for Age 1+ Mottled Sculpin from the Attawapiskat River and Nayshkootayaow River in 2022



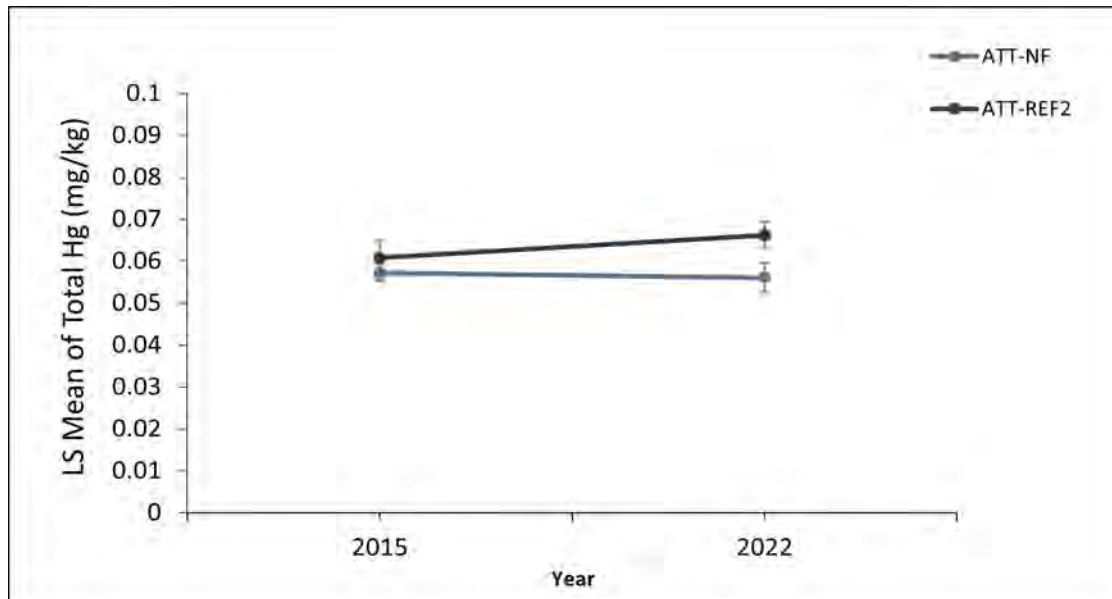
Comparison of total mercury levels (mg/kg) for age 1+ Mottled Sculpin from the Attawapiskat River and Nayshkootayaow River sampling locations. Each box shows the first quartile, median and third quartile. Whiskers show minimum and maximum values. Black dots represent average total mercury values. YOY Mottled Sculpin were not captured within the Attawapiskat River and Nayshkootayaow River sampling locations in sufficient abundance in 2022 to allow for statistical analysis.

Figure 23: Histogram of Total Mercury Adjusted for Total Length in Mottled Sculpin from the Attawapiskat River and Nayshkootayaow River



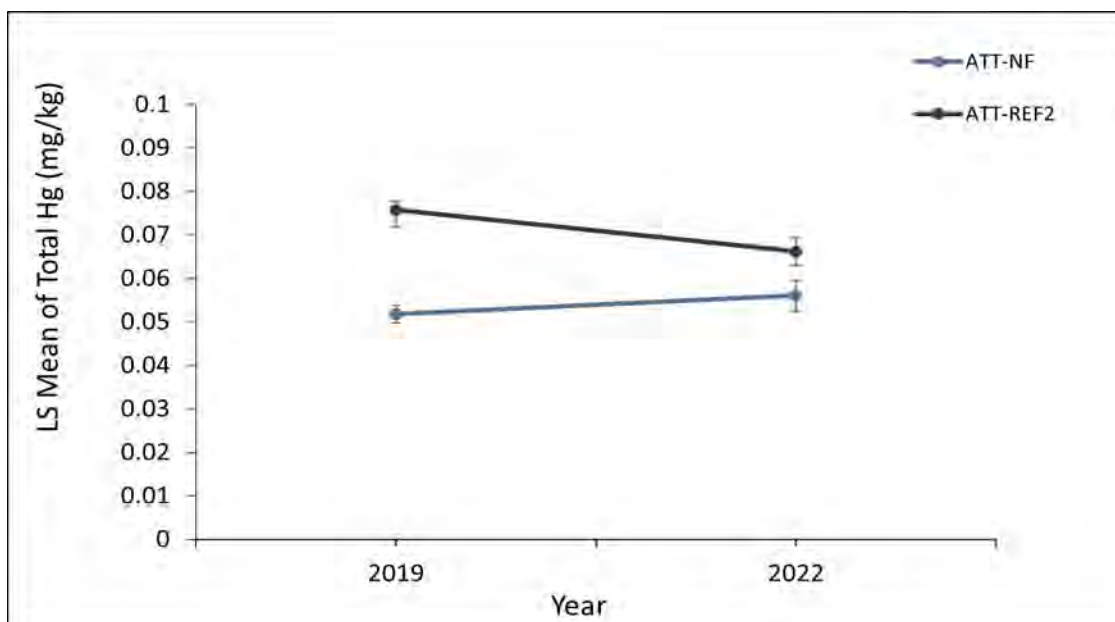
Histogram of least square means and standard error for total mercury adjusted for total length in age 1+ Mottled Sculpin from the Attawapiskat River and Nayshkootayaow River in 2022. YOY Mottled Sculpin were not captured within the Attawapiskat River and Nayshkootayaow River sampling locations in sufficient abundance to allow for statistical analysis in 2022.

Figure 24: Plot of Total Mercury Concentrations Adjusted for Total Length in 2015 and 2022 in Mottled Sculpin from the Attawapiskat River



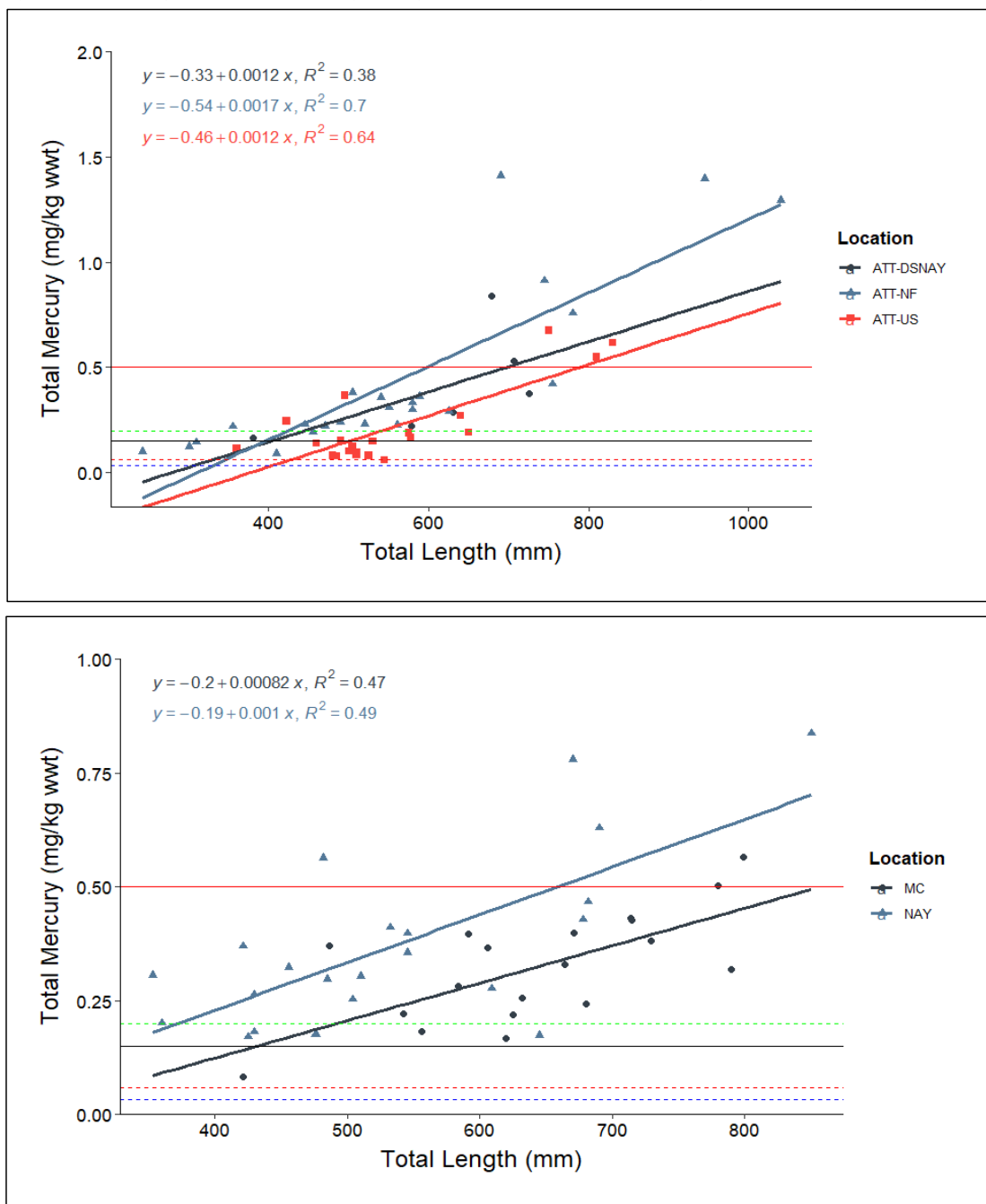
Plot of least square means of total mercury (mg/kg) adjusted for total length and area comparisons for Mottled Sculpin in 2015 and 2022 from the Attawapiskat River. Figure includes age 1+ fish captured in both years; model corrects for differences in total length. Sample sizes prior to 2015 were too small for LS mean statistical analysis.

Figure 25: Plot of Total Mercury Concentrations Adjusted for Total Length in 2019 and 2022 in Mottled Sculpin from the Attawapiskat River



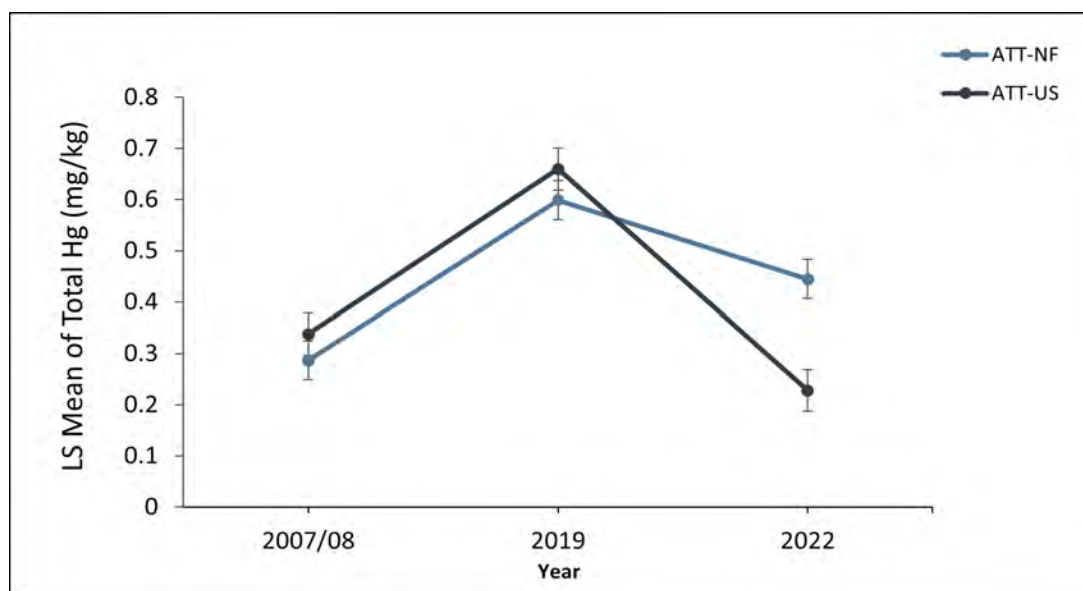
Plot of least square means of total mercury (mg/kg) adjusted for total length and area comparisons for Mottled Sculpin in 2019 and 2022 from the Attawapiskat River. Figure includes age 1+ fish captured in both years; model corrects for differences in total length. 2019 was the last sampling year where Mottled Sculpin were captured in sufficient abundance to allow for statistical analysis.

Figure 26: Linear Regression of Total Mercury at Length in Northern Pike from the Attawapiskat River and Nayshkootayaow River



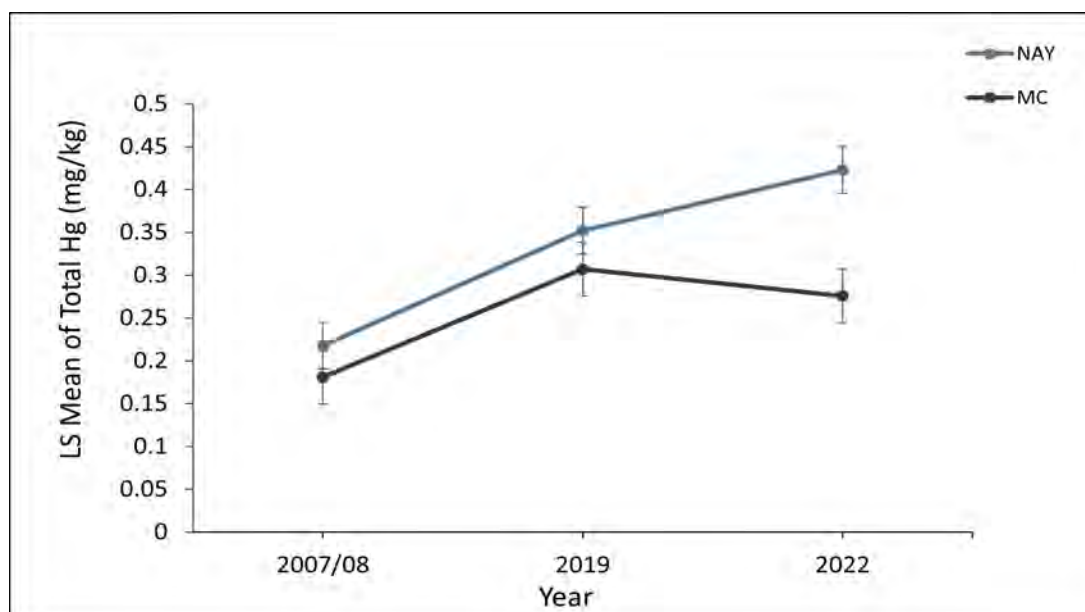
Advisories are displayed on each figure as applicable, based on ranges of data values. Relationships between total mercury and total length were significant in all cases ($p < 0.05$). All values for Northern Pike from the Attawapiskat River and Nayshkootayaow River were below the MOECC complete restriction guideline for the general population (1.8 mg/kg); this guideline was not included on the above figures.

Figure 27: Plot of Total Mercury Concentrations Adjusted for Total Length from 2007/08 to 2022 in Northern Pike from the Attawapiskat River



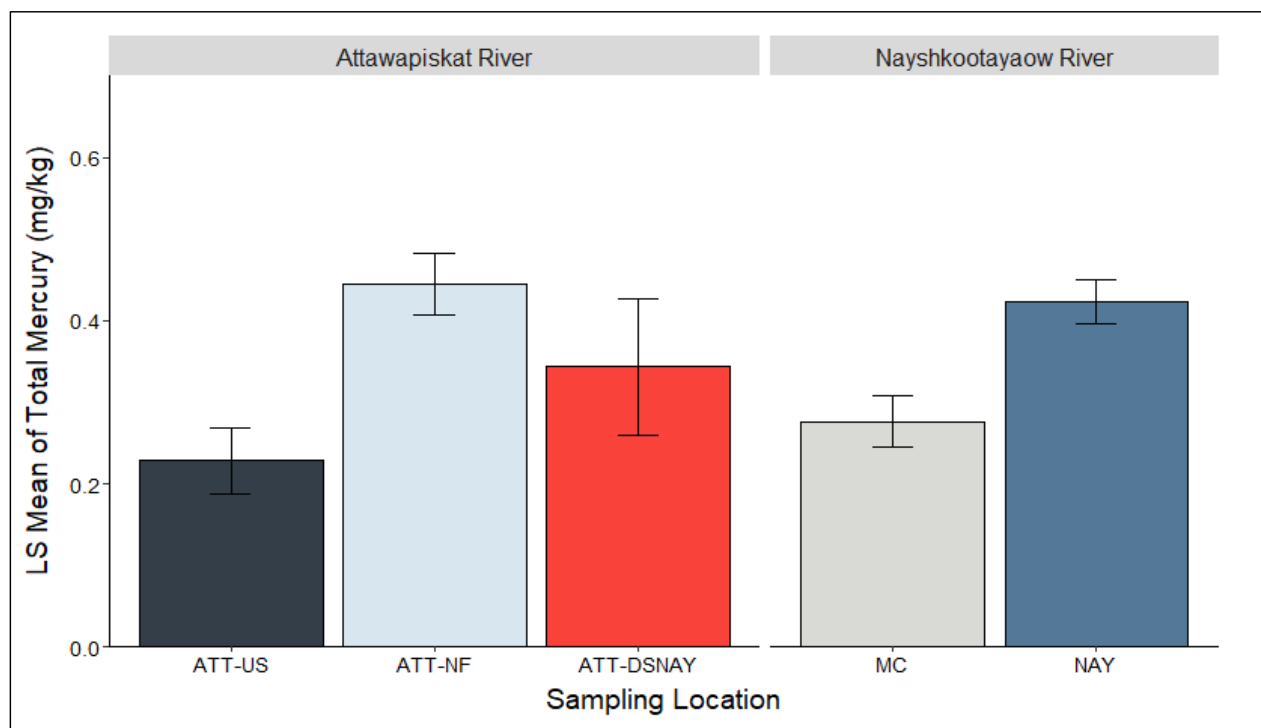
Plot of least square means of total mercury (mg/kg) adjusted for total length and area comparisons for Northern Pike in sampling years 2007/08, 2019 and 2022 from the Attawapiskat River. Sampling location ATT-DSNAY was added in 2022 and is not included in figure.

Figure 28: Plot of Total Mercury Concentrations Adjusted for Total Length from 2007/08 to 2022 in Northern Pike from the Nayshkootayaow River



Plot of least square means of total mercury (mg/kg) adjusted for total length and area comparisons for Northern Pike in sampling years 2007/08, 2019 and 2022 from the Nayshkootayaow River.

Figure 29: Histogram of Total Mercury LS Means in Northern Pike from the Attawapiskat River and Nayshkootayaow River



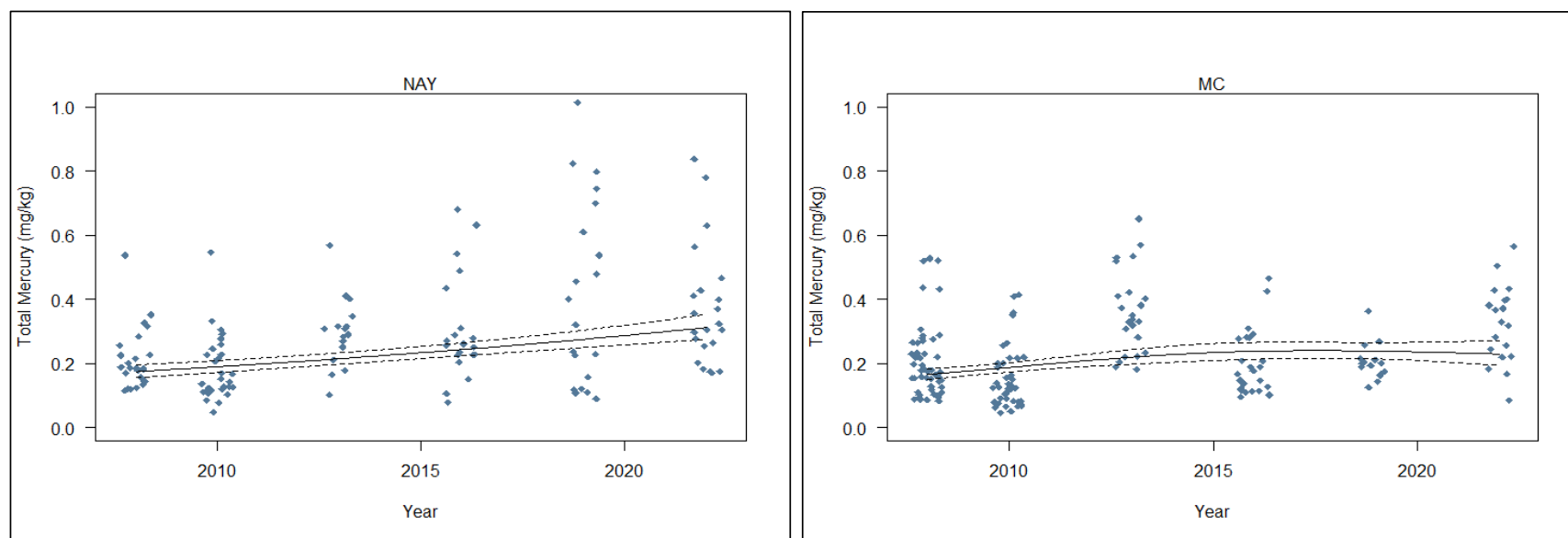
Histogram of least square means and standard error for total mercury adjusted for total length in Northern Pike from the Attawapiskat River and Nayshkootayaow River in 2022. ATT-DSNAY was added as an additional sampling location in 2022.

Figure 30: Total Mercury Additive Model for Northern Pike of Standard Size (650 mm) from 2008 to 2022 in Attawapiskat River



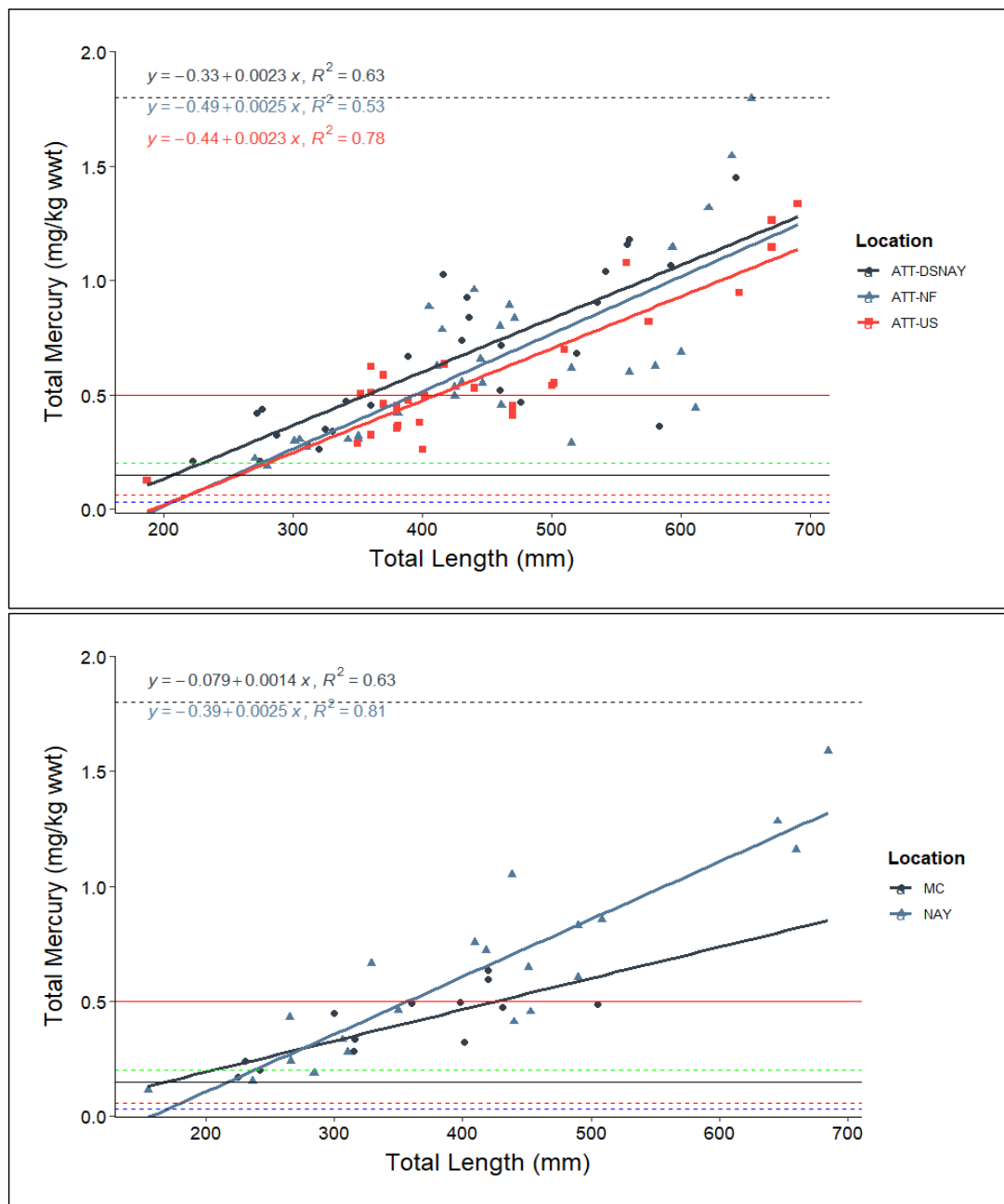
General additive model of total mercury with smoothers of year and total length (standard 650 mm) for Northern Pike from the Attawapiskat River sampling locations. Large-bodied fish sampling occurred on a three year basis (2008, 2010, 2013, 2016, 2019 and 2022).

Figure 31: Total Mercury Additive Model for Northern Pike of Standard Size (500 mm) from 2008 to 2022 in Nayshkootayaow River



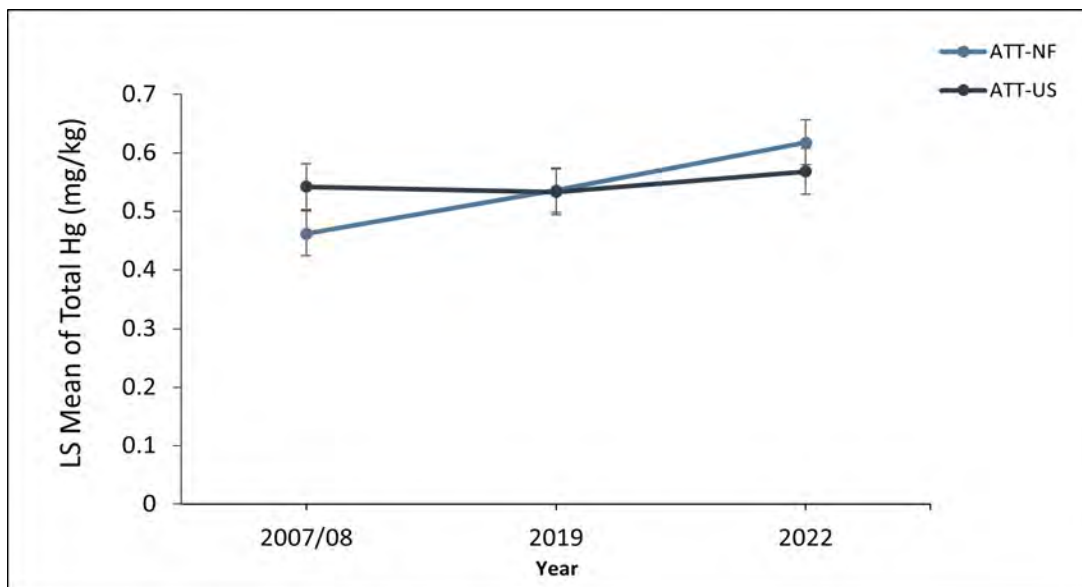
General additive model of total mercury with smoothers of year and total length (standard 500 mm) for Northern Pike from the Nayshkootayaow River sampling locations. Large-bodied fish sampling occurred on a three year basis (2008, 2010, 2013, 2016, 2019 and 2022).

Figure 32: Linear Regression of Total Mercury at Length in Walleye from the Attawapiskat River and Nayshkootayaow River



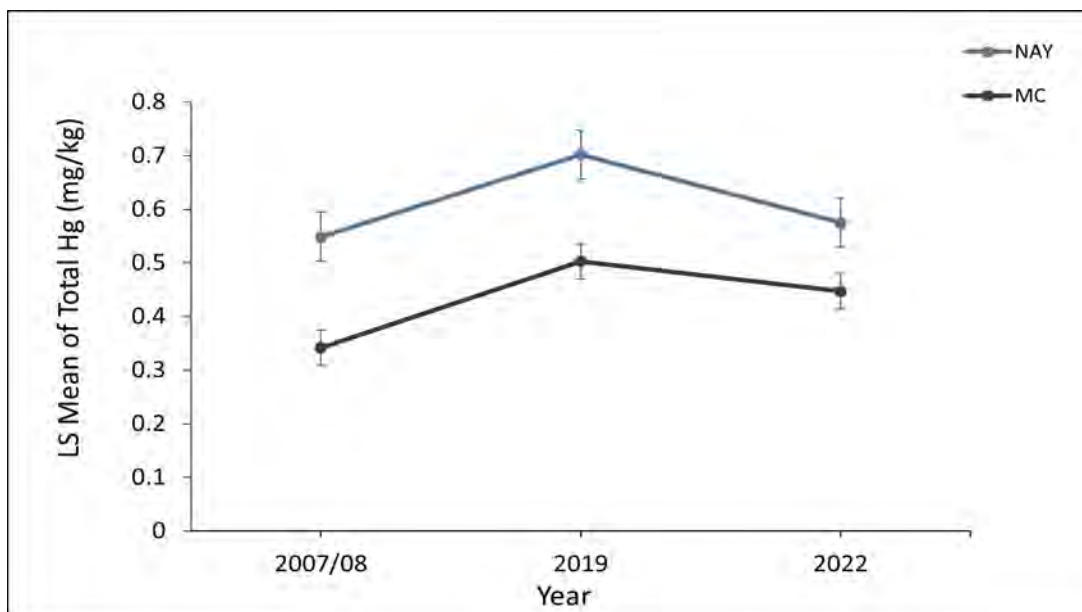
Advisories are displayed on each figure as applicable, based on ranges of data values. Relationships between total mercury and total length were significant in all cases ($p < 0.05$).

Figure 33: Plot of Total Mercury Concentrations Adjusted for Total Length from 2007/08 to 2022 in Walleye from the Attawapiskat River



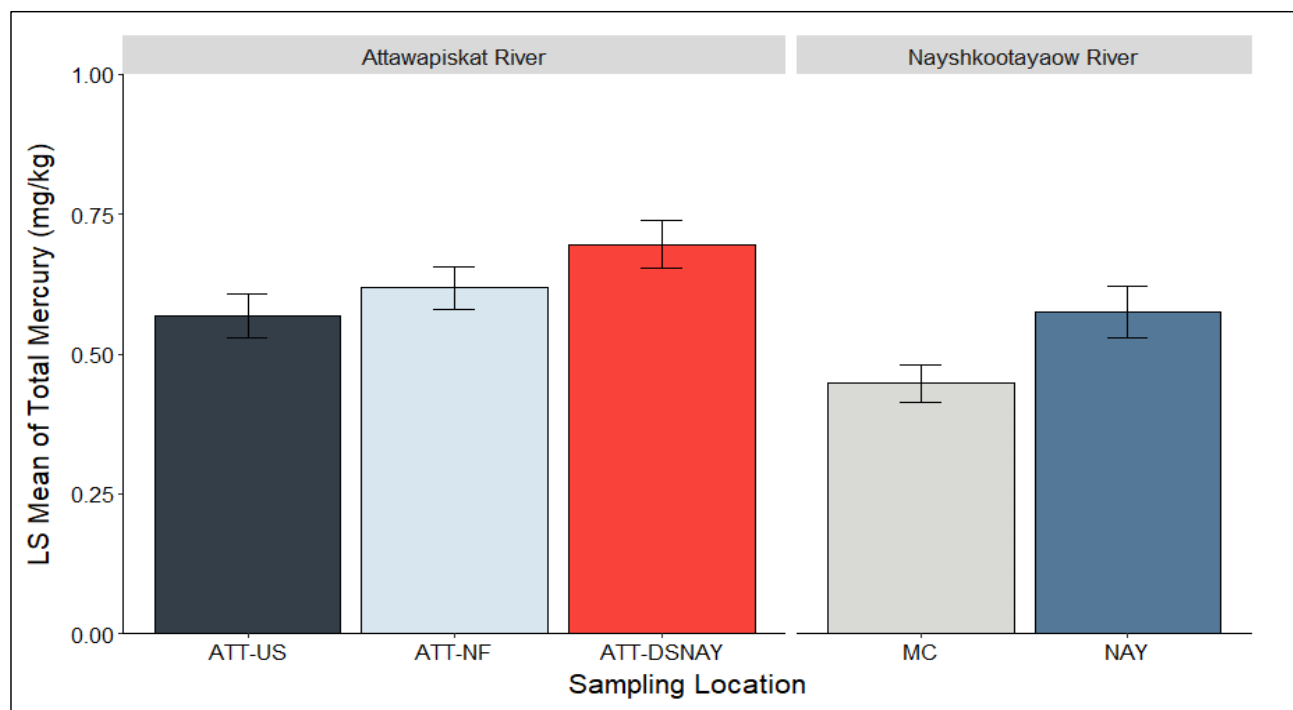
Plot of least square means of total mercury (mg/kg) adjusted for total length and area comparisons for Walleye in sampling years 2007/08, 2019 and 2022 from the Attawapiskat River. Sampling location ATT-DSNAY was added in 2022 and is not included in figure.

Figure 34: Plot of Total Mercury Concentrations Adjusted for Total Length from 2007/08 to 2022 in Walleye from the Nayshkootayaow River



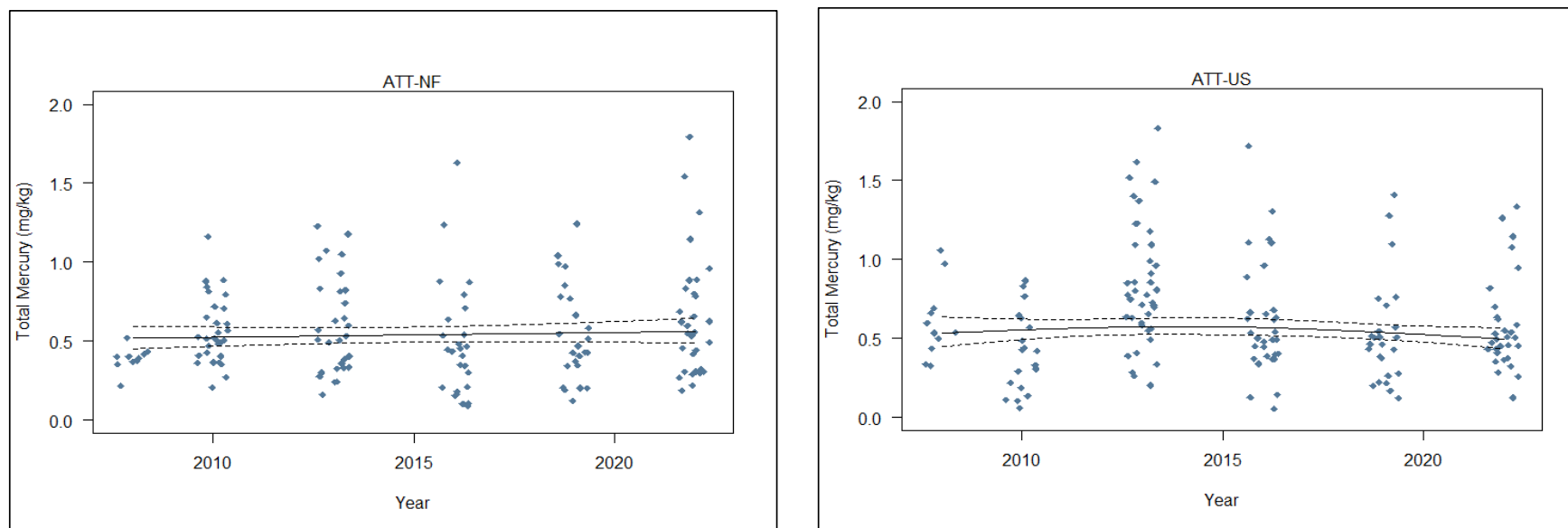
Plot of least square means of total mercury (mg/kg) adjusted for total length and area comparisons for Walleye in sampling years 2007/08, 2019 and 2022 from the Nayshkootayaow River.

Figure 35: Histogram of Total Mercury LS Means in Walleye from the Attawapiskat River and Nayshkootayaow River



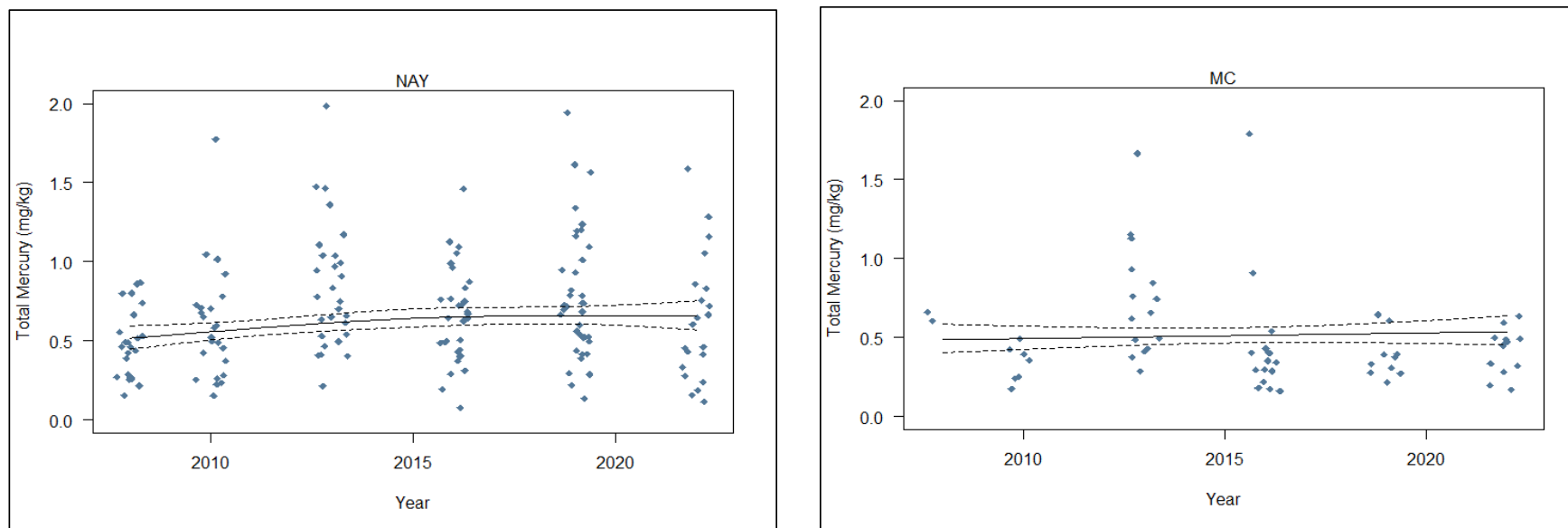
Histogram of least square means and standard error for total mercury adjusted for total length in Walleye from the Attawapiskat River and Nayshkootayaow River in 2022. ATT-DSNAY was added as an additional sampling location in 2022.

Figure 36: Total Mercury Additive Model for Walleye of Standard Size (430 mm) from 2008 to 2022 in Attawapiskat River



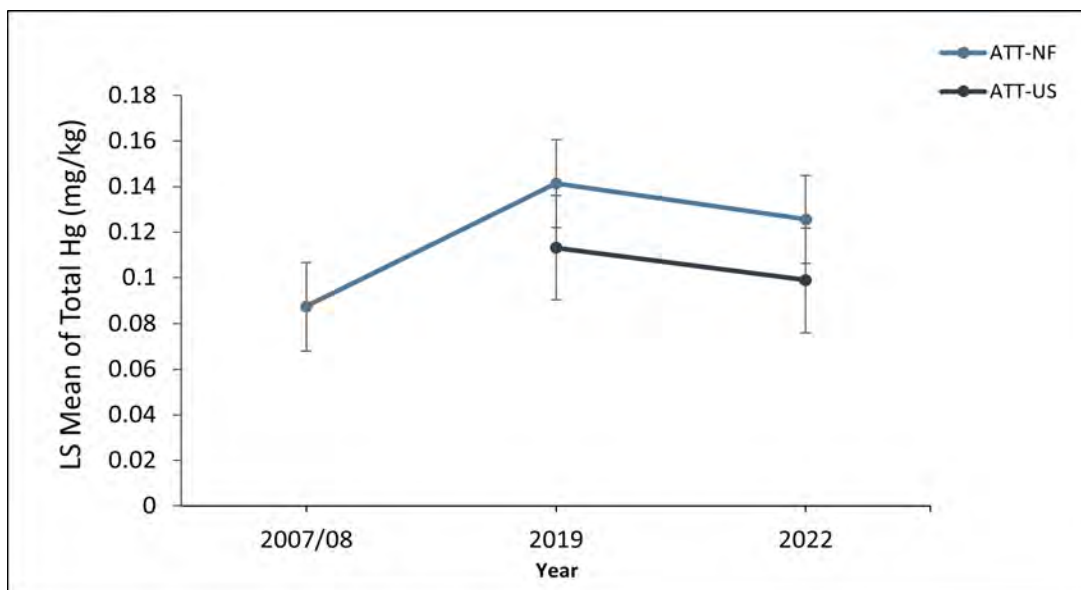
General additive model of total mercury with smoothers of year and total length (standard 430 mm) for Walleye from the Attawapiskat sampling locations. Large-bodied fish sampling occurred on a three year basis (2008, 2010, 2013, 2016, 2019 and 2022).

Figure 37: Total Mercury Additive Model for Walleye of Standard Size (430 mm) from 2008 to 2022 in Nayshkootayaow River



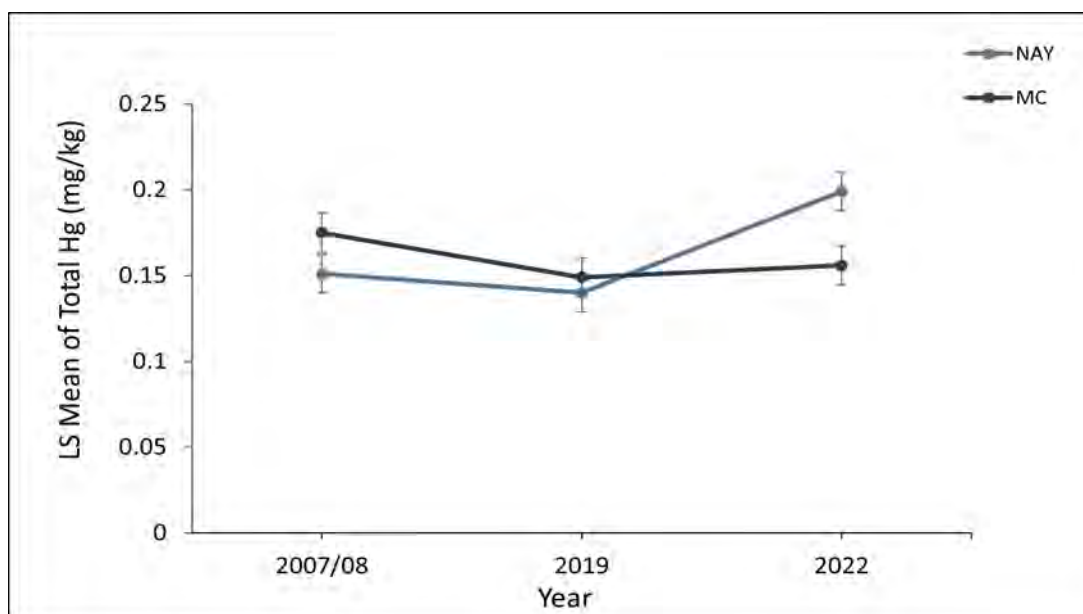
General additive model of total mercury with smoothers of year and total length (standard 430 mm) for Walleye from the Nayshkootayaow River sampling locations. Large-bodied fish sampling occurred on a three year basis (2008, 2010, 2013, 2016, 2019 and 2022).

Figure 38: Plot of Total Mercury Concentrations Adjusted for Total Length from 2007/08 to 2022 in White Sucker from the Attawapiskat River



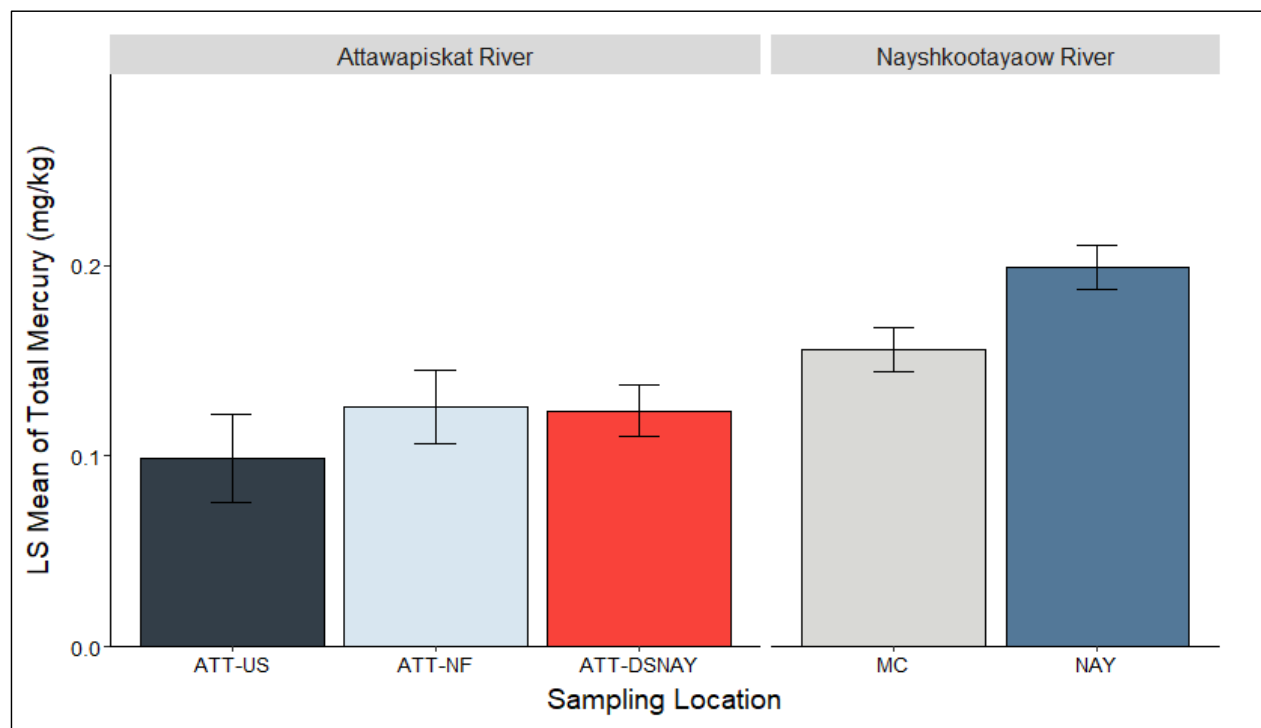
Plot of least square means of total mercury (mg/kg) adjusted for total length and area comparisons for White Sucker in sampling years 2007/08, 2019 and 2022 from the Attawapiskat River. Sampling location ATT-DSNAY was added in 2022 and is not included in figure.

Figure 39: Plot of Total Mercury Concentrations Adjusted for Total Length from 2007/08 to 2022 in White Sucker from the Nayshkootayaow River



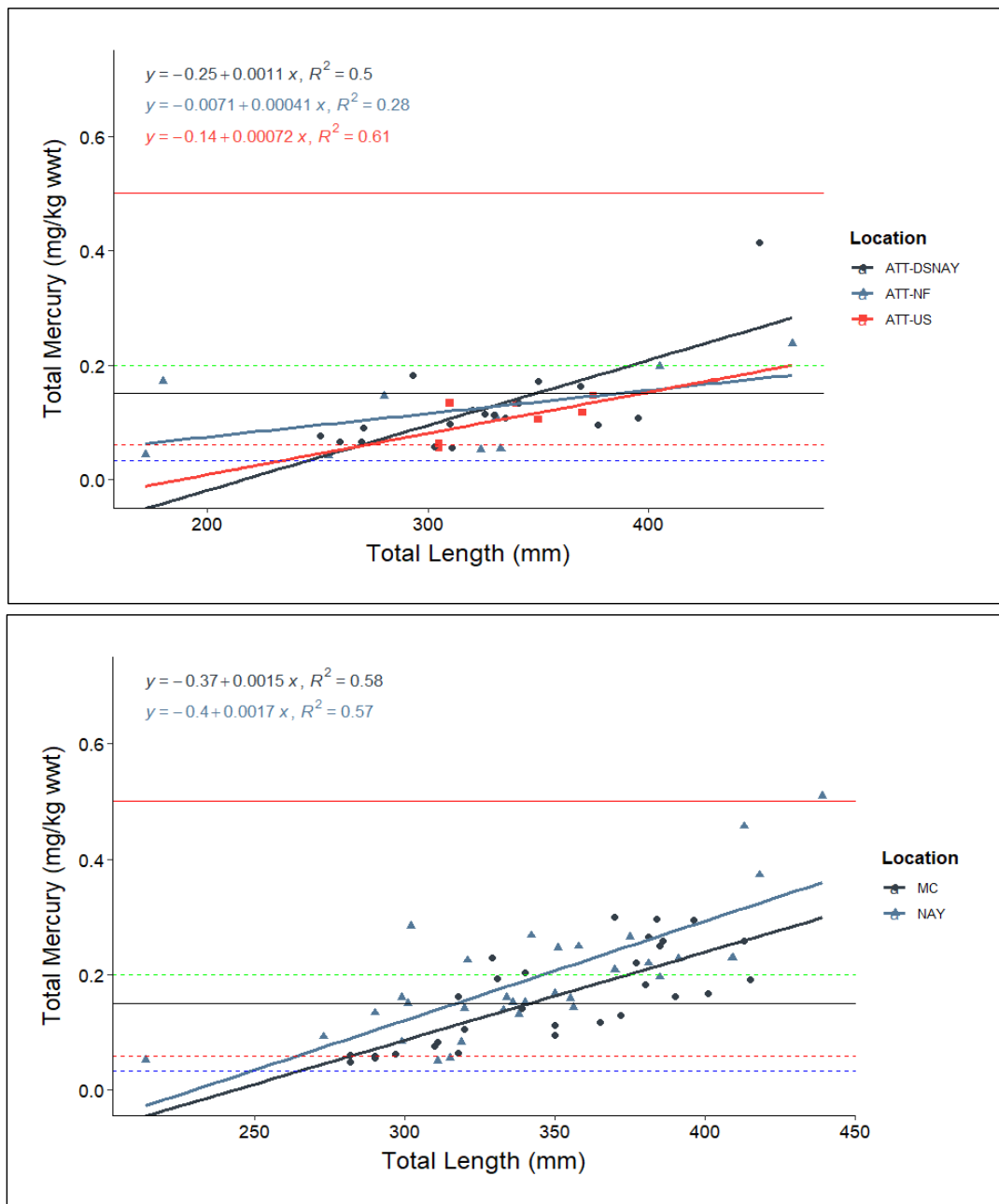
Plot of least square means of total mercury (mg/kg) adjusted for total length and area comparisons for White Sucker in sampling years 2007/08, 2019 and 2022 from the Nayshkootayaow River.

Figure 40: Histogram of Total Mercury LS Means in White Sucker from the Attawapiskat River and Nayshkootayaow River



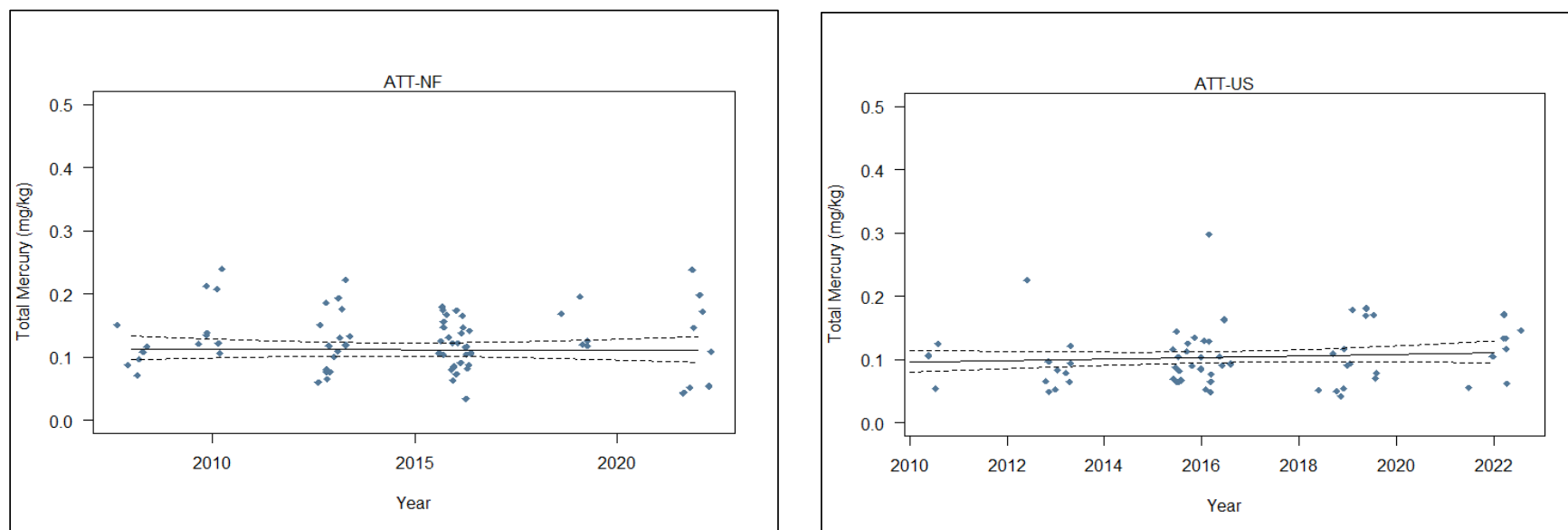
Histogram of least square means and standard error for total mercury adjusted for total length in White Sucker from the Attawapiskat River and Nayshkootayaow River in 2022. ATT-DSNAY was added as an additional sampling location in 2022.

Figure 41: Linear Regression of Total Mercury at Length in White Sucker from the Attawapiskat River and Nayshkootayaow River



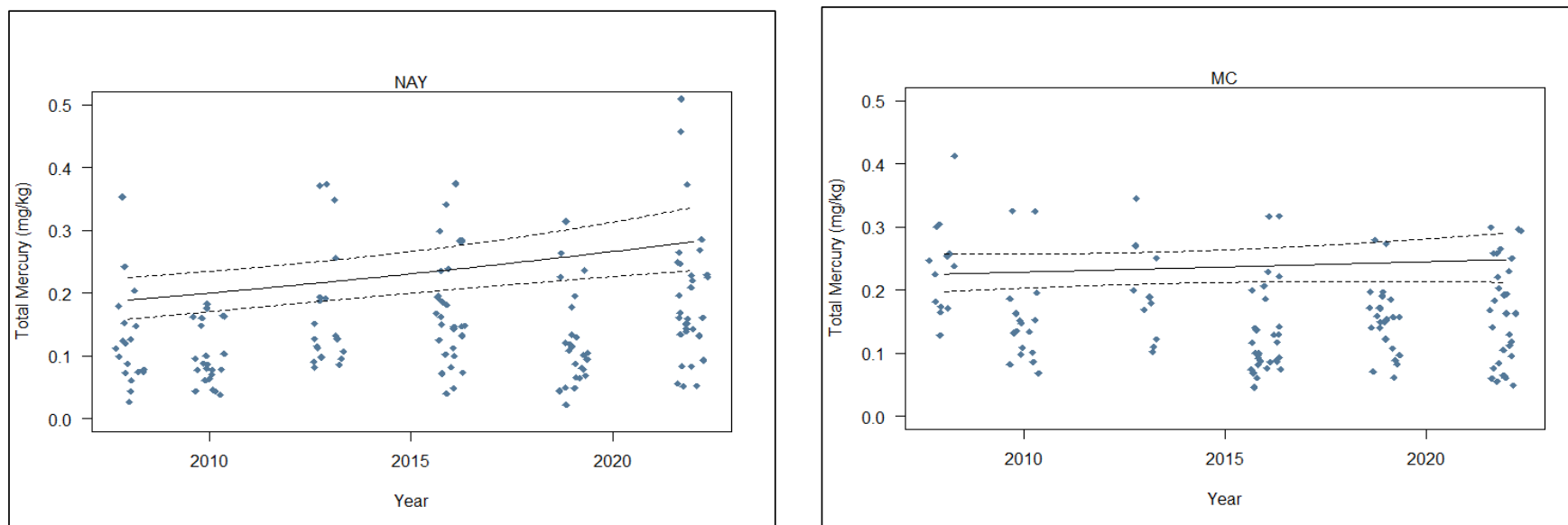
Advisories are displayed on each figure as applicable, based on ranges of data values. Relationships between total mercury and total length were significant in all cases ($p < 0.05$). All values for White Sucker from the Attawapiskat River and Nayshkootayaow River were below the MOECC complete restriction guideline for the general population (1.8 mg/kg); this guideline was not included on the above figures.

Figure 42: Total Mercury Additive Model for White Sucker of Standard Size (350 mm) from 2008 to 2022 in Attawapiskat River

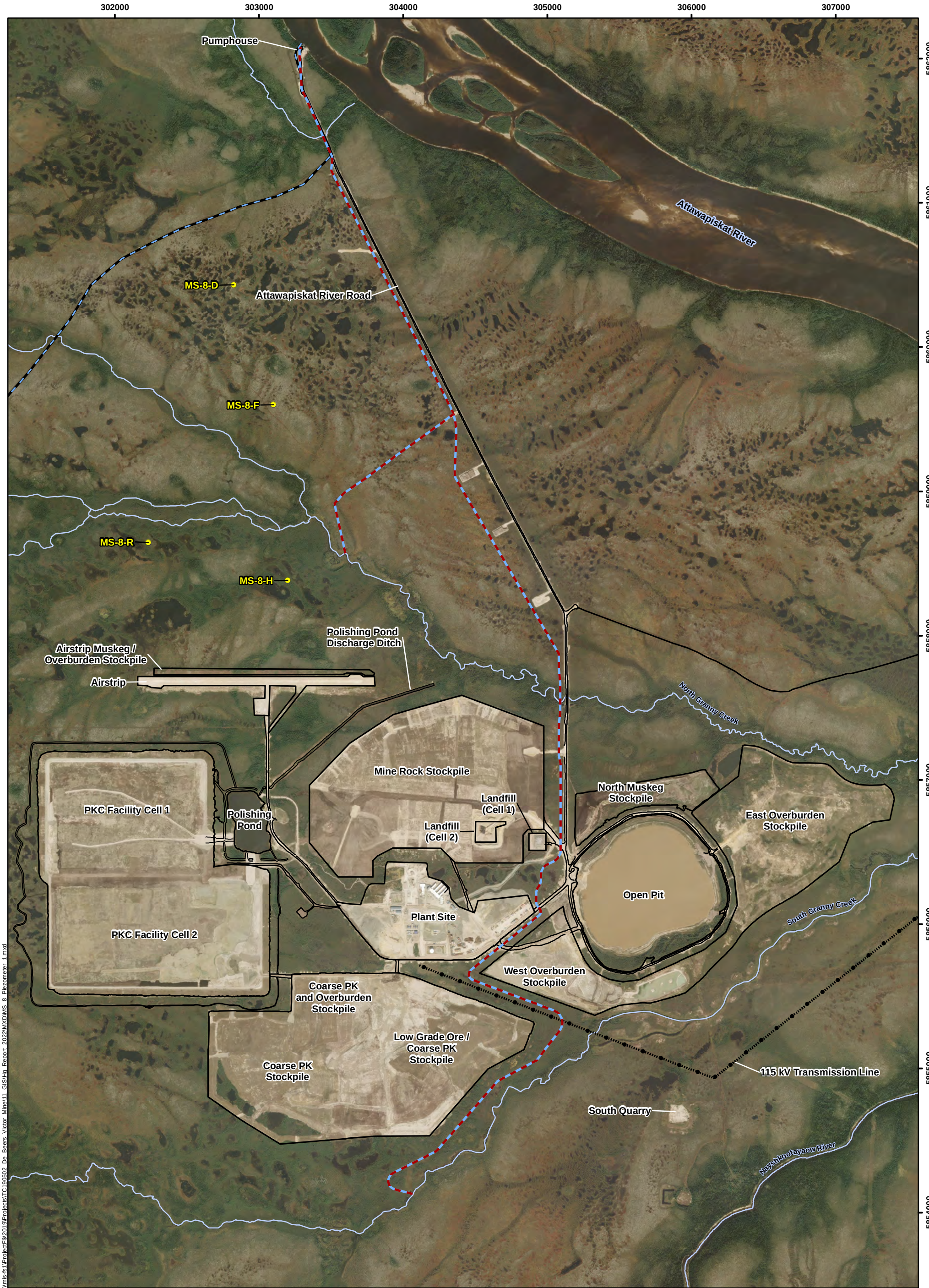


General additive model of total mercury with smoothers of year and total length (standard 350 mm) for White Sucker from the Attawapiskat River sampling locations. Large-bodied fish sampling occurred on a three year basis (2008, 2010, 2013, 2016, 2019 and 2022).

Figure 43: Total Mercury Additive Model for White Sucker of Standard Size (430 mm) from 2008 to 2022 in Nayshkootayaow River



General additive model of total mercury with smoothers of year and total length (standard 430 mm) for White Sucker from the Nayshkootayaow River sampling locations. Large-bodied fish sampling occurred on a three year basis (2008, 2010, 2013, 2016, 2019 and 2022).



LEGEND Mine Feature 115 kV Transmission Line Granny Creek Supplementation Pipeline Nayshkootayaow River Supplementation Pipeline Watercourse Muskeg Monitoring Stations Clay/Peat Piezometer		NOTES: - Site plan extracted from as built De Beers CAD drawing, 2017. - Aerial imagery current as of September 2022.		DE BEERS GROUP OF COMPANIES wsp	
				VICTOR DIAMOND MINE	
				MS-8 Piezometer Locations	
Datum: NAD83 Projection: UTM Zone 17N W N E S		PROJECT N ^o : TC190502	FIGURE: 44		
		SCALE: 1:24,000	DATE: June 2023		

Figure 45a: G3 / G4 Filtered Methyl Mercury Trend

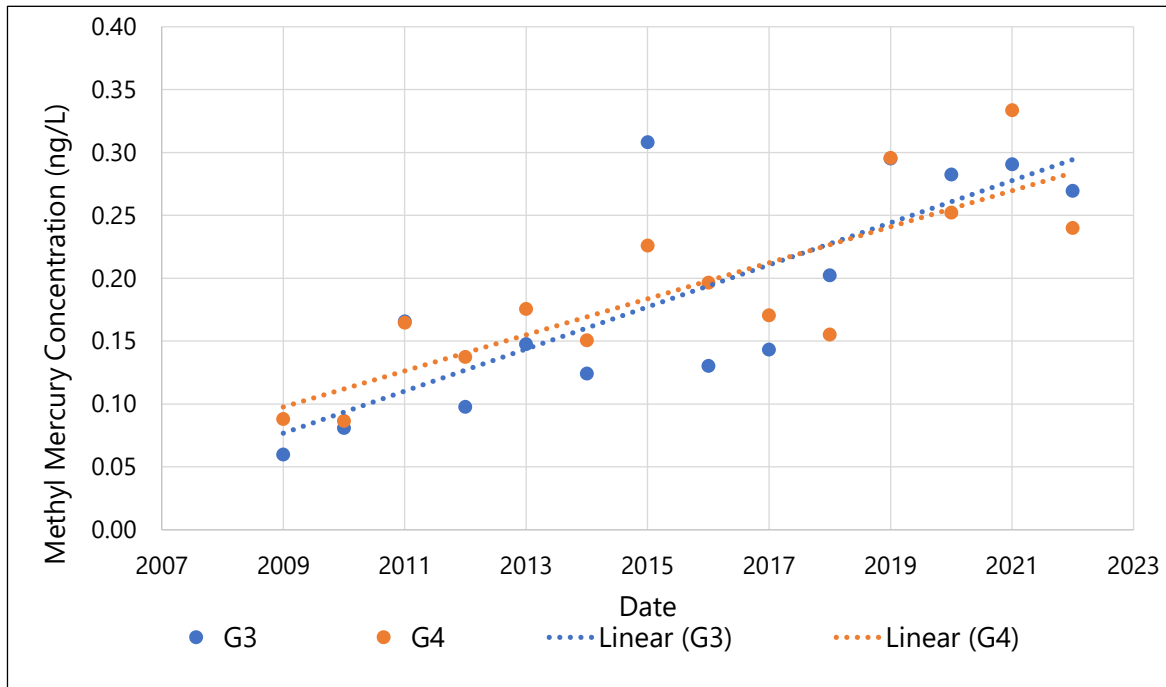
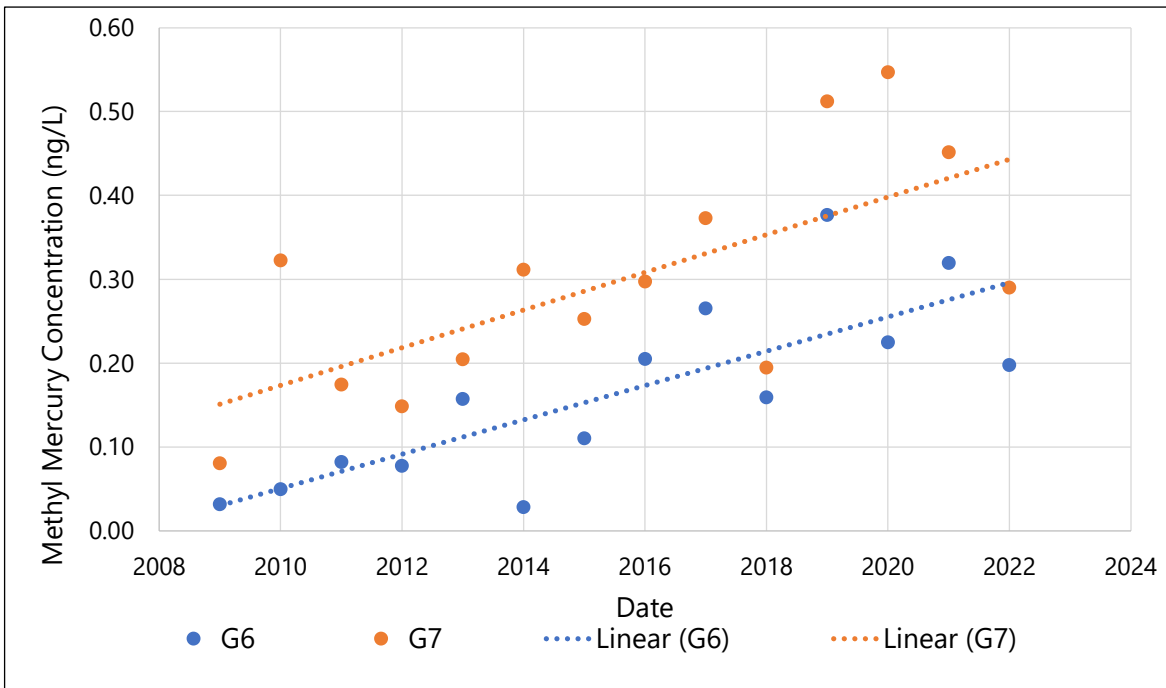
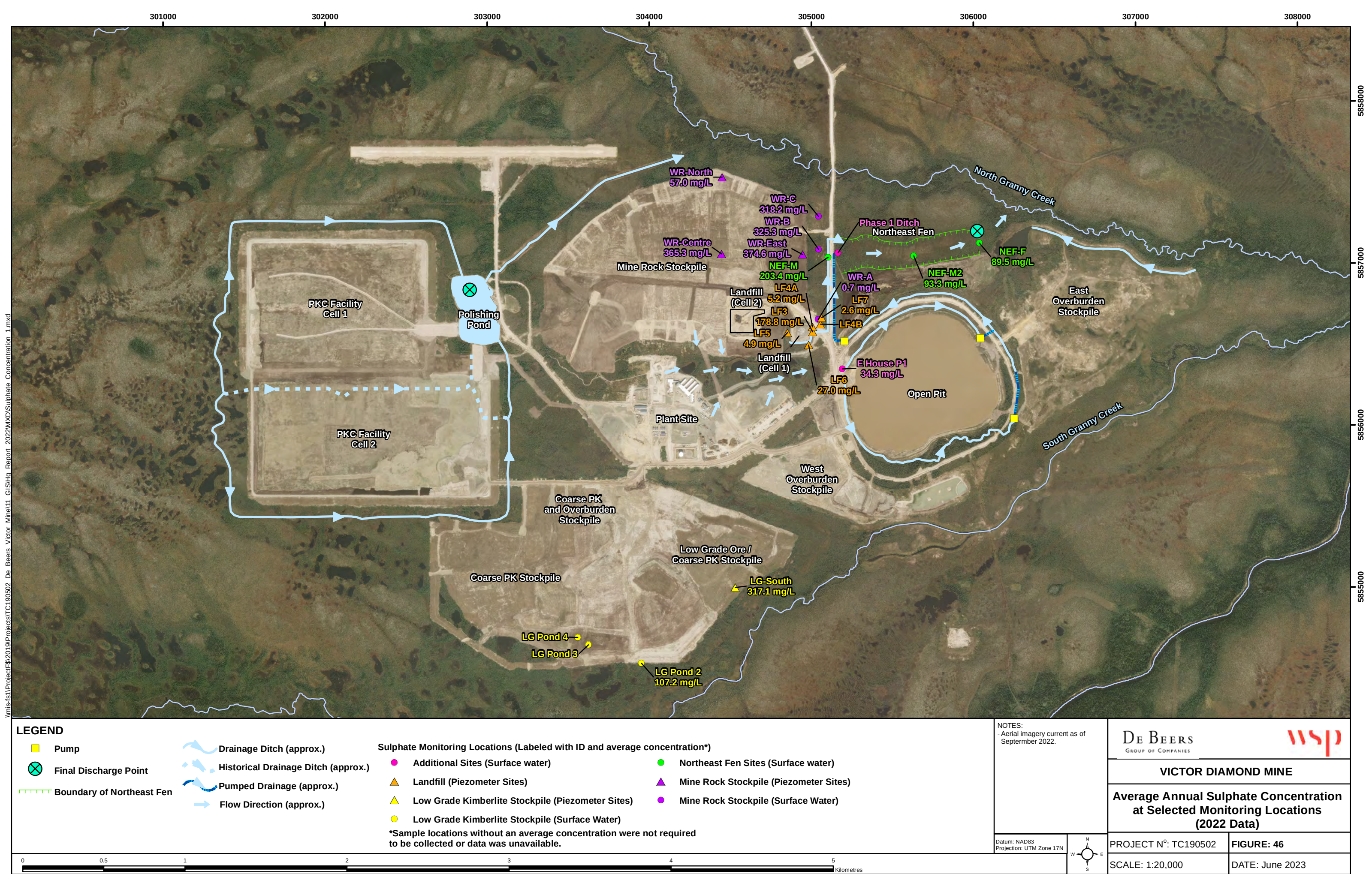


Figure 45b: G6 / G7 Filtered Methyl Mercury Trend



\\nis-fs1\Project\F\$2019\Projects\TC190502 De Beers Victor Mine\11 GIS\Hq Report 2022\MXD\Subphate Concentration 1.mxd



DE BEERS

GROUP OF COMPANIES

APPENDIX A

SUPPLEMENTAL FISH TISSUE ANALYSIS DATA

Figure A-1: Length-Frequency Distributions for Northern Pearl Dace in the Granny Creek System and Tributary 5A

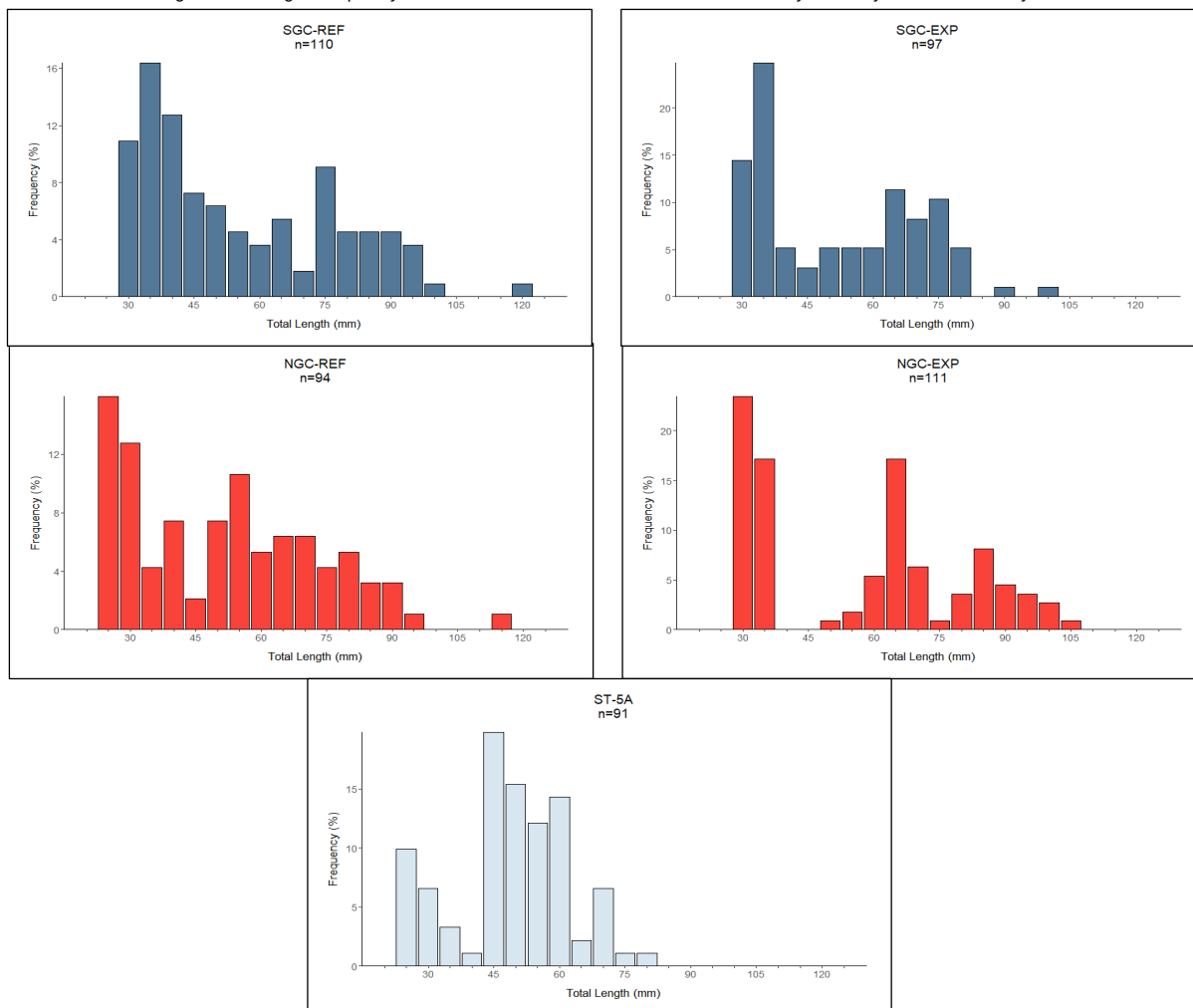
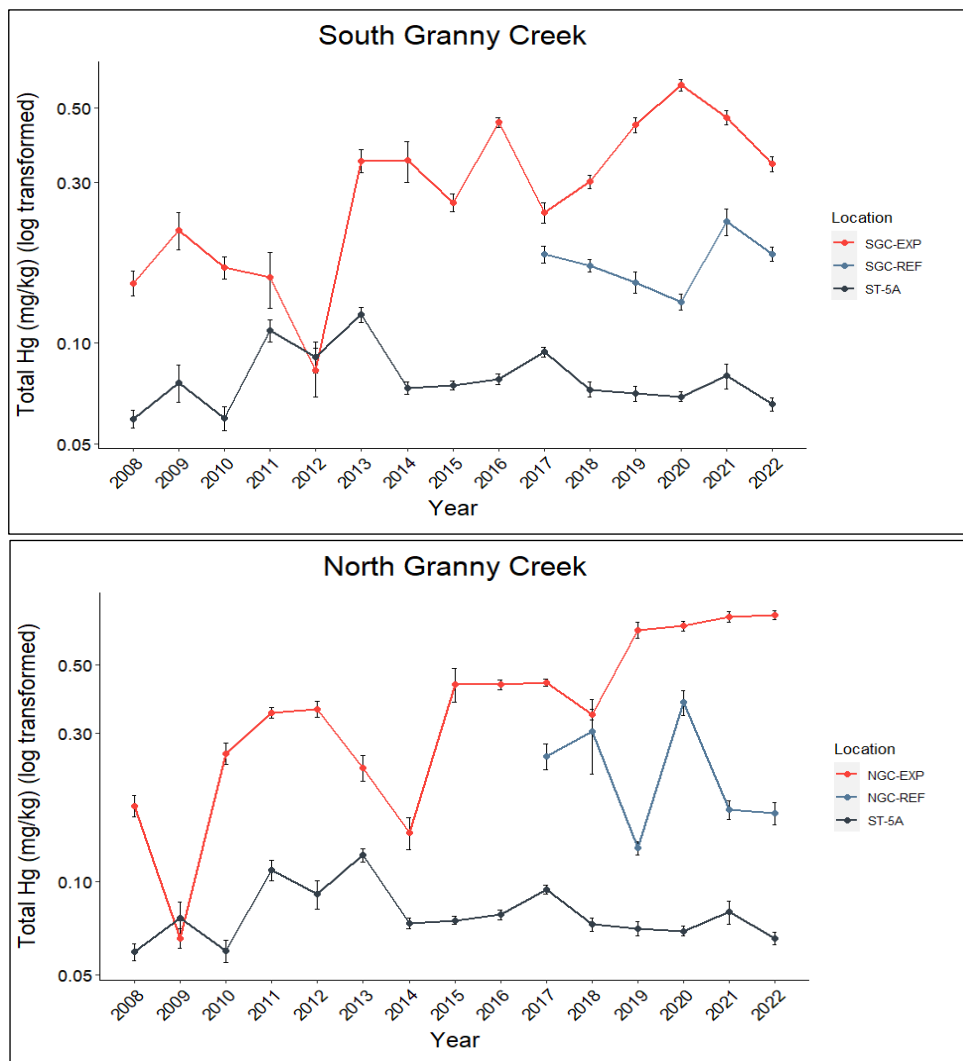


Figure A-2: Comparison of Average Total Mercury from 2008 to 2022 in Northern Pearl Dace from the Granny Creek System and Tributary 5A



Comparison of average total mercury levels (mg/kg) in Northern Pearl Dace from the Granny Creek System and Tributary 5A from 2008 to 2022. Figure consists of all Northern Pearl Dace captured each year regardless of age-class to increase sample size for summary statistics. A South Granny Creek reference location (SGC-REF) was not added until 2017. Dots represent average total mercury value with standard error. Y-axis is log transformed to better depict data trends.

Figure A-3: Length-Frequency Distributions for Trout Perch in the Attawapiskat River

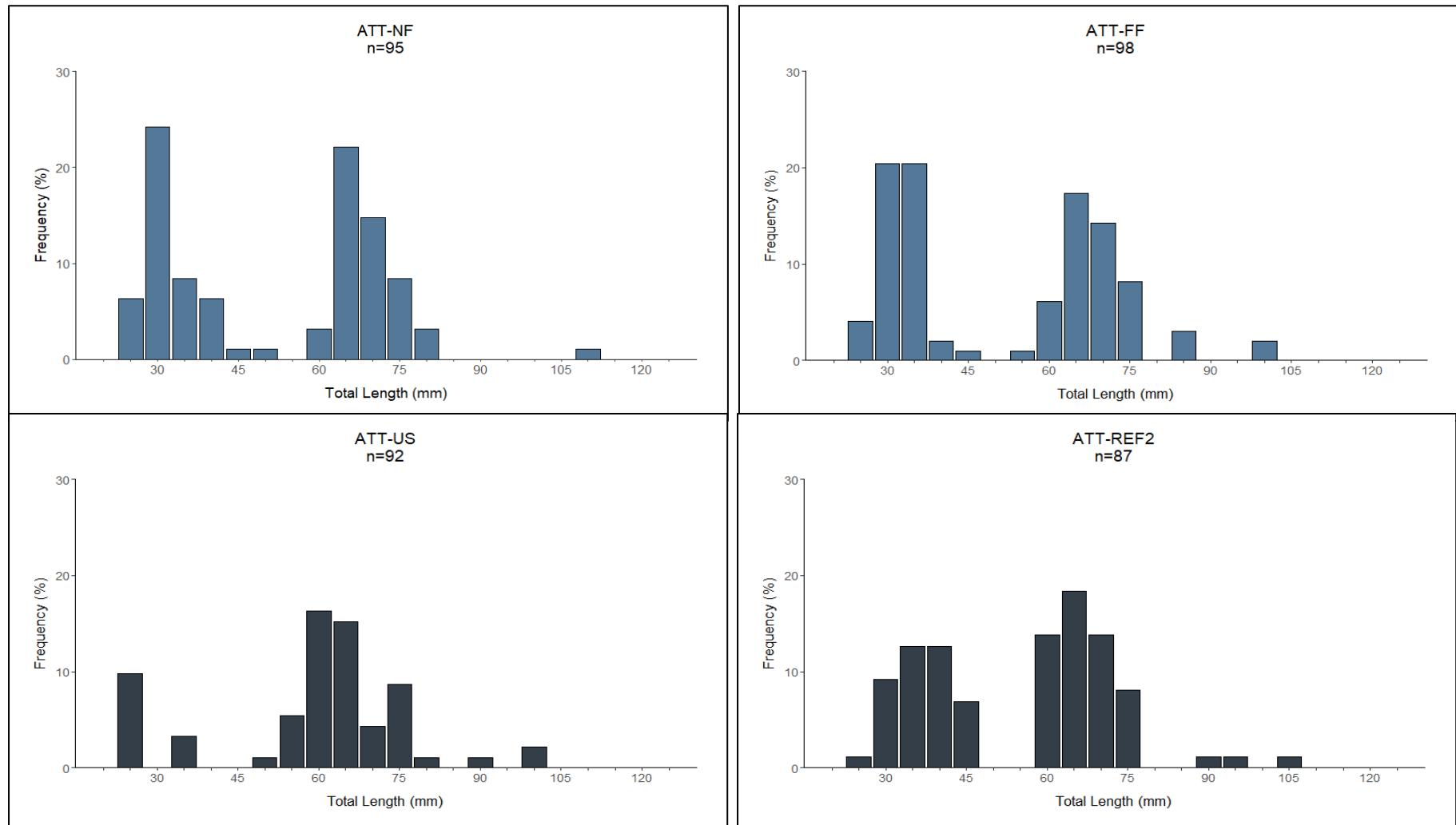
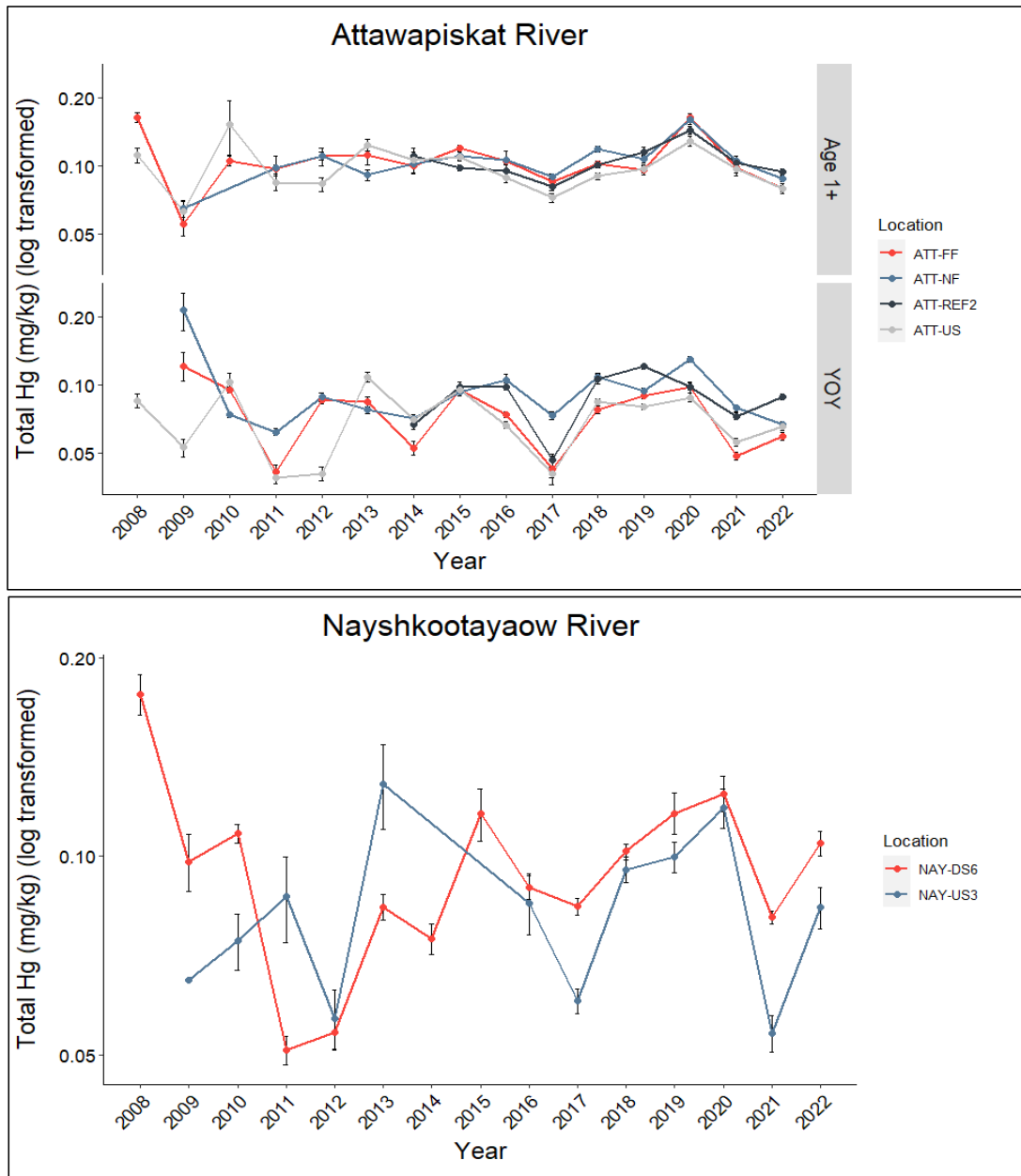


Figure A-4: Comparison of Average Total Mercury from 2008 to 2022 in Trout Perch from the Nayshkootayaow River and Attawapiskat River



Comparison of average total mercury levels (mg/kg) for Trout Perch from the Nayshkootayaow River and Attawapiskat River from 2008 to 2022. Nayshkootayaow River figure consists of all Trout Perch captured each year regardless of age-class to increase sample size for summary statistics. Age-class for Trout Perch from the Attawapiskat River was determined by otolith agine structures in 2011 and from 2013 to 2022, and by length frequency distributions from 2008 to 2010 and in 2012. ATT-REF2 was introduced as a sampling location in 2014. Dots represent average total mercury value with standard error. Y-axis is log transformed to better depict data trends.

Figure A-5: Length-Frequency Distributions for Trout Perch in the Nayshkootayaow River

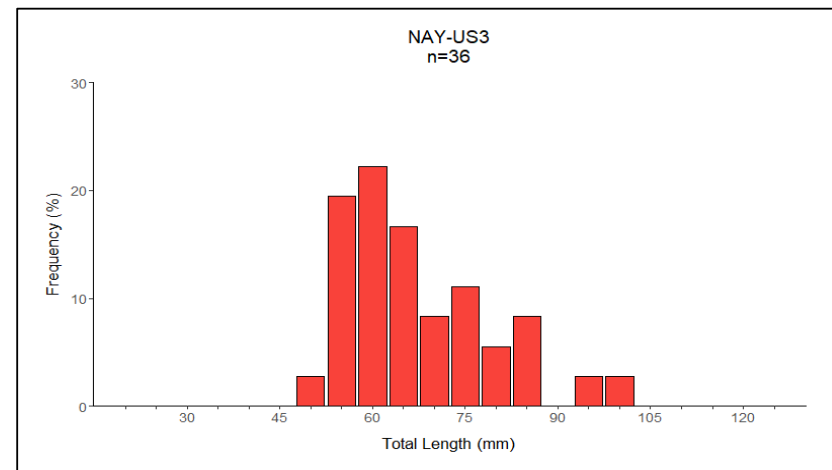
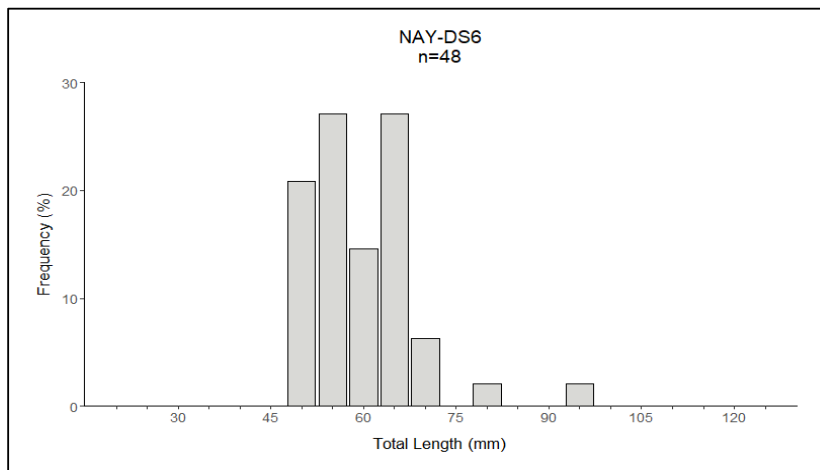


Figure A-6: Length-Frequency Distributions for Mottled Sculpin in the Attawapiskat River and Nayshkootayaow River

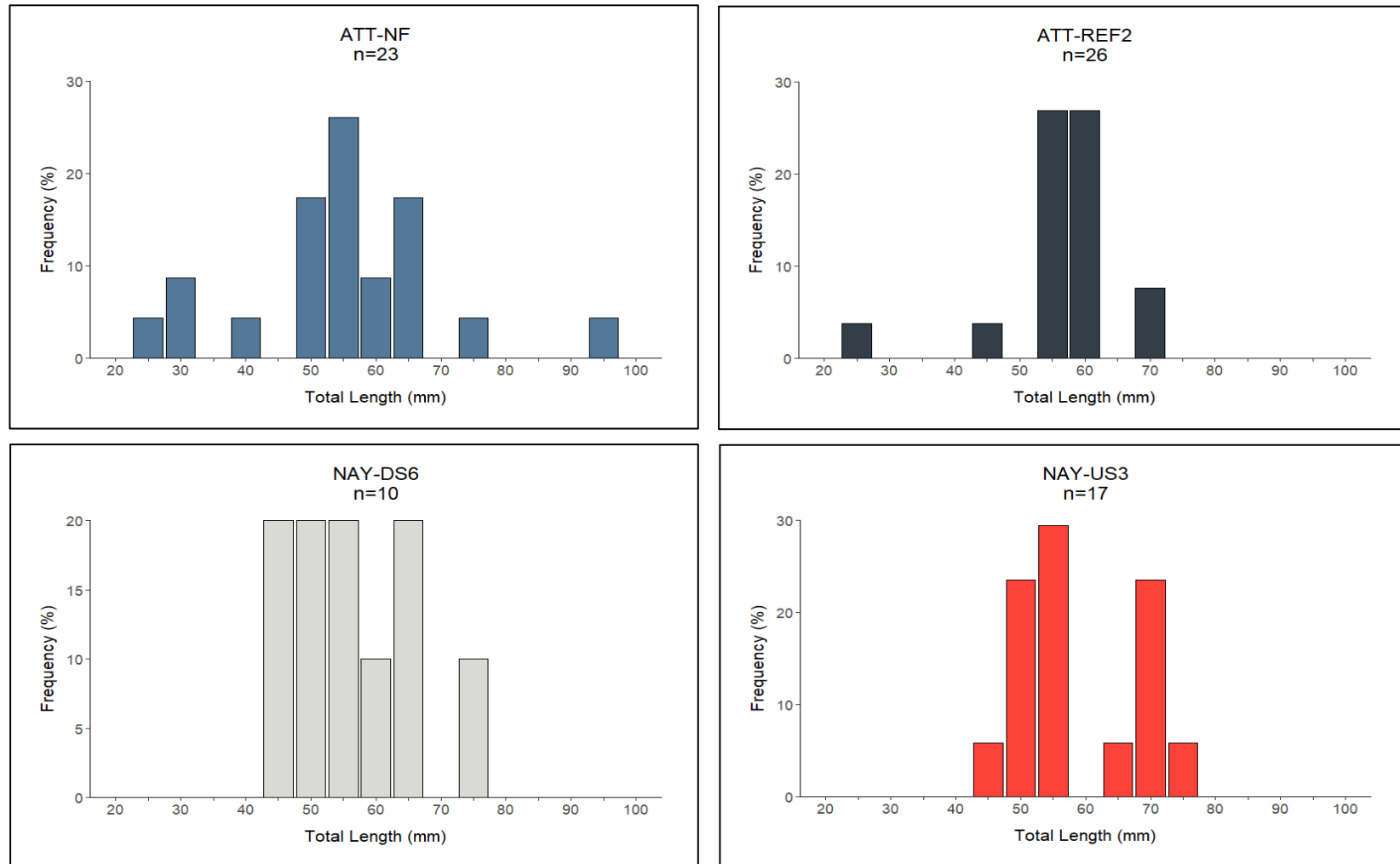
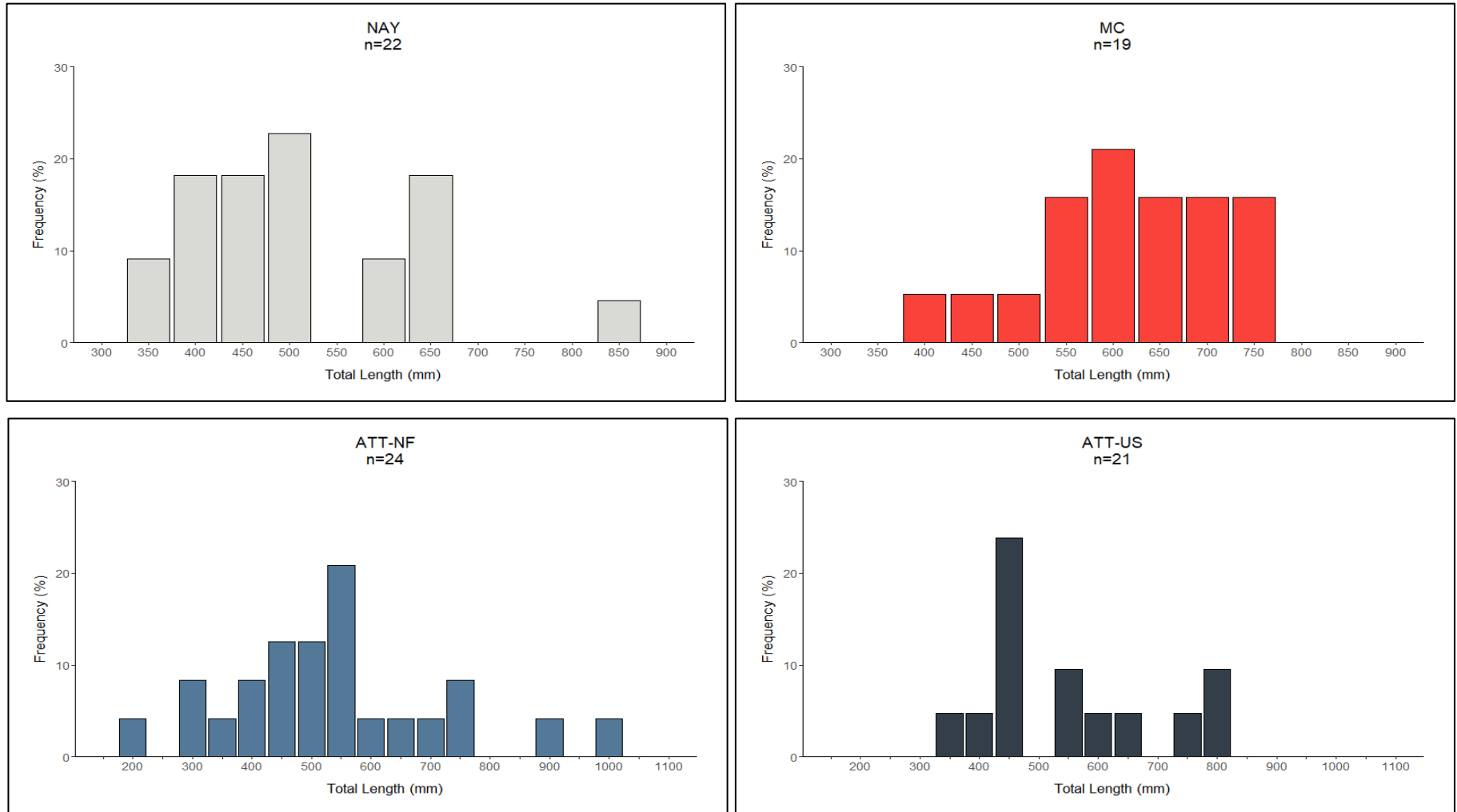
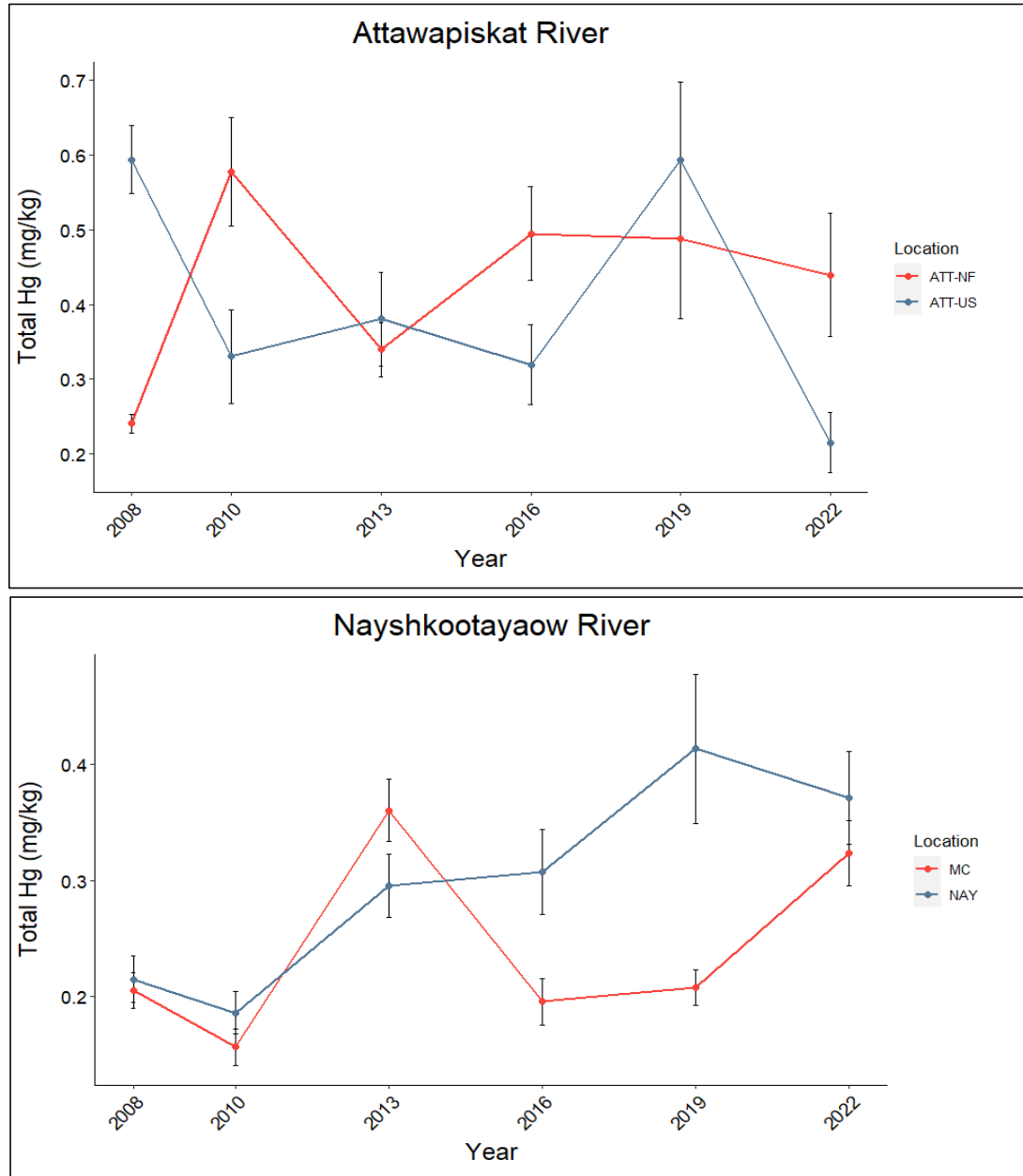


Figure A-7: Length-Frequency Distributions for Northern Pike in the Attawapiskat River and Nayshkootayaow River



Note: Sample size at sample location ATT-DSNAY was too small to be included in length-frequency histogram (n=6)

Figure A-8: Comparison of Average Total Mercury from 2008 to 2022 in Northern Pike from the Attawapiskat River and Nayshkootayaow River



Comparison of average total mercury levels (mg/kg) for Northern Pike from the Nayshkootayaow River and Attawapiskat River from 2008 to 2022. Figures consist of all Northern Pike captured and sampled for tissue analysis within each given year. Dots represent average total mercury value with standard error.

Figure A-9: Length-Frequency Distributions for Walleye in the Attawapiskat River and Nayshkootayaow River

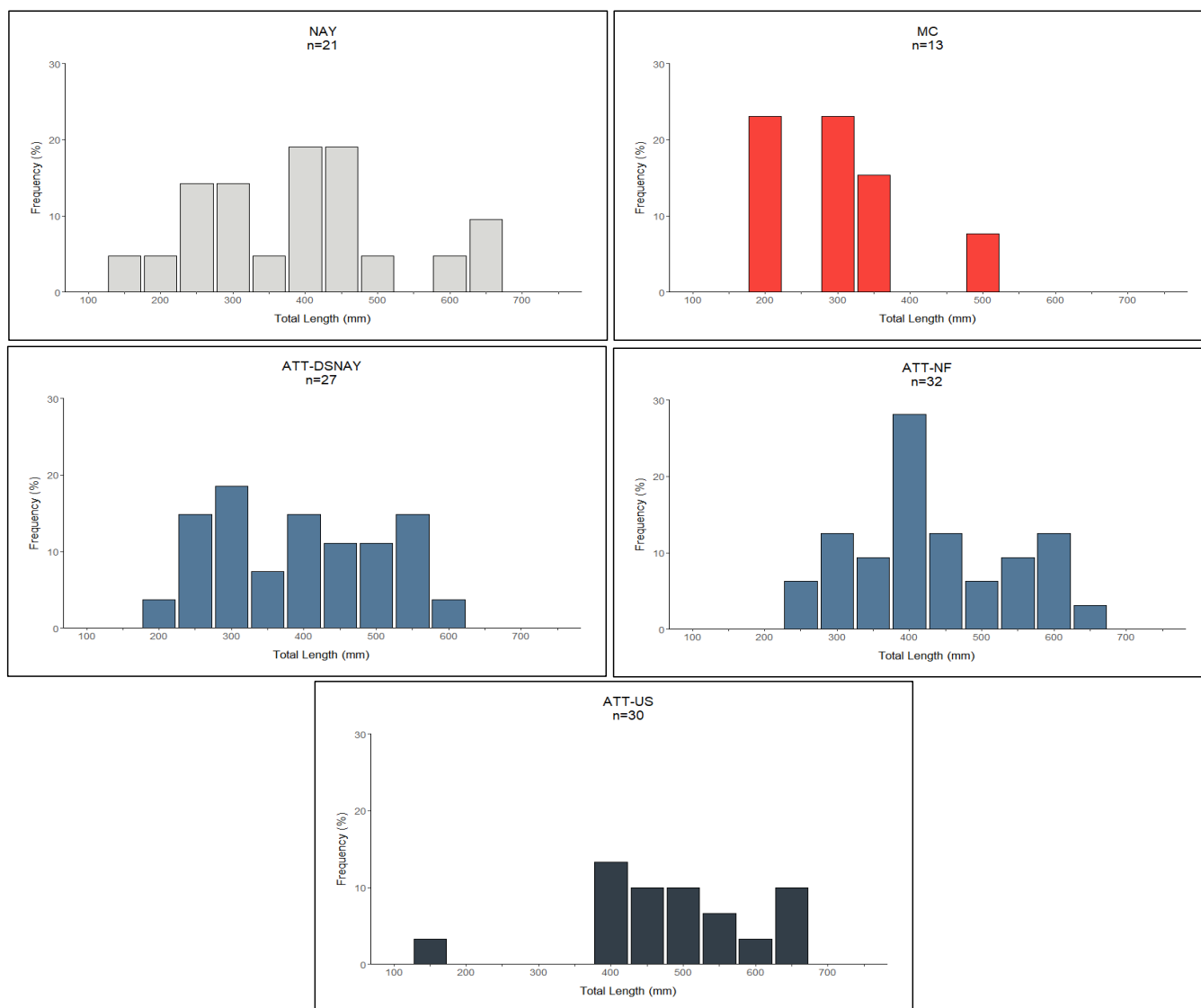
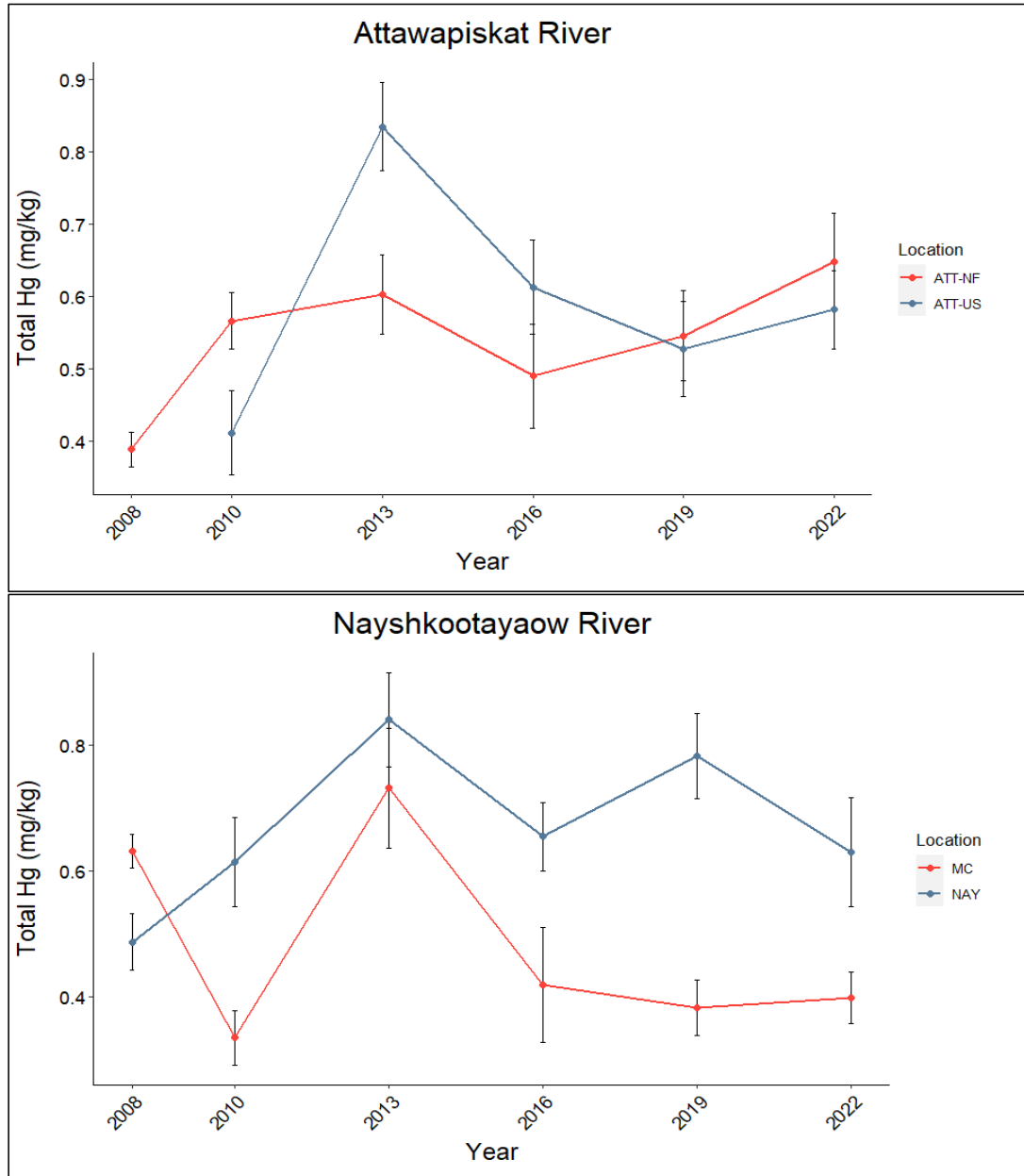


Figure A-10: Comparison of Average Total Mercury from 2008 to 2022 in Walleye from the Attawapiskat River and Nayshkootayaow River



Comparison of average total mercury levels (mg/kg) for Walleye from the Nayshkootayaow River and Attawapiskat River from 2008 to 2022. Figures consist of all Walleye captured and sampled for tissue analysis within each given year. Dots represent average total mercury value with standard error.

Figure A-11: Length-Frequency Distributions for White Sucker in the Attawapiskat River and Nayshkootayaow River

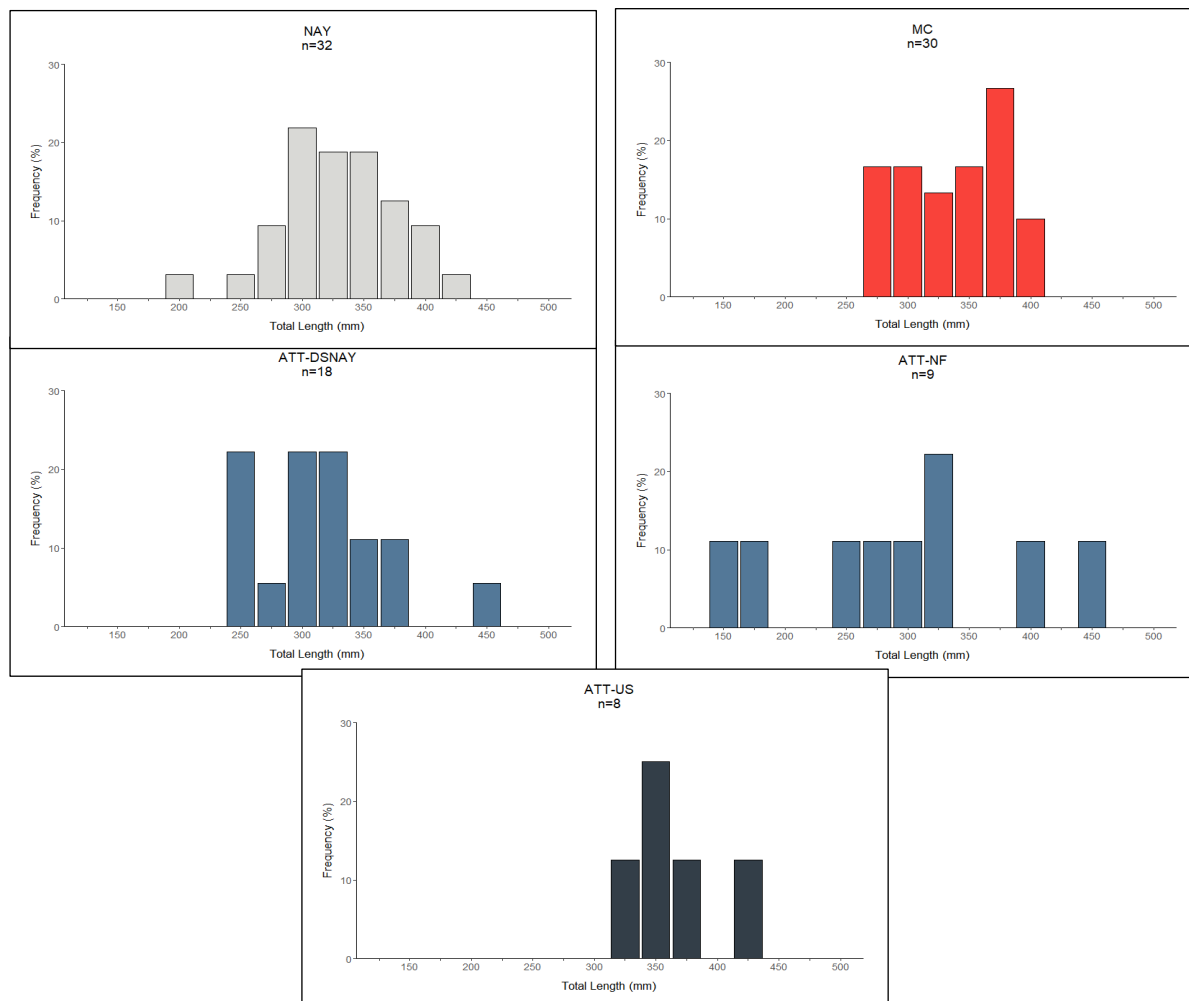
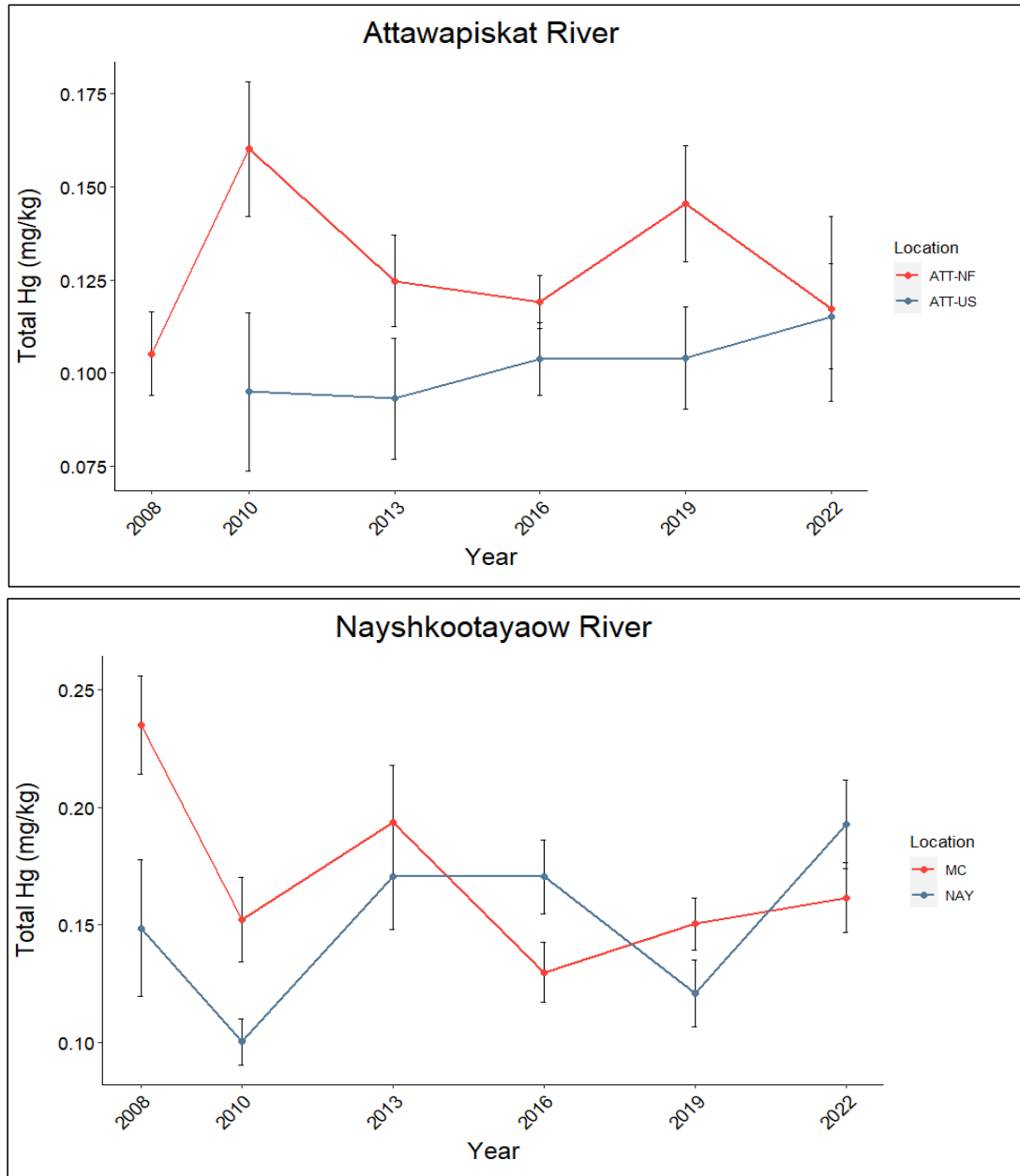


Figure A-12: Comparison of Average Total Mercury from 2008 to 2022 in White Sucker from the Nayshkootayaow River and Attawapiskat River



Comparison of average total mercury levels (mg/kg) for White Sucker from the Nayshkootayaow River and Attawapiskat River from 2008 to 2022. Figures consist of all White Sucker captured and sampled for tissue analysis within each given year. Dots represent average total mercury value with standard error.