HALIFAX REGIONAL MUNICIPALITY

2023 HRM WATER QUALITY MONITORING PROGRAM – BEDFORD WEST

BEDFORD WEST SUBDIVISION AND PAPERMILL LAKE WATERSHED

MAY 15, 2024

CONFIDENTIAL

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HALIFAX REGIONAL MUNICIPALITY

FINAL REPORT (AMENDED)
CONFIDENTIAL

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EXECUTIVE SUMMARY

WSP Canada Inc. (WSP) has prepared this report to provide Halifax Regional Municipality (HRM) with water quality data for 11 surface water stations throughout the Bedford West development area. Water quality monitoring in the Bedford West development area has been ongoing since 2009 and in June 2020 Wood (now WSP) was retained by HRM to complete water quality monitoring programs each spring, summer, and fall for three years beginning in July 2020. Sample collection in 2023 was completed during Spring (delayed until July), Summer (August), and Fall (October) events. The results of the 2023 surface water monitoring program are detailed herein. The overall purpose of the program is to conduct water quality sampling and testing prior to and during construction activities related to the development projects within the Papermill and Bedford West Watersheds to detect any impacts on and/or changes to water quality.

The 2023 water quality monitoring event included the collection of surface water samples at 11 water quality sampling stations for the analysis of inorganics, calculated parameters, standard metals, microbiological and additional metals. Additionally, field parameters collected at each station included in-situ pH, water temperature, dissolved oxygen, conductivity, Secchi depth (one station only), air temperature, cloud cover and wildlife sightings.

2023 Bedford West Water Quality Monitoring Program Results

Field Measurements

- All 11 stations were within the 5.0 – 9.0 pH Health Canada (HC) range for Recreational Water Quality during the Spring, Summer and Fall monitoring events. Seven sampling stations were found outside the Canadian Council of Ministers of the Environment (CCME) Freshwater Aquatic Life (FWAL) guidelines recommended range of 6.5-9.0 during specific Spring, Summer and Fall events, ranging from 6.03 to 7.75.
- In-situ dissolved oxygen was below the CCME FWAL acceptable range of >5.5 mg/L at three of the sampling stations during the Summer and Fall events (HWY-102-1, HWY-102-2, and LU).
- There are no applicable CCME, HC or Nova Scotia Department of Environment and Climate Change (NSECC) Environmental Quality Standards (EQS) for recreational water temperature. Water temperature was recorded between 12.4°C during the Fall event (HWY-102-1) and 22.3°C during the Summer event (KL-1).
- There are no applicable CCME, HC or NSECC guidelines for recreational water conductivity. However, specific water conductivity was recorded between 98.4 µs/cm at KL-2 during the Spring event to 661.0 µs/cm at LU during the Spring event.

Total Phosphorus

Two monitoring stations reported concentrations that exceeded HRM's Total Phosphorus (TP) management threshold criteria of 10 µg/L (equivalent to 0.01 mg/L) in the Fall of 2023 (October 16, 2023): LSD (0.146 mg/L) and PLM-1 (0.011 mg/L). WSP notified HRM of the TP exceedances, and HRM requested for these surface water stations (i.e., LSD and PLM-1) to be re-sampled for TP analysis only. On November 21, 2023, the surface water stations were resampled. Based on the laboratory results reported in milligrams per litre (mg/L), the TP exceedances in the re-samples were as follows:

- LSD: Fall 0.042 mg/L; and
- PML-1: Fall 0.021 mg/L.

General Chemistry and Metals

- Two sampling stations reported chloride concentrations above the CCME FWAL limit of 120 mg/L: HWY-102-1: Spring 125 mg/L and LU: Spring 164 mg/L. These two sampling stations were also found outside the NSECC EQS of 120 mg/L during the 2023 Spring event.
- All 11 stations were within the 5.0 – 9.0 pH HC range for Recreational Water Quality during the Spring, Summer and Fall monitoring events. Seven sampling stations were found outside the CCME-FWAL recommended range of 6.5-9.0 during specific Spring, Summer and Fall events, ranging from 6.03 to 6.48. All 11 stations exceeded the NSECC EQS for aluminum of 5 µg/L and all stations also exceeded the CCME FWAL limit of 100 µg/L.
- Five stations exceeded the NSECC EQS for iron and CCME FWAL limit of 300 µg/L: KL-2: Summer 512 µg/L, KL-3: Summer 318 mg/L, HWY-102-2: Spring 348 µg/L, Summer 1950 µg/L, Fall 1040 µg/L, LSD: Spring 410 mg/L, Summer 387 µg/L, Fall 369 mg/L, and LU: Summer 621 µg/L, Fall 456 µg/L.
- All 11 stations exceeded the NSECC EQS of 7 µg/L for zinc. One station exceeded the CCME FWAL zinc guideline of 30 µg/L: LU: Summer 36 µg/L.

Microbiology

- No stations exceeded the HC *E. coli* Guidelines of 400 CFU/100 mL (maximum allowable concentration); however, an *E. coli* concentration greater than 200 CFU/100 mL was detected in a sample collected at station KL-1 on August 28, 2023. This single result was not reproduced but is interpreted as an exceedance of the 200 CFU/100 mL criterion for an *E. coli* sample geomean.
- HC does not have a recreational water quality guideline for Total Coliform. All 11 stations reported Total Coliform concentrations greater than 200 CFU/mL.

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1 INTRODUCTION

WSP Canada Inc. (WSP, previously Wood) has prepared this report to provide Halifax Regional Municipality (HRM) with water quality data for 11 surface water stations throughout the Bedford West development area. Water quality monitoring in the Bedford West development area has been ongoing since 2009 and in June 2020 Wood (now WSP) was retained by HRM to complete water quality monitoring programs each spring, summer, and fall for three years beginning in July 2020. Sample collection in 2023 was completed during Spring (delayed until June), Summer (August), and Fall (October) events. The results of the 2023 surface water monitoring program are detailed herein. The overall purpose of the program is to conduct water quality sampling and testing prior to and during construction activities related to the development projects within the Papermill Lake and Bedford West watersheds to detect any impacts on and/or changes to water quality.

1.1 BACKGROUND

HRM has designated the Bedford West area as one of the primary locations for urban growth through 2031. The Bedford West Secondary Planning Strategy (SPS) was approved by Regional Council in 2006 and divides the Bedford West area into 12 sub-areas. The SPS provides direction for land use, environmental protection, and other activities, across the area. It also enables development primarily through the development agreement (DA) process. DAs for eight of the 12 Sub-Areas (2, 3+4, 5, 7+8, 9, and 10) have been approved by Council; DAs for the remaining areas are anticipated to be negotiated and approved at various points between 2020 and 2030.

Environmental protection policy in the SPS requires water quality testing to determine the impact of development on the Papermill Lake watershed. Each DA approved under the SPS identifies specific requirements for water quality monitoring, including the location of testing sites and required testing parameters. Water quality monitoring in the Bedford West area has been ongoing since 2009.

The goal of this contract is to fulfill the legislative requirement for water quality monitoring in Bedford West for a period of three years, to determine the potential impact of development activities within the affected watershed, in accordance with the terms of applicable DAs.

Water quality monitoring is required by HRM in spring (typically in May), summer (August), and fall (October) from the 11 locations identified on the Bedford West Sampling Location Map included in Appendix A.

1.2 PURPOSE

The overall purpose of the program is to conduct water quality sampling and testing prior to and during construction activities related to ongoing development projects to detect any impacts on and/or changes to water quality.

The 2023 sampling stations are summarized in Table 1 and shown in Figure 1 below.

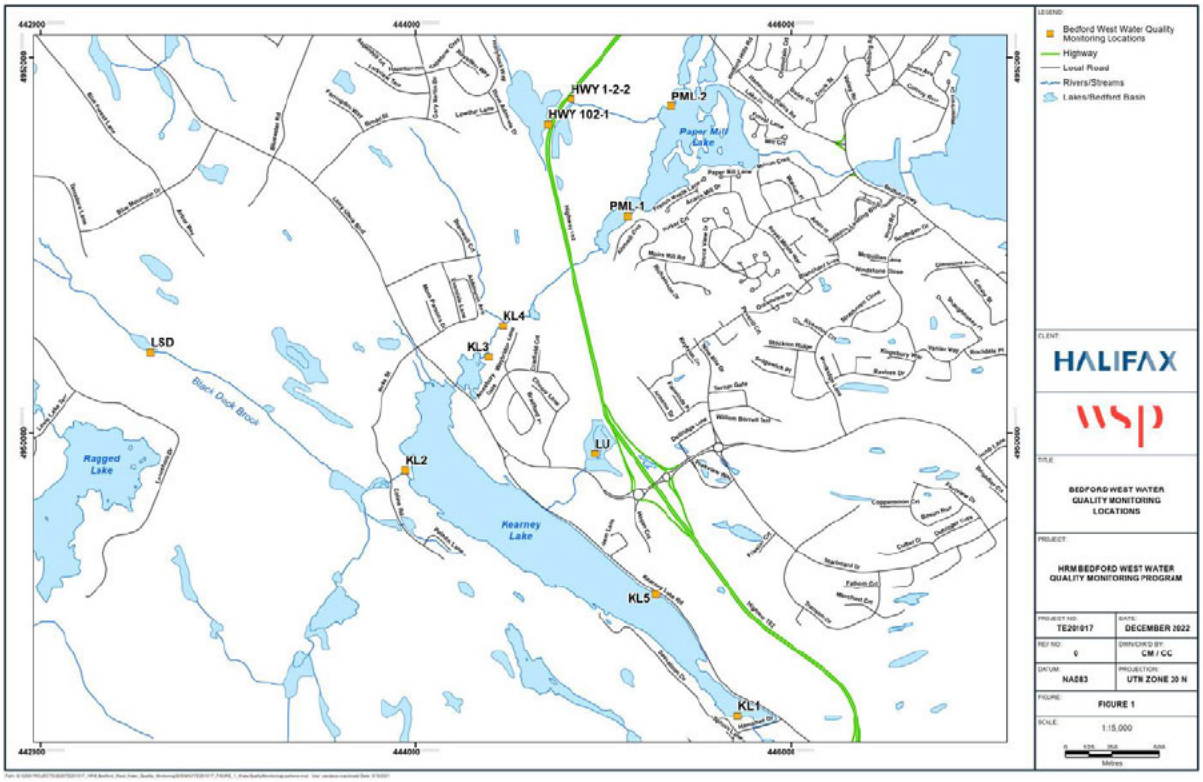

Figure 1: HRM Bedford West Water Quality Monitoring Program

Table 1: Bedford West Water Quality Sampling Stations

Watercourse	Sampling Location Name	Updated Coordinates (UTM NAD 83)	
		Easting	Northing
Kearney Lake	KL-1	20T0445718E	4948496N
Kearney Lake	KL-2	20T0443942E	4949803N
Kearney Run	KL-3	20T0444390E	4950406N
Kearney Run	KL-4	20T0444463E	4950571N
Kearney Lake	KL-5	20T0445280E	4949142N
Creek Above Highway	HWY-102-1	20T0444708E	4951644N
Creek Below Highway	HWY-102-2	20T0444829E	4951778N
Lake Shore Drive	LSD	20T0442583E	4950431N
Larry Uteck Off-Ramp	LU	20T0442583E	4949891N
Paper Mill Lake	PML-1	20T0445129E	4951154N
Paper Mill Lake	PML-2	20T0445363E	4951740N

2 METHODOLOGY

The 2023 water quality sampling events included measurements of Field Parameters (Group A) and collection of surface water for laboratory analysis of:

- Inorganics (Group B);
- Calculated Parameters (Group C);
- Standard Elements/Metals (Group D); and
- Microbiological Analyses (Group E).

Table 2 below summarizes the water quality parameters measured in the field or analyzed by the laboratory.

Table 2: Analytical Parameter Groups

Field Parameters (A)	Inorganics (B)	Calculated Parameters (C)	Standard Metals (D)	Microbiology (E)
– pH – TDS – Dissolved Oxygen – Temperature – Secchi Depth – Conductance – Air Temperature – Cloud Cover – Incidental Wildlife Sightings	– Total Alkalinity (as CaCO3) – Dissolved Chloride – Total Kjeldahl Nitrogen – Nitrate + Nitrite – Nitrate – Nitrite – Nitrogen (as NH4) – Total Organic Carbon – Orthophosphate (P) – pH – Low Total Phosphorus – Reactive Silica – Total Suspended Solids – Dissolved Sulphate – Turbidity – Conductivity	– Anion Sum – Cation Sum – Ion Balance – Bicarbonate Alkalinity (as CaCO3) – Carbonate Alkalinity (as CaCO3) – Hardness – Total Dissolved Solids – Saturation pH (@4°C & 20°C) – Langelier Index (@4°C & 20°C)	– Calcium – Copper – Iron – Magnesium – Manganese – Potassium – Sodium – Zinc	– Chlorophyll-A – *E. coli* – Most Probable Number (MPN) or CFU per 100 mL

The Spring water quality monitoring event at Bedford West was completed on 13 June 2023, followed by the Summer monitoring event on 18 August 2023, and the Fall event on 21 October 2023. Resampling for phosphorous at Stations PML-1 and LSD took place on 21 November 2023. The Spring water quality monitoring event is typically conducted in May; however, it was delayed until June due to regional wildfires, which limited access to the sampling locations in May and June 2023.

Field measurements of pH, dissolved oxygen, specific conductance, and water temperature were taken at each station using either a Horiba U-52 multiparameter meter or a YSI Professional Plus multi-meter probe. Although supplier calibration was confirmed prior to delivery to WSP, only the calibration log for the fall monitoring event could be retrieved for inclusion in this report. Field measurements and documentation of cloud cover, wildlife sightings, and wind and wave observations were recorded on Standard Project Field Reports, which are included in Appendix B. It should be noted that samples were collected from the shore at eight stations (KL-2, KL-3, KL-4, KL-5, HWY-102-1, HWY-102-2, LSD, and LU); however, a non-motorized boat was used to access three stations KL-1, PML-1, and PML-2. Photos of the stations for each sampling event are

included in Appendix E (photos of LU during the summer event and PML-1 and PML-2 during the fall sampling event are not available).

Surface water sampling followed WSP's Standard Operating Procedures (SOP), as adopted from Wood, for surface water sampling (Appendix G). A new pair of nitrile gloves was used at each sampling location. Water samples and field parameter readings were collected within a depth of ≤1.0 m below surface (if possible). Surface water grab samples were collected and placed in clean laboratory-supplied bottles and stored in a chilled container together with a chain of custody record for transport to the laboratory. Samples were sent to AGAT Laboratories located in Dartmouth, Nova Scotia. AGAT is an accredited laboratory by the Standard Council of Canada (SCC). Canadian Association of Laboratory Accreditation (CALA) and ISO9011:2015. AGAT utilized an accredited sub-contracted laboratory, InnoTech Alberta, to analyze Chlorophyll-A samples by phytoplankton method.

3 APPLICABLE GUIDELINES

For this water quality program, the Federal and Provincial Water Quality Guidelines being used for the assessment of surface water quality results are as follows:

- Canadian Council of Ministers of the Environment (CCME) Guidelines for the Protection of Aquatic Life – freshwater (FWAL) (Version, 2019);
- Health Canada (HC) guidelines for Recreational Water Quality (2012, Third Edition); and
- Table 3 Nova Scotia Environment and Climate Change (NSECC) Environmental Quality Standards (EQS) for Contaminated Sites (NSECC, 2021) for Surface Water (µg/L) for Fresh Water.

These guidelines were to gauge whether a tested parameter was an exceedance. Exceedances may be an indication of water quality impairment or conditions that will eventually lead to impairment. A detailed description of the guidelines is presented below.

3.1 CANADIAN COUNCIL OF MINISTERS OF THE ENVIRONMENT (CCME) GUIDELINES

The CCME FWAL guidelines were used for parameters such as dissolved oxygen, pH (in-situ and analytical), chloride, nitrate, nitrite, nitrogen, as well as for total metals such as aluminum, arsenic, boron, cadmium, copper, iron, lead, molybdenum, nickel, selenium, silver, thallium, uranium, and zinc.

There is no CCME recommended value for Total Suspended Solids (TSS); however, the following CCME narrative for TSS as high flow was applied “maximum increase of 25 mg/L from background levels at any time when background levels are between 25 and 250 mg/L should not increase more than 10% of background levels when background is ≥ 250 mg/L”.

According to CCME, 10 µg/L of total phosphorus is the threshold between oligotrophic and mesotrophic classification. In the Canadian framework, a trigger range is a desired concentration range for phosphorus; if the upper limit of the range is exceeded, it indicates potential for environmental quality issues, which may trigger the need for further investigation. HRM defined a Total Phosphorus management threshold value of 10 µg/L or 0.01 mg/L for this monitoring program.

3.2 HEALTH CANADA (HC) GUIDELINES

The HC guidelines for Canadian Recreational Quality was used for parameters such as Secchi depth (i.e. visibility at a minimum depth of 1.2 metres), pH guidelines of 5.0-9.0, turbidity (limit of 50 Nephelometric Turbidity Units), and *E. coli* (i.e. maximum allowable concentration of 400 *E. coli*/100 mL when evaluating a single sample rather than geomean). The maximum allowable concentration guideline of 400 *E. coli*/100 mL as well as a geomean, average of five samples not exceeding 200 CFU/100 mL with no single sample exceeding 400 CFU/100 mL, is also the guideline used by the HRM Beach Monitoring Program to assess compliance.

3.3 NOVA SCOTIA ENVIRONMENT AND CLIMATE CHANGE (NSECC) GUIDELINES

The NSECC Table 3 Tier 1 surface water EQS were used for assessment of total metals such as aluminum, antimony, arsenic, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, selenium, silver, strontium, thallium, uranium, vanadium, and zinc. It should be noted that NSECC updated their surface water EQSs for pH, chloride, nitrate as N, nitrite as N, sulphate, antimony, beryllium, boron, cadmium, total chromium, cobalt, manganese, silver, uranium, vanadium, and zinc in September 2021.

4 FIELD OBSERVATIONS

The 2023 site conditions were recorded for all 11 surface water quality monitoring stations during the Spring, Summer, and Fall monitoring events and are included in the field data sheets in Appendix B. Site condition observations include weather, cloud cover, air temperature, wildlife sightings and site accessibility.

5 FIELD MEASUREMENTS

Field parameters such as in situ pH, dissolved oxygen, water temperature, conductivity, and Secchi depth (where applicable) were recorded on field data sheets. Field collected data is included in Appendix B.

Field measurements are also tabulated in Appendix C: Table C1 – 2023 Results and Table C2: Historical Results.

5.1 IN-SITU PH

All 11 stations were within the 5.0 – 9.0 pH HC range for Recreational Water Quality during the Spring, Summer and Fall monitoring events. Seven sampling stations were found outside the CCME-FWAL recommended range of 6.5-9.0 during specific Spring, Summer and Fall events, ranging from 6.03 to 6.48. Laboratory measurements of pH were also collected, discussed in Section 6.2.2.

5.2 DISSOLVED OXYGEN

In-situ dissolved oxygen was below the CCME FWAL acceptable range of >5.5 mg/L at three of the sampling stations during the Summer and Fall events (HWY-102-1, HWY-102-2, and LU).

- HWY 102-1: Summer 4.31 mg/L, Fall 5.48 mg/L;
- HWY 102-2: Summer 3.21 mg/L, Fall 4.43 mg/L; and
- LU: Summer 4.91 mg/L.

It is typical for dissolved oxygen concentrations in freshwater to be higher during the winter months when water is cooler (unless ice blocks oxygen cycling with the atmosphere); and, lower during the summer when water temperatures rise and eutrophication may be depleting oxygen. During the fall season, water temperatures begin to cool, resulting in a decrease of eutrophication, thus increasing the dissolved oxygen concentrations in the waterbody. Additionally, thermal stratification increases as temperatures rise, which may decrease the oxygen levels in the bottom layer of a waterbody due to settled decaying matter. Therefore, the oxygen deficiencies in the above-noted sampling stations during summer months may be associated with ambient air temperatures, thermal stratification, and organic materials in the water bodies. Dissolved oxygen below 5.5 mg/L has potential physiological and behavioural effects for various organisms, especially fish (CCME, 1999).

5.3 WATER TEMPERATURE

There are no applicable CCME, HC, or NSECC guidelines for recreational water temperature. Water temperature was recorded between 12.4°C during the Fall event (HWY-102-1) and 22.3°C during the Summer event (KL-5). In general, water temperatures were warmest in the summer (ranging between 16.1°C and 22.3°C) and coolest in the fall (ranging between 12.4°C and 15.8°C); spring temperatures, which were measured in June for the 2023 monitoring program, ranged between 15.9°C and 21.0°C. Surface water temperatures are related to seasonal changes in ambient air temperature.

5.4 CONDUCTIVITY

There are no applicable CCME, HC, or NSECC guidelines for recreational water conductivity. However, specific water conductivity was recorded between 98.4 µs/cm at KL-2 during the Spring event to 661.0 µs/cm at LU during the Spring event. Laboratory measurements of conductivity are also reported in Table C1, Appendix C.

5.5 SECCHI DEPTH

Secchi depth measurements were not obtained in 2023 as the disc was visible at bottom of the watercourse or the sample location was too shallow for Secchi depth use.

6 ANALYTICAL RESULTS

Analytical results for the 2023 spring, summer, and fall monitoring programs and applicable reference guidelines are tabulated in Table C1 included in Appendix C. In addition, historical water quality results from 2009 through to 2022 for each sample location are summarized in Table C2 included in Appendix C.

Laboratory certificates of analysis for the 2023 sampling events are provided in Appendix D.

6.1 TOTAL PHOSPHORUS

Two monitoring stations reported concentrations that exceeded HRM's Total Phosphorus (TP) management threshold criteria of 10 µg/L (equivalent to 0.01 mg/L) in the Fall of 2023 (October 16, 2023): LSD (0.146 mg/L) and PLM-1 (0.011 mg/L). WSP notified HRM of the TP exceedances, and HRM requested for these surface water stations (i.e., LSD and PLM-1) to be re-sampled for TP analysis only. On November 21, 2023, the surface water stations were resampled, the TP exceedances in the re-samples were as follows:

- LSD: Fall 0.042 mg/L; and
- PML-1: Fall 0.021 mg/L.

6.2 GENERAL CHEMISTRY

Of the tested inorganic parameters (Column B, Table 2) and calculated parameters (Column C, Table 2), concentrations of chloride, fluoride, pH, and nitrite were reported outside or above the applicable guidelines.

6.2.1 CHLORIDE

Two sampling stations reported chloride concentrations above the CCME long-term FWAL limit of 120 mg/L:

- HWY-102-1: Spring 125 mg/L; and
- LU: Spring 164 mg/L.

These two sampling stations were also found outside the NSECC EQS of 120 mg/L during the 2023 Spring event.

6.2.2 PH

All 11 stations were within the 5.0 – 9.0 pH HC range for Recreational Water Quality during the Spring, Summer and Fall monitoring events.

Seven sampling stations were found outside the CCME-FWAL recommended range of 6.5-9.0 during specific Spring, Summer and Fall events, ranging from 6.03 to 6.48.

6.3 METALS

The following metals were analyzed during the Spring 2023 monitoring event: aluminum, antimony, arsenic, barium, beryllium, bismuth, boron, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, molybdenum, nickel, potassium, selenium, silver, sodium, strontium, thallium, tin, titanium, uranium, vanadium, and zinc. The following metals were analyzed during the Summer and Fall 2023 monitoring events: calcium, copper, iron, lead, manganese, magnesium, potassium, sodium, and zinc. During the 2023 monitoring events, exceedances were reported above the guidelines/reference limits for aluminum, cadmium, copper, lead, and zinc parameters.

6.3.1 ALUMINUM

All 11 stations exceeded the NSECC EQS aluminum guideline of 5 µg/L and all 11 stations also exceeded the CCME FWAL limit of 100 µg/L.

6.3.2 IRON

Five stations exceeded the NSECC EQS iron guideline and CCME FWAL limit of 300 µg/L:

- KL-2: Summer 512 µg/L;
- KL-3: Summer 318 µg/L;
- HWY-102-2: Spring 348 µg/L, Summer 1950 µg/L, Fall 1040 µg/L;
- LSD: Spring 410 µg/L, Summer 387 µg/L, and Fall 369 µg/L; and
- LU: Summer 621 µg/L, Fall 456 µg/L.

6.3.3 ZINC

All 11 stations in 2023 exceeded the NSECC EQS of 7 µg/L. One station (LU) exceeded the CCME FWAL zinc guideline of 30 µg/L for zinc.

- LU: Summer 36 µg/L.

6.4 MICROBIOLOGICAL

No stations exceeded the HC *E. coli* Guidelines of 400 CFU/100 mL (maximum allowable concentration). An *E. coli* concentration greater than 200 CFU/100 mL was detected in a sample collected at station KL-1 on August 28, 2023. This single result was not reproduced but is interpreted as an exceedance of the 200 CFU/100 mL criterion for an *E. coli* sample geomean. Concentrations of *E. coli* elevated above 200 CFU/100 mL have previously been reported at KL-1 in August of 2011 and 2022, suggesting a seasonal (i.e., summer) increase of this bacterium at KL-1. While this data acts as a general index, a more robust data set would be required to assess the presence and potential effects of *E. coli* in the freshwater system throughout each season.

HC does not have a recreational water quality guideline for Total Coliform. All 11 stations reported Total Coliform concentrations greater than 200 CFU/mL.

7 STATISTICAL PRESENTATION

A summary of the water quality data from June 2009 through October 2023 for all 11 water quality monitoring stations is included as Table C-2, Appendix C. Presented in Table 3 below are the seasonal statistics for each monitoring location, for the following six key water quality parameters selected by HRM:

- Total Phosphorus (mg/L);
- Dissolved Oxygen (mg/L);
- pH;
- Total Suspended Solids (mg/L);
- Conductivity (µs/cm); and
- Chlorophyll-A (µg/L).

Where analytical results were found to be less than the laboratory RDL, the statistics (i.e. minimum, maximum, median, and average) were calculated as half the laboratory RDL limit (1/2 RDL value) as a conservative approach. It should be noted that the number of decimal places presented for each listed parameter is based on the decimal places of the RDL and reported laboratory Certificate of Analysis.

In many cases, anomalous elevated concentrations skew the sample data distributions; in such cases, the median and the mean differ noticeably, and the median should be relied upon as the most appropriate measure of central tendency. Certain parameters, such as Total Suspended Solids, appear susceptible to skewness, while others, such as pH, have relatively normal frequency distributions. Anomalous elevated concentrations are reviewed graphically and in detail in Section 8.

The method of detection for Chlorophyll-A for this report was Spectrophotometer, which was changed from 2018 which used acidification by fluorometric (Holm-Hansen) and non-acidification by fluorometric (Welschmeyer). For the graphical representation of Chlorophyll-A, the results from the Welschmeyer method were graphed until August 2019, afterwards Spectrophotometer results were graphed. Historical samples had been submitted to Dalhousie prior to 2018; however, it was determined that the local laboratory was not an approved vendor for 17025 accreditation, thus following 2018, samples were sent to AGAT Laboratories in Burnaby, British Columbia, for Chlorophyll-A analysis by Spectrophotometer.

Table 3: Statistical Presentation of Key Water Quality Parameters

KL-1	RDL (2023)	Seasonal Result	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorus (mg/L)						
Spring 2023	0.002	0.008	0.003	0.037	0.010	0.012
Summer 2023	0.002	<0.002	<0.002	0.298	0.010	0.033
Fall 2023	0.002	0.005	0.001	0.030	0.008	0.011
Chloride (mg/L)						
Spring 2023	1	60	49	84	66	67
Summer 2023	1	30	30	76	59	60
Fall 2023	1	31	31	67	53	51

Table 3: Statistical Presentation of Key Water Quality Parameters

KL-1	RDL (2023)	Seasonal Result	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
pH						
Spring 2023	N/A	6.48	6.48	6.94	6.70	6.72
Summer 2023	N/A	6.36	6.36	7.31	6.95	6.88
Fall 2023	N/A	6.88	6.23	7.07	6.81	6.77
Total Suspended Solids (mg/L)						
Spring 2023	5	<5	<1	38	3	5
Summer 2023	5	<5	1	17	3	3
Fall 2023	5	<5	<1	5	3	3
Conductivity (µS/cm)						
Spring 2023	1	208	205	313	259	257
Summer 2023	1	134	134	339	261	250
Fall 2023	1	117	117	257	222	206
Chlorophyll-A Spectrophotometer (µg/L)*						
Spring 2023	0.3	2.1	1.0	4.4	1.8	2.2
Summer 2023	0.3	2.1	1.7	2.4	2.2	2.1
Fall 2023	0.3	1.1	1.0	1.5	1.1	1.2

Notes:

1 The statistics (i.e. minimum, maximum, median, and average) were calculated as half the laboratory Reportable Detection Limit (RDL) (1/2 RDL value) where analytical results were found to be less than the laboratory RDL for phosphorus and total suspended solids.

2 The statistics for Chlorophyll-A (i.e. minimum, maximum, median, and average) were calculated from analytical data from November 2019 to October 2023, since the method of detection was changed to Spectrophotometer.

Table 3 cont. Statistical Presentation of Key Water Quality Parameters – KL2

KL-2	RDL (2023)	Seasonal Result	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorus (mg/L)						
Spring 2023	0.002	0.008	0.008	0.021	0.013	0.013
Summer 2023	0.002	<0.002	<0.002	0.063	0.020	0.024
Fall 2023	0.002	0.007	0.004	0.031	0.013	0.016
Chloride (mg/L)						
Spring 2023	1	17	12	48	17	21
Summer 2023	1	8	8	48	19	20
Fall 2023	1	12	10	48	14	17
pH						
Spring 2023	N/A	6.33	6.27	7.70	6.50	6.59
Summer 2023	N/A	6.41	6.40	7.04	6.78	6.75
Fall 2023	N/A	6.39	5.89	7.04	6.29	6.36
Total Suspended Solids (mg/L)						
Spring 2023	5	<5	<1	103	3	16
Summer 2023	5	<5	1	135	3	19
Fall 2023	5	<5	<1	103	3	10
Conductivity (µS/cm)						
Spring 2023	1	84	64	350	83	115
Summer 2023	1	60	60	212	94	105
Fall 2023	1	64	45	212	73	88
Chlorophyll-A Spectrophotometer (µg/L)*						
Spring 2023	0.3	0.6	0.5	1.0	0.6	0.7
Summer 2023	0.3	0.3	0.3	4.3	1.3	1.8
Fall 2023	0.3	1.0	0.1	3.2	0.8	1.1

Notes:

1 The statistics (i.e. minimum, maximum, median, and average) were calculated as half the laboratory RDL (1/2 RDL value) where analytical results were found to be less than the laboratory RDL for total suspended solids and Chlorophyll-A.

2 The statistics for Chlorophyll-A (i.e. minimum, maximum, median, and average) were calculated from analytical data from November 2019 to October 2023, since the method of detection was changed to Spectrophotometer.

Table 3 cont. Statistical Presentation of Key Water Quality Parameters – KL3

KL-3	RDL (2023)	Seasonal Result	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorus (mg/L)						
Spring 2023	0.002	0.008	0.003	0.019	0.008	0.009
Summer 2023	0.002	<0.002	<0.002	0.045	0.009	0.012
Fall 2023	0.002	0.0.006	0.002	0.148	0.007	0.019
Chloride (mg/L)						
Spring 2023	1	60	49	79	56	59
Summer 2023	1	30	30	73	56	53
Fall 2023	1	33	33	65	52	51
pH						
Spring 2023	N/A	6.73	6.38	6.97	6.70	6.70
Summer 2023	N/A	6.50	6.50	7.28	6.96	6.89
Fall 2023	N/A	6.99	6.30	7.10	6.87	6.82
Total Suspended Solids (mg/L)						
Spring 2023	5	<5	<1	3	3	2
Summer 2023	5	<5	<1	3	3	2
Fall 2023	5	<5	<1	3	3	2
Conductivity (µS/cm)						
Spring 2023	1	198	115	275	220	219
Summer 2023	1	129	129	291	242	233
Fall 2023	1	128	128	252	220	209
Chlorophyll-A Spectrophotometer (µg/L)*						
Spring 2023	0.3	1.0	0.5	1.6	1.1	1.0
Summer 2023	0.3	1.3	1.3	1.6	1.4	1.4
Fall 2023	0.3	1.0	0.5	13.1	0.7	3.2

Notes:

1 The statistics (i.e. minimum, maximum, median, and average) were calculated as half the laboratory RDL (1/2 RDL value) where analytical results were found to be less than the laboratory RDL for phosphorus and total suspended solids.

2 The statistics for Chlorophyll-A (i.e. minimum, maximum, median, and average) were calculated from analytical data from November 2019 to October 2023, since the method of detection was changed to Spectrophotometer.

Table 3 cont. Statistical Presentation of Key Water Quality Parameters – KL4

KL-4	RDL (2023)	Seasonal Result	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorus (mg/L)						
Spring 2023	0.002	0.008	0.003	0.038	0.009	0.013
Summer 2023	0.002	0.004	0.004	2.390	0.010	0.172
Fall 2023	0.002	0.006	0.001	0.030	0.006	0.009
Chloride (mg/L)						
Spring 2023	1	59	50	80	56	59
Summer 2023	1	30	30	75	56	55
Fall 2023	1	33	33	91	53	53
pH						
Spring 2023	N/A	6.63	6.57	6.83	6.69	6.69
Summer 2023	N/A	6.30	6.30	7.13	6.93	6.84
Fall 2023	N/A	6.79	6.30	7.13	6.86	6.84
Total Suspended Solids (mg/L)						
Spring 2023	5	<5	<1	12	3	4
Summer 2023	5	<5	<1	7	3	3
Fall 2023	5	<5	<1	10	3	3
Conductivity (µS/cm)						
Spring 2023	1	211	200	289	220	233
Summer 2023	1	130	130	300	241	237
Fall 2023	1	128	128	254	228	210
Chlorophyll-A Spectrophotometer (µg/L)*						
Spring 2023	0.3	2.0	0.1	8.3	2.0	3.1
Summer 2023	0.3	0.9	0.6	1.8	0.8	1.0
Fall 2023	0.3	1.2	0.3	5.3	0.6	1.6

Notes:

1 The statistics (i.e. minimum, maximum, median, and average) were calculated as half the laboratory RDL limit (1/2 RDL value) where analytical results were found to be less than the laboratory RDL for phosphorus, total suspended solids, and Chlorophyll-A.

2 The statistics for Chlorophyll-A (i.e. minimum, maximum, median, and average) were calculated from analytical data from November 2019 to October 2023, since the method of detection was changed to Spectrophotometer.

Table 3 cont. Statistical Presentation of Key Water Quality Parameters – KL5

KL-5	RDL (2023)	Seasonal Result	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorus (mg/L)						
Spring 2023	0.008	0.003	0.003	0.031	0.009	0.011
Summer 2023	0.002	0.008	0.004	0.040	0.013	0.016
Fall 2023	0.002	0.008	0.003	0.135	0.006	0.017
Chloride (mg/L)						
Spring 2023	1	60	50	80	59	60
Summer 2023	1	29	29	72	56	53
Fall 2023	1	34	34	65	53	51
pH						
Spring 2023	N/A	7.24	6.56	7.24	6.71	6.75
Summer 2023	N/A	6.34	6.34	7.16	6.94	6.88
Fall 2023	N/A	6.96	6.30	7.47	6.89	6.84
Total Suspended Solids (mg/L)						
Spring 2023	5	<5	<1	3	3	2
Summer 2023	5	<5	3	3	3	3
Fall 2023	5	<5	1	3	3	2
Conductivity (µS/cm)						
Spring 2023	1	216	208	290	230	236
Summer 2023	1	133	133	284	247	238
Fall 2023	1	135	135	286	225	214
Chlorophyll-A Spectrophotometer (µg/L)*						
Spring 2023	0.3	1.4	0.5	1.4	0.9	0.9
Summer 2023	0.3	3.1	1.0	3.1	2.1	2.1
Fall 2023	0.3	0.9	0.3	63.1	0.8	13.2

Notes:

1 The statistics (i.e. minimum, maximum, median, and average) were calculated as half the laboratory RDL limit (1/2 RDL value) where analytical results were found to be less than the laboratory RDL for phosphorus, total suspended solids, and Chlorophyll-A.

2 The statistics for Chlorophyll-A (i.e. minimum, maximum, median, and average) were calculated from analytical data from November 2019 to October 2023, since the method of detection was changed to Spectrophotometer.

Table 3 cont. Statistical Presentation of Key Water Quality Parameters – HWY-102-1

HWY-102-1	RDL (2023)	Seasonal Result	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorus (mg/L)						
Spring 2023	0.002	0.007	0.005	0.070	0.011	0.018
Summer 2023	0.002	<0.002	<0.002	0.284	0.023	0.049
Fall 2023	0.002	0.004	0.002	0.031	0.011	0.015
Chloride (mg/L)						
Spring 2023	1	125	24	171	71	82
Summer 2023	1	44	19	101	54	57
Fall 2023	1	48	12	92	48	47
pH						
Spring 2023	N/A	6.84	4.54	7.34	6.84	6.60
Summer 2023	N/A	7.75	5.24	7.75	6.91	6.90
Fall 2023	N/A	6.67	5.31	7.20	6.67	6.43
Total Suspended Solids (mg/L)						
Spring 2023	5	<5	<1	9	3	3
Summer 2023	5	<5	1	80	3	10
Fall 2023	5	<5	<1	3	3	2
Conductivity (µS/cm)						
Spring 2023	1	392	100	573	298	329
Summer 2023	1	18	18	469	306	266
Fall 2023	1	197	88	365	218	213
Chlorophyll-A Spectrophotometer (µg/L)*						
Spring 2023	0.3	1.3	0.7	4.9	1.1	2.0
Summer 2023	0.3	1.7	1.2	13.4	1.6	4.5
Fall 2023	0.3	0.8	0.1	1.1	0.6	0.6

Notes:

1 The statistics (i.e. minimum, maximum, median, and average) were calculated as half the laboratory RDL limit (1/2 RDL value) where analytical results were found to be less than the laboratory RDL for total suspended solids.

2 The statistics for Chlorophyll-A (i.e. minimum, maximum, median, and average) were calculated from analytical data from November 2019 to October 2023, since the method of detection was changed to Spectrophotometer.

Table 3 cont. Statistical Presentation of Key Water Quality Parameters – HWY-102-2

HWY-102-2	RDL (2023)	Seasonal Result	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorus (mg/L)						
Spring 2023	0.002	0.0.007	0.006	0.222	0.014	0.029
Summer 2023	0.002	0.002	0.002	1.560	0.034	0.139
Fall 2023	0.002	0.004	0.003	0.201	0.018	0.043
Chloride (mg/L)						
Spring 2023	1	87	21	260	113	130
Summer 2023	1	91	21	226	101	121
Fall 2023	1	64	17	199	64	69
pH						
Spring 2023	N/A	6.41	5.43	7.20	6.41	6.43
Summer 2023	N/A	6.03	5.96	6.86	6.62	6.51
Fall 2023	N/A	6.48	5.47	7.07	6.37	6.37
Total Suspended Solids (mg/L)						
Spring 2023	5	<5	<1	342	3	31
Summer 2023	5	6	3	3000	15	236
Fall 2023	5	<5	3	194	3	21
Conductivity (µS/cm)						
Spring 2023	1	477	85	920	451	493
Summer 2023	1	250	100	952	422	463
Fall 2023	1	384	94	546	223	276
Chlorophyll-A Spectrophotometer (µg/L)*						
Spring 2023	0.3	0.4	0.4	8.2	2.0	3.1
Summer 2023	0.3	0.3	0.3	206.0	1.0	52.1
Fall 2023	0.3	0.3	0.3	5.0	0.6	1.6

Notes:

1 The statistics (i.e. minimum, maximum, median, and average) were calculated as half the laboratory RDL limit (1/2 RDL value) where analytical results were found to be less than the laboratory RDL for phosphorus, total suspended solids, and Chlorophyll-A.

2 The statistics for Chlorophyll-A (i.e. minimum, maximum, median, and average) were calculated from analytical data from November 2019 to October 2023, since the method of detection was changed to Spectrophotometer.

Table 3 cont. Statistical Presentation of Key Water Quality Parameters – LSD

LSD	RDL (2023)	Seasonal Result	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorus (mg/L)						
Spring 2023	0.002	0.008	0.007	1.250	0.020	0.113
Summer 2023	0.002	<0.002	<0.002	0.501	0.051	0.096
Fall 2023	0.002	0.004	0.003	0.201	0.018	0.043
Chloride (mg/L)						
Spring 2023	1	41	22	60	38	37
Summer 2023	1	14	14	45	33	33
Fall 2023	1	20	20	37	25	27
pH						
Spring 2023	N/A	6.40	6.20	7.35	6.91	6.82
Summer 2023	N/A	6.87	6.54	7.30	6.93	6.91
Fall 2023	N/A	6.82	6.34	7.15	6.72	6.72
Total Suspended Solids (mg/L)						
Spring 2023	5	<5	3	138	6	27
Summer 2023	5	<5	3	9020	88	776
Fall 2023	5	<5	3	69	5	11
Conductivity (µS/cm)						
Spring 2023	1	128	96	243	151	158
Summer 2023	1	NA	129	236	170	172
Fall 2023	1	90	63	171	125	127
Chlorophyll-A Spectrophotometer (µg/L)*						
Spring 2023	0.3	11.0	4.2	11.0	4.7	6.2
Summer 2023	0.3	0.9	0.9	12.5	2.7	4.7
Fall 2023	0.3	<0.3	<0.3	0.8	0.3	0.3

Notes:

1 The statistics (i.e. minimum, maximum, median, and average) were calculated as half the laboratory RDL limit (1/2 RDL value) where analytical results were found to be less than the laboratory RDL for phosphorus and total suspended solids.

2 The statistics for Chlorophyll-A (i.e. minimum, maximum, median, and average) were calculated from analytical data from November 2019 to October 2023, since the method of detection was changed to Spectrophotometer.

Table 3 cont. Statistical Presentation of Key Water Quality Parameters – LU

LU	RDL (2032)	Seasonal Result	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorus (mg/L)						
Spring 2023	0.002	0.008	0.006	0.260	0.015	0.042
Summer 2023	0.002	<0.002	<0.002	0.062	0.019	0.022
Fall 2023	0.002	0.004	0.004	0.160	0.021	0.032
Chloride (mg/L)						
Spring 2023	1	164	96	297	200	203
Summer 2023	1	52	52	221	132	139
Fall 2023	1	52	34	258	92	103
pH						
Spring 2023	N/A	6.79	6.42	7.37	6.98	7.00
Summer 2023	N/A	6.35	6.35	7.46	7.29	7.16
Fall 2023	N/A	6.98	6.41	7.38	7.01	6.93
Total Suspended Solids (mg/L)						
Spring 2023	5	<5	<1	626	4	63
Summer 2023	5	10	3	165	6	20
Fall 2023	5	<5	3	13	3	4
Conductivity (µS/cm)						
Spring 2023	1	577	518	1030	774	755
Summer 2023	1	304	304	928	613	612
Fall 2023	1	195	190	840	420	426
Chlorophyll-A Spectrophotometer (µg/L)*						
Spring 2023	0.3	3.0	2.4	10.9	5.3	6.0
Summer 2023	0.3	9.3	3.4	9.3	4.9	5.6
Fall 2023	0.3	5.0	0.1	6.1	3.8	3.5

Notes:

1 The statistics (i.e. minimum, maximum, median, and average) were calculated as half the laboratory RDL limit (1/2 RDL value) where analytical results were found to be less than the laboratory RDL for total suspended solids and Chlorophyll-A.

2 The statistics for Chlorophyll-A (i.e. minimum, maximum, median, and average) were calculated from analytical data from November 2019 to October 2023, since the method of detection was changed to Spectrophotometer.

Table 3 cont. Statistical Presentation of Key Water Quality Parameters – PML-1

PML-1	RDL (2023)	Seasonal Result	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorus (mg/L)						
Spring 2023	0.002	0.007	0.003	0.173	0.014	0.025
Summer 2023	0.002	0.005	0.002	0.104	0.011	0.027
Fall 2023	0.002	0.021	0.001	0.099	0.019	0.024
Chloride (mg/L)						
Spring 2023	1	59	39	86	59	60
Summer 2023	1	30	30	78	59	58
Fall 2023	1	33	18	62	50	48
pH						
Spring 2023	N/A	6.80	6.36	7.01	6.71	6.70
Summer 2023	N/A	6.66	6.50	7.28	6.98	6.96
Fall 2023	N/A	6.95	6.58	7.18	6.85	6.86
Total Suspended Solids (mg/L)						
Spring 2023	5	<5	1	531	3	40
Summer 2023	5	<5	1	149	3	14
Fall 2023	5	<5	<1	104	3	13
Conductivity (µS/cm)						
Spring 2023	1	206	170	320	230	237
Summer 2023	1	304	170	334	263	266
Fall 2023	1	195	100	256	224	205
Chlorophyll-A Spectrophotometer (µg/L)*						
Spring 2023	0.3	1.2	0.5	1.9	1.1	1.1
Summer 2023	0.3	0.4	0.4	2.9	1.1	1.4
Fall 2023	0.3	0.4	0.1	0.6	0.4	0.4

Notes:

1 The statistics (i.e. minimum, maximum, median, and average) were calculated as half the laboratory RDL limit (1/2 RDL value) where analytical results were found to be less than the laboratory RDL for phosphorus and total suspended solids.

2 The statistics for Chlorophyll-A (i.e. minimum, maximum, median, and average) were calculated from analytical data from November 2019 to October 2023, since the method of detection was changed to Spectrophotometer.

Table 3 cont. Statistical Presentation of Key Water Quality Parameters – PML-2

PML-2	RDL (2023)	Seasonal Result	Historical Seasonal Minimum	Historical Seasonal Maximum	Historical Seasonal Median	Historical Seasonal Mean
Total Phosphorus (mg/L)						
Spring 2023	0.002	0.008	0.003	0.047	0.010	0.014
Summer 2023	0.002	0.002	0.002	0.026	0.010	0.010
Fall 2023	0.002	0.003	0.001	0.030	0.008	0.010
Chloride (mg/L)						
Spring 2023	1	61	44	245	63	75
Summer 2023	1	31	31	82	59	60
Fall 2023	1	36	34	69	58	53
pH						
Spring 2023	N/A	7.00	6.37	7.13	6.81	6.78
Summer 2023	N/A	6.58	6.54	7.29	7.02	6.94
Fall 2023	N/A	6.94	6.29	7.17	6.87	6.85
Total Suspended Solids (mg/L)						
Spring 2023	5	<5	<1	45	3	7
Summer 2023	5	<5	1	14	3	4
Fall 2023	5	<5	<1	11	3	3
Conductivity (µS/cm)						
Spring 2023	1	223	85	920	433	449
Summer 2023	1	157	100	952	408	433
Fall 2023	1	128	94	546	208	249
Chlorophyll-A Spectrophotometer (µg/L)*						
Spring 2023	0.3	1.6	1.3	2.8	1.7	1.9
Summer 2023	0.3	1.1	0.6	1.3	1.1	1.0
Fall 2023	0.3	0.6	0.5	1.1	0.6	0.7

Notes:

1 The statistics (i.e. minimum, maximum, median, and average) were calculated as half the laboratory RDL limit (1/2 RDL value) where analytical results were found to be less than the laboratory RDL for phosphorus and total suspended solids.

2 The statistics for Chlorophyll-A (i.e. minimum, maximum, median, and average) were calculated from analytical data from November 2019 to October 2023, since the method of detection was changed to Spectrophotometer.

8 GRAPHS AND HISTORICAL TRENDS

Graphs were completed for all 11 water quality monitoring stations including all historical data collected from June 2009 to October 2023. This section presents graphs that illustrate seasonal concentrations of the following six key water quality parameters previously selected by HRM:

- Dissolved chloride (mg/L);
- Chlorophyll-A (µg/L);
- Conductivity (µS/cm);
- Laboratory pH;
- Total Phosphorus (mg/L); and
- Total Suspended Solids (mg/L).

The graphs allow for comparison between water quality sampling stations and identification of concentration increases and associated guideline exceedances. Many parameters show seasonal concentration fluctuations. It should be noted that where results were found to be less than the laboratory RDL (<RDL), results were graphed as half the RDL (1/2 RDL value) as a conservative approach.

8.1 CHLORIDE

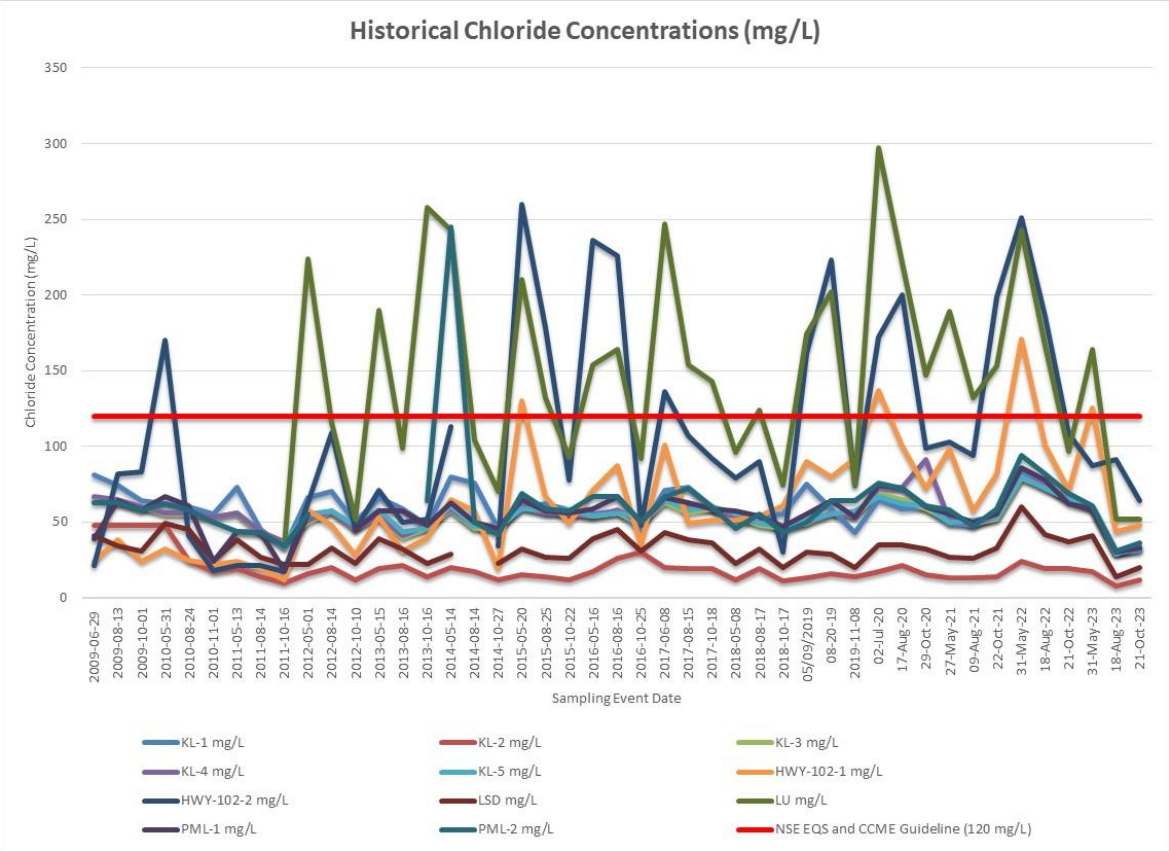

Figure 2: Historical Chloride Concentrations at All Monitoring Stations

The historical chloride concentrations shown on Figure 2 illustrate a typical seasonal increase in chloride during spring monitoring events. This trend is discernible at all monitoring locations, but is most pronounced at stations HWY-102-1, HWY-102-2, and LU, where spring concentrations of chloride are typically elevated above the NSE EQS and CCME Guideline of 120 mg/L. It is inferred that elevated chloride concentrations in spring are related to road maintenance activities during the winter season. Concentrations above 120 mg/L often persist year-round at LU and HWY-102-2.

It is expected that seasonal fluctuations in chloride concentrations will continue to be observed at all monitoring stations, with larger magnitudes of seasonal change occurring at HWY-102-1, HWY-102-2, and LU. These stations are in closest proximity to Highway 102 and may be most sensitive to winter road maintenance activities. Any development activities which increase the probability of chloride-laden (e.g., roadway) runoff reaching the freshwater system may contribute to the magnitudes of seasonal fluctuations in chloride concentrations.

8.2 CHLOROPHYLL-A

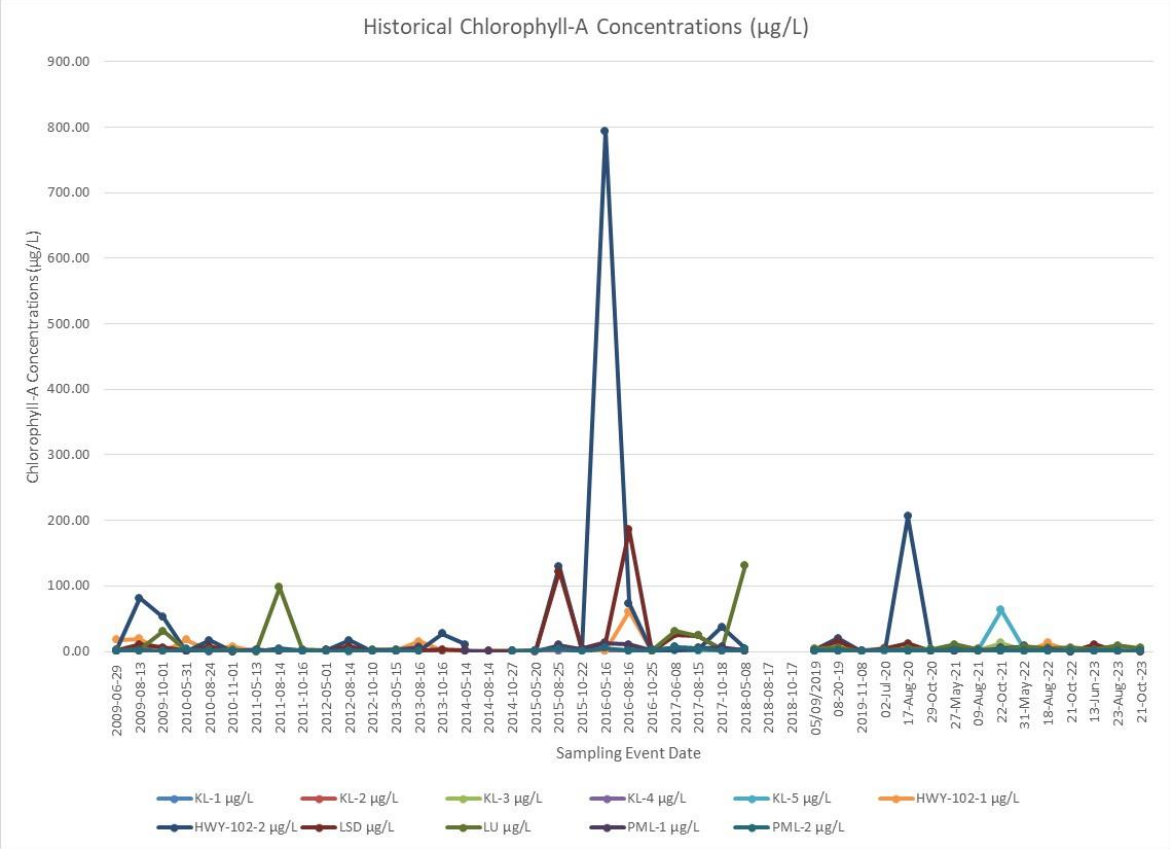

Figure 3: Historical Chlorophyll-A Concentrations at All Monitoring Stations

Figure 3 demonstrates that Chlorophyll-A concentrations are typically low, averaging less than 10 µg/L, with occasional peaks recorded since 2009. Stations HWY-102-2, LSD, and LU appear to be most susceptible to these anomalous results, with Chlorophyll-A concentrations occasionally increasing by an order of magnitude.

No such anomalies occurred during the 2023 monitoring period. It is possible that historical anomalies in Chlorophyll-A concentrations are related to isolated increases in algal content within the associated surface water bodies; however, this potential correlation has not been verified as part of this study. Furthermore, a direct analysis of development activities over time and their proximity to monitoring stations has not been undertaken in this analysis.

There are no apparent trends suggesting that Chlorophyll-A concentrations will be elevated at any station in the future; however, anomalously high concentrations appear to be most likely to occur at stations HWY-102-2, LSD, and LU.

8.3 CONDUCTIVITY

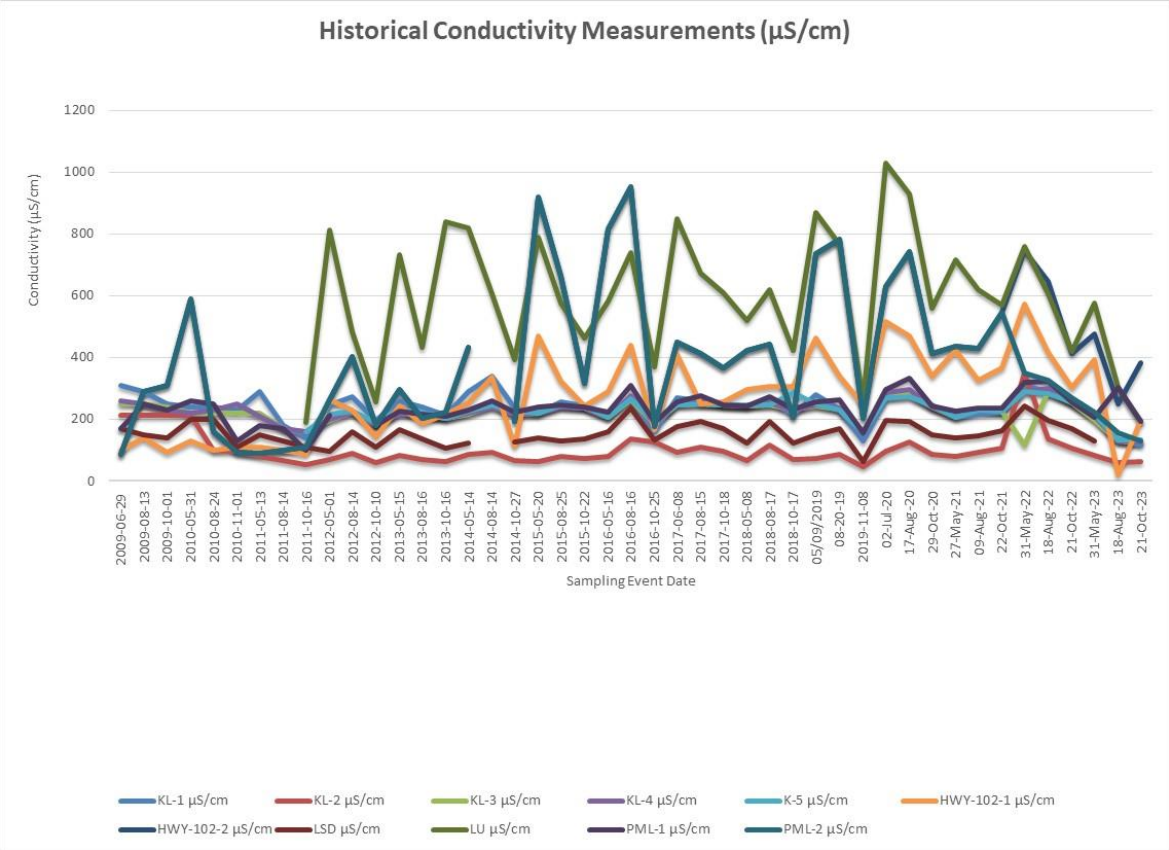

Figure 4: Historical Conductivity Measurements at All Monitoring Stations

Conductivity measurements, shown on Figure 4, typically fluctuate seasonally, with elevated conductivity recorded during spring monitoring events and often persisting through summer monitoring. Stations HWY-102-1, HWY-102-2, LU, and PML-2 tend to have the highest conductivities (above 400 µS/cm either seasonally or year-round); however, these concentrations are mid-range for surface water bodies and are not considered saline. The seasonal increase in conductivity may be largely associated with a variety of inorganic ions transported into the surface water system through runoff from annual snowmelt.

Based on the historical data, seasonal fluctuations in conductivity are expected to continue at all monitoring stations, with larger magnitudes of seasonal change occurring at HWY-102-1, HWY-102-2, LU, and PML-2.

8.4 PH

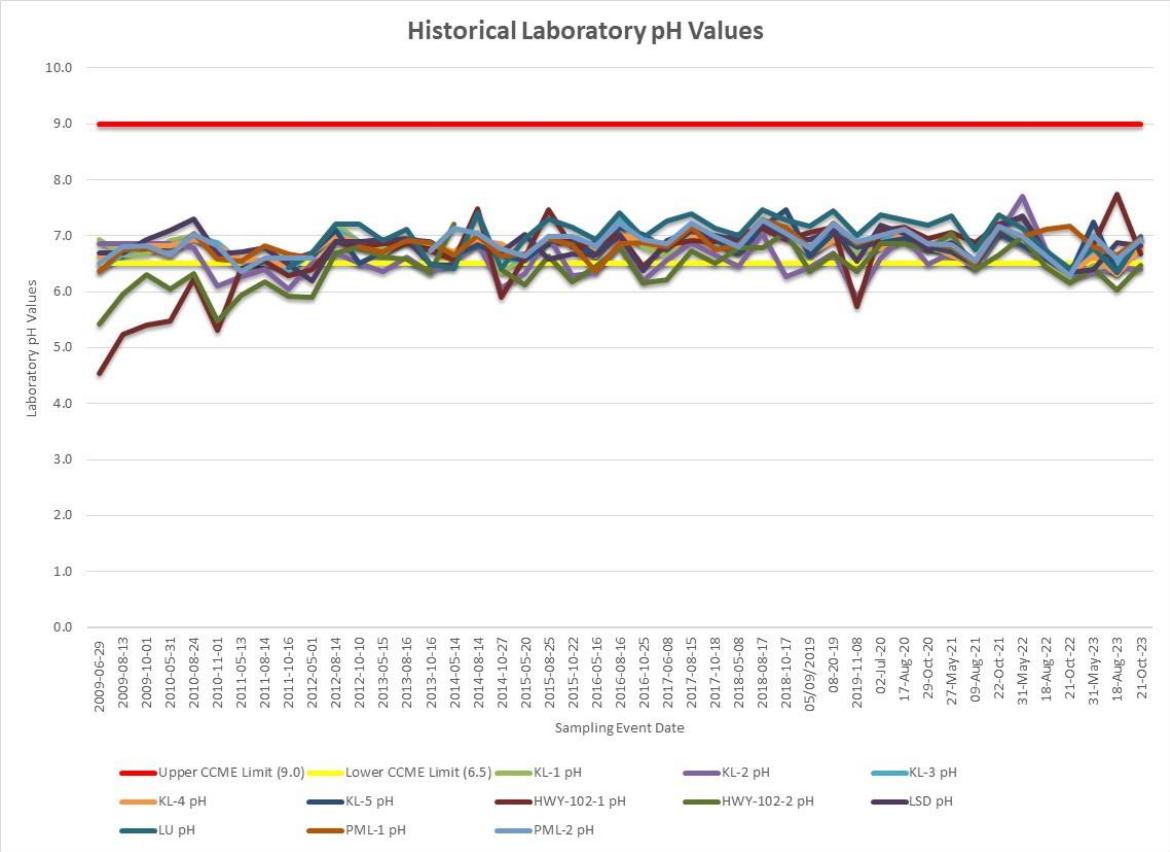

Figure 5: Historical pH Measurements at All Monitoring Stations

The pH levels reported since 2009 have generally been consistent, predominantly ranging between 6.0 and 7.5. No results have been recorded above the Upper CCME Limit of 9.0; however, pH occasionally drops below the Lower CCME Limit of 6.5, most commonly at stations HWY-102-1, HWY-102-2, and KL-2. Both the Upper and Lower CCME Limits are shown on Figure 5, along with the historical pH results.

Based on the historical data, it is expected that pH levels at all monitoring stations will continue to remain approximately neutral, sometimes below the Lower CCME Limit.

8.5 PHOSPHORUS

Phosphorus concentrations, shown on Figure 6, are typically low (less than 0.5 mg/L). There have been occasional elevated concentrations recorded since 2009, ranging up to 2.390 mg/L (KL-4 in August 2013). Elevated concentrations have historically been most common at station LSD. No such anomalies occurred during the 2023 monitoring period at any of the stations.

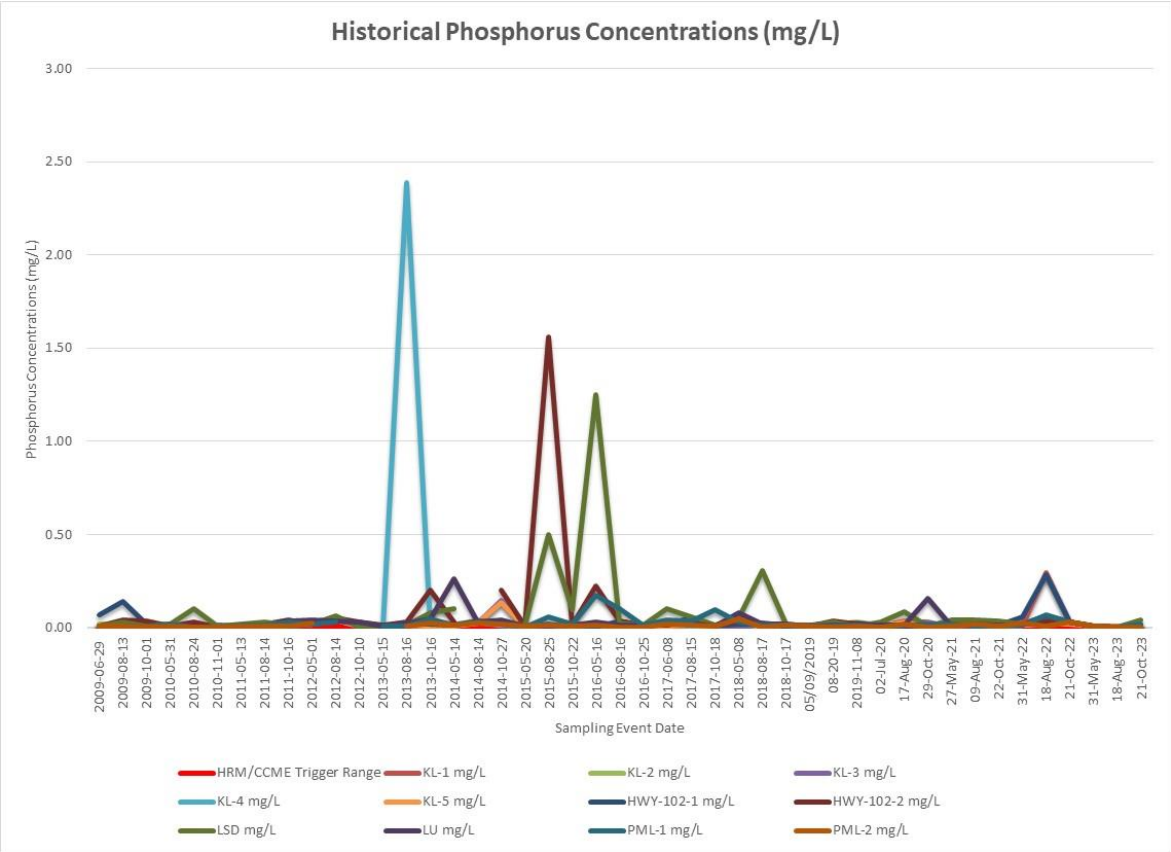

Figure 6: Historical Phosphorus Concentrations at All Monitoring Stations

There are no apparent concerns, based on the historical data, that elevated phosphorus concentrations will predictably occur at the monitoring stations. However, isolated occurrences of elevated concentrations may continue to be measured; this nutrient influx into surface water systems likely originates from surrounding land use and may be related to precipitation events that mobilize phosphorus from lands surrounding the surface water bodies. There is potential for development activities to contribute to the mobilization of phosphorus-laden runoff where overland flow is either channelled through or derived from lands where phosphorus is or has historically been applied to soils (e.g., for agricultural purposes).

8.6 TOTAL SUSPENDED SOLIDS

Total suspended solids concentrations have typically been low at all stations, with most concentrations below 100 mg/L. Concentrations have occasionally exceeded 500 mg/L, and on two isolated occasions, concentrations an order of magnitude larger have been reported (i.e., 3000 mg/L at HWY-102-2 in August 2015 and 9020 mg/L at LSD in August 2016). No total suspended solids concentrations have exceeded 32.0 mg/L in the last three years of monitoring.

The cause of the significantly elevated total suspended solids concentrations in 2015 (HWY-102-2) and 2016 (LSD) are unclear from this data set. However, based on the historical data, these occurrences appear to be anomalous. Under typical conditions, total suspended solids are not expected to be significantly concentrated, nor is there any apparent trend in the concentrations which would forecast changes in the future. It is observed that both anomalous concentrations discussed above occurred during summer monitoring events (August), and that other marginally elevated concentrations (e.g., on the order of roughly 500 mg/L) have also been reported during spring or summer monitoring events.

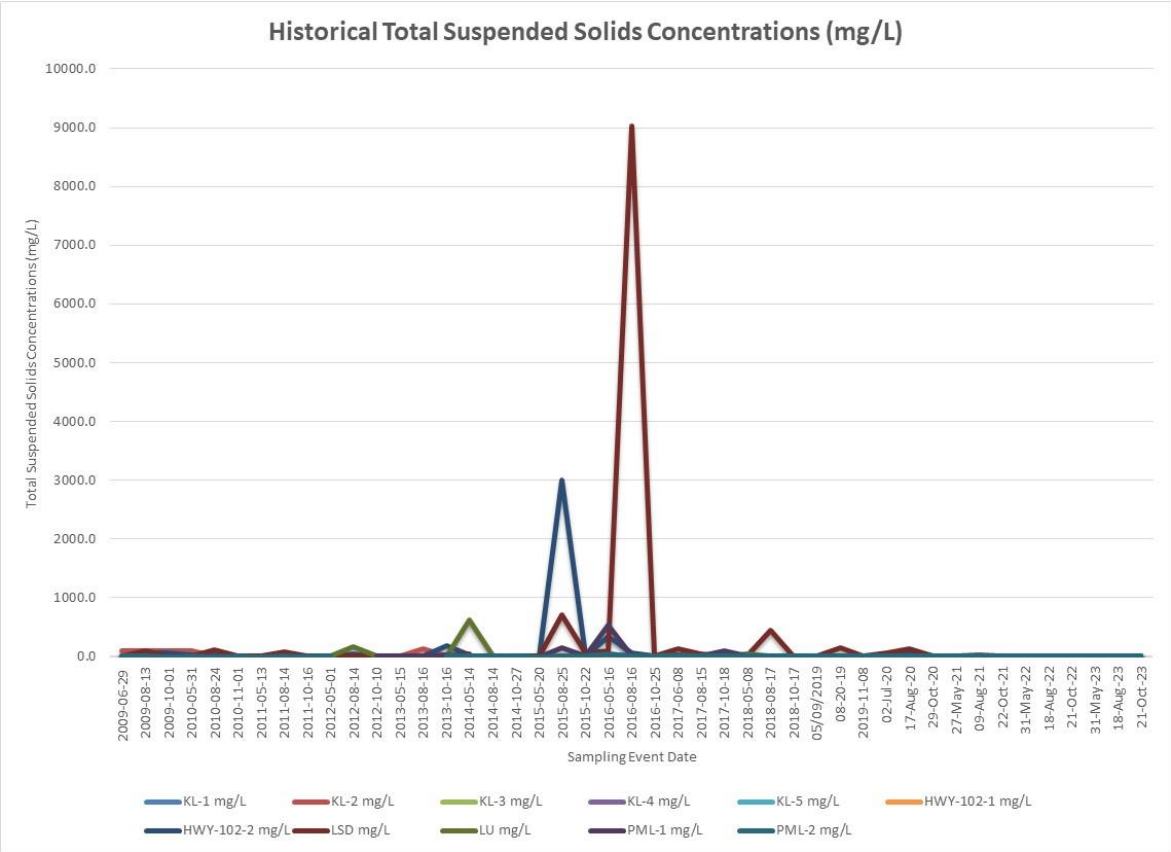

Figure 7: Historical Total Suspended Solids Concentrations at All Monitoring Stations

9 CONCLUSIONS

The 2023 water quality monitoring events included the collection of surface water samples at 11 water quality sampling stations for the analysis of inorganics, calculated parameters, standard metals, microbiological and additional metals. Additionally, field parameters collected at each station included in-situ pH, water temperature, dissolved oxygen, conductivity, air temperature, cloud cover and wildlife sightings. Secchi depths were not collected during the 2023 program as the conditions for its use were not met (i.e., monitoring station water depths were too shallow, or else the disc remained visible when lowered to the bottom of the water).

The historical trends reviewed in this report indicate that seasonal fluctuations in key surface water quality parameters can be expected to continue. Chloride and conductivity show pronounced seasonal trends. Other parameters tend to be relatively consistent, with occasional elevated concentrations measured over the years and seasons. These anomalies may be associated with distinct climactic conditions, land disturbances, or other variables; although these correlations have not been specifically examined by this report, development activities within the watershed and in proximity to the freshwater system should continue to be monitored for their potential to initiate significant influxes of the six key water quality parameters.

9.1 FIELD MEASUREMENTS

- All 11 stations were within the 5.0 – 9.0 pH HC range for Recreational Water Quality during the Spring, Summer and Fall monitoring events. Seven sampling stations were found outside the CCME-FWAL recommended range of 6.5-9.0 during specific Spring, Summer and Fall events, ranging from 6.03 to 7.75.
- In-situ dissolved oxygen was below the CCME FWAL acceptable range of >5.5 mg/L at three of the sampling stations during the Summer and Fall events (HWY-102-1, HWY-102-2, and LU).
- There are no applicable CCME, HC or NSECC guidelines for recreational water temperature. Water temperature was recorded between 12.4°C during the Fall event (HWY-102-1) and 22.3°C during the Summer event (KL-1).
- There are no applicable CCME, HC or NSECC guidelines for recreational water conductivity. However, specific water conductivity was recorded between 98.4 µs/cm at KL-2 during the Spring event to 661.0 µs/cm at LU during the Spring event.

9.2 TOTAL PHOSPHORUS

Two monitoring stations reported concentrations that exceeded HRM's TP management threshold criteria of 10 µg/L (equivalent to 0.01 mg/L) in the Fall of 2023 (October 16, 2023): LSD (0.146 mg/L) and PLM-1 (0.011 mg/L). WSP notified HRM of the TP exceedances, and HRM requested for these surface water stations (i.e., LSD and PLM-1) to be re-sampled for TP analysis only. On November 21, 2023, the surface water stations were resampled, the TP exceedances in the re-samples were as follows:

- LSD: Fall 0.042 mg/L; and
- PML-1: Fall 0.021 mg/L.

9.3 GENERAL CHEMISTRY AND METALS

- Two sampling stations reported chloride concentrations above the CCME long-term FWAL limit of 120 mg/L: HWY-102-1: Spring 125 mg/L and LU: Spring 164 mg/L. These two sampling stations were also found outside the NSECC EQS of 120 mg/L during the 2023 Spring event.
- All 11 stations were within the 5.0 – 9.0 pH HC range for Recreational Water Quality during the Spring, Summer and Fall monitoring events. Seven sampling stations were found outside the CCME-FWAL recommended range of 6.5-9.0 during specific Spring, Summer and Fall events, ranging from 6.03 to 6.48.
- All 11 stations exceeded the NSECC EQS aluminum guideline of 5 µg/L and all stations also exceeded the CCME FWAL limit of 100 µg/L.
- Five stations exceeded the NSECC EQS iron guideline and CCME FWAL limit of 300 µg/L: KL-2: Summer 512 µg/L, KL-3: Summer 318 mg/L, HWY-102-2: Spring 348 µg/L, Summer 1950 µg/L, Fall 1040 µg/L, LSD: Spring 410 mg/L, Summer 387 µg/L, Fall 369 mg/L, and LU: Summer 621 µg/L, Fall 456 µg/L.
- All 11 stations exceeded the NSECC EQS of 7 µg/L for zinc. One station exceeded the CCME FWAL zinc guideline of 30 µg/L: LU: Summer 36 µg/L.

9.4 MICROBIOLOGY

- No stations exceeded the HC *E. coli* Guidelines of 400 CFU/100 mL (maximum allowable concentration); however, an *E. coli* concentration greater than 200 CFU/100 mL was detected in a sample collected at station KL-1 on August 28, 2023. This single result was not reproduced but is interpreted as an exceedance of the 200 CFU/100 mL criterion for an *E. coli* sample geomean.
- HC does not have a recreational water quality guideline for Total Coliform. All 11 stations reported Total Coliform concentrations greater than 200 CFU/mL.

10 CLOSURE

This report was prepared for the exclusive use of Halifax Regional Municipality and is intended to provide water quality results for the program. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of the third party. Should additional parties require reliance on this report, written authorization from WSP Canada Inc. will be required. With respect to third parties, WSP Canada Inc. has no liability or responsibility for losses of any kind whatsoever, including direct or consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

The report is based on data and information collected during the 2023 Bedford West Water Quality Monitoring Program conducted by WSP Canada Inc.. It is based solely on the conditions of the Site encountered during field investigations conducted in July, August, and October 2023. Except as otherwise maybe specified, WSP Canada Inc. disclaims any obligation to update this report for events taking place, or with respect to information that becomes available to WSP Canada Inc. after the time during which WSP Canada Inc. conducted the Water Quality Monitoring program.

WSP Canada Inc. makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any property, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and change. Such interpretations and regulatory changes should be reviewed with legal counsel.

WSP Canada Inc.

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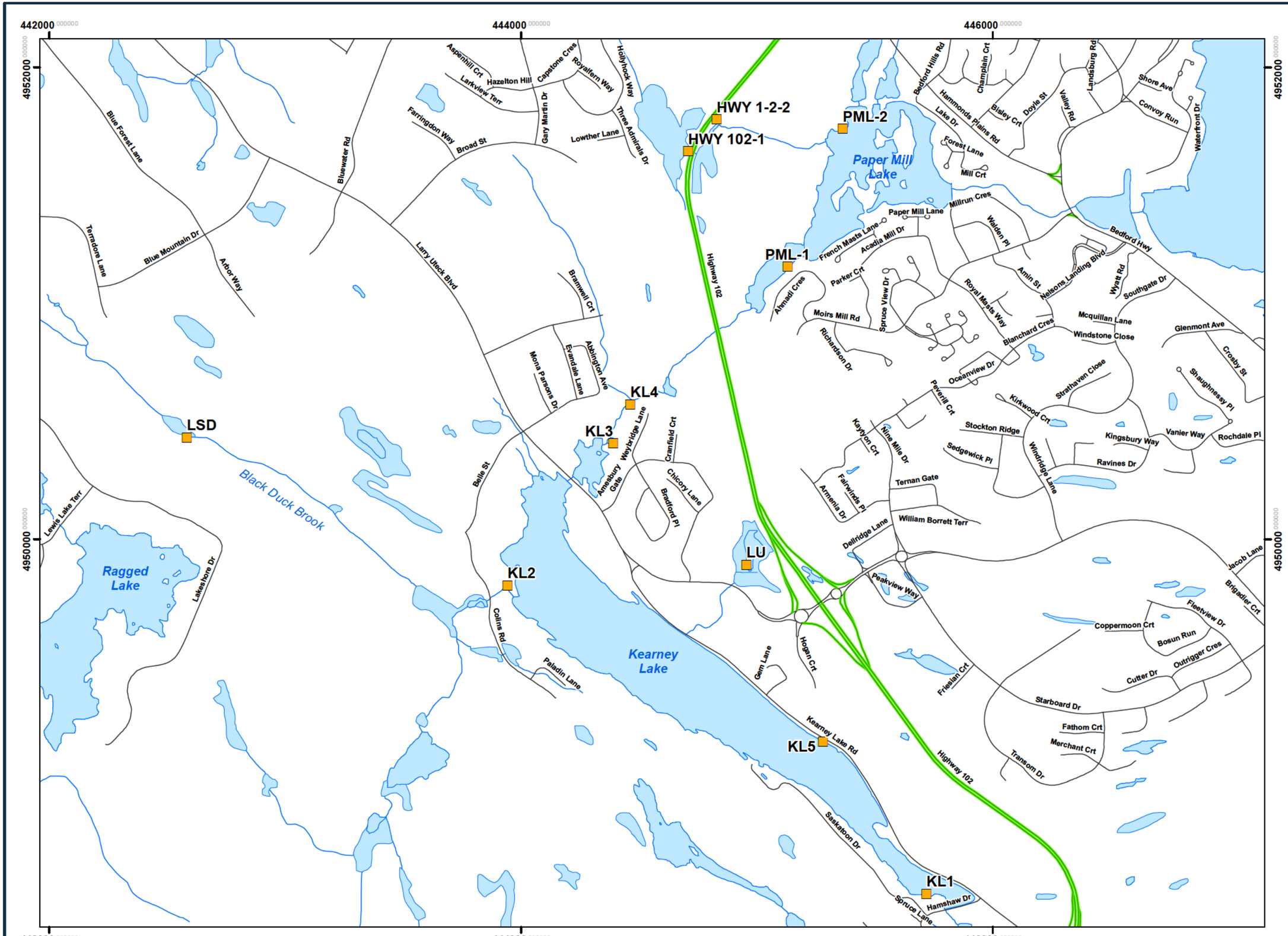
11 REFERENCES

- Canadian Environmental Quality Guidelines for the Protection of Aquatic Life, 2003, “Phosphorus Canadian Guidance Framework for the Management of Freshwater Systems”.
- Canadian Council of Ministers of the Environment, 1999. Canadian Guidelines for the Protection of Aquatic Life: Dissolved Oxygen (Freshwater).
- Canadian Council of Ministers of the Environment, 2015. Guidelines for the Protection of Aquatic Life – Freshwater.
- Health Canada, 2012. Canadian Guidelines for Recreation Water Quality, Third Edition.
- Nova Scotia Environment, 2020. Environmental Quality Standards for Surface Water (Notification of Contamination Protocol 100, Table 3).
- Nova Scotia Environment, September 2021. Environmental Quality Standards for Surface Water (Notification of Contamination Protocol 100, Table 3).

APPENDIX

A WATER QUALITY SAMPLING LOCATIONS



LEGEND:

- Bedford West Water Quality Monitoring Locations
- Highway
- Local Road
- Rivers/Streams
- Lakes/Bedford Basin

CLIENT:

HALIFAX

wood.

TITLE:

BEDFOR WEST WATER QUALITY MONITORING LOCATIONS

PROJECT:

HRM BEDFORD WEST WATER QUALITY MONITORING PROGRAM

PROJECT NO:	DATE:
TE201017	DECEMBER 2023
REV NO:	DWN/CHK'D BY:
0	CM / CC
DATUM:	PROJECTION:
NAD83	UTM ZONE 20 N

FIGURE: **FIGURE 1**

SCALE: 1:15,000

0 125 250 500

Metres

Path: G:\5290 PROJECTS\2020\TE201017_HRM_Bedford_West_Water_Quality_Monitoring\GIS\MXD\TE201017_FIGURE_1_WaterQualityMonitoringLocations.mxd User: candace.macdonald Date: 5/12/2021

APPENDIX

B FIELD REPORTS

HRM Bedford West - Field Report Event: 2023 Spring Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	PML
Client:	Halifax Regional Munipality		
Site:	Bedford west	Site ID:	PML - 2
Watercourse:	paper Mill Lake	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG		

Site Conditions

Weather:	Clear, Sunny
Air Temperature:	17°
Cloud Cover:	None
Wildlife Sightings:	Heard birds
Site Accessibility:	Good, via canoe
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	13.06.2023
Time (hh:mm):	08:00
Sample Depth (m):	Surface water
pH:	7.00
Dissolved Oxygen (mg/L):	~~9.9~~ 9.19
Secchi Depth (m):	can see bottom, no secchi
Water Temp (degrees C):	18.2
Conductivity (µs/cm):	SPC - 256.7 } 223.1

Additional Comments/Notes

PML-2

HRM Bedford West - Field Report Event: 2023 Spring Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	PML
Client:	Halifax Regional Munipality		
Site:	Bedford West	Site ID:	PML-1
Watercourse:	Paper Mill Lake	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG		

Site Conditions

Weather:	17°, Clear, Sunny
Air Temperature:	17°
Cloud Cover:	None
Wildlife Sightings:	Duck, deer birds
Site Accessibility:	Good, via canoe
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	13.06.2023
Time (hh:mm):	08:20
Sample Depth (m):	Surface waters
pH:	6.80
Dissolved Oxygen (mg/L):	9.16
Secchi Depth (m):	Can see bottom
Water Temp (degrees C):	17.6
Conductivity (µs/cm):	240.5 SPC } 206.3 C

Additional Comments/Notes

PML-1

HRM Bedford West - Field Report Event: 2023 Spring Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Bedford West	Site ID:	Hwy 102-1
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG		

Site Conditions

Weather:	Sunny, Clear
Air Temperature:	18°
Cloud Cover:	None
Wildlife Sightings:	Birds, Frogs
Site Accessibility:	Good, walked
Site Access Detail :	Same as previous events. Close to busy highway

Field Parameter Data

Date (d.m.y):	13.06.2023
Time (hh:mm):	09:30
Sample Depth (m):	Surface water
pH:	6.84
Dissolved Oxygen (mg/L):	5.88
Secchi Depth (m):	Can see bottom
Water Temp (degrees C):	15.9
Conductivity (µs/cm):	473.3 SPC & 392.1 C

Additional Comments/Notes

Hwy 102-1

HRM Bedford West - Field Report Event: 2023 Spring Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Bedford west	Site ID:	LH
Watercourse:	LH	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG		

Site Conditions

Weather:	Sunny clear
Air Temperature:	20°
Cloud Cover:	None
Wildlife Sightings:	Trout
Site Accessibility:	Okay
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	13.06.2023
Time (hh:mm):	10:10
Sample Depth (m):	Surface water
pH:	6.79
Dissolved Oxygen (mg/L):	9.02
Secchi Depth (m):	N/A
Water Temp (degrees C):	18.3
Conductivity (µs/cm):	661 SPC & 577 C

Additional Comments/Notes

HRM Bedford West - Field Report Event: 2023 Spring Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Bedford West	Site ID:	KL-5
Watercourse:	Kearney Lake	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG		

Site Conditions

Weather:	Clear, Sunny
Air Temperature:	21°
Cloud Cover:	None
Wildlife Sightings:	None
Site Accessibility:	Good
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	13.06.2023
Time (hh:mm):	10:42
Sample Depth (m):	Surface waters
pH:	7.24
Dissolved Oxygen (mg/L):	7.68 / 78.7 %
Secchi Depth (m):	can see bottom
Water Temp (degrees C):	21.0°
Conductivity (µs/cm):	233.3 SPC { 215.6 C

Additional Comments/Notes

KL-5

HRM Bedford West - Field Report Event: 2023 Spring Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Bedford West	Site ID:	KL-1
Watercourse:	Kearney Lake	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG		

Site Conditions

Weather:	Sunny, Clear
Air Temperature:	21°
Cloud Cover:	None
Wildlife Sightings:	Geese
Site Accessibility:	Good
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	13.06.2023
Time (hh:mm):	10:57
Sample Depth (m):	Surface water
pH:	~~6.77~~ 6.48
Dissolved Oxygen (mg/L):	9.13 / 100.7 %
Secchi Depth (m):	See bottom
Water Temp (degrees C):	19.6
Conductivity (µs/cm):	230.8 SPC } 207.6 C

Additional Comments/Notes

HRM Bedford West - Field Report Event: 2023 Spring Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Bedford West	Site ID:	KL-3
Watercourse:	Kearney Lake Stream	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG		

Site Conditions

Weather:	Sunny, clear
Air Temperature:	21°
Cloud Cover:	None
Wildlife Sightings:	Birds
Site Accessibility:	Good
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	13.06.2023
Time (hh:mm):	11:20
Sample Depth (m):	Surface water
pH:	6.73
Dissolved Oxygen (mg/L):	9.14 / 97.0 %
Secchi Depth (m):	See bottom
Water Temp (degrees C):	17.8
Conductivity (µs/cm):	230.2 SPC / 198.0 C

Additional Comments/Notes

HRM Bedford West - Field Report Event: 2023 Spring Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Bedford West	Site ID:	KL-4
Watercourse:	nearney lake Stream	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG		

Site Conditions

Weather:	Sunny, clear
Air Temperature:	21°
Cloud Cover:	None
Wildlife Sightings:	Birds
Site Accessibility:	Good
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	13.06.2023
Time (hh:mm):	11:35
Sample Depth (m):	Surface water
pH:	6.63
Dissolved Oxygen (mg/L):	6.26 / 66.3%
Secchi Depth (m):	see bottom
Water Temp (degrees C):	17.7
Conductivity (µs/cm):	245.8 SPC } 211.2 C

Additional Comments/Notes

HRM Bedford West - Field Report Event: 2023 Spring Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:		Site ID:	KL-2
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG		

Site Conditions

Weather:	Sunny, Clear
Air Temperature:	22°C
Cloud Cover:	10 %
Wildlife Sightings:	Fish Jumping up stream
Site Accessibility:	Good
Site Access Detail :	Same as previous events. Some Poison Ivy.

Field Parameter Data

Date (d.m.y):	13.06.2023
Time (hh:mm):	12:05
Sample Depth (m):	Surface Water
pH:	6.33
Dissolved Oxygen (mg/L):	7.88 (83.0 %)
Secchi Depth (m):	N/A
Water Temp (degrees C):	17.5 °C
Conductivity (µs/cm):	C = 84.0 MS/cm & SPC = 98.4 MS/cm.

Additional Comments/Notes

HRM Bedford West - Field Report Event: 2023 Spring Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:		Site ID:	LSD
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG		

Site Conditions

Weather:	22°C Sunny, clear
Air Temperature:	↓
Cloud Cover:	15 %
Wildlife Sightings:	Frog, Chipmonks, Birds.
Site Accessibility:	Easy
Site Access Detail :	Same as previous events. New gravel walking trail ↳ Photos taken.

Field Parameter Data

Date (d.m.y):	13.06.2023
Time (hh:mm):	12:46
Sample Depth (m):	Surface Water
pH:	6.39
Dissolved Oxygen (mg/L):	6.58 mg/L (69.3 %)
Secchi Depth (m):	N/A
Water Temp (degrees C):	18.2
Conductivity (µs/cm):	C= 128.2 µS/cm & SPC = 147.0 µS/cm.

Additional Comments/Notes

HRM Bedford West - Field Report Event: 2023 Spring Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Bedford west	Site ID:	Hwy 102-2
Watercourse:	Hwy 102 - 2	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG		

Site Conditions

Weather:	Clear, sunny
Air Temperature:	22°
Cloud Cover:	minor clouds / hazey
Wildlife Sightings:	birds
Site Accessibility:	good
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	13.06.2023
Time (hh:mm):	13:30
Sample Depth (m):	Surface water
pH:	6.41
Dissolved Oxygen (mg/L):	6.66 mg/L / 69.0%
Secchi Depth (m):	See bottom
Water Temp (degrees C):	16.6
Conductivity (µs/cm):	369.4 TDS / 476.7 C

Additional Comments/Notes

HRM Bedford West - Field Report

Event: ~~Spring~~ Summer 2023 Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Papermill Lake	Site ID:	PML-2
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	~~7~~ 8
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, ~~NG~~ KC		

Site Conditions

Weather:	Clear, Sunny, 0% cloudcover.
Air Temperature:	16°
Cloud Cover:	0%
Wildlife Sightings:	Osprey, Ducks
Site Accessibility:	Boat (Canoe)
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ 28 August 23
Time (hh:mm):	8:35
Sample Depth (m):	Surface Water
pH:	6.58
Dissolved Oxygen (mg/L):	7.14
Secchi Depth (m):	Can see Bottom.
Water Temp (degrees C):	18.5°C
Conductivity (µs/cm):	156.9 / SPC 181.0

Additional Comments/Notes

HRM Bedford West - Field Report

Event: Summer 2023 ~~Spring~~ Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Papermill Lake	Site ID:	PML-1
Watercourse:	Bedford west.	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	1 8
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, ~~NG~~ KC.		

Site Conditions

Weather:	~~Rain~~ Clear and Sunny
Air Temperature:	17°C
Cloud Cover:	0%
Wildlife Sightings:	osprey
Site Accessibility:	Boat (canoe)
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ 28 August 23
Time (hh:mm):	8:55
Sample Depth (m):	Surface Water
pH:	6.606
Dissolved Oxygen (mg/L):	8.19
Secchi Depth (m):	Can See Bottem
Water Temp (degrees C):	19.7°C
Conductivity (µs/cm):	130.3 SPC 144.9.

Additional Comments/Notes

Summer

HRM Bedford West - Field Report Event: 2023 ~~Spring~~ Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	HWY 102 Bedford West	Site ID:	HWY-102-1
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	X 8
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG KC		

Site Conditions

Weather:	Sunny ; Clear
Air Temperature:	19.c
Cloud Cover:	5%
Wildlife Sightings:	Ducks
Site Accessibility:	highway accress
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ August 28 2023
Time (hh:mm):	9:45 AM
Sample Depth (m):	SW
pH:	7.75
Dissolved Oxygen (mg/L):	43.1 mg/L
Secchi Depth (m):	NA - Can see bottom
Water Temp (degrees C):	16.1°c
Conductivity (µs/cm):	18.19 ms/cm

Additional Comments/Notes

* lab labelled Bottles as "HWY101-1" *

HRM Bedford West - Field Report

Event: ~~2023 Spring~~ Summer Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Larry Uteck	Site ID:	LU
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG KC		

Site Conditions

Weather:	Sunny
Air Temperature:	20°C
Cloud Cover:	5%
Wildlife Sightings:	
Site Accessibility:	Wooded / overgrown
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ August 29 '23
Time (hh:mm):	10:15 AM
Sample Depth (m):	Surface
pH:	6.35
Dissolved Oxygen (mg/L):	4.91 mg/L
Secchi Depth (m):	NA
Water Temp (degrees C):	17.7 °C
Conductivity (µs/cm):	304.4 µs/cm

Additional Comments/Notes

Summer

HRM Bedford West - Field Report Event: 2023 ~~Spring~~ Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:		Site ID:	LSD
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, ~~NG~~ KC		

Site Conditions

Weather:	Sunny
Air Temperature:	20°C
Cloud Cover:	5%
Wildlife Sightings:	Frogs
Site Accessibility:	
Site Access Detail :	~~Same as previous events~~ Access Path very Damaged from flood - use Caution

Field Parameter Data

Date (d.m.y):	13.06.2023
Time (hh:mm):	11:20 AM
Sample Depth (m):	Surface
pH:	6.87
Dissolved Oxygen (mg/L):	9.14 mg/L
Secchi Depth (m):	NA See Bottom
Water Temp (degrees C):	17.6
Conductivity (µs/cm):	77.7 µS/cm

Additional Comments/Notes

Summer

HRM Bedford West - Field Report Event: ~~2023 Spring~~ Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:		Site ID:	KL-2
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, ~~NG~~ KC		

Site Conditions

Weather:	Sunny
Air Temperature:	~~20~~ 22 °C
Cloud Cover:	5%
Wildlife Sightings:	None
Site Accessibility:	lots of washout from storms
Site Access Detail :	~~Same as previous events.~~ access slightly impacted by culvert install @ Bridge + storm

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ August 28/23
Time (hh:mm):	12:00
Sample Depth (m):	Surface
pH:	6.41
Dissolved Oxygen (mg/L):	6.64 mg/L
Secchi Depth (m):	—
Water Temp (degrees C):	17.7 °C
Conductivity (µs/cm):	59.7 µS/cm

Additional Comments/Notes

Summer

HRM Bedford West - Field Report Event: 2023 ~~Spring~~ Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Kearney Lake	Site ID:	KL-3
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, ~~NG~~ KC		

Site Conditions

Weather:	Clear, Sunny
Air Temperature:	22 °C
Cloud Cover:	5 %
Wildlife Sightings:	Crow.
Site Accessibility:	Good
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ 28 Aug 2023
Time (hh:mm):	12:25
Sample Depth (m):	Surface water
pH:	6.50
Dissolved Oxygen (mg/L):	8.74
Secchi Depth (m):	Can See Bottom
Water Temp (degrees C):	21.1 °C
Conductivity (µs/cm):	129.4 SPC 140.0

Additional Comments/Notes

Summer.

HRM Bedford West - Field Report Event: 2023 ~~Spring~~ Summer Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Kearney Lake	Site ID:	KL-4
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, ~~NG~~ KC		

Site Conditions

Weather:	Clear Sunny
Air Temperature:	22 °C
Cloud Cover:	5 %
Wildlife Sightings:	Songbirds
Site Accessibility:	Good
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ 28 August 2023
Time (hh:mm):	12:35
Sample Depth (m):	Surface water
pH:	6.30
Dissolved Oxygen (mg/L):	7.16
Secchi Depth (m):	Can see bottom
Water Temp (degrees C):	20.9 °C
Conductivity (µs/cm):	130.3 SPC 141.2

Additional Comments/Notes

Summer

HRM Bedford West - Field Report Event: ~~2023 Spring~~ Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Kearney Lake	Site ID:	KL-5
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7, 8
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, ~~NG~~ KC		

Site Conditions

Weather:	Sunny, clear
Air Temperature:	23°C
Cloud Cover:	5%
Wildlife Sightings:	NONE
Site Accessibility:	Good
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ 28 August 2023
Time (hh:mm):	12:55
Sample Depth (m):	Surface Water
pH:	6.34
Dissolved Oxygen (mg/L):	7.57
Secchi Depth (m):	Can See bottom
Water Temp (degrees C):	22.3°C
Conductivity (µs/cm):	132.6 SPC 140.1

Additional Comments/Notes

Summer

HRM Bedford West - Field Report Event: 2023 ~~Spring~~ Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Kearney Lake	Site ID:	KL - 1
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	X 8
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, ~~NG~~ KC		

Site Conditions

Weather:	Sunny Clear
Air Temperature:	23°C
Cloud Cover:	10 %
Wildlife Sightings:	NONE
Site Accessibility:	Good
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ 28 August 2023
Time (hh:mm):	13:10
Sample Depth (m):	Surface Water
pH:	6.36
Dissolved Oxygen (mg/L):	6.606
Secchi Depth (m):	Can See Bottom
Water Temp (degrees C):	22.3°C
Conductivity (µs/cm):	133.5 SPC 140.9.

Additional Comments/Notes

Summer.

HRM Bedford West - Field Report

Event: 2023 ~~Spring~~ Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Kearney Lake	Site ID:	HWY102-2
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7 & 8
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, ~~NG~~ KC		

Site Conditions

Weather:	Sunny & Clear.
Air Temperature:	23°C
Cloud Cover:	10%
Wildlife Sightings:	None.
Site Accessibility:	Good
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ 28 August 2023
Time (hh:mm):	13:30
Sample Depth (m):	Surface Water.
pH:	6.03
Dissolved Oxygen (mg/L):	3.21
Secchi Depth (m):	Can See Bottom
Water Temp (degrees C):	17.1 °C
Conductivity (µs/cm):	249.7 SPC 294.2

Additional Comments/Notes

Fall

HRM Bedford West - Field Report Event: 2023 Spring Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	—
Client:	Halifax Regional Munipality		—
Site:	HWY 102 - 1	Site ID:	
Watercourse:	—	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	~~JM, NG~~ JB / ICC		

Site Conditions

Weather:	12°C, Sunny w/ clouds
Air Temperature:	12°C
Cloud Cover:	Blue skys & cloud (30%/70%), Sunny
Wildlife Sightings:	Sparrow
Site Accessibility:	Off HWY - Parked & walked
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ OCT 16/23
Time (hh:mm):	1045
Sample Depth (m):	Surface
pH:	6.67
Dissolved Oxygen (mg/L):	5.48
Secchi Depth (m):	NA see bottom
Water Temp (degrees C):	12.4°C
Conductivity (µs/cm):	197.4

Additional Comments/Notes

HASP

Fall

HRM Bedford West - Field Report Event: 2023 ~~Spring~~ Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	—
Client:	Halifax Regional Munipality		
Site:	PML-2	Site ID:	—
Watercourse:	Papermill Lake	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG JB/KC		

Site Conditions

Weather:	overcast, 12°C
Air Temperature:	12°C
Cloud Cover:	overcast; some small sun Peaks thr (Unaided)
Wildlife Sightings:	Crows
Site Accessibility:	Good - SSA - via Canoe
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~19/09/2023~~ Oct 16 '23
Time (hh:mm):	9:45
Sample Depth (m):	Surface
pH:	6.94
Dissolved Oxygen (mg/L):	8.79
Secchi Depth (m):	NA (See Bottom)
Water Temp (degrees C):	14.6
Conductivity (µs/cm):	128.4

Additional Comments/Notes

HRM Bedford West - Field Report Event: 2023 ~~Spring~~ Fall Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	—
Client:	Halifax Regional Munipality		
Site:	PML - 1	Site ID:	—
Watercourse:	Papermill Lake	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	~~JM~~, NG JB IKC		

Site Conditions

Weather:	overcast / small sun peeking
Air Temperature:	12°C
Cloud Cover:	Some blue sky / cloudy
Wildlife Sightings:	cormorants
Site Accessibility:	Same - canoe
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~[illegible]~~ Oct 16 /23
Time (hh:mm):	955
Sample Depth (m):	Surface
pH:	6.95
Dissolved Oxygen (mg/L):	9.37
Secchi Depth (m):	NA
Water Temp (degrees C):	15.2°C
Conductivity (µs/cm):	128.8

Additional Comments/Notes

HRM Bedford West - Field Report

Event: ~~Fall~~ 2023 Spring Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	LU	Site ID:	
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	~~JM, NG~~ JB / KC		

Site Conditions

Weather:	13°C, Sunny
Air Temperature:	13°C
Cloud Cover:	70%. Cloud. 30%. Blue sky
Wildlife Sightings:	
Site Accessibility:	Good
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ Oct 16 123
Time (hh:mm):	11:15
Sample Depth (m):	Surface
pH:	6.98
Dissolved Oxygen (mg/L):	7.65
Secchi Depth (m):	NA See Bottom
Water Temp (degrees C):	14°C
Conductivity (µs/cm):	194.6

Additional Comments/Notes

HRM Bedford West - Field Report Event: ~~Spring~~ Fall 2023 Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	—
Client:	Halifax Regional Munipality		
Site:	LSD	Site ID:	—
Watercourse:	Black Duck Brook	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	~~JM, NG~~ JB / KC		

Site Conditions

Weather:	14°C, Overcast (cloudy day)
Air Temperature:	14°C
Cloud Cover:	100%
Wildlife Sightings:	NA
Site Accessibility:	Wash out from heavy Rain
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ Oct 16/23
Time (hh:mm):	12:46
Sample Depth (m):	Surface
pH:	6.82
Dissolved Oxygen (mg/L):	7.47
Secchi Depth (m):	NA
Water Temp (degrees C):	13°C
Conductivity (µs/cm):	89.7

Additional Comments/Notes

Seems as if water is cloudy; Const. (Rock Blasting?)
Potentially impacts watercourse.
* Photos

HRM Bedford West - Field Report Event: 2023 Spring Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	—
Client:	Halifax Regional Munipality		
Site:	KL-2	Site ID:	—
Watercourse:	—	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	~~JM, NG~~ KC/JB		

Site Conditions

Weather:	Slight Rain ; Cloud cover
Air Temperature:	13°C
Cloud Cover:	100%
Wildlife Sightings:	NA
Site Accessibility:	Okay - Still working in culvert from roadway
Site Access Detail :	Same as previous events. (Roadside)

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ Oct 16/23
Time (hh:mm):	13:28
Sample Depth (m):	Surface
pH:	6.39
Dissolved Oxygen (mg/L):	6.85
Secchi Depth (m):	NA See bottom
Water Temp (degrees C):	12.9
Conductivity (µs/cm):	63.9

Additional Comments/Notes

HASP

HRM Bedford West - Field Report

Event: FKM 2023 ~~Spring~~ Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	KL-3	Site ID:	
Watercourse:	—	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG		

Site Conditions

Weather:	13°c, Cloudy
Air Temperature:	13°c
Cloud Cover:	100%
Wildlife Sightings:	Frog
Site Accessibility:	Good
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ Oct 16 23
Time (hh:mm):	13:40
Sample Depth (m):	Surface
pH:	6.99
Dissolved Oxygen (mg/L):	9.08
Secchi Depth (m):	NA
Water Temp (degrees C):	15.7°c
Conductivity (µs/cm):	127.5

Additional Comments/Notes

HRM Bedford West - Field Report

Event: ~~Spring~~ Fall 2023 Event

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	KL-4	Site ID:	
Watercourse:	—	Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	JM, NG		

Site Conditions

Weather:	Same as KL-3
Air Temperature:	"
Cloud Cover:	"
Wildlife Sightings:	Chipmunk
Site Accessibility:	Good
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ Oct 16 23
Time (hh:mm):	13:50
Sample Depth (m):	Surface
pH:	6.79
Dissolved Oxygen (mg/L):	8.08
Secchi Depth (m):	NA Can see Bottom
Water Temp (degrees C):	15.6
Conductivity (µs/cm):	127.5

Additional Comments/Notes

No Sheets Left - Rest of info Here Can be transcribed

KC/JB

KL-5 @ 14:10 04/16/23

100% Cloud; 13°C; Overcast
Sample depth - Surface
T 15.8°C Secchi depth = NA see Bottom
C 134.6
pH 6.96
DO (mg/L) 8.82

KL-1 @ 14:25

100% Cloud Cover; 13°C; overcast KC/JB
Sample depth - surface
T 15.2 Secchi depth NA see Bottom
C 117.4
pH 6.88
DO 8.54

HW4102-2 @ 14:40

100% cloud cover; 13° overcast
Surface Sample
T - 13.1°C Secchi depth NA see Bottom
C - 384.1
pH - 6.48
DO - 4.43

*Follow up LLTP Sampling

Fall Resample

HRM Bedford West - Field Report Event: 2023 ~~Spring Event~~

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Bedford West	Site ID:	PMC-1
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	X 1
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	~~JM, NG~~ KC JB		

Site Conditions

Weather:	10°C Sunny, few clouds
Air Temperature:	10°C
Cloud Cover:	
Wildlife Sightings:	Crows, turkey Vulture
Site Accessibility:	same
Site Access Detail :	Same as previous events. Canoe

Field Parameter Data

Date (d.m.y):	~~[illegible]~~ Nov 21 123
Time (hh:mm):	1130
Sample Depth (m):	surface
pH:	5.85
Dissolved Oxygen (mg/L):	11.6
Secchi Depth (m):	NA
Water Temp (degrees C):	6.65
Conductivity ~~(µs/cm)~~:	0.173 mS/cm

Additional Comments/Notes

* Follow up LLTP Sampling

Fall Resample

HRM Bedford West - Field Report Event: 2023 ~~Spring Event~~

Project:	Water Quality Monitoring - Bedford West	Sub-Area(s):	
Client:	Halifax Regional Munipality		
Site:	Bedford West	Site ID:	LSD
Watercourse:		Location:	Bedford
Sample Type:	Surface Water	No. of bottles:	7
GPS Coordinates:	Same as previous events		
Wood Field Personnel:	~~JM, NG~~ ICC JB		

Site Conditions

Weather:	Sunny, few clouds
Air Temperature:	10°C
Cloud Cover:	—
Wildlife Sightings:	NA
Site Accessibility:	Same
Site Access Detail :	Same as previous events.

Field Parameter Data

Date (d.m.y):	~~13.06.2023~~ Nov 21/23
Time (hh:mm):	1230
Sample Depth (m):	Surface
pH:	5.99
Dissolved Oxygen (mg/L):	8.79
Secchi Depth (m):	NA
Water Temp (degrees C):	3.44
Conductivity ~~(µs/cm)~~:	0.113 mS/cm

Additional Comments/Notes

*Slightly better flow than last sampling event

APPENDIX

C SUMMARY TABLE REPORTS

Table C1: Bedford West Water Quality Sampling Program - 2023 Results

Tested Parameters	Units	RDL (2022)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	KL-1			KL-2			KL-3			KL-4			KL-5		
Sampling Event							Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall
Sampling Date							13-Jun-23	28-Aug-23	16-Oct-23	13-Jun-23	28-Aug-23	16-Oct-23	13-Jun-23	28-Aug-23	16-Oct-23	13-Jun-23	28-Aug-23	16-Oct-23	13-Jun-23	28-Aug-23	16-Oct-23
Sampling Time							10:57 AM	1:10 PM	2:25 PM	12:05 PM	12:00 PM	1:28 PM	11:20 AM	12:25 PM	13:40 PM	11:35 AM	12:35 PM	1:50 PM	10:42 AM	12:55 PM	2:10 PM
Field Data (in Situ)																					
Secchi Depth	meters	--	--	--	minimum of 1.2	--	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*
Water Temp	Celsius	--	--	--	--	--	19.6	22.3	15.2	17.5	17.7	12.9	17.8	21.1	15.7	17.7	20.9	15.6	21.0	22.3	15.8
Dissolved Oxygen	mg/L	--	--	--	--	> 5.5	9.13	6.66	8.54	7.88	6.64	6.85	9.14	8.74	9.00	6.26	7.16	8.08	7.68	7.57	8.82
pH	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	6.48	6.36	6.88	6.33	6.41	6.39	6.73	6.50	6.99	6.63	6.30	6.79	7.24	6.34	6.96
Specific Conductance (µs/cm)	uS/cm	--	--	--	--	--	230.8	140.9		98.4			230.2	140 0		245.8	141.2		233.3	140.1	
Inorganic Parameters																					
Alkalinity	mg/L	5	--	--	--	--	6	8	10	7	12	11	6	8	10	6	8	10	6	32	11
Chloride	mg/L	1	--	120	--	120	60	30	31	17	8	12	60	30	33	59	30	33	60	29	34
Fluoride	mg/L	0.12	--	--	--	0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
True Color	TCU	5	--	--	--	--	10.5	67.1	45.8	53.7	128.0	62.1	10.4	58.5	48 5	17.5	56.2	42.9	10.8	58.3	46.1
Nitrate + Nitrite as N	mg/L	0.05	--	--	--	--	0.12	0.17	0.52	0.08	0.10	0.16	0.21	0.21	0.54	0.23	0 23	0.51	0.14	0.20	0.50
Nitrate as N	mg/L	0.05	--	13	--	13	0.12	0.17	0.21	0.08	0.10	0.07	0.21	0.21	0.23	0.23	0 23	0.21	0.14	0.20	0.18
Nitrite as N	mg/L	0.05	--	0.06	--	0 06	<0.05	<0.05	0.31	<0.05	<0.05	0.09	<0.05	<0.05	0.31	<0 05	<0.05	0.3	<0.05	<0.05	0.32
Ammonia as N	mg/L	0.03	--	--	--	1.15 note [5]	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0 03	<0.03	<0.03	<0.03	<0.03	<0.03
Total Kjeldahl Nitrogen as N	mg/L	0.3	--	--	--	--	<0.10		0.25	0.11		0.31	<0.10		0.3	<0.10		0 26	<0.10		0.29
Total Organic Carbon	mg/L	0.5	--	--	--	--	6.3	8.7	6.4	10.9	15	8.4	6.4	8.3	6.3	6.5	8 3	6.3	6.0	9.4	6.3
Ortho-Phosphate as P	mg/L	0.01	--	--	--	--	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0 01	0 01	<0.01	<0.01
pH		--	6.5 - 9.0	5.0-9.0	6.5 - 9.0		6.48	6.36	6.88	6.33	6.41	6.39	6.73	6.5	6.99	6.63	6.3	6.79	7.24	6.34	6.96
Total Calcium	mg/L	0.1	--	--	--	--	6.0	5.0	4.5	4.4	4	4.7	6.9	5.3	4.9	6.6	5.1	5.5	6.0	4.9	5.8
Total Magnesium	mg/L	0.1	--	--	--	--	1.0	0.8	0.8	1	0.9	1.2	1.1	0.8	0.9	1.1	0.8	1	1.0	0.8	0.9
Total Phosphorus	mg/L	0.006	--	--	--	0.01 note [6]	0.008	<0.002	0.005	0.008	<0.002	0.007	0.008	<0.002	0.006	0.008	0.004	0 006	0.008	0.008	0.006
Total Potassium	mg/L	0.1	--	--	--	--	0.7	0.9	0.9	0.8	1	1.1	0.9	1	1	0.9	1	1.1	0.8	1.0	1.0
Total Sodium	mg/L	0.1	--	--	--	--	37.0	20.3	19.5	12	7.4	8.8	34.3	19.4	20 5	34.6	19.7	22.4	35.5	20.1	22.9
Reactive Silica as SiO2	mg/L	0.5	--	--	--	--	1.7	2.6	2.6	2.3	4.4	4.6	2	2.7	2.9	2	2.6	2.8	2.0	2.4	2.8
Total Suspended Solids	mg/L	5	--	--	--	note [7]	<5	<5	<5	<5	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sulphate	mg/L	2	--	128	--	--	8	6	6	8	5	6	8	7	7	8	7	7	8	6	7
Turbidity	NTU	0.1	--	--	50	--	0.9	1.6	4.0	0.9	4.0	1.3	1.1	0.8	1.7	1.3	0 5	1.8	1.1	0.5	0.9
Conductivity	umho/cm	1	--	--	--	--	207.6	133.5	117.4	84	59.7	63.9	198	129.4	127 5	211.2	130.3	127.5	215.6	132.6	134.6
Calculated Parameters																					
Anion Sum	me/L		--	--	--	--	1.99	1.14	1.24	0.75	0.58	0.69	1.99	1.17	1.32	1.97	1.17	1 31	1.99	1.60	1.36
Bicarb. Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	6	8	10	7	12	11	6	8	10	6	8	10	6	8	11
Calculated TDS	mg/L	1	--	--	--	--	117	69	71	46	35	42	116	70	76	115	70	79	116	82	81
Carb. Alkalinity (as CaCO3)	mg/L	10	--	--	--	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cation sum	me/L	--	--	--	--	--	2.04	1.27	1.19	0.89	0.69	0.78	1.97	1.24	1.26	1.97	1.23	1.39	1 97	1.24	1.41
Hardness	mg/L	--	--	--	--	--	19.1	15.8	14.5	15.1	13.7	16.7	21.8	16.5	15.9	21.0	16 0	17.9	19.1	15.5	18.2
% Difference/ Ion Balance (NS)	%	--	--	--	--	--	1.3	5.1	1.9	8.4	8.7	5.6	0.5	2.8	2.2	0.1	2.7	2.8	0 5	12.6	1.8
Langelier Index (@20C)	NA	--	--	--	--	--	-3.84	-3.58	-3.84	-3.74	-3.26	-3.82	-3.76	-3.61	-3.81	-3.78	-3.61	-3.76	-3.78	-3.04	-3.81
Langelier Index (@ 4C)	NA	--	--	--	--	--	-4.16	-3.90	-4.08	-4 06	-3.58	-4.04	-4.08	-3.93	-4.06	-4.10	-3.93	-4.00	-4.10	-3.36	-3.90
Saturation pH (@ 20C)	NA	--	--	--	--	--	10 00	9 97	10.00	10.1	9.9	9.9	9.98	9.94	9.96	10.00	9.96	9.92	10.0	9.4	9.8
Saturation pH (@ 4C)	NA	--	--	--	--	--	10.4	10.3	10.2	10.4	10.2	10.2	10.3	10.3	10.2	10.3	10.4	10 2	10.5	9.7	10.1
Metals (ICP-MS)																					
Total Aluminum	ug/L	5	5	5	--	100 (pH based)	216	285		295	412		167	197		165	186		171	195	
Total An imony	ug/L	2	20	9	--	--	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Arsenic	ug/L	2	5 0	5.0	--	5	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Barium	ug/L	5	1000	1000	--	--	13	11		17	15		18	13		19	14		13	12	
Total Beryllium	ug/L	2	5 3	0.15	--	--	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Bismuth	ug/L	2	--	--	--	--	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Boron	ug/L	5	1200	1500	--	1500	<5	7		8	11		6	8		<5	5		6	7	
Total Cadmium	ug/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	<0.09	<0.09		<0.09	<0.09		<0.09	<0.09		<0 09	<0.09		<0.09	<0.09	
Total Chromium	ug/L	1	---	8.9	--	--	<2	<2		<2	<2		<2	<2		<2	<2		<2	5	
Total Cobalt	ug/L	1	10	1	--	--	<1	<1		<1	<1		<1	<1		<1	<1		<1	<1	
Total Copper	ug/L	1	2	2	--	2 - 2.41 note [8]	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Total Iron	ug/L	50	300	300	--	300	154	299	192	248	512	246	93	318	155	121	176	189	90	177	150
Total Lead	ug/L	0.5	1	1	--	1 - 3.26 note [8]	<0.5	<0.5		<0.5	0.8		<0.5	<0.5		<0.5	<0.5		<0.5	<0.5	
Total Manganese	ug/L	2	820	430	--	--	57	56	22	25	20	11	30	49	23	35	44	45	36	37	16
Total Molybdenum	ug/L	2	73	73	--	73	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Nickel	ug/L	2	25	25	--	25 - 97.03 note [8]	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Selenium	ug/L	1	1.0	1.0	--	1	<1	<1		<1	<1		<1	<1		<1	<1		<1	<1	
Total Silver	ug/L	2	0.1	0.25	--	0 25	<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1	
Total Strontium	ug/L	5	21000	21000	--	--	31	23		20	17		33	24		32	24		30	23	
Total Thallium	ug/L	0.1	0.8	0.8	--	0.8	<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1	
Total Tin	ug/L	2	--	--	--	--	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Titanium	ug/L	2	--	--	--	--	<3	4		<3	7		<3	<3		<3	<3		<3	<3	
Total Uranium	ug/L	0.2	300	15	--	15	<0.2	<0.2		<0.2	<0.2		<0.2	<0.2		<0.2	<0.2		<0.2	<0.2	
Total Vanadium	ug/L	2	6	120	--	--	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Zinc	ug/L	5	30	7	--	30	7	15	25	<5	12	<5	7	8	10	5	26	17	6	<5	8
Microbiological Parameters																					
Total Coliforms	MPN/100 mL	100	--		--	--	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200
E. Coli	MPN/100 mL		--		400/ 100 mL	--	17	>200	95	20	93	12	11	24	12	12	23	29	2	4	11
Chlorophyll A - Spectrophotometer	ug/L	0.30	--		--	--	2.1	2.1	1.1	0.6	0.3	1.0	1	1.3	1	2.0	0.9	1 2	1.4	3.1	0.9

Notes:

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).

[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for he Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

* Secchi depth measurement not possible, disc visible at bottom of the watercourse or he sample location was too shallow for secchi depth use (KL4, KL5, HWY-102 locations, and LSD).

RDL = Reported Detection Limit (represents most recent sampling event)

" -- " = no guideline available / no parameter tested.

Bold and Black Shaded	Concentration exceeds CCME FWAL applicable guideline.
Underlined and Black Shaded	Concentration exceeds Health Canada Guideline for Recreational Water Quality (Reference Guidelines)
Italics and Black Shaded	Concentration exceeds NSECC EQS Contaminated Sites Regulations

Table C1: Bedford West Water Quality Sampling Program - 2023 Results

Tested Parameters	Units	RDL (2022)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HWY-102-1			HWY-102-2			LSD			LU			PML-1			PML-2		
Sampling Event							Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall	Spring	Summer	Fall
Sampling Date							13-Jun-23	28-Aug-23	16-Oct-23	13-Jun-23	28-Aug-23	16-Oct-23	13-Jun-23	28-Aug-23	16-Oct-23	13-Jun-23	28-Aug-23	16-Oct-23	13-Jun-23	28-Aug-23	16-Oct-23	13-Jun-23	28-Aug-23	16-Oct-23
Sampling Time							9:30 AM	9:45 AM	10:45 AM	1:15 PM	1:30 PM	2:40 PM	11:20 AM	11:20 AM	12:40 PM	10:10 AM	10:15 AM	11:15 AM	8:20 AM	8:55 AM	9:55 AM	8:00 AM	8:35 AM	9:45 AM
Field Data (in Situ)																								
Secchi Depth	meters	--	--	--	minimum of 1.2	--	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*
Water Temp	Celsius	--	--	--	--	--	15.9	16.1	12.4	16.6	17.1	13.1	18.2	17.6	13.0	18 3	17.7	14.0	17.7	19.7	15.2	18.2	18.5	14.6
Dissolved Oxygen	mg/L	--	--	--	--	> 5.5	5.88	**4.31**	**5.48**	6.66	**3.21**	**4.43**	6.58	9.14	7.47	9.02	**4.91**	7.65	9.16	8.79	9.37	9.19	7.14	8.79
pH	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	6.84	7.75	6.67	**6.41**	**6.03**	**6.48**	**6.39**	6.87	6.82	6.79	**6.35**	6.98	6 80	6.66	6.95	7.00	6.58	6.94
Specific Conductance (µs/cm)	uS/cm	--	--	--	--	--	423.3				294.2		147.0			661 0			206.3	144.9		256.7	181.0	
Inorganic Parameters																								
Alkalinity	mg/L	5	--	--	--	--	21	20	23	6	18	9	13	12	17	13	17	24	6	9	13	7	9	13
Chloride	mg/L	1	--	120	--	120	**125**	44	48	87	91	64	41	14	20	**124**	52	52	59	30	33	61	31	36
Fluoride	mg/L	0.12	--	--	--	0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	**<0.60**	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
True Color	TCU	5	--	--	--	--	9 2	55.8	39.6	14.7	107	44.8	13.5	52.6	30	10	47.9	19 8	17.4	56.4	40.3	11.5	45.9	40.1
Nitrate + Nitrite as N	mg/L	0.05	--	--	--	--	0.36	0 29	0.68	0.05	0.08	0.54	0.11	0.06	0.29	2.81	1.48	3.44	0.26	0.39	0 59	0.26	0.24	0.57
Nitrate as N	mg/L	0.05	--	13	--	13	0.30	0 29	0.33	0.05	0.08	0.07	0.11	0.06	0.09	2.81	1.48	3.01	0.26	0.39	0 27	0.26	0.24	0.27
Nitrite as N	mg/L	0.05	--	0.06	--	0 06	0.06	<0 05	**0.35**	<0.05	<0.05	**0.47**	<0.05	<0.05	**0.2**	<0.05	<0.05	**0.43**	<0.05	<0.05	**0.32**	<0.05	<0.05	**0.3**
Ammonia as N	mg/L	0.03	--	--	--	1.15 note [5]	<0.03	<0 03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0 03	<0.03	<0.03	<0.03
Total Kjeldahl Nitrogen as N	mg/L	0.3	--	--	--	--	0.16		0.35	0.1		0.32	0.29		0.31	0.28		0.65	<0.10		0.27	<0.10		0.26
Total Organic Carbon	mg/L	0.5	--	--	--	--	10.6	9.9	6 9	7.6	13	7	8.8	11	6.4	8.1	9.5	5.5	6.2	8.8	6 2	6.5	8.6	6.2
Ortho-Phosphate as P	mg/L	0.01	--	--	--	--	0.01	<0.01	<0 01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01
pH		--	6.5 - 9.0	5.0-9.0	6.5 - 9.0		6.84	7.75	6.67	**6.41**	**6.03**	**6.48**	**6.39**	6.87	6.82	6.79	**6.35**	6.98	6.8	6.66	6.95	7.00	6 58	6.94
Total Calcium	mg/L	0.1	--	--	--	--	18.7	10.5	11 3	11.7	7.4	7.1	6.4	4.2	4.8	18.3	9.1	12.1	6.8	5.1	5.7	7 2	5.7	5.6
Total Magnesium	mg/L	0.1	--	--	--	--	2.7	1.6	1.8	1 8	1.1	1.2	1.4	1	1.2	2.6	1.4	1.8	1.2	0.9	0.9	1.1	0 8	0.9
Total Phosphorus	mg/L	0.006	--	--	--	0.01 note [6]	0.007	<0.002	0.004	0.007	0.002	0 004	0.008	<0.002	**0.042**	0.008	<0.002	0.004	0.007	0.005	**0.021**	0.008	0.002	0.003
Total Potassium	mg/L	0.1	--	--	--	--	2.2	2.0	2.1	1.3	1.4	1.3	1.1	1.1	1.3	2.8	2	2.5	1	1	1.1	1.1	1 0	1.1
Total Sodium	mg/L	0.1	--	--	--	--	68.3	28.9	29.2	71 3	59.6	42.5	24.3	11.9	13.1	105	36.7	39.5	37.5	21	21.9	36.5	19 9	21.4
Reactive Silica as SiO2	mg/L	0.5	--	--	--	--	1.7	4.1	4.5	2.4	5 3	5.5	1.6	3.1	3.7	3.2	3.9	5.6	1.9	2.9	3.4	2.2	2.6	3.1
Total Suspended Solids	mg/L	5	--	--	--	note [7]	<5	<5	<5	<5	6	<5	<5	<5	<5	<5	10	<5	<5	<5	<5	<5	<5	<5
Sulphate	mg/L	2	--	128	--	--	17	11	14	11	10	7	5	4	4	26	14	18	8	7	7	8	7	8
Turbidity	NTU	0.1	--	--	50	--	0.8	1.3	1.4	0.7	3.8	1.6	2.9	1.5	6.0	1.3	6.6	12.1	0.9	0.8	0.8	0.8	0.6	1.1
Conductivity	umho/cm	1	--	--	--	--	392.1	18.2	197.4	476.7	249.7	384.1	128.2		89.7	577	304.4	194.6	206.3	130.3	128.8	223.1	156 9	128.4
Calculated Parameters																								
Anion Sum	me/L		--	--	--	--	4.33	1.89	2.15	2.81	3.14	2.57	1.53	0.72	1.01	5.63	2.20	2.57	1.97	1.20	1.38	2.05	1.22	1.48
Bicarb. Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	21	20	23	6	18	9	13	12	17	13	17	24	6	9	13	7	9	13
Calculated TDS	mg/L	1	--	--	--	--	248	112	124	188	184	132	88	44	57	339	133	157	119	73	80	121	72	84
Carb. Alkalinity (as CaCO3)	mg/L	10	--	--	--	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cation sum	me/L	--	--	--	--	--	4.20	1.99	2.06	3.89	3.19	2.40	1.57	0.88	0 99	5.78	2.31	2.61	2.12	1.30	1.37	2.09	1.27	1.34
Hardness	mg/L	--	--	--	--	--	57.8	32.8	35.6	36.6	23.0	22.7	21.7	14.6	16.9	56.4	28.5	37.6	21.9	16.4	17.9	22.5	17.5	17.7
% Difference/ Ion Balance (NS)	%	--	--	--	--	--	1.5	2.6	2.3	16.2	0.8	5.0	1.5	9.6	0.7	1.4	2.3	0.7	3.6	4.0	0.5	1.0	2.1	5.1
Langelier Index (@20C)	NA	--	--	--	--	--	-2.57	-2.77	-3.02	-3.52	-3.02	-3.90	-3.26	-3.38	-3.49	-2.81	-2.94	-2.96	-3.74	-3.50	-2.37	-3.56	-3.40	-3.46
Langelier Index (@ 4C)	NA	--	--	--	--	--	-2 89	-3.09	-3.28	-3.84	-3.34	-4.11	-3.58	-3.70	-3.69	-3.13	-3.26	-3.19	-4 06	-3.82	-2.61	-3.88	-3.72	-3.71
Saturation pH (@ 20C)	NA	--	--	--	--	--	9.03	9.27	9.24	9.77	9.49	9.90	9.66	9.85	9.77	9.26	9.41	9.23	9.98	9.91	9.79	9.89	9.86	9.79
Saturation pH (@ 4C)	NA	--	--	--	--	--	9.35	9.59	9.50	10.10	9.91	10.10	9.98	10.20	9.97	9.58	9.73	9.46	10.3	10.2	10.0	10.2	10.2	10.0
Metals (ICP-MS)																								
Total Aluminum	ug/L	5	5	5	--	100 (pH based)	***84***	***157***		**117**	**258**		**335**	**199**		**111**	**600**		**154**	**189**		**154**	**167**	
Total Antimony	ug/L	2	20	9	--	--	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Arsenic	ug/L	2	5.0	5.0	--	5	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Barium	ug/L	5	1000	1000	--	--	112	54		115	61		12	9		99	69		21	16		23	16	
Total Beryllium	ug/L	2	5.3	0.15	--	--	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Bismuth	ug/L	2	--	--	--	--	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Boron	ug/L	5	1200	1500	--	1500	14	11		6	7		14	15		16	11		7	7		9	12	
Total Cadmium	ug/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	<0.09	<0.09		<0.09	<0.09		<0.09	<0.09		***0.1***	<0.09		<0.09	<0.09		<0.09	<0.09	
Total Chromium	ug/L	1	---	8.9	--	--	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Cobalt	ug/L	1	10	1	--	--	<1	<1		<1	<1		<1	<1		<1	<1		<1	<1		<1	<1	
Total Copper	ug/L	1	2	2	--	2 - 2.41 note [8]	<2	<2	2	<2	***4***	<2	<2	<2	<2	<2	***9***	***4***	<2	<2	<2	<2	<2	2
Total Iron	ug/L	50	300	300	--	300	144	260	180	***348***	***1950***	***1040***	**410**	***387***	**369**	124	***621***	***456***	87	256	182	93	192	181
Total Lead	ug/L	0.5	1	1	--	1 - 3.26 note [8]	<0.5	<0.5		<0.5	0.8		<0.5	<0.5		<0.5	***1.3***		<0.5	<0.5		<0.5	0.9	
Total Manganese	ug/L	2	820	430	--	--	14	20	9	65	106	118	82	51	37	27	60	36	27	65	33	31	53	36
Total Molybdenum	ug/L	2	73	73	--	73	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Nickel	ug/L	2	25	25	--	25 - 97 03 note [8]	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Selenium	ug/L	1	1.0	1.0	--	1	<1	<1		<1	<1		<1	<1		<1	<1		<1	<1		<1	<1	
Total Silver	ug/L	2	0.1	0.25	--	0.25	<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1	
Total Strontium	ug/L	5	21000	21000	--	--	95	50		59	36		28	19		83	40		34	26		33	24	
Total Thallium	ug/L	0.1	0.8	0.8	--	0.8	<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1		<0.1	<0.1	
Total Tin	ug/L	2	--	--	--	--	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Titanium	ug/L	2	--	--	--	--	<3	<3		<3	4		6	4		<3	12		<3	<3		9	<3	
Total Uranium	ug/L	0.2	300	15	--	15	<0.2	<0.2		<0.2	<0.2		<0.2	<0.2		<0.2	<0.2		<0.2	<0.2		<0.2	<0.2	
Total Vanadium	ug/L	2	6	120	--	--	<2	<2		<2	<2		<2	<2		<2	<2		<2	<2		<2	<2	
Total Zinc	ug/L	5	30	7	--	30	*8*	5	*20*	*9*	5	*14*	5	<5	*10*	*30*	*36*	*29*	5	<5	*22*	<5	*15*	*18*
Microbiological Parameters																								
Total Coliforms	MPN/100 mL	100	--		--	--	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200
E. Coli	MPN/100 mL	1	--		400/ 100 mL	--	24	195	13	3	20	4	4	73	30	9	148	38	3	27	12	3	16	15
Chlorophyll A - Spectrophotometer	ug/L	0.30	--			--	1.3	1.7	0.8	0.4	0.3	0.3	11	0.9	0	3	9.3	5	1 2	0.4	0.4	1.6	1.1	0.6

Notes:

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).

[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for he Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

* Secchi depth measurement not possible, disc visible at bottom of the watercourse or he sample location was too shallow for secchi depth use (KL4, KL5, HWY-102 locations, and LSD).

RDL = Reported Detection Limit (represents most recent sampling event)

" -- " = no guideline available / no parameter tested.

Bold and Black Shaded	Concentration exceeds CCME FWAL applicable guideline.
Underlined and Black Shaded	Concentration exceeds Health Canada Guideline for Recreational Water Quality (Reference Guidelines)
Italics and Black Shaded	Concentration exceeds NSECC EQS Contaminated Sites Regulations

Table C2 Statistical Presentation of Key Water Quality Parameters - KL-1

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [5]	Kearney Lake																				
Sample Site (KL-1)								KL-1																				
Sampling Date	yyyy-mm-dd							2009-06-29	2009-08-13	2009-10-01	2010-05-31	2010-08-24	2010-11-01	2011-05-13	2011-08-14	2011-10-16	2012-05-01	2012-08-14	2012-10-10	2013-05-15	2013-08-16	2013-10-16	2014-05-14	2014-08-14	2014-10-27	2015-05-20	2015-08-25	2015-10-22	2016-05-16
Sampling Time	hh:mm							08:00	11:45	08:30	11:00	13:10	12:00	11:00	14:30	14:00	8:30	11:20	9:50	10:20	11:10	13:30	10:30	14:15	14:55	08:30	14:54	12:30	9:30
FIELD DATA																												
Secchi Depth	Meters	--	--	--	1.2	--	--	4.1	4.2	5.0	N/A	5.0	4.9	2.4	3.2	2.4	2.4	5.4	N/A	2.5	2.0	2.9	2.4	2.7	2.5	NCC	N/A	2.2	1.8
Water Temp	Celsius	--	--	--	--	--	--	14.0	22.2	16.7	12.9	23.3	8.8	11.5	25.6	15.9	8.9	23.3	15.4	13.2	22.2	14.1	12.7	23.2	12.2	14.1	26.1	9.4	12.8
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	10.77	8.20	7.00	9.13	7.86	10.48	10.69	8.22	9.22	8.98	7.93	8.72	9.76	8.57	8.30	15.29	7.22	8.12	9.55	8.13	7.38	14.02
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.20	6.76	6.67	7.23	7.32	6.61	6.60	6.16	6.84	8.67	6.91	6.32	6.32	8.24	6.35	6.74	7.46	6.44	8.33	6.95	7.02	8.29
Specific Conductance	uS/cm	--	--	--	--	--	--	263.0	299.0	261.0	248.0	242.0	218.7	268.0	178.6	146.3	277.0	279.0	198.1	243.0	216.5	217.9	547.0	341.0	223.0	0.2	298.3	238.5	239.0
INORGANICS																												
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	6	8	8	7	8	6	<5	9	7	24	7	<5	<5	<5	8	30	14	<5	5	6	7	5
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	81	74	64	62	60	55	73	45	33	66	70	50	66	59	48	80	76	46	60	62	58	55
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Colour	TCU	5	--	--	--	--	--	18	18	16	26	8	21	28	40	45	50	11	20	11	37	20	13	8	23	37	8	22	31
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.18	0.09	0.12	0.21	0.16	0.23	0.20	0.11	0.13	0.20	0.09	0.10	0.18	0.14	0.19	0.11	0.11	0.08	0.15	0.15	0.17	0.10
Nitrate (N)	mg/L	0.05	--	13	--	13	--	0.18	--	--	0.21	0.16	--	0.20	--	--	0.20	0.09	0.10	0.18	0.14	0.19	0.11	0.11	0.08	0.15	0.15	0.17	0.10
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen) *	mg/L	0.03	--	--	--	1.15 note [6]	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.04	0.03	<0.03	0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.060	<0.03	<0.03	0.05
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.9	3.1	0.4	--	0.7	<0.4	1.1	<0.4	0.4	0.2	4.5	0.4	0.7
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	2.4	2.9	4.7	3.3	3.2	3.1	3.4	5.9	5.5	5.4	2.9	5.2	4.4	4.1	4.3	4.6	2.4	4.4	3.0	5.3	5.5	4.3
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01
pH (Lab)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.94	6.65	6.68	6.91	7.00	6.79	6.52	6.51	6.52	6.70	7.20	6.90	6.78	6.93	6.85	6.72	7.06	6.35	6.62	6.95	6.99	6.64
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	9.2	8.5	7.2	7.7	8.7	8.3	7.7	4.8	5.3	6.8	8.4	6.3	7.5	6.6	6.5	8.1	11.0	6.0	6.400 0	7.9	6.1	6.8
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	1.5	1.4	1.2	1.4	1.4	1.3	1.3	0.9	1.1	1.1	1.5	1.5	1.1	1.2	1.2	1.6	1.6	0.9	920.0	1.3	0.9	1.1
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0 010	<0.020	<0 020	<0.002	0 009	0.007	0 005	0 008	0.012	0 009	0.037	0.043	0 007	0.007	0.011	0 008	0.011	0.026	0.013	0.008	0 002	0.011	0.024
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	1.1	0.9	1 3	0 9	0.9	0 9	0 8	0.8	0 9	0.7	0.9	0 9	0.8	0.7	1.1	0.9	1 6	0.7	680.0	0 9	0.7	0.7
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	51 0	46 0	37.0	31 8	35 2	33.8	43.7	22 8	19.8	40.1	42.0	29.8	35 8	26.2	31 6	50 2	54.2	37 6	33 0	43.3	39 8	35 5
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	2 6	2.2	2 3	2 9	2.7	2 9	2 8	1.9	2 3	2.4	1.3	2 2	2.5	1 8	2 2	2.0	1 5	1 8	2.5	1 8	2.7	2.8
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	1	1	<1	4	17	3	2	2	3	<5	<5	<5	<5	5	<5	<5	<5	<5	<1 0	<5	<5	38
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	14	13	12	11	11	11	12	10	8	8	9	9	11	9	9	12	11	7	9	10	8	10
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	0.7	0.8	1 0	1 3	0.6	1 0	1 0	1.0	0 9	2.4	0.8	1 3	1.6	3 3	0 5	2.9	0.7	1 9	0.8	1 9	1.1	10 6
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	310	290	250	240	240	230	290	180	140	246	274	196	259	241	212	290	339	235	220	257	244	212
Calculated Parameters																												
Anion Sum	me/L	N/A	--	--	--	--	--	2.72	2 52	2.23	2.12	2 08	1.91	2 33	1 66	1.27	2 52	2 31	1.60	2.10	1.86	1.71	3.11	2.66	1.45	1 98	2.09	1 95	1 87
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	6	8	8	7	8	6	<5	9	7	24	7	<5	<5	<5	8	30	14	<5	5	6	7	5
Calculated TDS	mg/L	1	--	--	--	--	--	166	151	131	123	125	118	143	92	77	139	137	98	124	104	103	172	165	99	120	130	119	113
Carb. Alkalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1 0	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	2.85	2 57	2.12	1 92	2.10	2.02	2.42	1 33	1.25	2 24	2.41	1.79	2 08	1.61	1.84	2.77	3.09	2 05	1 84	2.43	2.14	2 03
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	29 00	27.00	23 00	25 00	27.00	26 00	24.00	16.00	18 00	21.50	27 20	21 90	23.30	21.40	21 20	26.80	34.10	18.70	20.00	25.10	18.90	21.50
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	2.33	0 98	2.53	4 95	0.48	2.80	1 89	11.00	0.79	5 90	2.10	5.30	0.70	7.30	2.40	5.80	7.50	17 20	3 66	7.50	4 50	4.10
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-2.68	-2 87	-2.94	-2.72	-2 51	-2.87	NC	-3.18	-3.21	-2.69	-2 63	-3.19	-3.24	-3.14	-3.02	-2.51	-2.36	-3.76	-3 21	-2.97	-2 97	-3.42
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-2.93	-3.12	-3.19	-2.97	-2.76	-3.12	NC	-3.43	-3.46	-3.01	-2 95	-3.51	-3.56	-3.46	-3.34	-2.83	-2.68	-4 08	-3.46	-3.29	-3 29	-3.74
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	9.62	9 52	9.62	9 63	9 51	9.66	NC	9 69	9.73	9 39	9.83	10.10	10.00	10.10	9 87	9 23	9.42	10.10	9 83	9.92	9 96	10.10
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	9 87	9.77	9.87	9 88	9.76	9.91	NC	9 94	9.98	9.71	10 20	10.40	10.30	10.40	10 20	9 55	9.74	10.40	10.10	10 20	10.30	10.40
Metals (ICP-MS)																												
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	230	--	--	289	48	--	338	--	--	321	43	168	191	120	56	229	42	155	100	--	88	206
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2
Total Arsenic (As)	µg/L	2	5.0	5 0	--	5	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	16	--	--	19	16	--	13	--	--	12	15	9	12	7	16	14	20	9	16	--	17	14
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	8	--	--	11	9	--	<50	--	--	<5	11	33	6	10	9	7	22	10	<50	--	<5	8
Total Cadmium (Cd)	µg/L	0.017	0.01	0 09	--	0 04 - 0.16 note [8]	--	<0.3	--	--	0.053	<0.017	--	0.056	--	--	0.032	0.027	0.021	0.020	<0.017	0.017	0.037	<0.017	0.025	--	--	0.187	0.029
Total Chromium (Cr)	µg/L	1	---	8 9	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	6	<1	<1	<1.0	--	<1	<1
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	1	--	--	1	<0.40	--	1	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.40	--	<1	<1
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	<2	--	--	6	<2.0	<2.0	<2.0	<2.0	<2.0	<2	<2	<2	<2	<1	1	1	<1	1	<2.0	<1	2	<1
Total Iron (Fe)	µg/L	50	300	300	--	300	--	130	--	--	313	62	125	177	162	384	229	137	195	207	132	92	147	124	168	110	157	81	149
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	<0.5	--	--	10.3	<0.50	--	<0.50	--	--	<0.5	<0.5	1.9	<0.5	<0.5	<0.5	5.1	<0.5	<0.5	<0.50	--	<0.5	<0.5
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	100	--	--	79	57	59	78	52	56	48	65	68	73	48	24	48	115	42	39	41	22	47
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	5	--	--	3	<2.0	--	3	--	--	<2	<2	2	2	<2	<2	3	<2	3	<2.0	--	<2	3
Total Selenium (Se)	µg/L	1	1.0	1 0	--	1	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	--	<1	<1
Total Silver (Ag)	µg/L	0.1	0.1	0 25	--	0 25	--	<0.5	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	46	--	--	39	38	--	36	--	--	32	41	32	37	33	30	40	45	26	29	--	19	30
Total Thallium (Tl)	µg/L	0.1	0.8	0 8	--	0 8	--	<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	11	--	--	6	<5.0	--	5	--	--	8	<2	3	4	2	<2	2	<2	5	2	--	<2	2
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	0.1	--	--	0.1	<0.1	--	0.1	--	--	0.1	<0.1	0.1	0.1	0.1	<0.1	0.1	<0.1	<0.1	<0.1	--	<0.1	0.1
Total Vanadium (V)	µg/L	2	6	120	--	--	--	<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	27	--	--	14	8	11	12	13	10	5	<5	11	11	6	5	14	<5	9	13	8	<5	11
MICROBIOLOGICAL																												
Total Coliform	MPN/100mL	1	--	--	--	--	--	200	65	--	>250	63	>250	91	>250	--	2,420	>2420	1,120	1,200	866	488	525	1,550	>2420	---	980	122	866
E. coli	MPN/100mL	1	--	--	400	--	--	39	24	--	9	15	37	8	>250	<100	41	11	17	48	2	7	<1	15	28	60	24	6	4
Chlorophyll A - Spectrophotometer	µg/L	0 25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Acidification method	µg/L	0 05	--	--	--	--	--	0.53	0.79	1.11	1.73	1.47	0.99	0.76	1.44	1.36	0 62	2 30	1.54	1 22	1.40	1.19	0.40	0.41	0.84	0 64	1.14	1.79	2.76
Chlorophyll A - Welschmeyer method	µg/L	0 05	--	--	--	--	--	0.48	0 69	1.17	1.61	1.42	0.81	0 69	1.15	1.14	0 63	2 30	2.16	1.40	1.40	1.19	1 32	0.36	0.80	0 62	1.11	0 95	3.48

Notes:

N/A - Not Applicable, NC - Not Calculable, NCC Not Collected

RDL = Reported Detection Limit (represents most recent sampling event)

"--" = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

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[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[6] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[5] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.

(**) Dissolved oxygen field data not recorded - Post-calibration failure of field equipment for DO sensor.

Bold (black shaded) = Present Result - Parameter concentration exceeds CCME FWAL Guideline.

Underlined (black shaded) = Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality

Italics (black shaded) = Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations

Blue shaded = Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guide ine for Recreational Water Quality

Table C2 Statistical Presentation of Key Water Quality Parameters - KL-1

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [5]	Kearney Lake					Kearney Lake													
Sample Site (KL-1)																							KL-1			
Sampling Date	yyyy-mm-dd							2016-08-16	2016-10-25	2017-06-08	2017-08-15	2017-10-18	2018-05-08	2018-08-17	2018-10-17	05/09/2019	08-20-19	2019-11-08	02-Jul-20	17-Aug-20	29-Oct-20	27-May-21	09-Aug-21	22-Oct-21	31-May-22	18-Aug-22	21-Oct-22
Sampling Time	hh mm							7:50	13:20	8:30	9 30 AM	9:35 AM	9:15 AM	7 50 AM	9 00 AM	8:40 AM	9:15 AM	8:45 AM	3:05 PM	11:40 AM	12 59 PM	12:15 PM	12:12 PM	11 20 AM	1 00 PM	11 22 AM	11 55 AM
FIELD DATA																										
Secchi Depth	Meters	--	--	--	1.2	--	--	2.1	2.5	2.1	2.2	2.2	2.1	2.1	2.5	2.5	2.7	1.9	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	3.00
Water Temp	Celsius	--	--	--	--	--	--	22.2	11 9	16.6	23.2	14.1	12.2	24.2	12.8	12.2	23 6	10.4	25.4	22 6	11.6	15 6	22.6	15.2	18 9	22.64	14.6
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9 5	--	10.33	12.06	8.27	7 91	8 22	11.13	6.72	8 61	**	7.10	8 90	6.55	8 04	9.69	17 24	7.72	11 34	7.75	5.77	9.12
pH (in Situ)	pH	--	--	6.5 - 9 0	5.0-9 0	6.5 - 9 0	--	4.60	6.23	7.47	7 00	7 84	7.85	7 51	6 84	9.70	7.41	6.77	6.43	6 67	6.54	6.76	5.95	6.72	7.14	7 27	9.47
Specific Conductance	uS/cm	--	--	--	--	--	--	298 0	212.4	240 0	292.0	312.0	203.1	288.2	253.7	205 0	160.0	194 0	245 0	219.0	219 6	176 0	202.0	189 0	299.4	70	270.6
INORGANICS																										
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	8	6	<5	8	10	<5	9	7.0	<5	7.0	<5	<5	8.0	7 0	<5	9	10	6	9	7
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	57	45	71	73	60	53	54	55	75	59	43	65	59	60	49	48	53	84	73	67
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.12	--	<0.12	<0.12
Colour	TCU	5	--	--	--	--	--	17	18	15	14	12	42	16	18	41	21	19	22	11	16	20.7	14.7	10.9	16.1	9.5	11.0
Nitrite + Nitrate	mg/L	0 05	--	--	--	--	--	0.15	0.13	0.20	0 29	0.10	0.26	0.16	0 2	0 2	0.1	0.3	0.10	0 06	0.17	0.14	0.11	0.23	0.16	0.17	0.10
Nitrate (N)	mg/L	0 05	--	13	--	13	--	0.08	0.13	0.08	0 08	0.10	0.16	0 07	0.2	0 2	0.1	0.3	0.10	0 06	0.17	0.14	0.11	0.23	0.16	0.17	0.10
Nitrite (N)	mg/L	0 05	--	0 06	--	0 06	--	0.07	<0 05	0.12	0.21	<0 00	0.10	0.09	<0 03	<0 05	<0 05	<0 05	<0 05	<0 05	<0 05	<0 05	<0 05	<0 05	<0 05	<0 05	<0 05
Nitrogen (Ammonia Nitrogen) *	mg/L	0 03	--	--	--	1.15 note [6]	--	0.09	<0 03	<0 03	<0 03	0 04	<0 03	0 08	0.1	<0 03	0.1	0.1	<0 03	0 08	<0 03	<0 03	<0 03	<0 03	<0 03	<0 03	<0 03
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	<0.4	0.6	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	0.6	3.0	<0.4	0 60	1.70	0.19	0 22	<0 10	0.18	0 22	0.14
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	3.4	7.3	4 5	4 6	4.8	5.1	3.1	4.0	4 3	4.2	4.0	3.20	3 90	12.10	5 2	3.1	5 2	3 8	4.2	3 8
Orthophosphate (as P)	mg/L	0 01	--	--	--	--	--	<0.01	<0.01	<0 01	<0.01	<0.01	<0.01	<0 01	<0.01	<0 01	<0.01	<0.01	<0 01	0 01	0.01	<0 01	<0.01	<0 01	0.13	<0.01	0.02
pH (Lab)	pH	N/A	--	6.5 - 9 0	5.0-9 0	6.5 - 9 0	--	7.23	6 81	6.64	7 07	7 00	6.71	7 31	7 07	6.70	6 95	6.70	6.82	6 94	6.79	6.69	6 50	7.06	6 94	6 55	6.23
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	8 0	6.3	8 6	7.1	8.3	5 8	7 2	6.9	7 0	7.8	4.2	6 8	5.4	6.4	9 2	7.5	8 6	8 3	8.3	7 3
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	1.1	1.2	1 3	1 2	1 3	1 0	1 2	1 3	1 2	1 2	0 8	1 1	20 0	1 0	1 1	1 1	1 2	1 3	1 3	1 2
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0 010	0 005	0.008	0.010	0 010	0.005	0.012	0 007	0.008	0.011	0 005	0.008	0 008	0.036	0.029	<0.006	0.017	0.011	0.015	0.298	0.030
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	0 9	0.8	1 0	0 9	1 2	0.7	1 0	0.8	0 8	1.0	0.6	0 9	0.7	0 8	0 8	1.1	1 0	1.1	1.2	1 0
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	32 2	31 0	44.9	50 3	35.7	36.4	34.7	31.7	46.3	43.9	23.4	36.0	44.4	40.3	34 2	31 9	30.4	48 0	44 0	38.0
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	2 0	1.6	2 0	1 6	1.8	2 6	1.7	1.7	1.7	1.6	1.6	1.7	1.3	2 0	2 8	3.7	1.7	2 6	2.0	1.7
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	6 0	<5	<5	<5	<5	<5	<5	<5	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	10	10	11	9	10	8	7 0	9.0	10.0	9.0	9.0	9 0	8.0	9 0	8	8	10	9	9	9
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	0 9	2.6	1.4	1.1	0.8	1 3	0.7	2.1	0 9	3.2	2.9	3.4	0.8	0.7	1 0	2.1	0 9	1 0	1.4	0 6
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	270	161	271	260	249	243	261	215	280	232	129	266	275	239	205	217	222	313	286	257
Calculated Parameters																										
Anion Sum	me/L	N/A	--	--	--	--	--	1.99	1 61	2.25	2.43	2.11	1.68	1 86	1.9	2 3	2.0	1.42	2.03	2 00	2 03	1.56	1.71	1.92	2.69	2.44	2.22
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	8	6	<5	8	10	<5	9	7.0	<5	7.0	<5	<5	8	7	<5	9	10	6	9	7
Calculated TDS	mg/L	1	--	--	--	--	--	115	99	139	148	123	106	112	110.0	141 0	127.0	83.0	120	124	123	103	104	111	156	143	128
Carb. Alkalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	1.93	1 82	2.54	2.67	2.12	2.00	2 01	1.9	2 5	2.4	1.34	2.05	2 33	2.19	2.09	1 90	1.88	2 66	2.47	2.15
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	24 50	20.70	26 80	22.70	26.10	18.6	22 9	22 6	22.4	24.4	13.8	21.5	18 0	20.1	27 5	23 3	26.4	26.1	26.1	23.2
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	1.50	6 20	6.10	4 80	0 20	8 6	3 8	0.4	3 5	9.9	3.1	0 5	7.7	3.7	14 5	5.2	0 9	0 6	3.8	0.7	1.7
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-2.56	-3 20	-3.33	-2.78	-2 68	-3.42	-2.47	-2.8	-3.4	-2 9	-3.6	-3.24	-3 02	-3.15	-3.24	-3 26	-2.60	-2.97	-3.18	-3.66
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-2.88	-3 52	-3.65	-3.10	-3 00	-3.74	-2.79	-3.2	-3.7	-3 2	-3.9	-3.56	-3 34	-3.47	-3.56	-3 58	-2.92	-3.29	-3 50	-3.98
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	9.79	10.00	9.97	9 85	9 68	10.1	9.78	9.9	10.1	9 9	10.3	10.10	9 96	9.94	9.93	9.76	9.66	9 91	9.73	9.89
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	10.10	10.30	10 30	10 20	10.00	10.4	10.1	10 2	10.4	10 2	10.6	10.4	10 3	10.3	10 2	10.1	10.0	10 2	10 0	10.2
Metals (ICP-MS)																										
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	--	--	158	41	46	169	29	--	145	49	160	136	--	--	145	--	--	123	--	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Arsenic (As)	µg/L	2	5.0	5 0	--	5	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	--	--	16	--	17	12	16	--	14.0	15 0	8.0	18 0	--	--	14	--	--	22	--	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	--	<2	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	--	--	<5	--	26	5	10	--	5 0	11 0	5.0	9 0	--	--	16	--	--	7	--	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0 09	--	0 04 - 0.16 note [8]	--	--	--	0.058	--	<0 017	<0 09	<0 09	--	<0 09	<0 09	<0 09	0.024	--	--	<0 09	--	--	--	--	--
Total Chromium (Cr)	µg/L	1	---	8 9	--	--	--	--	--	<1	--	<1	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	--	--	1	--	<1	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	<1	<1	1	<1	2	1	<1	2.0	<1	1.0	1.0	2 0	<1	1 0	1	2	<1	<1	<1	<1
Total Iron (Fe)	µg/L	50	300	300	--	300	--	62	269	78	70	116	96	142	142	155	105	145	264	135	88	139	115	53	138	82	99
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	--	--	1.3	--	<0 5	1.3	<0 5	--	<0.5	<0 5	<0.5	<0 5	--	--	<0 5	--	--	<0 5	--	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	23	45	46	31	17	28	49	28 0	42.0	32 0	23.0	85	20	15	51	33	13	53	37	26
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	--	--	15	--	<2	<2	<2	--	2 0	<2	6.0	<2	--	--	7	--	--	<2	--	--
Total Selenium (Se)	µg/L	1	1.0	1 0	--	1	--	--	--	<1	--	<1	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Silver (Ag)	µg/L	0.1	0.1	0 25	--	0 25	--	--	--	<0.1	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	--	--	38	--	40	26	38	--	36.0	33 0	27.0	45.0	--	--	33	--	--	39	--	--
Total Thallium (Tl)	µg/L	0.1	0.8	0 8	--	0 8	--	--	--	<0.1	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	3.0	<2	--	--	<2	--	--	<2	--	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	--	--	<0.1	--	<0.1	<0.1	<0.1	--	0.1	<0.1	0.1	<0.1	--	--	<0 2	--	--	<0.2	--	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	--	--	2	--	<2	<2	<2	--	2 0	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	<5	19	58	<5	6	8	<5	19.0	8 0	<5	6.0	6 0	<5	<5	189	6	<5	<5	<5	<5
MICROBIOLOGICAL																										
Total Coliform	MPN/100mL	1	--	--	--	--	--	548	>2420	299	488	154	14	611	157.0	256	NDOGT	1198	>2420	345	158	>200	>200	>200	>200	8,600	4,800
E. coli	MPN/100mL	1	--	--	400	--	--	33	99	29	18	3	5	11	61 0	<1	6	26	59	11	1	25	130	43	18	1500	86
Chlorophyll A - Spectrophotometer	µg/L	0 25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1 26	4.42	1.73	0.95	0.95	2.4	1.05	1.4	2.3	1.5
Chlorophyll A - Acidification method	µg/L	0 05	--	--	--	--	--	0.90	2 08	1.45	1.75	1.10	1.91	1 26	1 63	1.50	2.18	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Welschmeyer method	µg/L	0 05	--	--	--	--	--	1.15	2.19	2.55	1 87	1.18	3.09	--	*	1.46	1 89	--	--	--	--	--	--	--	--	--	--

Notes:
N/A - Not Applicable, NC - Not Calculable, NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
"--" = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.
[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.
[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).
CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).
[4] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.
[5] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.
[6] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.
[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.
(**) Dissolved oxygen field data not recorded - Post-calibration failure of field equipment for DO sensor.

Bold (black shaded) = Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded) = Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded) = Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations

Blue shaded = Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guide ine for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - KL-2

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [5]	Kearney Lake																								
Sample Site - KL-2								KL-2																								
Sampling Date	yyyy-mm-dd							2009-06-29	2009-08-13	2009-10-01	2010-05-31	2010-08-24	2010-11-01	2011-05-13	2011-08-14	2011-10-16	2012-05-01	2012-08-14	2012-10-10	2013-05-15	2013-08-15	2013-10-16	2014-05-14	2014-08-14	2014-10-27	2015-05-20	2015-08-25	2015-10-22	2016-05-16	2016-08-16	2016-10-25	2017-06-08	2017-08-15	2017-10-18
Sampling Time	hh:mm							11:00	10:30	10:45	10:15	12:25	10:50	09:30	14:00	13:15	9:50	10:30	10:20	09:10	16:10	14:30	10:45	9:20	14:04	09:15	13:29	13:05	10:30	8:30	12:50	10:47	11:15 AM	10:30 AM
FIELD DATA																																
Secchi Depth	Meters	--	--	--	1.2	--	--	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NCC	N/A	1.3	2.1	1.8	1.9	2.0	1.5	1.2
Water Temp	Celsius	--	--	--	--	--	--	16.8	18.2	15.4	13.5	20.4	8.0	9.9	19.1	14.1	7.6	21.8	12.3	10.1	22.9	9.7	11.7	21.1	10.8	13.1	24.7	8.1	10.7	20.3	10.2	15.7	21.2	10.6
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	**10.16**	8.50	5.70	6.28	**4.66**	**9.58**	**9.66**	7.06	8.43	6.47	5.82	7.63	9.37	6.38	7.40	**14.90**	6.95	7.70	8.41	7.28	7.14	7.88	**4.21**	**9.65**	**9.72**	6.61	6.23
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	**6.33**	**6.35**	**6.19**	6.61	6.96	**6.25**	6.77	**5.90**	**5.62**	7.72	**6.41**	**6.29**	**5.75**	7.47	**5.57**	6.60	7.22	**5.79**	**6.36**	**5.88**	**6.43**	7.64	**5.97**	**5.54**	6.69	**6.00**	**6.29**
Specific Conductance	uS/cm	--	--	--	--	--	--	46.0	106.0	89.2	198.5	104.0	75.1	79.7	66.7	54.3	58.0	96.6	61.1	77.9	65.3	64.5	188.0	266.0	63.0	0.1	107.9	73.6	82.0	117.0	103.7	78.0	114.0	109.0
INORGANICS																																
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	8	8	8	8	7	<5	<5	7	<5	20	<5	8	<5	<5	<5	29	7	28	<5.0	7	<5	<5	10	6	5	12	9
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	48	48	48	48	25	17	19	14	10	16	20	12	19	21	14	20	17	12	15	14	12	17	26	30	20	19	19
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Colour	TCU	5	--	--	--	--	--	20	20	20	20	63	95	80	110	120	52	60	94	37	90	71	25	44	168	50	63	61	47	48	93	46	46	57
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.19	0.19	0.19	0.19	0.07	0.06	0.12	0.07	<0.05	0.11	0.08	<0.05	0.12	<0.05	<0.05	0.08	<0.05	<0.05	0.06	0.08	<0.05	<0.05	0.06	0.19	0.05	0.08	<0.05
Nitrate (N)	mg/L	0.05	--	13	--	13	--	0.19	0.19	0.19	0.19	0.07	--	0.12	--	--	0.11	0.08	<0.05	0.12	<0.05	<0.05	0.08	<0.05	<0.05	0.06	0.08	<0.05	<0.05	<0.05	0.19	<0.05	0.08	<0.05
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	<0.05	<0.05	<0.05	<0.05	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	<0.05	<0.05	<0.05	0.06	<0.05	0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen) *	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.03	<0.03	<0.03	<0.03	<0.05	<0.05	<0.05	<0.05	<0.05	<0.03	<0.03	<0.03	<0.03	0.04	<0.03	<0.03	0.04	<0.03	<0.050	<0.03	<0.03	0.05	0.06	<0.03	<0.03	0.03	0.04
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.4	2.2	0.7	--	1.1	<0.4	<0.4	0.4	<0.4	0.4	0.8	0.8	0.4	0.9	0.5	<0.4	0.5	<0.4
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	4.3	4.3	4.3	4.3	6.6	9.7	6.5	10.0	12.0	8.1	7.1	10.9	7.5	11.1	10.9	6.2	6.6	12.9	4.0	13.3	14.0	6.2	7.0	13.2	8.5	8.2	8.5
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pH (Lab)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.85	6.85	6.85	6.85	6.78	**6.11**	**6.27**	**6.40**	**6.05**	6.50	6.70	6.50	**6.37**	6.62	**6.34**	6.53	6.87	**6.06**	**6.32**	6.99	**6.28**	**6.35**	6.87	**6.19**	6.57	6.87	6.66
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	6.5	6.5	6.5	6.5	4.1	3.6	2.5	2.5	2.2	2.4	3.6	2.9	2.7	2.5	2.4	3.4	4.0	2.4	2,600.0	3.4	1.1	2.9	4.5	5.6	3.6	4.3	3.9
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	1.2	1.2	1.2	1.2	1.0	0.8	0.6	0.6	0.4	0.7	1.0	1.0	0.7	0.5	0.8	1.1	1.0	0.6	640.0	0.9	0.7	0.7	1.1	1.5	1.0	1.2	0.9
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	**0.020**	**0.020**	**0.020**	**0.020**	0.009	0.009	0.009	0.008	**0.013**	**0.021**	**0.059**	**0.013**	0.010	**0.020**	**0.029**	**0.013**	**0.039**	**0.025**	0.008	**0.012**	0.008	0.009	**0.016**	**0.013**	**0.012**	**0.028**	0.010
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	1.1	1.1	1.1	1.1	0.6	0.8	0.5	0.5	0.7	0.5	0.7	0.8	0.5	0.5	0.7	0.7	0.9	0.7	540.0	0.7	0.6	0.9	0.8	1.1	0.8	0.8	0.7
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	31.6	31.6	31.6	31.6	14.7	10.6	11.1	7.8	6.9	9.8	14.2	9.5	8.9	7.0	7.9	17.5	14.0	7.6	8.4	11.5	6.6	11.5	16.1	17.7	13.8	15.4	13.0
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	2.2	2.2	2.2	2.2	4.2	4.7	2.7	4.3	4.0	2.6	4.0	4.9	2.8	4.4	4.9	2.4	3.3	4.6	2.0	3.7	5.1	2.0	2.3	4.5	1.3	2.2	4.6
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	103	103	103	103	7	<1	<1	<2	<1	<5	<5	<5	<5	135	<5	<5	<5	<5	<1.0	<5	17	<5	<5	<5	<5	12	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	9	9	9	9	<2	<2	<2	<2	<2	3	3	2	4	5	4	4	2	3	3	<2	3	4	3	7	3	2	3
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	0.5	0.5	0.5	0.5	1.0	1.0	0.4	0.7	0.6	0.5	1.1	1.0	1.9	2.2	1.0	0.9	0.8	1.2	<1.0	1.6	6.2	0.7	2.0	1.9	0.8	4.4	1.6
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	212	212	212	212	100	97	79	66	54	71	91	61	83	69	62	87	94	66	64	81	73	79	135	125	93	110	97
Calculated Parameters																																
Anion Sum	me/L	N/A	--	--	--	--	--	0.49	0.82	0.45	0.77	0.85	0.49	0.53	0.53	0.28	0.92	0.63	0.54	0.63	0.70	0.48	1.23	0.66	0.96	0.48	0.54	0.40	0.56	1.00	1.13	0.73	0.82	0.78
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	<1	8	<1	5	7	<1	<1	7	<1	20	<5	8	<5	<5	<5	29	7	28	<1.0	7	<5	<5	10	6	5	12	9
Calculated TDS	mg/L	1	--	--	--	--	--	36	55	35	46	55	38	37	34	25	45	44	34	37	37	31	65	44	44	32	36	25	38	59	68	46	51	47
Carb. Alkalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	0.71	0.99	0.67	0.74	0.95	0.74	0.68	0.55	0.49	0.65	0.94	0.73	0.63	0.54	0.60	1.07	0.97	0.57	0.57	0.82	0.47	0.76	1.09	1.25	0.91	1.05	0.90
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	10.00	15.00	10.00	12.00	14.00	12.00	9.00	9.00	8.00	8.90	13.10	11.40	9.60	8.30	9.30	13.00	14.10	8.50	9.10	12.20	5.60	10.10	15.80	20.20	13.10	15.70	13.40
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	18.30	9.39	19.60	1.99	5.56	20.30	12.40	1.85	27.30	17.60	19.70	15.10	0.30	12.90	11.00	7.10	19.10	25.70	8.57	20.50	7.50	14.90	4.50	5.30	11.00	12.30	7.50
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	NC	-3.20	NC	-3.44	-3.05	NC	NC	-3.66	NC	-3.37	-3.60	-3.68	-4.05	-3.83	-4.12	-3.04	-3.23	-3.66	NC	-3.18	-4.51	-4.04	-3.04	-3.85	-3.73	-2.98	-3.35
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	NC	-3.45	NC	-3.70	-3.30	NC	NC	-3.91	NC	-3.69	-3.92	-4.00	-4.37	-4.15	-4.44	-3.36	-3.55	-3.98	NC	-3.50	-4.83	-4.36	-3.36	-4.17	-4.05	-3.30	-3.67
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	NC	9.78	NC	10.00	9.83	NC	NC	10.10	NC	9.87	10.30	10.20	10.40	10.50	10.50	9.57	10.10	9.72	NC	10.20	10.80	10.40	9.91	10.00	10.30	9.85	10.00
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	NC	10.00	NC	10.30	10.10	NC	NC	10.30	NC	10.20	10.60	10.50	10.70	10.80	10.80	9.89	10.40	10.00	NC	10.50	11.10	10.70	10.20	10.40	10.60	10.20	10.30
Metals (ICP-MS)																																
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	**290**	--	--	**175**	**151**	--	**271**	--	--	**209**	**205**	**338**	**256**	**270**	**259**	**205**	**236**	**340**	**180**	--	**284**	**187**	--	--	**185**	**150**	**240**
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--	<2
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--	<2
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	9	--	--	12	14	--	10	--	--	9	11	10	8	<5	13	13	18	9	9	--	9	10	--	--	10	--	14
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--	<2
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	8	--	--	15	13	--	<50	--	--	6	14	22	6	11	9	11	12	12	<50	--	<5	9	--	--	<5	--	17
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	<0.3	--	--	**0.018**	<0.017	--	<0.017	--	--	<0.017	<0.017	<0.017	<0.017	<0.017	**0.019**	<0.017	<0.017	**0.018**	**0.014**	--	**0.176**	<0.017	--	--	**0.041**	--	<0.017
Total Chromium (Cr)	µg/L	1	----	8.9	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	**9**	<1	<1	<1.0	--	<1	1	--	--	<1	--	1
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1	--	--	<0.40	<0.40	--	<0.40	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.40	--	<1	<1	--	--	<1	--	<1
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	<2	--	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	<2	<2	<2	<1	2	<1	<1	**4**	<2.0	<1	<1	<1	<1	2	<1	1	1
Total Iron (Fe)	µg/L	50	300	300	--	300	--	250	--	--	227	**403**	238	202	**418**	**358**	154	**541**	**813**	269	528	**523**	174	**723**	**305**	250	**641**	**478**	232	**1,000**	290	168	**759**	**572**
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	<0.5	--	--	**1.0**	<0.50	--	<0.50	--	--	<0.5	<0.5	**1.1**	<0.5	0.5	<0.5	**5.8**	<0.5	0.5	<0.5	--	0.6	<0.5	--	--	<0.5	--	<0.5
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	26	--	--	43	83	35	12	68	23	17	90	114	24	67	53	33	146	25	47	120	57	21	109	39	39	96	64
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<2	--	--	<1	<1	--	<1	--	--	<1	<1	1	<1	<1	<1	<1	<1	<1	<1.0	--	<1	<1	--	--	<1	--	<1
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.5	--	--	**0.420**	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	--	<0.1	<0.1	--	--	<0.1	--	<0.1
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	14	--	--	18	20	--	12	--	--	10	18	15	12	9	12	16	17	12	12	--	8	12	--	--	15	--	20
Total Thal ium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	--	--	<2	<2	--	<2	--	--	<2	<2	3	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	2	--	--	<2	<2	--	3	--	--	<2	2	3	4	<2	2	2	<2	3	3	--	<2	<2	--	--	<2	--	<2
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1
Total Vanadium (V)	µg/L	2	6	120	--	--	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	8	--	--	5	5	7	<5.0	<5.0	<5.0	<5	<5	7	<5	<5	<5	<5	<5	<5	<5.0	<5	<5	<5	<5	8	<5	8	6
MICROBIOLOGICAL																																
Total Coliform	MPN/100mL	1	--	--	--	--	--	1,800	170	--	>250	11	>250	59	>250	--	>2420	1,986	>2420	>2420	>2420	>2420	525	>2420	>2420	---	>2420	>2420	>2420	>2420	>2420	>2420	>2420	659
E. coli	MPN/100mL	1	--	--	400	--	--	**1,500**	100	--	**>250**	6	6	2	**>250**	<100	3	7	3	12	6	2	<1	18	11	30	11	5	4	15	25	31	16	3
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	0.82	6.05	1.97	0.73	0.55	0.22	0.44	0.89	0.97	0.53	2.20	0.07	0.62	1.00	0.73	0.13	0.83	0.41	0.34	0.96	0.46	0.30	1.86	0.32	0.99	1.47	0.31
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	0.87	5.97	1.95	0.66	0.54	0.21	0.42	0.73	0.82	0.56	2.20	0.12	0.72	1.00	0.74	0.14	0.86	0.41	---	1.26	0.26	0.43	2.43	0.36	1.86	1.81	0.49

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guide ines for Canadian Recreational Water Quality (Third Edition 2012).

[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.
(**) Dissolved oxygen field data not recorded - Post-calibration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Resu t - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - KL-2

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [5]	Kearney Lake													
Sample Site - KL-2								KL-2													
Sampling Date	yyyy-mm-dd							2018-05-08	2018-08-17	2018-10-17	05/09/2019	08-20-19	2019-11-08	02-Jul-20	17-Aug-20	29-Oct-20	27-May-21	09-Aug-21	22-Oct-21	31-May-22	18-Aug-22	21-Oct-22
Sampling Time	hh:mm							11:00 AM	10:10 AM	10:00 AM	10:44 AM	3:01 PM	10:45 AM	1:10 PM	4:05 PM	13.22 PM	11:33 AM	11:53 AM	11:46 AM	12:00 PM	11:40 AM	12:10 PM
FIELD DATA																					
Secchi Depth	Meters	--	--	--	1.2	--	--	2.1	1.4	1.4	2.2	1.80	1.20	1.35	1.60	NA*	0.2 m	NA*	1.65	NA*	NA*	NA*
Water Temp	Celsius	--	--	--	--	--	--	11.7	21.6	10.3	10.3	26.4	10.1	21.5	19.3	8.4	14.1	18.5	11.7	15.5	19.58	11.7
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	9.41	4.17	7.54	**	2.58	7.90	5.10	4.96	9.84	15.01	8.17	12.07	8.11	2.00	9.04
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.21	5.16	5.84	8.50	5.18	6.11	6.07	5.98	6.16	6.07	5.80	6.14	6.56	7.45	8.62
Specific Conductance	uS/cm	--	--	--	--	--	--	57.4	109.9	67.2	48.3	119.0	214.0	81.0	101.0	80.8	69.0	76.0	84.0	111.5	102	114.7
INORGANICS																					
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	<5	11	<5	<5	9.0	<5	9.0	14.0	7.0	8	8	15	95.0	24.0	10.0
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	12	19	11	13	16	14	17	21	15	13	13	14	24	19	19
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	<0.12			
Colour	TCU	5	--	--	--	--	--	82	59	123	76	106	77	59	40	81	47.0	84.1	66.3	59	65	80
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.07	0.05	<0.05	0.1	0.05	<0.05	0.12	0.10	0.08	0.05	0.41	0.10	0.29	0.12	0.10
Nitrate (N)	mg/L	0.05	--	13	--	13	--	0.07	<0.05	<0.05	0.06	0.05	<0.05	0.12	0.10	0.08	0.05	0.41	0.10	0.29	0.12	0.10
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	<0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen) *	mg/L	0.03	--	--	--	1.15 note [5]	--	0.04	0.06	0.05	<0.03	0.12	0.07	0.07	0.09	<0.03	<0.03	<0.03	0.44	<0.03	0.04	<0.03
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	<0.4	<0.4	<0.4	0.5	0.80	2.70	<0.4	1.70	0.60	0.24	0.24	<0.10	0.23	0.43	0.27
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	9.0	6.6	14.0	6.9	12.10	9.40	5.80	2.50	4.20	8.5	9.9	3.0	6.70	8.50	10.20
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.13	<0.01	0.01
pH (Lab)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.46	7.04	6.27	6.44	6.70	5.89	6.60	7.01	6.49	6.69	6.42	7.04	7.70	6.75	*6.29*
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	2.3	4.2	2.9	2.3	4.3	2.0	3.8	5.7	3.0	3.8	5.9	7.6	6.4	9.3	5.6
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	0.7	1.1	0.8	0.7	1.1	0.6	1.0	1.4	0.8	0.8	1.3	1.5	1.4	2.0	1.4
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	0.014	0.015	0.004	0.009	0.019	0.031	0.014	0.027	0.016	0.01	0.03	0.02	0.018	0.063	0.030
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	0.5	0.8	0.6	0.6	0.8	0.6	0.6	0.9	0.7	0.7	1.1	1.0	1.0	1.5	1.2
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	9.2	13.9	11.8	11.9	10.0	7.5	10.1	14.8	7.8	10.1	10.9	10.0	17.0	13.0	13.0
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	2.3	2.8	3.6	1.7	3.7	3.5	2.6	3.4	4.7	2.3	5.4	3.9	4.2	6.0	5.3
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	<5	<5	<5	<5	<5	<5	<5	<5	5.0	<5	<5	6.0	<5	<5	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	3	<2	3.0	3.0	<2	4.0	3.0	4.0	5.0	4	6	7	6.0	7.0	8.0
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	0.9	1.2	1.1	0.6	3.5	1.3	1.3	1.8	2.9	3.0	5.6	1.3	1.2	1.4	2.0
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	68	115	70	72	88	45	95	128	88	79	94	106	350	135	105
Calculated Parameters																					
Anion Sum	me/L	N/A	--	--	--	--	--	0.41	0.76	0.4	0.4	0.6	0.5	0.73	0.96	0.67	0.61	0.68	0.85	2.72	1.17	0.91
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	<5	11	<5	<5	9.0	<5	9	14	7	8	8	15	95	24	10
Calculated TDS	mg/L	1	--	--	--	--	--	28	47	31.0	32.0	40.0	29.0	42	58	38	38	46	52	115	68	55
Carb. Alkalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	0.62	0.97	0.8	0.7	0.9	0.5	0.78	1.13	0.64	0.76	0.97	1.04	1.24	1.28	1.03
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	8.6	15	10.5	8.6	15.3	7.5	13.6	20.0	10.8	12.8	20.1	25.2	21.7	31.5	19.7
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	20.8	12.4	36.7	25.6	14.6	6.4	3.1	8.2	2.6	10.4	17.7	10.3	37.5	4.4	6.4
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-4.02	-2.85	-4.1	-4.0	-3.3	-4.7	-3.42	-2.65	-3.73	-3.37	-3.46	-2.46	-1.11	-2.47	-3.52
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-4.34	-3.17	-4.4	-4.4	-3.6	-5.0	-3.74	-2.97	-4.05	-3.69	-3.78	-2.78	-1.43	-2.79	-3.84
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	10.5	9.89	10.4	10.5	10.0	10.5	10.00	9.66	10.20	10.1	9.88	9.50	8.81	9.22	9.81
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	10.8	10.2	10.7	10.8	10.3	10.9	10.3	10.0	10.5	10.4	10.2	9.8	9.1	9.5	10.1
Metals (ICP-MS)																					
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	228	123	--	156	257	318	227	--	--	204	--	--	*231*	--	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	7	14	--	10	37	9	15.0	--	--	13	--	--	23.0	--	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	7	13	--	7	11	7	14.0	--	--	11	--	--	16.0	--	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	<0.09	<0.09	--	<0.09	<0.09	<0.09	<0.017	--	--	<0.09	--	--	<0.09	--	--
Total Chromium (Cr)	µg/L	1	--	8.9	--	--	--	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1	<1	--	<1	1	<1	<1	--	--	<1	--	--	<1	--	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	<1	<1	1	<1	<1	1	<1	<1	1.0	1	2	<1	<1	<1	1.0
Total Iron (Fe)	µg/L	50	300	300	--	300	--	148	783	336	227	1,210	277	486	1,040	659	472	503	462	*338*	*631*	*339*
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	1.2	<0.5	--	<0.5	1.0	1.6	<0.5	--	--	0.7	--	--	<0.5	--	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	17	78	29	28	295	23	98	260	168	77	36	44	46	92	50
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	<2	<2	--	<2	<2	<2	<2	--	--	3	--	--	<2	--	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	10	24	--	13	24	13	17.0	--	--	17	--	--	22.0	--	--
Total Thal ium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	<2	<2	--	<2	2	2	3.0	--	--	4	--	--	3.0	--	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.2	--	--	<0.2	--	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	<5	<5	20	<5	9	6	<5	<5	<5	<5	<5	<5	<5	<5	<5
MICROBIOLOGICAL																					
Total Coliform	MPN/100mL	1	--	--	--	--	--	10	2420	140.0	1960	630	1240	>2420	>2420	1730	>200	>200	>200	>200	21,600	8,600
E. coli	MPN/100mL	1	--	--	400	--	--	4	20	50	<10	2	12	31	58	4	195	26	12	36	13	28
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	<0.25	0.53	4.25	3.15	0.95	0.6	0.79	0.6	2.0	0.5
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	0.51	1.25	0.73	0.47	1.67	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	0.91	--	*	0.49	1.50	--	--	--	--	--	--	--	--	--	--

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guide ines for Canadian Recreational Water Quality (Third Edition 2012).

[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.
(**) Dissolved oxygen field data not recorded - Post-calibration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Resu t - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - KL-3

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Kearney Lake																								
Sample Site KL-3								KL-3																								
Sampling Date	yyyy-mm-dd							2009-06-29	2009-08-13	2009-10-01	2010-05-31	2010-08-24	2010-11-01	2011-05-13	2011-08-14	2011-10-16	2012-05-01	2012-08-14	2012-10-10	2013-05-15	2013-08-16	2013-10-16	2014-05-14	2014-08-14	2014-10-27	2015-05-20	2015-08-25	2015-10-22	2016-05-16	2016-08-16	2016-10-25	2017-06-08	2017-08-15	2017-10-18
Sampling Time	hh:mm							09:00	11:00	09:30	11:30	14:12	11:40	10:30	12:20	12:00	10:26	12:20	11:20	9:50	10:00	14:00	11:00	11:50	14:25	10:35	11:45	10:40	11:00	11:30	11:00	9:36	10:15	10:15
FIELD DATA																																
Secchi Depth	Meters	--	--	--	1.2	--	--	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NCC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Water Temp	Celsius	--	--	--	--	--	--	14.0	21.6	17.3	14.7	23.1	9.9	10.3	21.1	15.5	9.0	24.5	15.6	11.7	21.5	13.6	11.0	22.7	12.8	14.7	25.0	8.4	12.1	21.7	12.5	16.1	22.5	13.8
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	**10.79**	8.00	8.00	9.26	7.83	**10.35**	**11.06**	8.42	**9.60**	8.89	8.17	7.72	**10.20**	9.20	8.90	5.90	7.87	8.12	8.02	**9.91**	8.65	9.34	7.72	**11.41**	9.00	7.40	8.17
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	7.27	6.74	6.97	7.27	7.33	6.76	6.83	6.96	**6.30**	7.68	6.85	6.51	**5.86**	7.25	**6.49**	6.55	7.37	6.67	6.84	6.87	7.17	7.40	6.82	**5.58**	7.02	7.04	6.97
Specific Conductance	uS/cm	--	--	--	--	--	--	95.0	282.0	246.0	220.0	228.0	199.4	220.0	175.0	161.3	204.0	225.0	177.2	207.3	194.4	210.6	405.0	252.0	208.0	0.2	245.1	236.6	213.0	264.0	227.8	204.0	248.0	248.0
INORGANICS																																
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	<5	7	7	6	7	7	6	7	7	23	6	5	<5	5	7	15	5	6	<5.0	6	6	<5	9	8	<5	8	9
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	66	63	60	55	55	53	56	43	37	50	57	46	54	40	46	58	46	45	60	56	56	54	56	49	63	56	59
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Colour	TCU	5	--	--	--	--	--	22	20	20	28	12	20	31	38	40	57	15	31	19	23	20	16	13	20	34	13	14	29	13	21	24	13	15
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.14	0.12	0.14	0.24	0.15	0.22	0.24	0.15	0.16	0.19	0.09	0.09	0.21	0.11	<0.05	0.17	0.13	0.13	0.16	0.12	0.21	0.14	0.13	0.10	0.24	0.30	0.24
Nitrate (N)	mg/L	0.05	--	13	--	13	--	0.14	--	--	0.24	0.15	--	0.24	--	--	0.19	0.09	0.09	0.21	0.11	<0.05	0.17	0.13	0.13	0.16	0.12	0.21	0.14	0.06	0.10	0.13	0.17	0.24
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	<0.05	<0.05	<0.05	**0.07**	<0.05	**0.11**	**0.13**	<0.05
Nitrogen (Ammonia Nitrogen) *	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.03	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.050	<0.03	<0.03	0.06	<0.03	<0.03	<0.03	0.03	0.03
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.4	2.8	<0.4	--	1.3	<0.4	0.6	0.4	0.4	0.2	1.2	0.9	<0.4	<0.4	0.4	<0.4	0.8	<0.4
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	2.6	3.9	4.3	3.6	3.1	3.3	3.8	5.1	5.0	5.9	3.4	4.9	4.3	4.4	4.6	4.6	2.8	4.5	3.4	5.7	5.8	4.3	2.7	8.0	5.3	4.9	4.1
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pH (Lab)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	**6.38**	6.67	6.82	6.82	6.99	6.87	6.52	6.50	**6.38**	6.70	7.10	6.90	6.68	6.96	6.86	6.68	6.87	6.59	6.54	6.92	6.94	6.69	7.28	6.93	6.77	7.13	6.88
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	6.7	7.1	6.8	6.8	8.0	8.3	7.1	4.7	5.6	5.7	6.9	6.0	7.0	5.3	6.8	6.4	7.9	6.8	6,600.0	7.8	5.2	6.2	8.3	7.3	6.9	7.2	8.1
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	1.2	1.2	1.1	1.2	1.3	1.3	1.2	0.8	1.0	1.0	1.2	1.3	1.0	0.9	1.3	1.4	1.2	1.0	940.0	1.2	0.9	1.0	1.3	1.3	1.0	1.1	1.2
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	<0.02	<0.02	0.005	0.005	<0.002	0.003	0.008	0.003	**0.012**	**0.019**	**0.045**	0.007	0.006	0.006	**0.012**	0.009	**0.023**	**0.148**	0.004	0.004	0.002	0.008	0.005	0.004	0.006	0.009	0.007
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	0.9	1.1	0.9	0.8	0.8	1.0	0.9	0.7	0.9	0.7	0.9	0.9	0.8	0.6	1.2	0.8	1.1	0.9	770.0	0.9	0.7	0.7	1.0	1.0	0.8	0.9	1.0
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	38.0	38.0	35.0	28.3	33.1	33.0	33.0	20.8	21.3	31.2	34.5	26.4	35.1	20.1	32.1	36.4	39.0	35.3	34.0	40.0	27.1	32.1	37.2	32.8	44.0	41.4	35.9
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	2.7	2.6	2.6	3.2	2.9	3.2	2.9	2.5	2.6	2.7	2.0	2.6	2.9	2.6	2.7	2.6	1.9	2.4	2.5	2.4	2.6	2.6	1.8	2.5	2.2	1.6	1.9
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	<1	1	1	2	<2	<1	<1	<1	<1	<5	<5	<5	<5	<5	<5	<5	<5	<5	3	<5	<5	<5	<5	<5	<5	<5	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	11	12	12	10	10	10	9	10	8	7	8	7	7	7	8	9	7	7	8	9	8	10	10	10	10	9	10
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	0.7	1.4	0.6	0.3	0.5	0.6	0.6	0.6	0.4	0.8	0.7	1.0	0.7	2.4	0.4	0.4	0.3	0.9	0.7	0.5	0.7	1.1	1.1	1.0	1.0	1.3	2.6
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	250	250	240	220	220	220	220	170	160	197	222	182	219	216	204	218	243	216	220	242	238	206	262	185	245	251	247
Calculated Parameters																																
Anion Sum	me/L	N/A	--	--	--	--	--	2.11	2.17	2.08	1.90	1.93	1.87	1.90	1.58	1.36	2.03	1.90	1.55	1.68	1.38	1.60	2.14	1.55	1.54	1.87	1.90	1.88	1.74	1.98	1.76	2.00	1.95	2.07
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	<1	7	7	6	7	7	6	7	7	23	6	5	<5	5	7	15	5	6	<1.0	6	6	<5	9	8	<5	8	9
Calculated TDS	mg/L	1	--	--	--	--	--	128	130	123	110	117	116	115	88	82	111	113	91	106	78	100	122	106	100	110	119	103	105	120	107	127	122	122
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	2.12	2.16	1.99	1.69	1.97	1.98	1.92	1.23	1.32	1.77	1.98	1.60	2.00	1.24	1.89	2.07	2.23	2.00	1.89	2.27	1.55	1.83	2.18	1.94	2.38	2.28	2.10
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	22.00	23.00	22.00	22.00	25.00	26.00	23.00	15.00	18.00	18.40	22.20	20.30	21.60	16.90	22.30	21.70	24.70	21.10	20.00	24.40	16.70	19.60	26.10	23.60	21.30	22.50	25.20
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	0.24	0.23	2.21	5.85	1.03	2.86	0.52	12.50	1.49	6.80	2.10	1.60	8.60	5.50	8.30	1.50	17.90	12.80	0.53	9.00	9.80	2.60	4.80	4.90	8.60	7.90	0.80
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	NC	-3.00	-2.89	-2.92	-2.60	-2.73	-3.23	-3.33	-3.35	-2.77	-2.88	-3.21	-3.37	-3.19	-3.05	-2.93	-3.12	-3.39	NC	-3.00	-3.15	-3.41	-2.44	-2.89	-3.29	-2.71	-2.85
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	NC	-3.25	-3.14	-3.17	-2.85	-2.99	-3.49	-3.58	-3.60	-3.09	-3.20	-3.53	-3.69	-3.51	-3.37	-3.25	-3.44	-3.71	NC	-3.32	-3.47	-3.73	-2.76	-3.21	-3.61	-3.03	-3.17
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	NC	9.67	9.71	9.74	9.59	9.60	9.75	9.83	9.73	9.47	9.98	10.10	10.00	10.20	9.91	9.61	9.99	9.98	NC	9.92	10.10	10.10	9.72	9.82	10.10	9.84	9.73
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	NC	9.92	9.96	9.99	9.84	9.86	10.00	10.10	9.98	9.79	10.30	10.40	10.40	10.50	10.20	9.93	10.30	10.30	NC	10.20	10.40	10.40	10.00	10.10	10.40	10.20	10.10
Metals (ICP-MS)																																
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	**259**	**259**	--	**124**	**54**	--	**266**	--	--	**199**	**54**	**153**	**140**	**65**	**100**	**260**	**52**	**105**	**180**	--	**90**	**163**	--	--	**128**	**36**	**43**
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	<2	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--	<2
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	<2	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--	<2
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	13	13	--	16	13	--	19	--	--	18	17	15	19	9	18	17	17	16	19	--	19	15	--	--	17	--	20
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	<2	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--	<2
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	<2	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	<2	<2	--	<2
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	9	9	--	8	9	--	<50	--	--	5	9	17	7	7	10	8	10	12	<50	--	<5	8	--	--	7	--	12
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	**0.019**	**0.019**	--	**0.030**	<0.017	--	**0.046**	--	--	**0.019**	**0.021**	**0.027**	**0.028**	<0.017	<0.017	**0.038**	<0.017	**0.017**	**0.033**	--	<0.017	**0.021**	--	--	**0.020**	--	<0.017
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	<1	<1	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	**7**	<1	<1	<1.0	--	<1	<1	--	--	<1	--	<1
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1	<1	--	<0.40	<0.40	--	<0.40	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.40	--	<1	<1	--	--	<1	--	<1
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	2	2	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	<2	<2	<3	<1	1	1	<1	2	<2.0	1	<1	2	<1	<1	<1	<1	1
Total Iron (Fe)	µg/L	50	300	300	--	300	--	**523**	**523**	--	73	133	58	136	104	154	137	136	119	131	71	172	137	96	118	120	165	115	112	117	99	125	83	130
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	<2.0	<0.5	--	0.6	<0.5	--	<0.5	--	--	<0.5	<0.5	0.7	<0.5	<0.5	0.9	**3.6**	<0.5	<0.5	<0.5	--	<0.5	<0.5	--	--	<0.5	--	<0.5
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	53	53	--	37	67	32	42	33	33	25	47	46	37	20	92	41	45	27	36	48	24	31	41	20	30	35	54
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	<2	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	<2	<2	--	2	<2.0	--	2	--	--	<2	<2	<2	<2	<2	<2	2	<2	<2	<2.0	--	<2	2	--	--	<2	--	<2
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<1	<1	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	--	<1	<1	--	--	<1	--	<1
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.1	<0.1	--	<0.10	<0.10	--	<0.10	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	--	<0.1	<0.1	--	--	<0.1	--	<0.1
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	12	12	--	34	36	--	33	--	--	25	33	29	33	18	32	31	32	29	29	--	21	28	--	--	33	--	41
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	<0.1	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	<2	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	2	2	--	<2.0	<2.0	--	5	--	--	<2	<2	<2	<2	<2	2	3	<2	2	3	--	<2	<2	--	--	<2	--	<2
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	<0.1	--	<0.1	<0.1	--	0.1	--	--	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	--	0.1	<0.1	--	--	<0.1	--	<0.1
Total Vanadium (V)	µg/L	2	6	120	--	--	--	<2	<2	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2	--	--	<2	--	<2
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	<5	<5	--	10	7	6	9	7	9	<5	<5	8	10	5	7	10	<5	6	9	7	8	8	<5	<5	6	6	6
MICROBIOLOGICAL																																
Total Coliform	MPN/100mL	1	--	--	--	--	--	120	24	--	190	16	58	72	110	--	291	1,553	178	345	2,420	1,300	86	1,730	>2420	---	2,420	285	548	1,990	2,420	687	2,420	411
E. coli	MPN/100mL	1	--	--	400	--	--	1	17	--	2	<1	8	5	37	<100	2	<1	3	8	21	<1	<1	<1	13	<0.10	7	6	2	38	30	7	13	46
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	1.04	1.11	1.18	1.30	1.14	0.51	0.78	1.26	1.24	0.52	1.30	0.81	1.44	2.00	0.65	0.76	0.59	1.23	0.72	1.27	1.34	1.63	0.81	2.29	1.96	1.24	1.34
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	0.94	0.97	1.21	1.09	1.19	0.42	0.67	0.98	1.01	0.55	1.20	1.14	1.62	2.30	0.61	0.69	0.51	1.12	0.68	1.34	0.69	2.00	0.99	2.37	2.46	1.32	1.87

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
* -- * = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).

[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.

(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - KL-3

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [4]	Kearney Lake												
Sample Site KL-3								KL-3												
Sampling Date	yyyy-mm-dd							2018-05-08	2018-08-17	2018-10-17	05/09/2019	08-20-19	2019-11-08	02-Jul-20	17-Aug-20	29-Oct-20	27-May-21	09-Aug-21	22-Oct-21	31-May-22	18-Aug-22	21-Oct-22
Sampling Time	hh:mm							10:30	9:10	11:30 AM	10:00 AM	10:00 AM	11:45 AM	3:30 PM	3:30 PM	13:42 PM	1:20 PM	12:44 PM	12:02 PM	12:15 PM	11:58 AM	11:58 AM
FIELD DATA																				
Secchi Depth	Meters	--	--	--	1.2	--	--	N/A	N/A	N/A	N/A	N/A	N/A	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*
Water Temp	Celsius	--	--	--	--	--	--	12.1	23.8	12.4	9.6	23.3	11.3	25.2	21.8	11.5	16.4	21.9	15.0	16.36	22.9	14.6
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	7.33	6.90	8.64	**	7.28	9.30	**5.09**	6.94	8.84	17.84	8.36	15.96	7.34	5.97	10.35
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.66	6.94	6.64	8.25	7.05	6.61	6.61	**6.21**	6.51	6.87	**6.34**	6.78	7.17	7.42	8.16
Specific Conductance	uS/cm	--	--	--	--	--	--	190.3	242.7	209.8	158.6	319.0	183.0	253.0	217.0	219.9	182.0	211.0	186.0	278.9	72	270.9
INORGANICS																				
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	<5	8	7	<5	8	6	7.0	8.0	8.0	6	8	9	9	10	8
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	54	48	46	49	56	54	69	65	59	51	49	52	79	73	65
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	<0.12	--	<0.12	<0.12
Colour	TCU	5	--	--	--	--	--	63	26	27	53	13	21	25	12	12	18.5	13.4	13.6	27.8	11.5	20.8
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.17	0.06	0.13	0.14	0.10	0.29	0.18	<0.05	0.18	<0.05	0.18	0.19	0.20	0.09	0.19
Nitrate (N)	mg/L	0.05	--	13	--	13	--	0.17	0.06	0.13	0.14	0.10	0.29	0.18	<0.05	0.18	<0.05	0.18	0.19	0.20	0.09	0.19
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen) *	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.03	0.04	0.03	<0.03	0.08	0.07	<0.03	0.08	<0.03	<0.03	<0.03	0.67	<0.03	0.04	0.09
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	<0.4	<0.4	<0.4	<0.4	<0.4	2.0	0.40	0.70	0.80	0.14	0.1	<0.10	0.18	0.32	0.14
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	5.1	3.2	4.0	4.4	4.1	4.0	3.30	<0.5	4.10	5.1	2.9	7.5	4.1	4.0	4.3
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	1.04	<0.01	0.01	<0.01	0.88	0.1	0.0	0.0
pH (Lab)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.72	7.21	7.10	6.66	7.07	6.81	6.89	7.02	6.83	6.76	6.50	7.10	6.97	6.61	***6.30***
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	6.0	7.3	8.4	5.9	7.6	5.0	7.6	7.7	7.3	7.5	7.6	8.6	8.30	9.40	8.30
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	1.0	1.2	1.4	1.0	1.2	0.9	1.2	1.1	1.2	1.0	1.3	1.2	1.3	1.5	1.3
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	0.010	0.010	0.006	**0.011**	0.007	0.007	0.010	**0.014**	**0.023**	<0.006	**0.024**	**0.014**	**0.016**	**0.021**	**0.030**
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	0.7	1.0	1.1	0.7	1.0	0.8	0.9	0.9	1.0	0.8	1.2	1.0	1.1	1.3	1.3
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	35.9	36.6	39.9	44.3	38.9	30.1	36.9	42.2	39.4	31.3	32.8	28.6	44.0	45.0	39.0
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	2.6	1.7	1.9	2.1	1.4	2.2	1.6	1.3	2.1	2.9	4.1	0.7	3.1	2.1	2.3
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	**<5**	<5	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	8	7	7	6	9	9	9.0	8.0	9.0	8	8	10	9	9	9
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	1.0	0.5	1.2	0.9	2.0	1.1	1.0	0.8	0.7	0.7	0.8	0.7	1.4	0.5	<0.5
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	244	246	232	244	233	160	275	288	240	210	233	227	115	291	252
Calculated Parameters																				
Anion Sum	me/L	N/A	--	--	--	--	--	1.70	1.66	1.6	1.5	1.9	1.9	2.29	2.16	2.02	1.73	1.72	1.87	1.73	1.72	1.87
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	<5	8	<5	<5	8.0	6.0	7	8	8	6	8	9	6	8	9
Calculated TDS	mg/L	1	--	--	--	--	--	107	106	109.0	108.0	119.0	105.0	130	130	123	103	106	109	103	106	109
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	1.98	2.09	2.3	2.3	2.2	1.7	2.14	2.35	2.22	1.86	1.95	1.85	1.86	1.95	1.85
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	19.1	23.2	26.7	18.9	23.9	16.2	24.7	23.8	23.2	22.8	24.3	26.4	22.80	24.30	26.40
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	7.6	11.4	18.4	21.4	6.7	5.2	3.3	4.2	4.5	3.7	6.3	0.5	3.70	6.30	0.50
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-3.39	-2.61	-2.7	-3.5	-2.7	-3.3	-2.97	-2.79	-3.00	-3.18	-3.31	-2.60	-3.18	-3.31	-2.60
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-3.71	-2.93	-3.0	-3.8	-3.1	-3.6	-3.29	-3.11	-3.32	-3.50	-3.63	-2.92	-3.50	-3.63	-2.92
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	10.1	9.82	9.8	10.1	9.8	10.1	9.86	9.81	9.83	9.94	9.81	9.70	9.94	9.81	9.70
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	10.4	10.1	10.1	10.4	10.1	10.4	10.2	10.1	10.1	10.3	10.1	10.0	10.30	10.10	10.00
Metals (ICP-MS)																				
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	**164**	**26**	--	**139**	**39**	**80**	**60**	--	--	**116**	--	--	***137***	--	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	14	15	--	17	16	15	21.0	--	--	16	--	--	29	--	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	5	10	--	6	9	6	8.0	--	--	9	--	--	7	--	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	<0.09	<0.09	--	<0.09	<0.09	<0.09	<0.017	--	--	<0.09	--	--	<0.09	--	--
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	<1	<1	--	<1	<1	<1	2.0	--	--	<1	--	--	<1	--	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	<1	<1	1	<1	1	<1	1.0	<1	1.0	1	1	<1	<1	<1	<1
Total Iron (Fe)	µg/L	50	300	300	--	300	--	81	148	<50	123	93	<50	274	180	105	114	68	<50	143	178	73
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	0.7	<0.5	--	<0.5	<0.5	<0.5	<0.5	--	--	<0.5	--	--	<0.5	--	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	21	50	22	26	44	18	137	80	19	24	16	35	54	97	28
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	<2	<2	--	3	<2	2	2.0	--	--	<2	--	--	<2	--	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<2	--	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	27	38	--	30	34	31	49.0	--	--	31	--	--	36	--	--
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.2	--	--	<0.2	--	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	<2	<2	--	2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	6	<5	<5	16	<5	<5	<5	<5	<5	**40**	<5	<5	<5	<5	<5
MICROBIOLOGICAL																				
Total Coliform	MPN/100mL	1	--	--	--	--	--	<1	NDOGT	5,020.0	103.0	NDOGT	628.0	>2420	1990	130	>200	>200	>200	>200	2,700	3,900
E. coli	MPN/100mL	1	--	--	400	--	--	<1	51	20	1	15	6	44	61	<1	12	18	29	41	173	62
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	0.47	0.47	1.41	0.64	1.1	1.6	13.1	1.6	1.4	0.7
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	1.16	1.14	1.28	0.74	1.94	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	1.80	--	*	0.74	1.73	--	--	--	--	--	--	--	--	--	--

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
* -- * = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).

[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.

(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - KL-4

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Kearney Lake																								
Sample Site KL-4								KL-4																								
Sampling Date	yyyy-mm-dd							2009-06-29	2009-08-13	2009-10-01	2010-05-31	2010-08-24	2010-11-01	2011-05-13	2011-08-14	2011-10-16	2012-05-01	2012-08-14	2012-10-10	2013-05-15	2013-08-16	2013-10-16	2014-05-14	2014-08-14	2014-10-27	2015-05-20	2015-08-25	2015-10-22	2016-05-16	2016-08-16	2016-10-25	2017-06-08	2017-08-15
Sampling Time	hh:mm							10:00	11:30	10:00	11:20	13:50	11:15	10:10	11:40	11:40	10:16	12:00	11:40	9:41	10:30	14:20	11:15	11:35	14:35	10:25	11:02	11:15	11:30	12:00	11:11	9:25	10:45 AM
FIELD DATA																																
Secchi Depth	Meters	--	--	--	1.2	--	--	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NCC	N/A	N/A	N/A	N/A	N/A	N/A
Water Temp	Celsius	--	--	--	--	--	--	13.4	21.9	17.3	14.5	21.9	9.8	10.1	21.2	15.3	9.0	24.4	15.7	11.7	20.4	13.5	11.0	21.8	12.5	14.8	24.7	9.5	12.2	20.6	12.3	16.5	22.4
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	10.87	8.10	8.30	9.01	6.27	10.89	10.99	8.55	9.65	8.70	7.32	8.87	10.09	8.89	9.60	14.50	5.92	7.52	9.81	9.09	8.80	8.27	5.50	10.11	8.33	6.41
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	8.00	6.71	6.94	7.19	6.98	6.07	6.49	6.43	6.02	9.00	6.71	6.77	5.72	7.08	6.41	6.30	7.25	6.55	6.64	6.81	7.09	7.32	6.72	6.14	6.90	6.88
Specific Conductance	uS/cm	--	--	--	--	--	--	771.0	262.0	247.0	224.0	226.0	214.8	218.0	171.9	126.2	206.0	225.0	185.9	207.1	196.2	209.0	273.0	251.0	208.0	0.2	243.5	232.4	215.0	260.0	228.0	213.0	262.0
INORGANICS																																
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	5	7	7	6	8	7	5	8	7	22	8	<5	<5	<5	<5	30	5	29	<5.0	6	7	<5	9	8	<5	9
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	67	65	60	56	56	53	56	44	37	51	57	46	54	41	47	59	47	48	61	56	55	54	58	49	64	62
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Colour	TCU	5	--	--	--	--	--	22	18	20	27	11	20	32	38	43	48	11	20	17	21	20	13	11	28	33	10	12	25	12	22	19	11
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.15	0.12	0.14	0.23	0.23	0.19	0.21	0.23	0.15	0.17	0.19	0.11	0.09	0.20	0.11	0.17	0.25	0.17	0.16	0.16	0.14	0.21	0.15	0.21	0.10	0.27	0.12
Nitrate (N)	mg/L	0.05	--	13	--	13	--	0.15	--	--	0.23	0.19	--	0.23	--	--	0.19	0.11	0.09	0.20	0.11	0.17	0.25	0.17	0.16	0.16	0.14	0.21	0.15	0.14	0.10	0.15	0.12
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	<0.05	<0.05	<0.05	0.07	<0.05	0.12	<0.05
Nitrogen (Ammonia Nitrogen) *	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.10	<0.03	0.04	0.06	<0.03	<0.03	<0.03	0.03
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5	<0.4	0.7	--	1.8	1.1	<0.4	<0.4	<0.4	0.2	0.4	1.0	<0.4	<0.4	0.4	<0.4	0.5
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	2.5	2.6	4.0	3.3	2.6	3.1	3.7	6.0	5.4	7.5	3.2	4.8	4.2	4.5	4.3	4.4	2.1	4.4	2.8	5.2	5.7	4.3	3.3	8.1	5.1	4.3
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pH (Lab)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.61	6.75	6.83	6.83	6.93	6.83	6.57	6.57	6.46	6.70	7.00	6.90	6.69	6.96	6.85	6.69	6.91	6.85	6.59	6.94	6.97	6.70	7.03	6.89	6.75	6.99
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	6.8	7.7	7.0	6.8	8.0	8.5	6.8	4.9	5.2	5.7	6.8	5.8	6.8	5.1	6.8	6.4	7.9	6.8	6,500.0	7.9	3.7	6.5	7.1	7.3	7.7	7.5
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	1.2	1.3	1.2	1.2	1.2	1.3	1.2	0.9	1.0	1.0	1.2	1.2	1.0	0.8	1.2	1.3	1.2	1.0	920.0	1.3	1.0	1.0	1.1	1.3	1.2	1.1
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	<0.02	<0.02	<0.002	0.004	<0.002	<0.002	0.007	0.003	0.026	0.022	0.043	0.007	0.006	2.390	0.016	0.022	0.031	0.015	0.006	0.007	0.003	0.007	0.004	0.007	0.020	0.008
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	0.9	1.0	1.0	1.0	0.8	0.9	1.0	0.8	0.7	1.1	0.7	1.0	0.9	0.8	0.6	1.2	0.8	1.1	0.9	760.0	0.9	0.7	0.7	0.9	1.0	0.8	0.9
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	39.0	41.0	37.0	28.5	34.3	33.9	32.1	21.5	21.1	31.5	34.5	25.2	31.6	20.1	30.7	35.9	38.6	34.1	34.0	40.0	28.2	32.4	41.4	31.1	37.6	41.4
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	2.7	2.6	2.6	3.1	2.9	3.1	2.9	2.5	2.7	2.7	2.2	2.6	3.0	2.6	2.5	2.6	2.1	2.5	2.5	2.6	3.0	2.6	2.0	2.4	2.3	1.7
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	<1	1	<1	<2	<2	<1	2	<1	<2	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1.0	7	<5	7	<5	10	6	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	11	12	11	10	10	10	9	10	8	7	8	7	7	7	9	9	8	8	8	9	8	10	10	10	10	9
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	0.5	1.0	0.3	0.3	0.2	0.8	0.7	0.7	0.4	0.7	0.4	0.8	0.7	2.6	2.1	1.1	0.6	0.8	0.6	0.7	1.2	1.2	1.5	1.6	1.3	0.9
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	260	250	230	220	230	250	210	170	160	200	224	183	218	218	204	219	241	218	220	241	235	206	275	185	251	255
Calculated Parameters																																
Anion Sum	me/L	N/A	--	--	--	--	--	2.23	2.22	2.09	1.91	1.94	1.85	1.88	1.62	1.36	2.04	1.94	1.45	1.68	1.31	1.53	2.47	1.60	2.11	1.88	1.90	1.87	1.74	2.04	1.76	2.03	2.12
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	5	7	7	6	8	7	5	8	7	22	8	<5	<5	<5	<5	30	5	29	<1.0	6	7	<5	9	8	<5	9
Calculated TDS	mg/L	1	--	--	--	--	--	132	135	125	111	118	116	113	90	81	111	114	87	103	75	97	132	108	117	110	121	102	106	125	105	123	128
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	2.16	2.32	2.07	1.70	2.02	2.03	1.86	1.28	1.30	1.78	1.97	1.53	1.84	1.23	1.84	2.04	2.21	1.94	1.91	2.35	1.53	1.86	2.28	1.87	2.17	2.31
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	22.00	25.00	22.00	22.00	25.00	27.00	22.00	16.00	17.00	18.40	21.90	19.40	21.10	16.00	21.90	21.30	24.70	21.10	20.00	25.10	13.40	20.30	22.30	23.60	24.20	23.30
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	1.59	2.20	0.48	5.82	2.02	4.64	0.53	11.70	2.26	6.60	0.80	2.80	4.50	3.20	9.20	9.50	15.80	4.20	0.79	10.70	10.10	3.40	5.50	3.00	3.20	4.10
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-3.21	-2.89	-2.84	-2.92	-2.64	-2.75	-3.22	-3.18	-3.31	-2.79	-2.86	-3.22	-3.37	-3.21	-3.21	-2.63	-3.08	-2.45	NC	-2.98	-3.20	-3.38	-2.76	-2.93	-3.26	-2.78
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-3.46	-3.14	-3.09	-3.17	-2.89	-3.00	-3.47	-3.43	-3.56	-3.11	-3.18	-3.54	-3.69	-3.53	-3.53	-2.95	-3.40	-2.77	NC	-3.30	-3.52	-3.70	-3.08	-3.25	-3.58	-3.10
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	9.82	9.64	9.67	9.75	9.57	9.58	9.79	9.75	9.77	9.49	9.86	10.10	10.10	10.20	10.10	9.32	9.99	9.30	NC	9.92	10.20	10.10	9.79	9.82	10.00	9.77
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	10.10	9.89	9.92	10.00	9.82	9.83	10.00	10.00	10.00	9.81	10.20	10.40	10.40	10.50	10.40	9.64	10.30	9.62	NC	10.20	10.50	10.40	10.10	10.10	10.30	10.10
Metals (ICP-MS)																																
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	150	--	--	125	29	--	231	--	--	188	48	149	141	106	159	236	46	93	160	--	84	172	--	--	180	89
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	16	--	--	17	18	--	18	--	--	18	17	16	18	10	19	17	19	16	20	--	17	16	--	--	20	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	6	--	--	9	9	--	<50	--	--	6	9	16	7	6	9	8	11	11	<50	--	<5	7	--	--	<5	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	<0.3	--	--	0.031	<0.017	--	0.035	--	--	0.021	<0.017	0.027	0.027	<0.017	0.050	0.027	<0.017	<0.017	0.033	--	<0.017	0.024	--	--	0.021	--
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	6	<1	<1	<1	6	<1	<1	<1.0	--	<1	<1	--	--	<1	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1	--	--	<0.40	<0.40	--	<0.40	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.4	--	<1	<1	--	--	<1	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	<2	--	--	<2.0	2	<2.0	2	<2.0	<2.0	<2	4	9	<1	1	<1	<1	<1	2	7	1	1	1	<1	<1	<1	<1
Total Iron (Fe)	µg/L	50	300	300	--	300	--	86	--	--	82	51	55	119	109	138	129	118	133	213	144	248	129	55	104	100	217	83	122	61	114	136	131
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	<0.5	--	--	3.2	<0.5	--	<0.5	--	--	<0.5	<0.5	0.8	0.9	<0.5	<0.5	2.0	<0.5	<0.5	<0.5	--	<0.5	<0.5	--	--	<0.5	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	51	--	--	35	64	29	39	27	30	23	34	38	34	77	130	34	29	24	25	78	34	34	58	29	74	76
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	3	--	--	2	<2.0	--	<2.0	--	--	<2	<2	5	<2	<2	<2	<2	<2	<2	<2.0	--	<2	2	--	--	7	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	--	3	<1	--	--	<1	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.5	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	34	--	--	33	37	--	33	--	--	25	32	28	32	17	31	31	31	29	30	--	20	28	--	--	33	--
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	5	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	<2	--	--	<2	<2	--	4	--	--	<2	<2	<2	<2	<2	3	2	<2	<2	<2.0	--	<2	<2	--	--	<2	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	--	--	<0.1	<0.1	--	0.1	--	--	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	0.1	--	--	<0.1	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2	--	--	<2	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	14	--	--	10	7	7	11	7	7	<5	<5	68	21	<5	9	9	<5	<5	10	8	12	7	<5	<5	13	7
MICROBIOLOGICAL																																
Total Coliform	MPN/100mL	1	--	--	--	--	--	28	58	--	100	16	75	83	95	--	345	>2420	921	548	>2420	770	308	1,550	>2420	---	>2420	281	488	1,730	>2420	792	>2420
E. coli	MPN/100mL	1	--	--	400	--	--	4	33	--	1	<1	2	5	39	<100	4	<1	4	6	38	<1	<1	1	8	<10	5	1	2	35	29	15	1
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	0.78	1.11	1.06	0.92	0.07	0.50	0.60	1.04	1.31	0.52	0.70	0.55	1.34	1.50	0.40	0.44	0.50	1.03	0.55	0.26	1.09	1.62	0.16	2.18	2.40	0.33
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	0.69	0.96	1.11	0.77	0.07	0.41	0.55	0.82	1.07	0.55	0.70	0.74	1.48	1.70	0.39	0.40	0.57	0.95	0.51	0.31	0.55	2.09	0.21	2.15	3.04	0.39

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
* -- * = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).

[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument
(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - KL-4

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Kearney Lake													
Sample Site KL-4								KL-4													
Sampling Date	yyyy-mm-dd							2017-10-18	2018-05-08	2018-08-17	2018-10-17	05/09/2019	08-20-19	2019-11-08	02-Jul-20	17-Aug-20	29-Oct-20	27-May-21	09-Aug-21	22-Oct-21	31-May-22	18-Aug-22	21-Oct-22
Sampling Time	hh:mm							10:05 AM	10:45 AM	9:00 AM	11:45 AM	9:43 AM	9:43 AM	12:15 PM	4:06 PM	3:09 PM	13:59 PM	12:40 PM	1:02 PM	12:16 PM	12:30 PM	12:46 PM	12:45PM
FIELD DATA																					
Secchi Depth	Meters	--	--	--	1.2	--	--	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA**	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*
Water Temp	Celsius	--	--	--	--	--	--	13.8	12.7	23.1	12.7	9.9	23.4	10.9	23.6	20.7	11.4	16.1	21.9	15.0	16.9	22.4	14.5
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	7.32	11.01	4.70	8.46	**	2.98	10.80	3.49	4.73	9.22	16.37	8.77	19.23	7.98	5.77	8.09
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.84	7.01	6.67	6.91	8.68	6.97	6.81	6.30	5.78	6.68	6.68	6.29	6.79	7.13	7.39	8.12
Specific Conductance	uS/cm	--	--	--	--	--	--	252.0	202.9	251.0	210.6	161.1	540.0	188.0	259.0	221.0	220.6	185.0	212.0	188.0	282.6	73.0	271.0
INORGANICS																					
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	10	<5	9	8	<5	9	6	7.0	12.0	5.0	<5	8	11	6	10	9
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	59	52	50	47	50	56	54	72	73	91	51	49	53	80	75	65
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.12	--	<0.12	<0.12
Colour	TCU	5	--	--	--	--	--	16	35	10	16	42	<5	17	22	<5	16	21.7	10.5	13.3	23.6	11.4	16.4
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.15	0.27	0.25	0.13	0.15	0.18	0.29	0.24	0.19	0.17	0.18	0.16	0.21	0.18	0.13	0.19
Nitrate (N)	mg/L	0.05	--	13	--	13	--	0.15	0.17	0.13	0.13	0.15	0.18	0.29	0.24	0.19	0.17	0.18	0.16	0.21	0.18	0.13	0.19
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	<0.05	0.10	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen) *	mg/L	0.03	--	--	--	1.15 note [5]	--	0.04	<0.03	0.04	0.03	<0.03	0.06	0.07	<0.03	0.10	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.19
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	<0.4	<0.4	<0.4	<0.4	<0.4	0.6	0.6	<0.4	0.40	0.80	0.22	0.1		0.16	0.27	0.13
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	4.0	5.1	2.7	4.0	4.5	3.3	4.3	2.60	2.90	2.10	6.1	3.1	3.0	4.0	3.7	4.3
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.13	<0.01	<0.01
pH (Lab)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.95	6.74	7.13	7.13	6.67	6.91	6.87	6.77	7.08	6.86	6.64	6.49	7.08	6.82	6.57	***6.30***
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	8.6	5.9	7.9	7.7	6.2	8.0	5.1	8.1	8.6	7.1	10.1	8.1	8.6	8.1	9.1	8.2
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	1.3	1.0	1.2	1.3	1.0	1.2	0.9	1.3	1.3	1.2	1.2	1.3	1.2	1.3	1.4	1.3
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	0.006	0.024	0.004	0.004	0.009	0.011	0.005	<0.006	0.014	0.003	0.038	0.031	0.008	0.016	0.013	0.030
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	1.1	0.7	1.0	1.0	0.8	1.1	0.8	1.0	1.1	1.0	1.0	1.1	1.0	1.1	1.3	1.2
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	38.9	35.6	39.2	40.6	37.0	36.7	23.4	37.4	39.4	39.6	34.8	34.0	29.0	42.0	44.0	38.0
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	2.1	2.6	1.8	2.0	2.1	1.4	2.2	1.8	1.7	2.1	3.1	3.9	1.9	3.2	2.1	2.4
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	<5	<5	<5	<5	<5	6	<5	<5	<5	<5	12	<5	<5	12	<5	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	10	8	7	8	6	9	9	9.0	9.0	13.0	8	8	10	9	9	10
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	1.6	1.2	0.5	1.7	0.8	1.5	1.1	1.0	0.8	1.1	22.6	0.6	0.7	0.6	<0.5	<0.5
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	248	243	252	231	246	236	158	288	297	240	213	234	228	289	300	254
Calculated Parameters																					
Anion Sum	me/L	N/A	--	--	--	--	--	2.08	1.65	1.75	1.7	1.6	2.0	1.9	2.38	2.50	2.95	1.62	1.72	1.94	2.58	2.51	2.24
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	10	<5	9	8.0	<5	9.0	6.0	7	12	5	<5	8	11	6	10	9
Calculated TDS	mg/L	1	--	--	--	--	--	126	105	113	111.0	102.0	119.0	98.0	135	141	157	111	107	110	146	147	130
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	2.27	1.96	2.24	2.3	2.0	2.1	1.4	2.18	2.31	2.21	2.40	2.03	1.82	2.380	2.520	2.220
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	26.80	18.9	24.7	24.6	19.6	24.9	16.4	25.6	26.8	22.7	30.2	25.6	26.4	25.6	28.5	25.8
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	4.30	8.6	12.1	16.2	13.8	4.4	14.5	4.2	4.1	14.3	19.5	8.2	3.1	3.9	0.2	0.3
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-2.71	-3.38	-2.61	-2.7	-3.4	-2.8	-3.2	-3.08	-2.51	-3.20	-3.25	-3.29	-2.54	-3.1	-3.1	-3.4
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-3.03	-3.70	-2.93	-3.0	-3.8	-3.2	-3.6	-3.40	-2.83	-3.52	-3.57	-3.61	-2.86	-3	-3	-4
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	9.66	10.1	9.74	9.8	10.1	9.7	10.1	9.85	9.59	10.10	9.89	9.78	9.62	9.92	9.64	9.73
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	9.98	10.4	10.1	10.1	10.4	10.1	10.4	10.2	9.9	10.4	10.2	10.1	9.9	10.2	10.0	10.1
Metals (ICP-MS)																					
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	55	157	32	--	132	70	92	52	--	--	1,510	--	--	***116***	--	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	20	15	19	--	18	20	17	21.0	--	--	30	--	--	30	--	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	11	6	10	--	6	9	6	7.0	--	--	18	--	--	7	--	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	<0.017	<0.09	<0.09	--	<0.09	<0.09	<0.09	0.020	--	--	0.150	--	--	<0.09	--	--
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	<1	<1	<1	--	<1	<1	<1	<1	--	--	2	--	--	<1	--	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1	<1	<1	--	<1	<1	<1	<1	--	--	5	--	--	<1	--	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	<1	<1	<1	1	<1	1	1	2.0	<1	1.0	4	1	<1	<1	<1	<1
Total Iron (Fe)	µg/L	50	300	300	--	300	--	141	83	119	78	120	100	<50	177	139	102	2,070	69	73	124	96	75
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	<0.5	1.4	<0.5	--	<0.5	<0.5	<0.5	<0.5	--	--	5.1	--	--	<0.5	--	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	48	19	84	43	24	85	19	209	357	18	252	19	32	41	42	24
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	6	--	--	<2	--	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<1	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	40	27	39	--	33	35	31	45.0	--	--	37	--	--	37	--	--
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	30	--	--	<2	--	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	0.4	--	--	<0.2	--	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	<2	<2	<2	--	2	<2	<2	<2	--	--	5	--	--	<2	--	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	<5	7	<5	7	7	6	6	<5	<5	<5	201	<5	<5	<5	<5	<5
MICROBIOLOGICAL																					
Total Coliform	MPN/100mL	1	--	--	--	--	--	>2420	4	NDOGT	8,000.0	198.0	560.0	604.0	2,420	>2420	172	>200	>200	>200	>200	4,600	3,000
E. coli	MPN/100mL	1	--	--	400	--	--	3	2	19	12	<1	1	<1	48	133	5	39	24	44	37	100	50
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	--	--	0.32	<0.25	0.60	0.63	8.31	1.8	5.26	2.0	0.6	0.4
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	0.35	1.06	0.24	1.12	0.78	0.47	--	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	0.43	1.71	--	*	0.82	0.42	--	--	--	--	--	--	--	--	--	--	--

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
* -- * = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).

[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument
(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - KL-5

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Kearney Lake																		
Sample Sites								KL-5																		
Sampling Date	yyyy-mm-dd							2011/10/17	2012-05-01	2012-08-14	2012-10-10	2013-05-15	2013-08-16	2013-10-16	2014-05-14	2014-08-14	2014-10-27	2015-05-20	2015-08-25	2015-10-22	2016-05-16	2016-08-16	2016-10-25	2017-06-08	2017-08-15	2017-10-18	2018-05-09	2018-08-17	2018-10-17
Sampling Time	hh:mm							9:40	10:52	13:10	12:10	10:03	10:50	13:45	11:30	13:55	10:45	09:00	12:04	12:00	10:00	8:00	13:05	9:00	9:45	9:50	9:30	8:20	9:30 AM
FIELD DATA																										
Secchi Depth	Meters	--	--	--	1.2	--	--	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NCC	N/A	2.7	2.1	5.3	4.2	2.1	4.6	2.7	3.1	3.01	3.8
Water Temp	Celsius	--	--	--	--	--	--	14.7	10.5	26.1	16.6	13.3	22.7	14.7	13.7	22.9	12.8	14.1	25.4	9.4	12.2	22.2	12.7	16.8	21.0	14.6	12.7	24.5	13.1
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	9.38	7.88	7.90	8.16	**9.67**	8.89	8.60	**15.83**	7.64	7.91	8.32	8.75	7.63	**10.47**	8.39	**9.92**	8.70	7.07	7.17	**10.42**	6.42	7.58
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.52	7.76	6.69	6.72	**6.20**	8.57	6.51	6.79	7.86	6.60	7.82	6.77	7.05	**5.75**	**5.11**	**5.72**	7.00	6.83	7.05	6.74	7.14	6.67
Specific Conductance	uS/cm	--	--	--	--	--	--	111.9	230.0	229.0	189.0	219.5	202.1	212.9	472.0	251.0	211.0	0.2	249.8	240.8	209.0	267.0	243.2	219.0	246.0	257.0	196.4	244.9	236.4
INORGANICS																										
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	9	21	8	<5	<5	6	5	32	<5	<5	5	6	7	<5	7	9	<5	7	9	<5	7	26
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	37	55	57	48	58	44	46	61	47	47	59	58	58	54	56	53	65	58	60	56	49	47
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Colour	TCU	5	--	--	--	--	--	35	43	10	27	10	22	18	14	11	22	35	8	19	27	13	17	18	14	14	34	14	12
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.17	0.19	0.15	0.83	0.21	0.21	0.25	0.16	0.10	0.16	0.16	0.12	0.19	0.14	0.19	0.15	0.25	0.21	0.09	0.17	0.20	0.42
Nitrate (N)	mg/L	0.05	--	13	--	13	--	--	0.19	0.15	0.83	0.21	0.21	0.20	0.16	0.10	0.16	0.16	0.12	0.19	0.14	0.09	0.15	0.13	0.07	0.09	0.17	0.09	0.42
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	<0.05	<0.05	<0.010	<0.05	<0.05	<0.05	**0.10**	<0.05	**0.12**	**0.14**	<0.05	<0.05	**0.11**	<0.05
Nitrogen (Ammonia Nitrogen) *	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.05	<0.03	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.06	<0.050	<0.03	0.04	0.06	<0.03	<0.03	<0.03	<0.03	0.04	<0.03	0.04	0.05
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	--	<0.4	2.3	1.0	--	0.6	1.1	<0.4	0.5	1.1	0.3	<0.4	1.8	0.5	<0.4	0.7	0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	4.8	5.8	3.4	4.7	4.0	4.6	7.0	4.3	2.7	4.5	3.1	5.3	5.7	4.4	3.3	7.0	4.7	4.8	3.9	4.9	2.9	3.0
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pH (Lab)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.57	6.70	7.10	6.50	6.71	6.93	6.89	6.64	6.84	6.63	6.56	6.90	6.94	6.66	7.16	7.03	6.74	7.09	6.93	6.70	7.15	7.47
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	5.8	6.1	6.6	5.9	7.1	5.7	6.4	6.5	7.6	7.0	6,500.0	8.0	4.7	6.3	7.3	8.2	7.4	7.0	7.5	5.9	6.7	7.6
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	1.1	1.0	1.1	1.2	1.0	1.0	1.1	1.4	1.2	1.0	930.0	1.3	0.9	1.0	1.1	1.3	1.2	1.0	1.1	1.0	1.1	1.2
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	0.009	0.018	0.040	0.006	0.005	0.013	0.010	0.010	0.026	0.135	0.005	0.005	0.005	0.004	0.004	0.003	0.010	0.012	0.005	0.031	0.005	0.005
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	0.9	0.7	0.9	0.8	0.8	0.7	1.1	0.8	1.1	0.9	720.0	0.1	0.7	0.7	0.9	1.0	0.9	0.8	0.9	0.7	0.9	0.9
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	22.0	34.6	32.0	27.7	33.6	19.2	31.3	37.5	40.3	38.3	33.0	42.6	28.3	32.5	33.1	33.5	38.9	42.4	37.2	37.2	38.5	41.7
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	2.5	2.7	2.0	2.4	2.7	2.5	2.5	2.7	2.1	2.5	3.3	1.9	2.2	2.7	2.0	2.3	2.1	1.6	1.7	2.4	1.7	3.4
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	1	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1.0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	9	7	8	8	8	7	8	9	8	8	8	9	8	10	10	10	10	8	10	8	7	11
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	0.9	1.1	0.7	0.9	0.7	0.8	0.4	1.1	0.4	0.8	0.7	1.0	1.0	0.7	1.3	1.2	0.9	0.9	0.9	1.4	0.4	0.7
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	160	215	226	189	232	223	204	228	246	225	220	248	244	208	267	196	248	249	246	247	247	286
Calculated Parameters																										
Anion Sum	me/L	N/A	--	--	--	--	--	1.42	2.13	1.95	1.58	1.82	1.52	1.58	2.56	1.50	1.50	1.94	1.95	1.96	1.74	1.94	1.89	2.06	1.96	2.09	1.76	1.68	2.1
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	9	21	8	<5	<5	6	5	32	<5	<5	5	6	7	<5	7	9	<5	7	9	<5	7	26.0
Calculated TDS	mg/L	1	--	--	--	--	--	84	118	111	96	110	82	98	136	106	103	120	124	106	105	114	113	125	122	123	110	108	127.0
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	1.36	1.94	1.85	1.64	1.94	1.23	1.81	2.12	2.27	2.14	1.87	2.40	1.58	1.86	1.93	2.01	2.20	2.30	2.12	2.04	2.13	2.3
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	19.00	19.30	21.00	19.70	21.80	18.40	20.50	22.00	23.90	21.60	20.00	25.30	15.40	19.80	22.80	25.80	23.40	21.60	23.30	18.9	21.3	23.9
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	2.16	4.70	2.60	2.00	3.20	10.60	6.70	9.40	20.30	17.50	1.84	10.20	10.80	3.20	0.40	3.00	3.40	8.10	0.70	7.3	11.8	5.0
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-3.06	-2.79	-2.77	-3.62	-3.33	-3.11	-3.19	-2.64	-3.17	-3.42	-3.24	-3.20	-3.13	-3.43	-2.72	-2.69	-3.29	-2.82	-2.84	-3.42	-2.77	-1.8
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-3.31	-3.11	-3.09	-3.94	-3.65	-3.43	-3.51	-2.96	-3.49	-3.74	-3.50	-3.34	-3.45	-3.75	-3.04	-3.01	-3.61	-3.14	-3.16	-3.74	-3.09	-2.2
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	9.63	9.49	9.87	10.10	10.00	10.00	10.10	9.28	10.00	10.00	9.81	9.92	10.10	10.10	9.88	9.72	10.00	9.91	9.77	10.1	9.92	9.3
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	9.88	9.81	10.20	10.40	10.40	10.40	10.40	9.60	10.30	10.40	10.10	10.20	10.40	10.40	10.20	10.00	10.30	10.20	10.10	10.4	10.2	9.6
Metals (ICP-MS)																										
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	--	**222**	**52**	**154**	**136**	**58**	**61**	**224**	**53**	**108**	**180**	---	**79**	**163**	--	--	**156**	**45**	**44**	**172**	**30**	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	---	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	---	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	--	18	16	15	19	9	16	16	17	17	17	---	19	14	--	--	17	--	17	13	13	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	---	<2	<2	--	<2	<2	--	<2	<2	<2	--
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	---	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	--	6	9	15	7	7	9	7	6	10	<50	---	<5	7	--	--	<5	--	10	5	9	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	--	**0.022**	**0.027**	**0.029**	**0.024**	<0.017	**0.034**	**0.036**	<0.017	**0.024**	**0.035**	---	**0.332**	**0.024**	--	--	**0.025**	--	<0.017	<0.09	<0.09	--
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	--	<1	<1	**5**	<1	<1	<1	**6**	<1	<1	<1.0	---	**7**	<1	--	--	**2**	--	<1	<1	<1	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.40	---	<1	<1	--	--	<1	--	<1	<1	<1	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	<2.0	<2	<2	<2	<2	<1	1	<1	<1	**5**	<2.0	1	<1	<1	<1	<1	<1	<1	1	<1	1	1
Total Iron (Fe)	µg/L	50	300	300	--	300	--	175	160	78	120	111	70	79	111	<50	119	100	123	158	96	55	88	59	<50	106	80	81	<50
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	--	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	**1.9**	<0.5	0.5	<0.5	---	<0.5	<0.5	--	--	<0.5	--	<0.5	0.9	<0.5	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	36	30	14	37	35	13	12	40	18	25	34	24	35	23	15	17	24	11	13	24	15	14
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	---	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	--	<2	<2	5	<2	<2	<2	2	<2	<2	<2.0	---	3	3	--	--	14	--	<2	<2	<2	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	---	<1	<1	--	--	<1	--	<1	<1	<1	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	---	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	--	27	31	29	31	18	31	31	30	30	29	---	23	28	--	--	32	--	38	28	35	--
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	---	<0.1	<0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	---	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	--	3	<2	<2	<2	<2	<2	<2	<2	2	2	---	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	--	0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	---	0.1	0.1	--	--	<0.1	--	<0.1	<0.1	<0.1	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	---	<2	<2	--	--	<2	--	<2	<2	<2	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	9	5	<5	**64**	11	7	5	10	<5	10	14	6	12	10	<5	<5	11	8	<5	8	<5	7
MICROBIOLOGICAL																										
Total Coliform	MPN/100mL	1	--	--	--	--	--	--	461	613	93	461	308	461	42	629	>2470	---	356	163	179	517	2,420	260	577	>2420	58	601	6,000.0
E. coli	MPN/100mL	1	--	--	400	--	--	100	14	2	6	6	6	4	<1	1	17	<10	1	2	<1	23	44	<1	5	**517**	8	1	11
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	0.91	0.30	1.20	1.09	1.44	2.20	0.64	0.20	0.61	0.90	0.48	1.22	2.71	1.52	1.20	2.32	1.09	1.43	1.22	6.25	1.28	1.68
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	0.85	0.33	1.00	1.41	1.59	2.40	0.62	0.20	0.54	0.84	---	1.26	1.44	1.86	1.57	2.34	1.28	1.40	1.33	3.35	--	*

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).

[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.

(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - KL-5

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [5]	Kearney Lake											
Sample Sites								KL-5											
Sampling Date	yyyy-mm-dd							05/09/2019	08-20-19	2019-11-08	02-Jul-20	17-Aug-20	29-Oct-20	27-May-21	09-Aug-21	22-Oct-21	31-May-22	18-Aug-22	21-Oct-22
Sampling Time	hh:mm							9:10 AM	9:27 AM	10:00 AM	2:40 PM	11:27 AM	12:45 PM	11.:52 PM	12:24 PM	11:08 AM	12:50 PM	11:05 AM	11:43 AM
FIELD DATA																			
Secchi Depth	Meters	--	--	--	1.2	--	--	3.1	3.70	2.20	NA**	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*
Water Temp	Celsius	--	--	--	--	--	--	11.2	23.8	12.8	25.6	22.9	12.2	16.0	23.1	15.4	18.7	22.9	15.1
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	**	5.46	8.10	6.85	7.43	8.02	17.88	8.66	16.90	8.70	5.83	9.44
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	9.20	7.45	6.62	6.49	6.73	6.73	6.74	6.24	6.70	7.45	7.44	8.94
Specific Conductance	uS/cm	--	--	--	--	--	--	171.6	220.0	216.0	245.0	221.0	224.0	181.0	210.0	190.0	278.2	99.0	270.0
INORGANICS																			
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	<5	7	6	6.0	7.0	8.0	<5	8.0	11.0	6.0	9.0	8.0
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	51	55	57	67	62	61	50	51	53	80	72	65
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	<0.12	--	<0.12	<0.12
Colour	TCU	5	--	--	--	--	--	38	16	19	28	17	15	17	13	13	23	11	14
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.14	0.16	0.35	0.38	0.08	0.17	0.19	0.15	0.20	0.17	0.11	0.18
Nitrate (N)	mg/L	0.05	--	13	--	13	--	0.14	0.16	0.35	0.38	0.08	0.17	0.19	0.15	0.20	0.17	0.11	0.18
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen) *	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.03	0.06	0.06	<0.03	0.06	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	<0.4	<0.4	0.6	1.50	0.80	8.10	0.16	<0.10		0.12	0.27	0.17
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	4.5	4.5	4.2	3.20	3.80	4.00	5.10	2.90	2.90	3.90	3.90	4.10
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	0.13	0.01	0.01
pH (Lab)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.64	7.04	6.81	6.88	6.95	6.81	6.71	6.47	7.07	6.82	6.59	***6.30***
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	6.4	7.7	5.4	6.8	5.5	7.0	6.0	7.3	8.6	8.3	8.4	7.9
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	1.1	1.2	0.9	1.1	4.0	1.1	1.0	1.1	1.2	1.2	1.3	1.3
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	0.011	0.007	0.005	<0.008	0.028	0.004	0.007	0.019	0.009	**0.015**	**0.023**	**0.020**
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	0.8	1.0	0.8	0.8	0.8	1.0	0.8	1.1	1.0	1.1	1.2	1.1
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	43.8	37.7	30.6	35.4	39.7	38.0	34.7	31.4	30.7	47.0	43.0	39.0
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	2.1	1.4	2.0	1.8	1.5	1.9	3.0	4.2	1.6	3.0	2.1	2.2
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	6	8	9	9.0	8.0	9.0	8.0	8.0	10.0	9.0	9.0	9.0
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	0.9	2.0	0.8	0.9	1.2	0.9	1.3	0.6	<0.5	0.7	<0.5	1.0
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	249	229	160	269	272	248	208	229	226	290	284	257
Calculated Parameters																			
Anion Sum	me/L	N/A	--	--	--	--	--	1.6	1.9	1.9	2.22	2.06	2.08	1.59	1.78	1.94	2.58	2.41	2.19
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	<5	7.0	6.0	6	7	8	<5	8	11	6	9	8
Calculated TDS	mg/L	1	--	--	--	--	--	110.0	116.0	109.0	125	122	123	102	105	112	151	141	129
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	2.4	2.2	1.7	2.00	2.12	2.13	1.93	1.86	1.89	2.60	2.43	2.24
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	20.5	24.2	17.2	21.5	17.9	22.0	19.1	22.8	26.4	25.7	26.3	25.1
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	19.9	7.3	6.3	5.3	1.3	1.2	9.6	2.2	1.1	0.5	0.6	1.0
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-3.5	-2.8	-3.3	-3.11	-3.06	-3.04	-3.40	-3.35	-2.55	-3.09	-3.13	-3.50
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-3.8	-3.1	-3.6	-3.43	-3.38	-3.36	-3.72	-3.67	-2.87	-3.41	-3.45	-3.82
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	10.1	9.9	10.1	9.99	10.00	9.85	10.10	9.82	9.62	9.91	9.72	9.80
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	10.4	10.2	10.4	10.3	10.3	10.2	10.4	10.1	9.9	10.2	10.0	10.1
Metals (ICP-MS)																			
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	142	57	97	75	--	--	126	--	--	***115***	--	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	17	16	15	15.0	--	--	15.0	--	--	26.0	--	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	6	9	7	8.0	--	--	7.0	--	--	7.0	--	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	<0.09	<0.09	<0.09	**0.026**	--	--	<0.09	--	--	<0.09	--	--
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	<1	1	1	1.0	<1	<1	1.0	2.0	<1	<1	1.0	<1
Total Iron (Fe)	µg/L	50	300	300	--	300	--	121	63	<50	<50	72	111	103	<50	<50	96	56	62
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	<0.5	<0.5	<0.5	<0.5	--	--	<0.5	--	--	<0.5	--	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	25	18	17	28	4	25	21	8	7	21	16	19
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.1	<0.1	**0.300**	<0.1	--	--	<0.1	--	--	<2	--	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	31	33	33	28.0	--	--	30.0	--	--	36.0	--	--
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.2	--	--	<0.2	--	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	7	<5	5	5.0	<5	<5	6.0	<5	<5	<5	<5	<5
MICROBIOLOGICAL																			
Total Coliform	MPN/100mL	1	--	--	--	--	--	55.0	770.0	560.0	>2420	291	159	196	>200	>200	>200	300	400
E. coli	MPN/100mL	1	--	--	400	--	--	1	<1	8	6	122	<1	<1	9	1	4	13	12
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	0.32	0.47	0.95	0.83	0.79	1.9	63.1	1.1	2.3	0.7
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	1.24	3.70	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	1.19	3.00	--	--	--	--	--	--	--	--	--	--

Notes:

N/A - Not Applicable; NC - Not Calculable; NCC Not Collected

RDL = Reported Detection Limit (represents most recent sampling event)

" -- " = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).

[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.

(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - HWY102-1

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Highway 102-1																					
Sample Sites								HWY102-1																					
Sampling Date	yyyy-mm-dd							2009-06-29	2009-08-13	2009-10-01	2010-05-31	2010-08-24	2010-11-01	2011-05-13	2011-08-14	2011-10-16	2012-05-01	2012-08-15	2012-10-11	2013-05-15	2013/08/15	2013-10-16	2014-05-14	2014-08-14	2014-10-27	2015-05-20	2015-08-25	2015-10-22	2016-05-16	2016-08-16	2016-10-25
Sampling Time	hh:mm							07:00	12:45	08:00	13:00	10:20	09:00	13:40	11:00	11:00	14:50	11:00	9:50	14:15	12:22	12:30	12:00	10:10	9:30	13:15	09:20	9:40	14:30	11:00	10:20
FIELD DATA																													
Secchi Depth	Meters	--	--	--	1.2	--	--	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Water Temp	Celsius	--	--	--	--	--	--	11.8	18.8	15.7	14.9	19.6	7.4	11.4	17.8	14.6	10.7	21.8	13.6	11.7	19.5	8.9	12.1	19.6	10.2	14.3	20.7	5.4	13.4	19.3	9.2
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	11.44	5.80	4.34	8.18	4.25	6.05	8.15	3.88	5.34	5.65	1.03	3.83	7.55	3.32	3.10	12.03	2.09	4.54	4.27	3.82	5.03	8.18	10.14	7.35
pH (In Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	7.98	8.15	5.25	8.37	5.26	5.62	5.75	5.77	5.96	8.76	5.73	6.38	6.19	7.10	6.79	6.02	6.63	5.12	6.35	6.24	6.92	7.34	6.14	5.69
Specific Conductance	uS/cm	--	--	--	--	--	--	194.0	153.0	103.8	135.0	106.0	108.6	114.1	107.6	88.6	288.0	225.0	155.5	226.0	173.2	234.0	880.0	337.0	109.0	0.4	335.8	251.2	289.0	353.0	208.9
INORGANICS																													
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	<5	<5	<5	<5	<5	<5	5	11	8	22	25	15	9	23	20	31	28	30	16	21	12	14	27	10
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	24	38	24	32	25	22	24	19	12	58	48	28	53	31	40	65	57	19	130	67	49	71	87	35
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Colour	TCU	5	--	--	--	--	--	67	68	57	37	89	53	39	65	79	24	65	40	9	65	25	11	31	93	22	27	29	23	37	64
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	<0.05	<0.05	<0.05	0.69	<0.05	1.20	0.69	0.25	1.20	2.61	0.06	0.43	0.51	<0.05	<0.05	<0.05	<0.05	0.53	<0.050	<0.05	0.17	0.05	0.13	0.53
Nitrate (N)	mg/L	0.05	--	13	--	13	--	<0.05	--	--	0.69	<0.05	--	0.69	--	--	2.61	0.06	0.43	0.51	<0.05	<0.05	<0.05	<0.05	0.53	<0.050	<0.05	0.17	0.05	<0.05	0.53
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	<0.05	<0.05	<0.05	0.13	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.05	0.29	<0.05	<0.05	<0.05	<0.05	0.05	0.10	0.07	0.31	0.19	0.04	<0.03	0.05	0.06	<0.03	0.04	0.03	<0.050	<0.03	0.04	0.06	0.06	<0.03
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.1	1.3	0.6	--	0.6	0.6	0.7	0.6	<0.4	0.3	0.5	0.6	0.7	1.2	0.7
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	6.5	10.0	7.7	4.7	11.0	6.3	4.5	7.2	7.4	5.5	10.0	7.0	5.1	10.1	17.7	4.1	7.7	9.0	2.7	14.6	8.4	4.5	8.0	11.5
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01
pH (units)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	4.54	5.24	5.40	5.48	6.24	5.31	6.42	6.55	6.28	6.40	6.90	6.80	6.86	6.87	6.73	6.56	7.49	5.90	6.61	7.46	6.80	6.87	7.03	6.45
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	1.7	1.8	1.6	4.9	3.3	5.1	4.9	5.2	5.6	12.5	11.7	7.5	11.1	10.5	13.9	7.2	23.3	2.2	18,000.0	18.0	12.4	12.9	25.8	9.9
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	0.3	0.5	0.5	1.1	0.8	1.1	0.9	0.9	1.2	1.7	2.0	1.4	1.4	1.5	2.3	1.6	3.2	0.6	2,400.0	2.7	2.3	1.7	2.7	1.7
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	0.070	0.140	0.020	0.006	0.007	0.011	0.009	0.012	0.010	0.019	0.039	0.020	0.006	0.021	0.022	0.013	0.038	0.031	0.007	0.020	0.002	0.005	0.038	0.009
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	0.5	1.2	0.7	1.1	1.6	1.3	1.1	1.5	1.9	1.6	2.5	1.5	1.3	1.7	2.4	1.2	2.5	0.7	2,000.0	2.1	1.5	1.4	1.9	1.7
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	15.0	25.0	13.0	15.9	14.5	14.6	14.8	10.2	8.3	36.3	27.7	14.6	30.8	15.0	20.5	39.1	38.7	18.6	64.0	37.7	28.8	45.4	43.8	24.8
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	2.5	2.2	2.0	1.1	3.8	5.1	2.8	5.2	4.6	4.1	6.1	5.1	3.1	5.1	5.8	1.7	7.1	4.7	2.1	4.9	4.8	1.4	6.3	4.6
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	7	80	2	<2	11	<2	<1	1	<1	9	6	<5	<5	<5	<5	6	<5	<5	<1.0	<5	<5	<5	10	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	5	3	3	8	<2	8	10	8	10	14	8	9	12	8	12	10	7	6	13	9	14	14	14	18
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	14.0	35.0	0.9	1.4	1.2	0.6	0.4	0.6	1.1	0.9	1.9	0.9	0.5	1.6	0.5	0.7	1.6	0.9	0.6	0.9	0.8	1.0	4.1	1.0
Conductivity (uS/cm)	uS/cm	1	--	--	--	--	--	100	140	92	130	100	110	110	100	88	263	231	143	243	188	218	252	338	112	470	324	244	289	440	167
Calculated Parameters																													
Anion Sum	me/L	N/A	--	--	--	--	--	0.77	1.12	0.73	1.11	0.71	0.88	1.03	0.95	0.80	2.55	2.02	1.31	1.96	1.50	1.78	2.66	2.31	1.30	4.20	2.50	1.93	2.58	3.29	1.60
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	<1	<1	<1	<1	<1	<1	5	11	8	22	25	15	9	23	20	31	28	30	16	21	12	14	27	10
Calculated TDS	mg/L	1	--	--	--	--	--	50	73	45	67	50	63	65	58	54	150	117	73	117	83	104	143	150	68	240	151	116	155	193	100
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	0.84	1.32	0.74	1.06	0.93	1.02	1.00	0.83	0.80	2.43	6.04	1.19	2.06	1.40	1.87	2.25	3.22	1.04	3.94	2.88	2.11	2.81	3.51	1.79
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	6.00	6.00	6.00	17.00	12.00	17.00	16.00	17.00	19.00	38.20	37.50	24.50	33.50	32.40	44.20	24.60	71.40	8.00	55.00	56.10	40.40	39.20	75.50	31.70
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	4.35	8.20	0.68	2.30	13.40	7.37	1.48	6.74	0.00	2.60	1.90	4.60	2.40	3.50	2.60	8.40	16.40	11.20	3.19	7.10	4.70	4.40	3.10	5.70
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	NC	NC	NC	NC	NC	NC	-3.50	-2.99	-3.36	-2.77	-2.23	-2.72	-2.33	-2.41	-2.69	-1.30	-3.85	-2.32	-1.57	-2.62	-2.48	-1.74	-3.14
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	NC	NC	NC	NC	NC	NC	-3.75	-3.25	-3.61	-3.09	-2.55	-3.04	-3.05	-2.65	-2.73	-3.01	-1.62	-4.17	-2.57	-1.89	-2.94	-2.80	-2.06	-3.46
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	NC	NC	NC	NC	NC	NC	9.92	9.54	9.64	9.17	9.13	9.52	9.59	9.20	9.14	9.25	8.79	9.75	8.93	9.03	9.42	9.35	8.77	9.59
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	NC	NC	NC	NC	NC	NC	10.20	9.80	9.89	9.49	9.45	9.84	9.91	9.52	9.46	9.57	9.11	10.10	9.18	9.35	9.74	9.67	9.09	9.91
Metals (ICP-MS)																													
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	510	--	--	169	192	--	205	--	--	134	183	146	86	145	150	187	83	310	51	--	52	81	--	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	22	--	--	53	37	--	37	--	--	58	284	42	57	57	80	46	142	17	130	--	86	79	--	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	<2
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	<5	--	--	11	11	--	<50	--	--	12	18	13	10	10	11	9	14	11	<50	--	<5	10	--	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	<0.300	--	--	0.043	<0.017	--	0.023	--	--	0.034	0.021	<0.017	<0.017	<0.017	0.040	0.022	<0.017	0.022	0.024	--	<0.017	<0.017	--	--
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	8	<1	<1	<1.0	--	<1	<1	--	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1	--	--	1	0	--	<0.40	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.40	--	<1	<1	--	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	2	--	--	3	<2.0	<2.0	<2.0	<2.0	<2.0	<2	<2	3	<2	<1	2	<1	<1	2	<2.0	<1	1	<1	2	2
Total Iron (Fe)	µg/L	50	300	300	--	300	--	720	--	--	146	637	150	107	209	219	102	1,380	255	111	938	446	147	820	290	140	1,280	138	144	766	228
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	1.6	--	--	2.4	0.6	--	<0.5	--	--	<0.5	0.7	<0.5	<0.5	<0.5	0.6	2.6	<0.5	0.6	<0.5	--	<0.5	<0.5	--	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	40	--	--	55	39	67	28	21	31	34	79	28	23	45	31	56	122	61	28	95	22	19	78	38
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	--	<1	<1	--	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.5	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	11	--	--	29	20	--	24	--	--	48	58	36	52	47	62	38	103	13	85	--	39	58	--	--
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	--	<0.1	<0.1	--	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2	--	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	6	--	--	<2	<2	--	4	--	--	<2	3	<2	<2	<2	4	2	<2	<2	<2	--	<2	<2	--	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	21	--	--	16	7	7	<5.0	<5.0	7	<5	6	<5	<5	<5	10	10	<5	7	11	<5	<5	<5	<5	6
MICROBIOLOGICAL																													
Total Coliform	MPN/100mL	1	--	--	--	--	--	84	>250	--	>250	>250	180	120	180	--	687	>2420	>2420	1,550	>2420	1,553	120	>2420	>2420	---	>2420	659	>2420	>2420	--
E. coli	MPN/100mL	1	--	--	400	--	--	54	>250	--	12	17	5	1	78	<100	3	68	145	4	9	5	3	179	3	20	25	2	<1	86	--
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	15.40	19.29	0.70	18.12	1.61	8.45	0.93	0.58	0.69	0.53	2.59	0.81	1.27	14.70	1.99	0.25	1.10	1.22	0.50	7.27	0.36	0.94	51.51	0.33
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	17.50	19.60	0.84	17.62	1.68	7.52	0.84	0.56	0.65	0.59	2.89	1.05	1.45	15.80	2.20	0.82	1.11	1.38	0.55	6.79	0.23	1.30	60.68	0.43

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
* -- * = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).
[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).
[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.
(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - HWY102-1

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Highway 102-1																
Sample Sites								HWY102-1																
Sampling Date	yyyy-mm-dd							2017-06-08	2017-08-15	2017-10-18	2018-05-08	2018-08-17	2018-10-17	05/09/2019	08-20-19	2019-11-08	02-Jul-20	17-Aug-20	29-Oct-20	27-May-21	09-Aug-21	22-Oct-21	31-May-22	18-Aug-22	21-Oct-22
Sampling Time	hh:mm							12:00	15:00	11:40	12:40	11:00	15:40:00 PM	2:45 PM	12:40 PM	4:15 PM	10:22 AM	10:34 AM	8:40 AM	9:42 AM	9:53 AM	9:49 AM	10:20 AM	9:15 AM	9:55 AM
FIELD DATA																								
Secchi Depth	Meters	--	--	--	1.2	--	--	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA**	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*
Water Temp	Celsius	--	--	--	--	--	--	16.4	22.1	10.1	14.4	21.4	10.6	14.0	27.4	9.7	21.2	19.7	6.2	15.1	17.7	12.3	15.7	18.9	10.6
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	5.77	5.77	5.56	7.09	2.78	6.06	**	6.27	7.80	3.27	2.61	6.05	11.15	7.16	20.74	**5.45**	**2.80**	**4.79**
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.49	7.76	6.32	6.13	6.13	6.70	7.20	6.09	6.37	6.20	6.22	6.49	6.38	5.74	6.31	7.48	7.45	8.88
Specific Conductance	uS/cm	--	--	--	--	--	--	354.0	257.0	266.0	232.2	280.5	189.4	330.0	383.0	210.0	446.0	345.0	318.2	367.0	259.0	316.0	544.0	99.0	306.0
INORGANICS																								
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	17	21	16	13	26	12	12	23	<5	23.0	27.0	14.0	21.0	23.0	25.0	20	25	18
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	101	49	51	51	54	61	90	80	92	137	100	72	98	57	82	**171**	101	71
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.12	--	<0.12	<0.12
Colour	TCU	5	--	--	--	--	--	24	31	29	27	56	68	35	37	28	30	32	24	19	52	28	34.4	23.9	46.0
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.35	0.71	0.58	0.37	0.11	0.19	0.57	<0.05	0.12	0.05	<0.05	0.50	0.25	0.65	0.17	0.16	0.06	0.30
Nitrate (N)	mg/L	0.05	--	13	--	13	--	0.18	0.50	0.58	0.37	<0.05	0.19	0.32	<0.05	0.12	0.05	<0.05	0.50	0.25	0.65	0.17	0.16	0.06	0.30
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	**0.17**	**0.21**	<0.05	<0.05	**0.11**	<0.05	**0.25**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.03	0.10	0.07	<0.03	0.07	<0.03	<0.03	0.06	0.06	0.24	0.17	<0.03	<0.03	<0.03	<0.03	<0.03	0.05	<0.03
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	0.5	1.3	3.8	1.1	0.7	<0.4	<0.4	0.6	0.9	<0.4	0.90	3.80	0.24	0.30	0.15	0.29	0.44	0.29
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	7.4	8.6	6.9	5.0	7.7	7.0	4.4	9.5	4.1	6.00	9.00	6.20	6.70	5.20	3.00	6.0	6.9	7.9
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.13	<0.01	0.01
pH (units)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.84	6.91	6.90	7.02	7.14	6.94	7.07	7.15	5.73	7.10	7.16	6.95	7.06	6.87	7.20	7.34	6.70	**6.22**
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	20.9	10.3	14.6	12.5	15.6	9.9	16.5	17.9	12.2	22.5	23.7	17.8	18.0	15.9	19.6	21.5	18.4	13.7
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	3.0	1.7	2.2	1.8	2.2	1.8	2.5	2.6	1.8	3.0	41.0	2.4	2.7	2.2	2.6	3.1	2.6	2.2
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	**0.017**	**0.052**	0.008	**0.022**	**0.014**	0.010	**0.011**	**0.023**	**0.026**	**0.012**	**0.016**	0.007	0.007	**0.034**	**0.012**	**0.059**	**0.284**	**0.030**
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	2.0	2.1	2.0	1.6	2.0	1.4	2.3	2.3	0.9	2.4	2.9	2.3	2.0	2.3	2.1	2.6	2.4	2.4
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	64.1	29.7	29.6	41.2	35.5	47.9	69.1	54.3	38.3	68.7	60.3	41.7	60.4	39.6	41.1	80.0	55.0	36.0
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	1.8	3.8	5.6	2.5	5.3	4.6	2.2	4.7	4.8	4.3	5.9	6.2	2.8	7.1	3.8	3.8	4.6	3.2
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	<5	11	<5	<5	<5	<5	<5	8	<5	<5	<5	<5	5.0	<5	<5	<5	<5	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	15	13	19	12	7	11	14	10	8	13.0	8.0	20.0	15.0	21.0	17.0	14	10	12
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	1.3	7.7	1.1	1.7	1.1	3.2	0.8	2.6	1.5	1.2	1.5	1.0	1.1	0.8	0.8	1.1	1.9	1.0
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	411	251	258	298	306	306	464	340	247	517	469	339	424	326	365	573	418	303
Calculated Parameters																								
Anion Sum	me/L	N/A	--	--	--	--	--	3.53	2.12	2.20	1.97	2.2	2.2	3.1	2.9	2.8	4.60	3.53	2.76	3.51	2.55	3.18	5.53	3.56	2.63
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	17	21	16	13	26	12.0	12.0	23.0	<5	23	27	14	21	23	25	20	25	18
Calculated TDS	mg/L	1	--	--	--	--	--	218	127	131	130	133	142.0	204.0	182.0	154.0	262	215	167	210	155	180	305	205	150
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	4.14	2.22	2.28	2.62	2.6	2.8	4.1	3.6	2.5	4.46	4.15	2.97	3.81	2.78	3.05	4.89	3.61	2.51
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	64.50	32.70	45.50	38.6	48	32.1	51.5	55.4	37.9	68.5	70.3	54.3	56.1	48.8	59.6	66.5	56.7	43.3
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	8.00	2.20	1.80	14.0	8.3	12.1	13.8	10.0	5.3	1.5	8.1	3.7	4.1	4.4	2.1	6.1	0.6	2.5
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-2.23	-2.35	-2.33	-2.37	-1.85	-2.6	-2.3	-1.9	-4.1	-1.82	-1.65	-2.26	-1.98	-2.17	-1.72	-1.66	-2.26	-2.83
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-2.55	-2.67	-2.65	-2.69	-2.17	-2.9	-2.6	-2.2	-4.4	-2.14	-1.97	-2.58	-2.30	-2.49	-2.04	-1.98	-2.58	-3.15
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	9.07	9.26	9.23	9.39	8.99	9.5	9.3	9.0	9.8	8.92	8.81	9.21	9.04	9.04	8.92	9.00	8.96	9.21
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	9.39	9.58	9.55	9.71	9.31	9.9	9.6	9.3	10.1	9.2	9.1	9.5	9.4	9.4	9.2	9.32	9.28	9.53
Metals (ICP-MS)																								
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	**69**	**450**	**100**	**72**	**80**	--	**45**	**93**	**215**	**107**	--	--	**66**	--	--	***54***	--	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	130	--	77	68	100	--	108	104	197	141	--	--	110	--	--	155	--	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	<5	--	24	11	14	--	10	16	6	11	--	--	11	--	--	14	--	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	**0.032**	--	<0.017	<0.09	<0.09	--	<0.09	<0.09	<0.09	<0.017	--	--	<0.09	--	--	<0.09	--	--
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	1	--	1	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1	--	<1	<1	<1	--	<1	<1	2	<1	--	--	<1	--	--	<1	--	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	<1	**4**	1	1	<1	**3**	1	2	2	<1	<1	2	1	2	1	1	1	1
Total Iron (Fe)	µg/L	50	300	300	--	300	--	151	**3,960**	281	85	**634**	**403**	122	**896**	256	**429**	**528**	196	193	294	179	289	276	151
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	<0.5	--	<0.5	0.8	<0.5	--	<0.5	0.7	0.9	<0.5	--	--	<0.5	--	--	<0.5	--	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	22	511	28	9	99	71	14	62	125	33	41	8	16	34	21	25	44	11
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	12	--	<2	6	<2	--	<2	<2	5	<2	--	--	12	--	--	<2	--	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<1	--	<1	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.1	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<2	--	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	92	--	76	54	88	--	93	88	67	102.0	--	--	89	--	--	109	--	--
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.2	--	--	<0.2	--	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	<2	--	<2	<2	<2	--	2	2	<2	<2	--	--	<2	--	--	<2	--	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	9	**37**	8	6	<5	12	5	8	12	<5	<5	<5	6	8	<5	6	<5	<5
MICROBIOLOGICAL																								
Total Coliform	MPN/100mL	1	--	--	--	--	--	914	>2420	>2420	105	9010	370.0	1,520.0	450.0	1,128.0	>2420	>2420	1,200	>200	>200	>200	>200	20,400	8,900
E. coli	MPN/100mL	1	--	--	400	--	--	12	14	3	<1	10	2	1	3	2	70	33	3	27	34	1	46	400	68
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.25	4.93	1.57	0.63	0.95	1.2	1.05	0.7	13.4	0.4
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	1.56	5.32	0.62	1.57	0.86	1.11	1.88	5.55	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	2.04	5.48	0.99	2.62	--	*	1.90	5.09	--	--	--	--	--	--	--	--	--	--

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).
[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).
[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.
(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - HWY102-2

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Highway 102-2
Sample Site HWY102-2								HWY102-2
Sampling Date	yyyy-mm-dd							2009-06-29
Sampling Time	hh:mm							12:30
FIELD DATA								
Secchi Depth	Meters	--	--	--	1.2	--	--	N/A
Water Temp	Celsius	--	--	--	--	--	--	16.7
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	10.01
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.57
Specific Conductance	uS/cm	--	--	--	--	--	--	37.0
INORGANICS								
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	<5
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	21
Fluoride	mg/L	0.12	--	--	--	0.12	--	--
Colour	TCU	5	--	--	--	--	--	120
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	<0.05
Nitrate (N)	mg/L	0.05	--	13	--	13	--	<0.05
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	<0.01
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.05
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	--
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	8.5
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01
pH (units)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	5.43
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	1.6
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	0.4
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	<0.02
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	0.5
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	15.0
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	2.2
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	<2
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	<2
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	0.7
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	85
Calculated Parameters								
Anion Sum	me/L	N/A	--	--	--	--	--	0.60
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	<1
Calculated TDS	mg/L	1	--	--	--	--	--	42
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<1
Cation Sum	me/L	N/A	--	--	--	--	--	0.81
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	6.00
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	14.90
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	NC
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	NC
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	NC
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	NC
Metals (ICP-MS)								
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	270
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	20
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	<5
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	<0.300
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	<2
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	2
Total Iron (Fe)	µg/L	50	300	300	--	300	--	880
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	1.9
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	110
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	<2
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<2
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.5
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	11
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	4
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1
Total Vanadium (V)	µg/L	2	6	120	--	--	--	<2
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	12
MICROBIOLOGICAL								
Total Coliform	MPN/100mL	1	--	--	--	--	--	28
E. coli	MPN/100mL	1	--	--	400	--	--	4
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	<2
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	0.90
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	0.91

Tested Parameters	2009-08-13	2009-10-01	2010-05-31	2010-08-24	2010-11-01	2011-05-13	2011-08-14	2011-10-16	2012-05-01	2012-08-15	2012-10-11	2013-05-15	2013-08-15	2013-10-16	2014-05-14	2014-10-27	2015-05-20	2015-08-25	2015-10-22	2016-05-16	2016-08-16	2016-10-25
Sampling Time	12:15	12:30	12:40	09:30	12:30	11:20	15:00	15:30	11:20	12:20	10:35	10:40	10:00	10:22	12:15	10:07	11:00	12:58	14:30	12:50	12:45	10:40
Secchi Depth	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NCC	N/A	N/A	N/A	N/A	N/A
Water Temp	19.2	16.4	17.2	17.0	8.7	10.8	24.2	15.1	7.8	23.7	14.3	11.5	22.0	10.7	11.4	10.4	12.7	23.7	9.3	13.4	20.4	10.2
Dissolved Oxygen	5.90	4.80	4.91	2.45	2.99	6.92	7.03	5.09	3.73	13.10	3.28	6.30	1.57	4.20	10.50	9.25	4.24	6.11	5.28	6.77	7.06	6.80
pH (in Situ)	5.71	5.40	6.33	5.86	5.64	6.22	5.93	5.29	7.30	6.37	6.72	6.01	6.92	5.40	5.40	5.55	6.45	6.04	5.96	5.86	6.19	5.36
Specific Conductance	457.0	162.1	415.0	167.0	101.2	92.2	123.1	96.0	225.0	226.0	159.1	288.0	188.5	204.4	204.4	174.0	0.4	699.0	197.6	968.0	838.0	219.2
Total Alkalinity (as CaCO3)	<5	7	6	5	<5	<5	5	<5	17	7	<5	6	14	7	30	8	8	5	<5	13	21	6
Dissolved Chloride (Cl)	82	83	170	41	18	21	21	17	63	109	45	71	50	52	113	34	260	178	78	236	226	48
Fluoride	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Colour	190	91	96	160	68	65	98	77	32	100	70	11	61	36	13	85	17	9	8	14	39	86
Nitrite + Nitrate	<0.05	<0.05	0.10	<0.05	0.62	0.26	1.80	3.20	1.54	<0.05	0.14	0.17	<0.05	<0.05	<0.05	0.12	<0.050	<0.05	0.15	0.21	0.23	0.11
Nitrate (N)	--	--	0.10	<0.05	--	0.26	--	--	1.54	<0.05	0.14	0.17	<0.05	<0.05	<0.05	0.12	<0.050	<0.05	0.15	<0.05	<0.05	0.11
Nitrite (N)	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	<0.05	<0.05	0.21	0.23	<0.05
Nitrogen (Ammonia Nitrogen)	0.06	<0.05	<0.05	0.20	<0.05	<0.05	0.30	0.08	0.09	<0.03	<0.03	<0.03	0.17	0.09	<0.03	<0.03	0.06	0.19	0.05	0.14	0.37	<0.03
Total Kjeldahl Nitrogen as N	--	--	--	--	--	--	--	--	0.6	1.1	0.5	--	0.7	2.0	15.3	<0.4	0.3	62.6	2.0	24.3	2.1	0.6
Total Organic Carbon	13.0	13.0	7.2	14.0	7.4	5.7	9.2	8.4	7.0	15.8	11.2	6.1	10.6	5.1	17.4	8.0	3.0	29.0	9.9	79.3	11.1	13.4
Orthophosphate (as P)	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01
pH (units)	5.96	6.30	6.05	6.32	5.47	5.93	6.18	5.92	5.90	6.70	6.80	6.61	6.59	6.34	7.20	6.40	6.12	6.64	6.18	6.46	6.80	6.15
Total Calcium (Ca)	4.0	4.8	7.4	3.8	4.0	3.1	2.2	3.8	7.0	8.4	5.6	7.6	8.5	8.2	14.1	9.5	20,000.0	33.3	9.8	23.9	23.8	8.6
Total Magnesium (Mg)	0.7	0.9	1.0	0.6	1.0	0.7	0.7	1.4	1.2	1.4	1.2	1.2	1.3	2.2	3.1	1.8	2,500.0	32.7	2.2	3.2	2.5	1.7
Total Phosphorus	0.040	0.034	0.010	0.028	0.003	0.009	0.019	0.041	0.021	0.054	0.030	0.014	0.028	0.199	0.028	0.201	0.010	1.560	0.012	0.222	0.034	0.012
Total Potassium (K)	0.8	1.1	1.0	1.0	1.4	0.8	1.3	1.9	1.2	1.7	1.6	1.3	1.5	2.5	2.9	1.7	1,900.0	12.5	1.1	4.0	2.1	1.4
Total Sodium (Na)	51.0	55.0	83.7	32.0	12.1	13.3	13.1	13.3	41.5	63.6	20.4	39.0	19.1	34.5	69.6	24.0	150.0	124.0	36.8	149.0	124.0	26.4
Reactive Silica (SiO2)	4.4	4.0	3.0	6.4	5.4	2.5	6.5	6.7	4.1	6.9	5.8	1.6	6.2	6.6	1.6	5.9	2.3	7.2	5.6	2.8	9.0	4.5
Total Suspended Solids	58	62	34	27	3	<1	10	14	<5	39	<5	<5	<5	194	34	<5	2	3,000	15	342	69	<5
Dissolved Sulphate (SO4)	3	8	11	<2	7	5	5	8	12	6	10	10	9	10	12	8	15	7	8	22	21	8
Turbidity (NTU)	3.8	4.2	2.6	3.1	0.5	0.4	1.2 (1)	3.9	0.6	10.8	2.0	1.5	3.3	144.0	1.1	1.1	1.2	1,490.0	9.9	131.0	54.2	1.1
Conductivity (uS/cm)	290	310	590	160	94	91	100	110	263	403	179	295	203	223	433	194	920	662	315	817	952	177
Anion Sum	2.37	2.62	5.13	1.27	0.70	0.73	0.91	0.86	2.48	3.34	1.49	2.34	1.88	1.81	4.04	1.29	7.88	5.27	2.38	7.39	7.25	1.65
Bicarb. Alkalinity (calc. as CaCO3)	<1	7	6	5	<1	<1	5	<1	17	7	<5	6	14	7	30	8	8	5	<5	13	21	6
Calculated TDS	150	165	282	93	52	48	62	67	143	200	86	135	100	145	235	85	460	712	138	473	422	99
Carb. A kalinity (calc. as CaCO3)	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	<10	<10	<10	<10
Cation Sum	2.65	2.89	4.17	1.81	0.86	0.82	0.83	0.97	2.32	2.10	1.40	2.24	1.50	3.50	4.17	1.76	7.87	29.10	2.35	9.27	7.23	1.80
Hardness (CaCO3)	13.00	16.00	23.00	12.00	14.00	11.00	8.00	15.00	22.40	26.70	18.90	23.90	26.60	29.50	48.00	31.10	59.00	218.00	33.50	72.90	69.70	28.50
Ion Balance (% Difference)	5.58	4.90	10.30	17.50	10.30	5.81	4.60	6.01	3.30	3.60	3.10	2.30	11.30	31.70	1.60	15.10	0.06	69.40	0.50	11.30	0.10	4.30
Langelier Index (@ 20C)	NC	NC	-3.72	-3.70	NC	NC	-4.07	NC	-3.63	-3.15	-3.34	-3.33	-2.92	-3.50	-1.80	-3.30	-3.18	-2.81	-3.73	-2.70	-2.15	-3.72
Langelier Index (@ 4C)	NC	-3.82	-3.97	-3.95	NC	NC	-4.32	NC	-3.95	-3.47	-3.66	-3.65	-3.24	-3.82	-2.12	-3.62	-3.42	-3.13	-4.05	-3.02	-2.47	-4.04
Saturation pH (@ 20C)	NC	9.87	9.77	10.00	NC	NC	10.30	NC	9.53	9.85	10.10	9.94	9.51	9.84	9.00	9.70	9.29	9.45	9.91	9.16	8.95	9.87
Saturation pH (@ 4C)	NC	10.10	10.00	10.30	NC	NC	10.50	NC	9.85	10.20	10.50	10.30	9.83	10.20	9.32	10.00	9.54	9.77	10.20	9.48	9.27	10.20
Total Aluminum (Al)	--	--	189	368	--	260	--	--	145	466	259	130	138	2,760	400	216	100	--	129	3,880	--	--
Total Antimony (Sb)	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--
Total Arsenic (As)	--	--	<1.0	2	--	<1.0	--	--	<2	<2	<2	<2	<2	6	<2	<2	<1.0	--	<2	3	--	--
Total Barium (Ba)	--	--	53	28	--	27	--	--	49	74	33	44	43	213	381	63	140	--	147	762	--	--
Total Beryllium (Be)	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	<2
Total Bismuth (Bi)	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--
Total Boron (B)	--	--	8	8	--	<50	--	--	10	17	15	9	10	13	11	12	<50	--	<5	9	--	--
Total Cadmium (Cd)	--	--	0.051	<0.017	--	<0.017	--	--	0.037	0.031	0.032	0.019	<0.017	0.096	0.051	0.019	0.100	--	<0.017	0.778	--	--
Total Chromium (Cr)	--	--	<1.0	1	--	<1.0	--	--	<1	<1	<1	<1	1	9	2	<1	<1.0	--	<1	8	--	--
Total Cobalt (Co)	--	--	1	1	--	<0.40	--	--	<1	1	1	<1	1	3	1	<1	2	--	3	4	--	--
Total Copper (Cu)	--	--	2	<2.0	<2.0	3	3	3	<2	3	3	<2	1	12	4	2	<2.0	404	2	13	<1	2
Total Iron (Fe)	880	1,380	3,850	303	229	897	1,110	214	5,210	1,550	383	1,720	28,400	1,660	485	960	217,000	714	21,300	7,380	375	
Total Lead (Pb)	--	--	1.6	2.7	--	0.6	--	--	<0.5	5.2	2.1	0.6	0.7	19.4	3.5	1.0	<0.50	--	0.6	39.7	--	--
Total Manganese (Mn)	--	--	387	135	53	41	106	176	78	219	207	83	173	327	212	93	470	2,800	303	586	359	71
Total Molybdenum (Mo)	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--
Total Nickel (Ni)	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	4	2	<2	<2.0	--	<2	8	--	--
Total Selenium (Se)	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	--	<1	<1	--	--
Total Silver (Ag)	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--
Total Strontium (Sr)	--	--	37	21	--	17	--	--	33	45	31	39	40	45	75	43	96	--	38	96	--	--
Total Thallium (Tl)	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--
Total Tin (Sn)	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2	--	--
Total Titanium (Ti)	--	--	<2	6	--	5	--	--	<2	10	4	4	<2	60	9	6	<2	--	<2	41	--	--
Total Uranium (U)	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	--	<0.1	0.2	--	--
Total Vanadium (V)	--	--	<2	<2	--	<2	--	--	<2	2	<2	<2	<2	11	<2	<2	<2.0	--	<2	18	--	--
Total Zinc (Zn)	6	9	14	12	9	6	9	13	<5	7	12	12	<5	46	36	17	27	1,210	10	170	22	11
Total Coliform	>250	--	>250	75	41	110	>250	--	1,553	>2420	>2420	2,420	1,990	>2420	687	>2420	---	>2420	328	>2420	>2420	>2420
E. coli	230	--	9	5	<1	7	>250	<100	<1	16	50	111	9	4	<1	<1	<10	201	2	1	20	11
Chlorophyll A - Spectrophotometer	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Acidification method	82.63	48.17	0.85	16.36	0.25	0.97	4.91	1.90	2.07	21.03	0.33	2.41	1.10	21.62	10.34	0.46	0.53	119.14	6.24	539.78	54.98	0.43
Chlorophyll A - Welschmeyer method	81.20	52.50	0.85	17.35	0.23	0.87	4.49	2.15	2.27	17.26	0.50	3.02	1.30	27.02	11.09	0.55	0.58	129.77	2.23	793.90	73.67	0.56

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).

[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.

(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded) = Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded) = Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded) = Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations

Blue shaded = Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - HWY102-2

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Highway 102																
Sample Site HWY102-2								HWY102-2																
Sampling Date	yyyy-mm-dd							2107-06-08	2017-08-15	2017-10-18	2018-05-09	2018-08-17	2018-10-17	05/09/2019	08-20-19	2019-11-08	02-Jul-20	17-Aug-20	29-Oct-20	27-May-21	09-Aug-21	22-Oct-21	31-May-22	18-Aug-22	21-Oct-22
Sampling Time	hh:mm							11:45	15:25	12:25	12:30	11:30	14:15 PM	3:55PM	12:20PM	16:30	10:00 AM	1:54 PM	9:01 AM	1:38 PM	1:22 PM	12:34 PM	1:15 PM	12:10 PM	1:15 PM
FIELD DATA																								
Secchi Depth	Meters	--	--	--	1.2	--	--	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA**	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*
Water Temp	Celsius	--	--	--	--	--	--	13.0	22.4	15.2	14.9	18.3	10.6	11.4	23.1	9.7	18.8	17.7	7.5	14.9	18.5	13.7	14.9	18.4	12.8
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	5.68	1.81	11.32	8.75	2.29	5.62	**	3.81	12.70	4.92	7.96	5.45	17.91	4.27	15.05	3.92	2.27	5.05
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.04	7.56	8.32	6.13	6.88	7.24	6.83	6.19	6.98	5.99	5.56	6.18	6.52	5.99	6.07	6.71	7.29	7.86
Specific Conductance	uS/cm	--	--	--	--	--	--	400.0	414.0	338.0	355.6	394.7	246.4	501.0	720.0	202.0	461.0	472.0	399.0	424.0	729.0	728.0	693.0	689.0	450.2
INORGANICS																								
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	<5	22	11	9	21	13	<5	17	<5	18.0	11.0	11.0	16	11	8	8	13	9
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	136	107	92	79	90	30	161	223	74	172	200	99	103	94	199	251	186	108
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.12	--	<0.12	<0.12
Colour	TCU	5	--	--	--	--	--	20	41	22	25	85	85	22	42	45	27	56	28	22.9	86.6	24.8	33	45.8	42.6
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.20	0.09	0.07	0.33	0.21	0.76	0.60	0.14	0.58	0.08	<0.05	0.30	0.11	<0.05	0.06	0.06	0.09	0.08
Nitrate (N)	mg/L	0.05	--	13	--	13	--	<0.05	0.09	0.07	0.16	<0.05	0.76	0.17	0.07	0.58	0.08	<0.05	0.30	0.11	<0.05	0.06	0.06	0.09	0.08
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	0.20	<0.05	<0.05	0.17	0.21	<0.05	0.43	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.03	0.09	0.14	<0.03	0.24	0.06	0.04	0.29	0.05	0.25	0.31	<0.03	<0.03	<0.03	<0.03	<0.03	0.09	0.22
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	<0.4	0.7	0.6	1.4	0.9	<0.4	<0.4	0.7	1.2	<0.4	4.10	9.80	0.35	0.4	0.1	0.23	0.64	0.25
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	5.4	9.2	5.9	5.6	7.5	8.0	3.2	8.2	6.8	4.90	21.20	6.30	9.0	10.4	4.7	5.7	9.4	7.8
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.13	0.01	0.01
pH (units)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.22	6.73	6.51	6.79	6.79	7.07	6.36	6.67	6.37	6.86	6.86	6.77	7.05	6.40	6.66	6.99	6.44	6.73
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	13.3	14.7	14.7	11.5	12.5	16.5	22.8	17.2	7.9	23.2	9.8	19.2	19.3	11.9	17.1	16.6	16	11.1
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	2.5	1.9	2.1	1.4	1.7	1.9	3.6	2.2	1.4	3.1	340.0	2.8	2.8	1.8	2.1	2.4	2.4	2.1
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	0.013	0.042	0.011	0.034	0.025	0.014	0.006	0.037	0.022	0.018	0.008	0.013	0.018	0.036	0.018	0.020	0.033	0.030
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	1.1	1.6	1.6	1.3	1.6	1.7	2.2	2.1	1.1	2.1	3.7	2.1	1.9	1.2	2.0	2	2.1	1.9
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	68.8	66.0	55.2	59.4	81.6	29.4	148.0	139.0	31.7	96.7	118.0	57.8	64.7	61.9	98.1	123	107	63
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	3.1	5.7	6.4	1.6	8.8	4.6	3.1	7.2	4.4	5.7	7.6	6.7	3.3	6.6	4.5	4.8	9.4	5.3
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	6	7	8	12	<5	<5	<5	16	<5	<5	57.0	<5	9	14	<5	13	<5	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	10	7	9	9	4	16	13	11	9	12.0	10.0	16.0	13	6	8	13	16	10
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	2.4	9.9	12.5	7.0	13.8	1.1	1.2	26.8	4.4	9.7	32.9	3.0	2.6	1.7	6.8	1.1	5.4	2.0
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	451	413	366	422	444	208	737	782	204	629	742	412	436	430	546	746	647	413
Calculated Parameters																								
Anion Sum	me/L	N/A	--	--	--	--	--	4.06	3.61	3.01	2.62	3.06	1.5	4.9	6.9	2.3	5.47	6.07	3.37	3.50	3.00	5.94	7.52	5.85	3.44
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	<5	22	11	9	21	13.0	<5	17.0	<5	18	11	11	16	11	8	8	13	9
Calculated TDS	mg/L	1	--	--	--	--	--	233	215	187	170	209	107.0	354.0	415.0	129.0	324	359	206	217	185	335	414	339	203
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	3.92	3.93	3.60	3.36	4.53	2.3	8.0	7.5	2.0	5.83	6.25	3.81	4.13	3.54	5.49	6.46	5.78	3.56
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	43.50	44.50	45.40	34.5	38.2	49.0	71.8	52.0	25.5	70.7	33.1	59.5	59.7	37.1	51.3	51.3	49.8	36.4
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	1.80	4.20	8.90	12.4	19.4	21.8	24.3	4.4	8.0	3.2	1.5	6.2	8.4	4.0	7.6	0.6	1.7	
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-3.58	-2.38	-3.20	-2.90	-2.81	-2.41	-2.2	-2.2	-2.5	-3.6	-2.16	-2.75	-2.52	-2.08	-3.10	-2.84	-2.54	-2.88	-3.47
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-3.90	-2.70	-3.22	-3.13	-2.73	-2.5	-3.6	-2.8	-4.0	-2.48	-3.07	-2.84	-2.40	-3.42	-3.16	-2.86	-3.20	-3.79
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	9.80	9.11	9.41	9.60	9.2	9.3	9.6	9.2	10.0	9.02	9.61	9.29	9.13	9.50	9.50	9.53	9.32	9.62
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	10.10	9.43	9.73	9.92	9.52	9.6	9.9	9.5	10.3	9.3	9.9	9.6	9.45	9.82	9.82	9.85	9.64	9.94
Metals (ICP-MS)																								
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	99	149	542	167	152	--	126	194	306	99	--	--	112	--	--	98	--	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	--	<2	<2	<2	--	<2	4	<2	<2	--	--	<2	--	--	<2	--	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	151	--	122	96	146	--	272	138	100	266.0	--	--	174	--	--	180	--	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	<5	--	12	7	11	--	7	9	6	11.0	--	--	10	--	--	9	--	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	0.019	--	0.048	<0.09	<0.09	--	<0.09	<0.09	<0.09	<0.017	--	--	<0.09	--	--	<0.09	--	--
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	<1	--	2	<1	2	--	<1	1	<1	<1	--	--	<1	--	--	<1	--	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1	--	2	<1	2	--	<1	3	<1	<1	--	--	<1	--	--	1	--	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	<1	1	3	2	1	2	2	1	3	3	4	2.0	2	2	5	2	2	2
Total Iron (Fe)	µg/L	50	300	300	--	300	--	369	2,650	4,760	870	3,600	93	728	8,440	506	3,260	7,640	1,030	1,600	1,080	2,400	*367*	*1250*	*309*
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	<0.5	--	3.3	2.3	1.0	--	1.4	1.4	1.9	0.7	--	--	0.6	--	--	<0.5	--	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	125	160	215	55	262	10	137	625	50	341	340	99	100	328	562	134	148	40
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	6	--	3	<2	<2	--	3	<2	2	<2	--	--	<2	--	--	<2	--	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<1	--	<1	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.1	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	72	--	80	53	81	--	129	95	49	112.0	--	--	97	--	--	82	--	--
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	<2	--	15	4	3	--	<2	3	7	2.0	--	--	3	--	--	<2	--	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.2	--	--	<0.2	--	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	2	--	3	<2	2	--	4	5	<2	<2	--	--	<2	--	--	2	--	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	14	9	19	12	6	69	16	15	13	<5	24.0	7.0	6	6	16	*11*	7	7
MICROBIOLOGICAL																								
Total Coliform	MPN/100mL	1	--	--	--	--	--	>2420	>2420	>2420	6	410	81.0	930.0	NDOGT	1,152.0	>2420	>2420	816	>200	>200	>200	>200	10,500	4,700
E. coli	MPN/100mL	1	--	--	400	--	--	<1	8	41	1	26	3	<10	30	18	365	172	<1	14	31	<1	33	49	22
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	--	--	--	0.32	2.89	206	0.81	1.1	0.77	4.99	8.2	1.2	<0.3
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	1.40	2.11	28.94	2.56	2.58	0.53	3.06	23.70	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	1.74	3.20	37.67	4.28	--	*	3.04	20.50	--	--	--	--	--	--	--	--	--	--

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.

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[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.

(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - LSD

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Lake Shore Drive																				
Sample Site - LSD								LSD																				
Sampling Date	yyyy-mm-dd							2009-06-29	2009-08-13	2009-10-01	2010-05-31	2010-08-24	2010-11-01	2011-05-13	2011-08-14	2011-10-17	2012-05-01	2012-08-15	2012-10-11	2013-05-15	2013-08-15	2013-10-16	2014-05-15	2014-10-27	2015-05-20	2015-08-25	2015-10-22	2016-05-16	2016-08-16	2016-10-25
Sampling Time	hh:mm							12:00	09:30	11:45	09:00	11:28	10:00	08:45	13:20	9:00	9:15	13:00	9:10	08:40	15:30	11:55	9:30	13:30	09:50	16:02	13:40	15:00	12:10	12:25
FIELD DATA																												
Secchi Depth	Meters	--	--	--	1.2	--	--	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NCC	N/A	N/A	N/A	N/A	N/A
Water Temp	Celsius	--	--	--	--	--	--	13.1	16.7	15.3	13.4	21.3	7.3	10.2	21.0	12.0	5.7	25.7	13.4	7.7	20.2	8.8	8.9	10.5	12.5	24.3	5.8	13.2	24.0	9.4
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	**10.84**	5.70	5.50	8.60	**5.41**	8.47	9.44	7.87	8.16	**4.06**	**2.69**	7.58	8.77	7.26	7.60	**14.75**	7.22	6.26	7.25	7.21	8.22	**1.86**	8.67
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	7.88	6.74	**6.34**	**6.42**	6.64	**6.17**	7.09	6.88	6.63	8.22	7.16	6.92	**6.19**	7.28	**6.23**	7.02	**6.31**	6.88	**6.34**	**6.43**	6.63	**6.16**	**6.25**
Specific Conductance	uS/cm	--	--	--	--	--	--	723.0	210.0	167.7	217.8	203.2	110.3	145.9	126.4	111.9	62.0	177.5	116.7	123.6	132.5	147.8	180.0	111.0	0.1	155.3	132.3	162.0	254.0	162.2
INORGANICS																												
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	13	16	12	13	21	9	9	15	12	21	14	11	8	20	11	35	10	11	7	9	11	22	8
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	41	34	31	49	45	25	38	27	22	22	33	23	39	32	23	29	23	32	27	26	39	45	31
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Colour	TCU	5	--	--	--	--	--	32	27	37	20	26	33	32	41	49	13	20	40	10	21	25	9	31	20	11	26	25	26	24
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.14	0.14	0.06	0.23	0.10	0.12	0.25	0.17	0.09	0.13	0.80	<0.05	0.18	0.20	<0.05	0.09	0.11	0.15	0.25	0.30	0.08	0.08	<0.05
Nitrate (N)	mg/L	0.05	--	13	--	13	--	0.14	--	--	0.23	0.10	--	0.25	--	--	0.13	0.80	<0.05	0.18	0.20	<0.05	0.09	0.11	0.15	0.16	0.30	0.08	0.08	<0.05
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	**0.09**	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	0.06	0.03	<0.03	<0.03	<0.03	0.03	0.03	0.04	<0.03	<0.050	0.11	<0.03	0.06	0.10	<0.03
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5	3.5	0.5	--	0.7	3.0	1.0	<0.4	0.3	77.4	2.8	2.2	11.8	0.5
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	5.0	3.8	6.8	3.7	6.0	5.3	4.7	7.1	7.5	3.1	8.0	7.7	4.7	6.3	6.9	5.2	8.1	3.2	14.1	9.9	5.5	14.0	8.9
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01
pH (units)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.69	6.69	6.93	7.10	7.30	6.67	6.72	6.79	**6.49**	**6.20**	6.90	6.90	6.94	6.95	**6.49**	**6.47**	6.72	7.02	6.59	6.68	6.65	7.01	**6.38**
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	6.5	6.9	5.4	8.0	10.5	5.3	5.9	5.1	5.0	2.6	18.1	5.1	6.4	6.0	5.6	5.4	5.1	6,100.0	52.2	5.4	6.6	9.9	4.8
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	1.4	1.6	1.3	2.0	2.1	1.2	1.3	1.2	1.2	0.7	3.3	1.4	1.2	1.4	1.6	1.5	1.1	1,300.0	23.0	1.5	1.4	1.8	1.3
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	<0.02	**0.030**	0.009	**0.018**	**0.100**	0.009	**0.018**	**0.028**	**0.014**	**0.022**	**0.063**	0.003	0.007	**0.015**	**0.078**	**0.100**	**0.031**	**0.011**	**0.501**	**0.095**	**1.250**	**0.023**	**0.012**
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	1.2	1.1	1.3	1.2	1.2	1.0	1.1	1.0	1.2	0.6	1.9	1.3	1.2	1.1	1.4	1.1	1.1	1,100.0	9.7	1.0	1.2	1.3	1.1
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	24.0	21.0	18.0	24.8	26.9	15.2	23.2	14.3	13.8	11.3	18.6	15.2	21.9	26.6	14.6	23.4	18.1	19.0	24.4	13.4	25.1	23.4	19.7
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	3.1	4.2	4.0	3.2	3.4	4.3	2.6	3.9	3.8	3.1	2.9	4.9	2.6	3.9	5.0	2.9	4.2	2.4	4.2	4.4	1.6	3.3	3.5
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	16	98	5	6	110	7	4	77	5	<5	16	19	<5	17	9	51	8	5	**719**	69	93	**9,020**	15
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	6	4	5	7	3	4	6	4	4	5	5	5	6	7	5	5	4	5	<2	3	5	6	7
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	0.6	12.0	2.5	12.0	6.2	1.0	0.6	2.5	1.7	6.7	**283.0**	2.1	1.1	31.6	**82.6**	6.6	1.4	1.2	**4,430.0**	5.4	**65.3**	**206.0**	7.9
Conductivity (uS/cm)	uS/cm	1	--	--	--	--	--	170	150	140	200	200	110	150	130	110	96	161	110	168	136	105	122	125	140	129	136	160	236	133
Calculated Parameters																												
Anion Sum	me/L	N/A	--	--	--	--	--	1.56	0.82	1.22	1.80	1.77	0.97	1.39	1.14	0.96	1.15	1.37	0.97	1.40	1.46	0.97	1.63	0.94	1.22	0.92	1.00	1.43	1.84	1.18
Bicarb. A kalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	13	8	12	13	21	9	9	15	12	21	14	11	8	20	11	35	10	11	7	9	11	22	8
Calculated TDS	mg/L	1	--	--	--	--	--	92	55	74	104	107	62	84	66	60	56	163	58	82	87	66	88	59	74	498	65	91	107	70
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	1.53	0.99	1.20	1.69	1.94	1.05	1.44	1.02	1.00	0.76	3.59	1.10	1.43	1.62	1.62	1.52	1.19	1.28	31.00	1.42	1.94	2.04	1.27
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	22.00	15.00	19.00	28.00	35.00	18.00	20.00	18.00	18.00	9.40	58.80	18.50	20.90	20.70	20.60	19.70	17.30	21.00	225.00	19.70	22.20	32.10	17.30
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	0.97	9.39	0.83	3.15	4.58	3.96	1.77	5.56	2.04	20.70	63.00	6.10	1.00	5.20	25.00	3.40	11.80	2.40	94.20	17.50	15.20	5.30	3.80
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-2.74	-3.20	-2.60	-2.22	-1.71	-2.99	-2.88	-2.64	-3.05	-3.62	-2.30	-2.91	-2.93	-2.55	-3.29	-2.84	-3.14	-2.50	-2.50	-3.20	-2.97	-2.24	-3.61
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-2.99	-3.45	-2.85	-2.47	-1.96	-3.24	-3.13	-2.89	-3.31	-3.94	-2.62	-3.23	-3.25	-2.87	-3.61	-3.16	-3.46	-2.75	-2.82	-3.52	-3.29	-2.56	-3.93
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	9.43	9.78	9.53	9.32	9.01	9.66	9.60	9.43	9.54	9.82	9.20	9.81	9.87	9.50	9.78	9.31	9.86	9.51	9.09	9.88	9.72	9.25	9.99
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	9.68	10.00	9.78	9.57	9.26	9.91	9.85	9.68	9.80	10.10	9.52	10.10	10.20	9.82	10.10	9.63	10.20	9.77	9.41	10.20	10.00	9.57	10.30
Metals (ICP-MS)																												
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	**259**	--	--	**349**	**189**	--	**217**	--	--	**490**	**19,200**	**186**	**131**	**93**	**3,420**	**487**	**141**	**120**	--	**1,960**	**2,150**	--	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	**8**	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	13	--	--	15	19	--	14	--	--	11	86	12	12	7	24	15	11	12	--	27	34	--	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	<2
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	9	--	--	41	22	--	<50	--	--	6	24	16	10	15	15	14	16	<50	--	<5	12	--	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	**0.019**	--	--	**0.018**	<0.017	--	<0.017	--	--	**0.029**	**1.050**	**0.023**	<0.017	<0.017	**0.073**	**0.032**	<0.017	**0.011**	--	<0.017	**0.120**	--	--
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	<1	--	--	<1.0	<1.0	--	<1.0	--	--	<1	**11**	<1	<1	<1	**2**	<1	<1	<1.0	--	**3**	**2**	--	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1	--	--	<0.40	1	--	<0.40	--	--	<1	34	<1	<1	<1	**1**	<1	<1	<0.40	--	4	4	--	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	2	--	--	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2	**22**	2	<2	1	**12**	2	**3**	<2.0	**183**	**6**	3	<1	<1
Total Iron (Fe)	µg/L	50	300	300	--	300	--	**523**	--	--	**554**	**965**	120	211	**388**	**384**	161	**38,900**	**312**	236	254	**4,200**	**593**	**363**	230	**176,000**	**4,570**	**2,790**	**2,190**	**303**
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	<0.5	--	--	**3.0**	0.5	--	<0.5	--	--	0.6	**82.4**	<0.5	<0.5	<0.5	**5.2**	0.5	<0.5	<0.5	--	**5.9**	**4.3**	--	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	53	--	--	113	632	23	30	53	39	26	**13,200**	67	71	81	124	140	60	130	**13,800**	**985**	**921**	**2,420**	75
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	13	<2	<2	<2	2	<2	<2	<2.0	--	5	2	--	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<1	--	--	<1.0	<1.0	--	<1.0	--	--	<1	**2**	<1	<1	<1	<1	<1	<1	<1.0	--	<1	<1	--	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	0.100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	12	--	--	36	42	--	24	--	--	12	82	22	24	24	25	26	19	25	--	16	29	--	--
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2	--	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	2	--	--	7	4	--	5	--	--	3	405	4	<2	2	36	6	3	3	--	41	30	--	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	1.6	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	--	0.2	0.2	--	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	<2	--	--	<2	<2	--	<2	--	--	<2	**30**	<2	<2	<2	2	<2	<2	<2	--	6	4	--	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	<5	--	--	7	7	<5.0	<5.0	<5.0	5	<5	**110**	7	6	<5	15	<5	<5	<5.0	**799**	11	17	14	<5
MICROBIOLOGICAL																												
Total Coliform	MPN/100mL	1	--	--	--	--	--	53	>250	--	>250	>250	280	85	>250	--	1,414	>2420	>2420	1,990	>2420	>2420	1,203	8	---	>2420	>2420	>2420	>2420	>2420
E. coli	MPN/100mL	1	--	--	400	--	--	22	24	--	4	45	6	10	**>250**	<100	2	26	10	10	20	2	--	**>2420**	<10	16	17	9	30	16
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	1.46	10.70	4.68	1.21	6.64	0.21	1.19	1.93	1.41	1.88	6.62	0.13	<0.50	1.60	2.02	1.91	0.32	1.02	90.33	5.12	8.22	127.14	0.38
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	1.85	11.10	5.62	1.32	7.71	0.19	1.07	1.73	1.18	2.28	7.58	0.22	<0.50	2.00	2.98	1.91	0.33	1.07	121.83	4.62	13.77	185.98	0.48

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.
[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.
[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).
[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).
[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using he highest water pH and temperature). The value is converted to mg/L total ammonia-N by mutiplying by 0.8224.
[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.
[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.
[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents he guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.
(**) Dissolved oxygen field data not recorded - Post-calibration failure of field equipment for DO sensor.

Bold (black shaded) = Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded) = Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded) = Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations

Blue shaded = Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Heal h Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - LSD

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Lake Shore Drive															
Sample Site - LSD								LSD															
Sampling Date	yyyy-mm-dd							2017-06-08	2017-08-15	2017-10-18	2018-05-09	2018-08-17	2018-10-17	05/09/2019	08-20-19	2019-11-08	02-Jul-20	17-Aug-20	29-Oct-20	27-May-21	09-Aug-21	22-Oct-21	31-May-22	18-Aug-22	21-Oct-22
Sampling Time	hh:mm							10:20	11:55	11:05	11:30	10:30	10:50 AM	11:26 AM	10:44 AM	1:45 PM	12:15 PM	1:08 PM	11:22 AM	10:52 PM	11:07 AM	10:38 AM	11:20 AM	1:00 PM	11:07 AM
FIELD DATA																							
Secchi Depth	Meters	--	--	--	1.2	--	--	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA	NA**	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*
Water Temp	Celsius	--	--	--	--	--	--	15.6	23.0	9.7	14.4	22.4	9.3	10.2	25.0	8.3	26.5	18.3	6.8	13.9	18.6	10.5	15.7	19.2	11.7
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	11.35	6.95	5.34	9.08	6.85	7.24	**	4.93	7.90	2.66	3.24	11.40	12.45	6.46	12.45	8.69	4.09	9.27
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.78	6.57	5.91	5.82	6.41	5.90	7.01	6.51	6.40	6.31	6.05	6.41	6.75	6.55	5.98	7.58	7.52	8.94
Specific Conductance	uS/cm	--	--	--	--	--	--	150.0	188.0	92.0	75.0	182.9	108.1	99.7	368.0	171.0	195.0	158.0	145.8	120.0	137.0	129.0	246.9	141.0	171.4
INORGANICS																							
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	12	26	20	9	27	9	12	33	<5	30.0	21.0	13.0	15	13	17	16	14	10
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	43	38	36	23	32	20	30	29	20	35	35	32	27	26	33	60	42	37
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.12	--	<0.12	<0.12
Colour	TCU	5	--	--	--	--	--	25	31	21	36	40	65	39	86	38	56	60	30	17.0	50.8	31.1	25.1	16.7	31.5
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.19	0.48	0.22	0.32	<0.05	0.10	0.08	0.07	0.07	<0.05	<0.05	0.05	0.10	<0.05	<0.05	0.08	0.31	<0.05
Nitrate (N)	mg/L	0.05	--	13	--	13	--	0.10	0.39	0.22	0.32	<0.05	0.10	0.08	0.07	0.07	<0.05	<0.05	0.05	0.10	<0.05	<0.05	0.08	0.31	<0.05
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	0.09	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.03	0.08	0.04	<0.03	0.06	<0.03	<0.03	0.53	0.06	0.60	0.68	<0.03	<0.03	<0.03	<0.03	<0.03	0.13	0.14
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	1.0	34.5	10.0	<0.4	1.7	<0.4	<0.4	1.6	1.6	0.70	4.10	0.60	0.64	0.3	<0.10	0.23	0.61	0.3
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	7.7	8.1	6.9	5.8	5.8	8.0	5.9	12.1	6.2	7.50	8.70	6.90	7.3	6.4	3.7	5.4	6.1	7.3
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.13	<0.01	0.01
pH (units)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.92	7.08	7.01	6.91	7.20	6.99	6.93	7.11	6.55	7.19	7.04	6.75	6.88	6.54	7.15	7.35	6.7	6.24
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	7.1	8.0	6.7	4.4	10.2	3.5	6.0	9.6	2.7	8.4	4.5	6.3	7.5	6.3	8.4	8.9	8.1	6.4
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	1.6	1.7	1.6	1.1	2.3	0.9	1.5	2.6	0.7	1.8	1,190.0	1.5	1.6	1.4	1.7	2	1.9	1.6
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	0.102	0.059	0.015	0.052	0.305	0.018	0.008	0.031	0.008	0.028	0.084	0.010	0.044	0.043	0.034	0.020	0.064	0.030
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	1.3	1.4	1.2	0.9	1.6	0.8	1.3	1.7	0.6	1.2	0.9	1.2	1.1	1.0	1.4	1.6	1.4	1.5
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	25.2	26.0	23.0	16.5	21.7	15.4	24.4	20.7	9.8	21.4	25.1	21.9	17.9	19.9	20.2	34	24	22
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	1.1	2.7	4.0	2.4	2.4	3.3	1.7	4.2	3.5	3.9	2.0	3.9	3.0	4.9	3.4	3.9	4.3	3.9
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	138	41	<5	<5	444	6	8	150	<5	56.0	132.0	<5	19	32	<5	<5	6	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	4	3	4	5	<2	5	4	<2	5	3.0	3.0	5.0	4	4	4	7	5	7
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	53.8	21.3	15.1	2.0	72.2	2.5	5.0	44.4	1.2	6.4	18.2	0.7	8.2	0.9	1.2	1.4	4.6	2.9
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	178	192	171	122	192	123	151	170	63	197	193	150	139	146	163	243	197	170
Calculated Parameters																							
Anion Sum	me/L	N/A	--	--	--	--	--	1.55	1.69	1.51	0.96	1.44	0.9	1.2	1.5	0.7	1.65	1.47	1.27	1.15	1.08	1.35	2.16	1.59	1.39
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	12	26	20	9	27	9.0	12.0	33.0	<5	30	21	13	15	13	17	16	14	10
Calculated TDS	mg/L	1	--	--	--	--	--	92	97	87	58	95	52.0	76.0	96.0	39.0	96	90	77	70	67	80	124	94	82
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	1.75	1.74	1.59	1.08	2.27	1.0	1.6	2.1	0.7	1.83	1.76	1.45	1.40	1.35	1.51	2.15	1.71	1.49
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	24.30	27.00	23.30	15.5	34.9	12.4	21.2	34.7	9.6	28.4	17.0	21.9	25.3	21.5	28.0	30.5	28.0	22.6
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	6.10	1.40	2.30	6.0	22.2	6.6	14.2	17.9	1.0	5.1	9.0	6.6	9.6	11.3	5.4	0.3	3.6	3.5
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-2.73	-2.19	-2.44	-3.06	-1.94	-3.1	-2.8	-2.0	-3.9	-1.99	-2.57	-2.91	-2.64	-3.12	-2.27	-2.09	-2.83	-3.43
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-3.05	-2.51	-2.76	-3.38	-2.26	-3.4	-3.1	-2.3	-4.2	-2.31	-2.89	-3.23	-2.96	-3.44	-2.59	-2.41	-3.15	-3.75
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	9.65	9.27	9.45	9.97	9.14	10.1	9.7	9.1	10.4	9.18	9.61	9.66	9.52	9.66	9.42	9.44	9.53	9.77
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	9.97	9.59	9.77	10.3	9.46	10.4	10.0	9.4	10.7	9.5	9.9	10.0	9.84	9.98	9.74	9.76	9.85	10.10
Metals (ICP-MS)																							
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	731	48	401	142	2,590	--	124	665	154	248	--	--	199	--	--	92	--	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	--	<2	<2	<2	--	<2	3	<2	<2	--	--	<2	--	--	<2	--	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	32	--	11	8	53	--	13	53	7	42.0	--	--	18	--	--	17	--	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	<5	--	20	10	20	--	9	21	9	18.0	--	--	14	--	--	20	--	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	0.031	--	<0.017	<0.09	0.130	--	<0.09	<0.09	<0.09	<0.017	--	--	<0.09	--	--	<0.09	--	--
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	<1	--	1	<1	2	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	1	--	<1	<1	6	--	<1	6	<1	2.0	--	--	1	--	--	<1	--	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	<1	<1	1	<1	4	1	<1	2	1	<1	1.0	1.0	1	2	<1	1	<1	1
Total Iron (Fe)	µg/L	50	300	300	--	300	--	1,080	375	874	239	5,460	164	560	5,530	118	3,510	4,550	378	1,020	356	440	239	761	245
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	0.6	--	0.7	0.7	4.3	--	<0.5	3.2	<0.5	0.8	--	--	<0.5	--	--	<0.5	--	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	436	212	250	55	2,630	58	368	5,050	8	2,840	1,190	102	678	74	308	112	529	27
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	<2	--	<2	<2	4	--	<2	<2	9	<2	--	--	<2	--	--	<2	--	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<1	--	<1	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.1	--	<0.1	<0.1	<0.1	--	<0.1	0.200	<0.1	<0.1	--	--	<0.1	--	--	<2	--	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	28	--	31	17	54	--	27	56	15	32.0	--	--	30	--	--	36	--	--
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	14	--	7	3	36	--	<2	6	<2	5.0	--	--	4	--	--	<2	--	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	--	<0.1	<0.1	0.2	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.2	--	--	<0.2	--	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	<2	--	<2	<2	4	--	<2	2	<2	<2	--	--	<2	--	--	<2	--	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	8	<5	7	<5	23	<5	<5	10	<5	<5	<5	<5	8	8	<5	<5	<5	<5
MICROBIOLOGICAL																							
Total Coliform	MPN/100mL	1	--	--	--	--	--	534	>2420	641	46	3020	2,380.0	1120	NDOGT	932	>2420	>2420	1,200	>200	>200	>200	>200	23,000	7,900
E. coli	MPN/100mL	1	--	--	400	--	--	1	479	1	23	20	20	7	50	12	12	172	2	>200	27	18	109	>200	53
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.25	4.42	12.5	0.32	5.06	2.3	0.79	4.2	3	0.5
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	18.67	20.15	1.85	0.93	141.49	0.60	2.47	14.60	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	25.84	24.37	2.89	1.60	--	*	2.51	15.40	--	--	--	--	--	--	--	--	--	--

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.
[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.
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[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.
[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.
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(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.
(**) Dissolved oxygen field data not recorded - Post-calibration failure of field equipment for DO sensor.

Bold (black shaded) = Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded) = Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded) = Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations

Blue shaded = Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Heal h Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - LU

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Larry Uteck Blvd																
Sample Site - LU																	LU							
Sampling Date	yyyy-mm-dd							2011-10-17	2012-05-01	2012-08-15	2012-10-11	2013-05-15	2013-08-15	2013-10-16	2014-05-15	2014-08-14	2014-10-27	2015-05-20	2015-08-25	2015-10-22	2016-05-16	2016-08-16	2016-10-25	2017-06-08	2017-08-15	2017-10-18
Sampling Time	hh:mm							10:30	15:20	11:30	10:10	14:30	14:30	13:00	11:45	10:45	9:54	13:45	10:23	10:05	12:20	11:20	11:45	11:25	10:15 AM	12:00
FIELD DATA																								
Secchi Depth	Meters	--	--	--	1.2	--	--	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NCC	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Water Temp	Celsius	--	--	--	--	--	--	11.3	12.8	27.3	14.6	13.9	18.3	10.9	15.0	22.8	10.2	16.1	23.4	8.2	13.3	21.9	11.6	18.2	22.4	13.3
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	4.24	6.17	8.20	9.04	10.15	8.29	4.80	11.56	8.08	7.55	7.28	9.49	8.50	8.75	16.62	9.68	9.56	8.34	7.43
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.97	7.82	6.65	6.78	6.39	7.49	5.45	6.50	7.23	6.17	6.57	6.80	6.99	7.17	6.24	6.23	6.80	7.11	6.90
Specific Conductance	uS/cm	--	--	--	--	--	--	203.0	955.0	480.0	262.0	670.0	320.0	845.0	999.0	611.0	371.0	0.6	569.0	436.2	588.0	574.0	483.4	755.0	660.0	590.0
INORGANICS																								
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	12	14	14	14	6	22	7	30	21	<5	13	16	13	13	27	14	13	27	20
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	34	224	116	52	190	99	258	243	104	70	210	132	93	154	164	92	247	154	143
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Colour	TCU	5	--	--	--	--	--	94	18	14	18	7	7	19	6	8	18	8	6	6	17	13	26	12	12	8
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.61	1.00	0.64	1.89	1.11	2.57	0.34	1.22	0.47	1.97	0.53	0.59	1.63	1.01	0.47	2.61	1.35	0.87	1.72
Nitrate (N)	mg/L	0.05	--	13	--	13	--	--	1.00	0.64	1.89	1.11	2.57	0.34	1.22	0.47	1.97	0.53	0.59	1.63	1.01	0.41	2.61	1.01	0.51	1.72
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	<0.05	<0.05	<0.05	0.06	<0.05	0.34	0.36	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	--	1.15 note [5]	--	0.06	0.04	0.16	<0.03	<0.03	0.04	0.04	0.05	<0.03	<0.03	<0.050	0.05	<0.03	0.05	0.05	<0.03	<0.03	0.09	0.04
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	--	0.4	4.2	0.7	--	0.5	<0.4	1.2	1.7	<0.4	0.3	8.0	0.7	1.2	1.1	0.6	0.7	3.8	0.6
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	11.0	3.7	22.8	4.8	3.1	4.5	2.9	6.9	4.7	4.7	2.2	7.6	6.5	3.9	5.3	7.6	6.1	6.8	5.4
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
pH (units)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.43	6.70	7.20	7.20	6.92	7.11	6.49	6.42	7.42	6.41	6.95	7.30	7.15	6.94	7.42	6.96	7.26	7.40	7.13
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	7.6	30.7	22.1	14.5	22.0	17.6	21.8	23.9	27.6	12.6	27,000.0	20.3	15.9	20.6	17.2	17.9	25.7	23.8	22.8
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	2.3	4.2	3.6	2.2	2.8	2.7	4.0	4.2	3.8	2.2	3,800.0	3.4	1.9	2.9	3.4	2.6	3.8	3.0	2.5
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	0.034	0.043	0.036	0.030	0.006	0.027	0.046	0.260	0.028	0.039	0.007	0.009	0.011	0.029	0.011	0.012	0.024	0.027	0.008
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	2.1	3.2	3.6	2.5	2.6	2.8	2.9	3.1	3.7	3.0	3,300.0	2.8	1.6	2.8	2.6	2.7	3.2	3.0	2.6
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	22.7	124.0	62.2	32.3	95.1	51.7	170.0	147.0	88.1	62.7	110.0	102.0	57.8	96.4	81.1	65.6	137.0	113.0	86.9
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	6.9	4.9	0.7	6.3	5.1	8.6	7.0	2.1	2.5	6.9	3.6	4.9	6.9	4.2	1.3	6.7	4.6	3.6	5.9
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	13	5	165	<5	<5	<5	<5	626	<5	<5	<1.0	<5	6	29	<5	<5	22	16	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	21	26	25	23	26	29	33	29	20	27	27	31	30	28	23	41	32	18	33
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	3.3	4.1	23.0	2.3	1.8	1.6	0.7	42.7	10.1	1.6	0.3	2.8	2.4	15.8	3.0	3.3	7.3	6.6	3.0
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	190	813	482	255	732	433	840	819	605	394	790	575	462	582	739	371	849	673	610
Calculated Parameters																								
Anion Sum	me/L	N/A	--	--	--	--	--	1.69	7.21	4.12	2.36	6.10	4.02	8.13	8.15	3.80	2.68	6.77	4.73	3.62	5.26	5.68	3.91	7.99	5.32	5.24
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	12	14	14	14	6	22	7	30	21	<5	13	16	13	13	27	14	13	27	20
Calculated TDS	mg/L	1	--	--	--	--	--	109	426	246	144	347	229	496	477	262	187	400	305	216	321	310	242	463	341	311
Carb. Alkalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<1	<10	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	1.70	7.40	4.30	2.43	5.55	3.51	8.90	8.24	5.64	3.64	6.69	5.86	3.52	5.78	4.76	4.06	7.65	6.74	5.21
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	29.00	94.00	70.00	45.30	66.50	55.10	70.90	77.00	84.60	40.50	84.00	64.70	47.50	63.40	56.90	55.40	79.80	71.80	67.20
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	0.29	1.30	2.20	1.40	4.70	6.80	4.50	0.60	19.40	15.20	0.59	10.60	1.40	4.70	8.80	1.80	2.20	11.80	0.30
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-2.95	-2.32	-1.94	-2.10	-2.60	-1.93	-2.98	-2.38	-1.45	-3.41	-1.95	-1.82	-2.16	-2.27	-1.55	-2.27	-1.87	-1.43	-1.85
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-3.20	-2.64	-2.26	-2.42	-2.92	-2.25	-3.30	-2.70	-1.77	-3.73	-2.20	-2.14	-2.48	-2.59	-1.87	-2.59	-2.19	-1.75	-2.17
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	9.38	9.02	9.14	9.30	9.52	9.04	9.47	8.80	8.87	9.82	8.90	9.12	9.31	9.21	8.97	9.23	9.13	8.83	8.98
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	9.63	9.34	9.46	9.62	9.84	9.36	9.79	9.12	9.19	10.10	9.15	9.44	9.63	9.53	9.29	9.55	9.45	9.15	9.30
Metals (ICP-MS)																								
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	--	218	227	252	107	447	31	1,400	46	109	59	--	66	1,420	--	--	61	978	29
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--	<2
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--	<2	--	<2
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	--	225	201	116	133	134	119	185	157	80	150	--	111	127	--	--	132	--	111
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	<2	<2	--	<2
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	--	11	17	22	10	22	18	22	20	21	<50	--	9	14	--	--	<5	--	19
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	--	0.538	0.171	0.168	0.300	0.236	0.148	0.171	0.031	0.079	0.150	--	0.176	0.426	--	--	0.069	--	0.052
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	--	<1	<1	<1	<1	1	<1	<1	<1	<1	<1.0	--	<1	3	--	--	<1	--	1
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	--	<1	1	<1	<1	<1	<1	<1	<1	<1	<0.40	--	<1	2	--	--	<1	--	<1
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	3	<2	3	16	2	6	2	2	<1	4	2	3	3	10	<1	3	<1	14	3
Total Iron (Fe)	µg/L	50	300	300	--	300	--	2,150	347	1,320	500	194	890	157	2,000	207	229	170	671	171	1,940	374	223	<50	3,540	289
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	--	0.8	0.7	1.0	<0.5	1.4	<0.5	1.8	<0.5	<0.5	<0.5	--	<0.5	3.4	--	--	<0.5	--	<0.5
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	129	182	485	120	87	89	26	71	182	36	110	371	61	444	148	35	77	1,870	91
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--	<2	--	<2
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	--	<2	<2	<2	<2	<2	<2	3	<2	<2	<2.0	--	<2	3	--	--	<2	--	<2
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	--	<1	<1	--	--	<1	--	<1
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	--	112	94	60	93	90	96	116	111	54	120	--	43	89	--	--	104	--	111
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--	<0.1	--	<0.1
Total Tin (Sn)	µg/L	2	--	--	--	--	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	<2	--	--	<2	--	<2
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	--	4	3	7	3	11	2	22	<2	3	<2	--	<2	31	--	--	<2	--	<2
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	--	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	0.2	--	--	<0.1	--	<0.1
Total Vanadium (V)	µg/L	2	6	120	--	--	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	--	<2	4	--	--	3	--	<2
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	9	79	92	39	57	49	26	17	8	23	27	17	16	64	7	52	21	120	22
MICROBIOLOGICAL																								
Total Coliform	MPN/100mL	1	--	--	--	--	--	--	>2420	>2420	2,420	866	>2420	866	>2420	961	>2420	---	>2420	>2420	>2420	>2420	>2420	488	>2420	1,990
E. coli	MPN/100mL	1	--	--	400	--	--	<100	<1	2	19	3	86	<1	<1	7	1,730	<10	19	6	<1	40	50	6	51	4
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	1.99	2.44	32.52	1.80	1.54	2.30	0.12	99.13	2.54	0.96	0.69	3.14	4.94	5.43	4.57	1.55	25.83	21.03	2.47
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	2.08	2.71	31.31	2.15	1.77	2.50	0.11	98.00	2.51	0.96	0.68	3.10	2.71	6.73	5.23	1.61	31.14	24.37	2.85

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.
[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).
[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.
(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - LU

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Larry Uteck Blvd													
Sample Site - LU								LU													
Sampling Date	yyyy-mm-dd							2018-05-08	2018-08-17	2018-10-17	05/09/2019	08-20-19	2019-11-08	02-Jul-20	17-Aug-20	29-Oct-20	27-May-21	09-Aug-21	22-Oct-21	31-May-22	18-Aug-22	21-Oct-22
Sampling Time	hh:mm							10:00	8:40	12:25 PM	3:20PM	11:45 AM	12:15 PM	11:00 AM	11:00 AM	12:22 PM	10:05 AM	10:18 AM	10:08 AM	10:45 AM	9:35 AM	10:25 AM
FIELD DATA																					
Secchi Depth	Meters	--	--	--	1.2	--	--	N/A	N/A	N/A	N/A	N/A	N/A	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*
Water Temp	Celsius	--	--	--	--	--	--	14.3	23.1	12.4	13.8	25.8	10.8	24.5	21.6	10.2	16.4	18.8	14.0	18.3	21.0	13.8
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	11.34	6.76	9.79	**	5.54	10.30	3.53	6.44	8.12	18.71	10.02	12.39	7.40	3.55	7.47
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.73	6.85	7.09	7.22	6.92	6.62	6.36	6.24	6.27	6.89	6.03	6.33	7.51	7.60	8.80
Specific Conductance	uS/cm	--	--	--	--	--	--	434.6	588.0	384.4	621.0	710.0	196.0	945.0	710.0	511.8	618.0	507.0	503.0	770.0	190.0	419.6
INORGANICS																					
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	11	23	13	10	23	10	26.0	21.0	17.0	15	17	24	12	24	16
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	96	124	74	174	202	75	297	221	147	189	132	153	243	167	97
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	<0.12	--	<0.12	<0.12
Colour	TCU	5	--	--	--	--	--	28	21	24	18	14	16	17	16	11	6.12	26.2	12.2	14.7	24.6	26.4
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	1.01	0.41	1.26	1.27	0.37	1.77	0.20	0.24	1.23	0.69	1.09	0.71	0.41	0.24	0.75
Nitrate (N)	mg/L	0.05	--	13	--	13	--	0.87	0.16	1.26	0.80	0.30	1.24	0.20	0.24	1.23	0.60	1.09	0.71	0.41	0.24	0.75
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	0.14	0.25	<0.05	0.47	0.07	0.53	<0.05	<0.05	<0.05	0.09	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.03	0.17	<0.03	<0.03	0.09	0.15	0.24	0.11	<0.03	<0.03	<0.03	<0.03	<0.03	0.14	0.06
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	1.1	0.6	<0.4	0.6	<0.4	0.7	<0.4	1.60	6.40	0.27	<0.10	<0.10	0.34	0.77	0.33
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	9.3	5.5	5.0	4.3	5.7	3.9	4.80	6.60	3.90	5.7	3.5	4.4	4.8	6.3	5.9
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	0.13	<0.01	<0.01
pH (units)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	7.01	7.46	7.29	7.17	7.45	7.01	7.37	7.28	7.19	7.36	6.75	7.38	7.13	6.73	6.42
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	12.7	20.8	14.9	25.2	30.2	9.6	33.4	33.7	16.7	20.2	19.8	18.0	20.1	18.7	11.8
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	1.6	2.7	2.1	3.5	4.2	1.5	4.6	18.0	2.3	2.7	2.8	2.4	2.9	2.8	1.9
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	0.078	0.019	0.021	0.010	0.014	0.013	0.011	0.013	0.160	0.007	0.018	0.011	0.019	0.062	0.030
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	2.2	2.9	2.3	3.2	3.4	1.7	3.4	3.2	2.5	2.3	2.7	2.2	2.8	2.7	2.2
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	73.0	94.7	69.9	159.0	129.0	44.0	183.0	150.0	86.1	120	102	81.2	119	91	60
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	3.5	5.4	4.7	3.7	3.0	4.4	3.8	1.8	5.2	4.0	6.8	3.2	3.5	3.4	2.8
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	52	11	<5	7	6	<5	<5	<5	<5	<5	8	<5	<5	6	7
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	19	15	24	22	23	23	21.0	23.0	30.0	25	27	29	22	17	21
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	21.4	2.4	4.5	3.6	3.7	3.8	3.6	2.4	1.7	1.6	2.9	1.4	2.2	2.8	3.8
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	518	620	422	871	765	256	1,030	928	558	717	620	568	758	605	420
Calculated Parameters																					
Anion Sum	me/L	N/A	--	--	--	--	--	3.40	4.3	2.9	5.7	6.7	2.9	9.35	7.15	5.20	6.20	4.70	5.45	7.58	5.56	3.55
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	11	23	13.0	10.0	23.0	10.0	26	21	17	15	17	24	12	24	16
Calculated TDS	mg/L	1	--	--	--	--	--	216	277	201.0	399.0	408.0	169.0	561	449	301	372	302	304	419	316	207
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	4.04	5.52	4.1	8.6	7.6	2.6	10.20	8.61	4.86	6.53	5.77	4.70	6.51	5.23	3.45
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	38.3	63.1	45.9	77.3	92.7	30.1	102.0	99.0	51.2	61.6	61.0	54.8	62.1	58.2	37.3
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	8.7	12.5	15.9	20.4	6.5	5.8	4.2	9.3	3.4	2.6	10.2	7.4	7.6	3.0	1.5
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-2.47	-1.49	-2.0	-2.1	-1.4	-2.6	-1.35	-1.52	-1.99	-1.80	-2.36	-1.62	-2.14	-2.26	-2.92
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-2.79	-1.81	-2.4	-2.4	-1.7	-2.9	-1.67	-1.84	-2.31	-2.12	-2.68	-1.94	-2.46	-2.58	-3.24
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	9.48	8.95	9.3	9.3	8.8	9.6	8.72	8.80	9.18	9.16	9.11	9.00	9.27	8.99	9.34
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	9.80	9.27	9.7	9.6	9.1	10.0	9.0	9.1	9.5	9.48	9.43	9.32	9.59	9.31	9.66
Metals (ICP-MS)																					
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	231	94	--	84	31	169	32	--	--	52	--	--	*56*	--	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	110	143	--	135	184	63	350.0	--	--	116	--	--	118	--	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	9	16	--	11	16	10	13.0	--	--	11	--	--	9	--	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	0.140	<0.09	--	0.120	<0.09	<0.09	0.025	--	--	<0.09	--	--	<0.09	--	--
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	4	2	5	3	2	4	<1	1	3	2	3	2	2	2	3
Total Iron (Fe)	µg/L	50	300	300	--	300	--	494	1,090	206	290	556	313	1,210	429	432	289	650	231	235	*633*	*360*
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	1.3	<0.5	--	<0.5	<0.5	0.8	<0.5	--	--	<0.5	--	--	<0.5	--	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	91	240	40	51	66	33	291	18	63	77	103	59	58	147	56
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	<2	2	--	10	<2	3	3.0	--	--	3	--	--	<2	--	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	56	115	--	107	134	58	146.0	--	--	96	--	--	95	--	--
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	6	2	--	<2	<2	4	2.0	--	--	<2	--	--	<2	--	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.2	--	--	<0.2	--	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	2	<2	--	5	<2	2	2.0	--	--	<2	--	--	2	--	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	41	13	38	27	8	23	6.0	5	22.0	31	26	13	*13*	*10*	*18*
MICROBIOLOGICAL																					
Total Coliform	MPN/100mL	1	--	--	--	--	--	210	5020	330.0	540.0	NDOGT	984.0	>2420	>2420	921	<1	>200	>200	>200	18,700	12,300
E. coli	MPN/100mL	1	--	--	400	--	--	<1	20	30	<10	26	8	11	2	<1	<1	60	70	32	500	500
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	<0.25	2.41	4.41	3.78	10.9	3.4	2.37	7.5	5.3	6.1
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	78.76	5.50	2.39	4.19	6.38	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	131.56	--	*	4.24	6.19	--	--	--	--	--	--	--	--	--	--

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.
[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).
[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.
(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - PML-2

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Paper Mill Lake																	
Sample Site PML-2								PML-2																	
Sampling Date	yyyy-mm-dd							2009-06-29	2009-08-13	2009-10-01	2010-05-31	2010-08-24	2010-11-01	2011-05-13	2011-08-14	2011-10-16	2012-05-01	2013-05-15	2013-10-16	2014-05-15	2014-08-14	2014-10-27	2015-05-20	2015-08-25	2015-10-22	2016-05-16	2016-08-16	2016-10-25
Sampling Time	hh:mm							13:15	13:40	13:45	14:30	16:20	13:00	12:40	16:20	16:15	13:16	13:40	11:20	11:00	9:20	8:30	11:30	13:45	9:08	13:45	10:00	9:50
FIELD DATA																											
Secchi Depth	Meters	--	--	--	1.2	--	--	2.8	2.2	2.3	N/A	3.0	2.0	2.2	2.3	2.2	2.4	3.2	N/A	N/A	N/A	3.1	NCC	N/A	2.4	2.7	2.3	2.6
Water Temp	Celsius	--	--	--	--	--	--	14.8	24.2	19.7	17.8	25.3	10.1	10.9	23.1	15.2	11.6	14.8	12.6	14.4	21.1	12.1	15.1	27.0	9.0	13.8	22.1	11.8
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	**10.20**	8.30	8.40	8.78	8.09	**10.58**	**9.88**	8.70	8.94	7.75	9.26	8.90	**12.44**	6.95	7.92	8.06	**9.76**	8.28	8.55	7.69	**10.31**
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	**6.36**	6.82	6.84	7.09	7.39	6.53	**6.31**	6.67	**6.13**	8.61	**6.49**	**6.13**	6.50	7.22	**5.92**	6.56	6.76	7.25	7.57	**5.93**	**5.37**
Specific Conductance	uS/cm	--	--	--	--	--	--	267.0	264.0	241.0	237.0	234.0	200.5	158.7	173.2	155.9	231.0	234.0	250.5	966.0	266.0	215.0	0.2	255.6	454.9	264.0	298.0	230.3
INORGANICS																											
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	5	7	7	6	8	7	<5	8	7	21	<5	8	32	10	26	<5.0	5	7	7	10	8
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	63	63	58	62	58	50	44	43	34	55	63	64	**245**	50	42	69	59	57	67	67	50
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Colour	TCU	5	--	--	--	--	--	22	17	19	20	13	23	35	38	48	39	18	8	6	7	31	26	10	9	22	13	22
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.14	0.07	0.09	0.19	0.11	0.23	0.33	0.14	0.22	0.24	0.22	<0.05	0.13	0.18	0.18	0.11	0.32	0.23	0.10	0.11	0.18
Nitrate (N)	mg/L	0.05	--	13	--	13	--	0.14	--	--	0.19	0.11	--	0.33	--	--	0.24	0.22	<0.05	0.13	0.18	0.18	0.11	0.17	0.23	0.10	<0.05	0.18
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	**0.15**	<0.05	<0.05	**0.11**	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.03	0.03	0.23	0.05	0.03	<0.03	<0.050	<0.03	<0.03	0.05	<0.03	<0.03
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.4	--	1.7	<0.4	0.4	<5	0.2	1.2	3.0	0.6	<0.4	0.5
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	3.6	2.6	4.5	3.2	3.4	3.6	4.0	6.0	5.6	5.9	4.4	4.0	2.7	2.4	5.8	2.8	6.0	6.1	4.0	3.6	8.3
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01
pH (units)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.50	6.81	6.82	6.66	7.02	6.83	**6.37**	6.60	6.60	6.60	6.68	6.73	7.13	7.04	6.77	6.64	6.98	6.98	6.83	7.23	6.93
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	6.1	7.1	6.1	7.2	7.7	8.0	5.3	4.8	5.0	6.1	6.7	7.7	19.2	8.8	6.9	7,300.0	8.2	6.2	8.9	8.1	7.4
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	1.1	1.1	1.1	1.3	1.2	1.2	0.9	0.9	0.9	1.0	1.0	1.4	1.7	1.4	1.0	1,000.0	1.3	1.2	1.2	1.2	1.3
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	<0.02	<0.02	0.002	0.010	0.002	<0.002	0.009	0.009	0.007	**0.025**	0.006	**0.026**	**0.011**	**0.026**	**0.018**	0.008	**0.012**	0.008	**0.012**	0.003	0.005
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	0.9	1.0	0.9	1.0	0.9	1.0	0.9	0.8	1.0	0.8	0.8	1.3	1.4	1.2	1.1	830.0	1.0	0.9	1.0	1.0	1.1
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	35.0	40.0	34.0	31.1	35.1	30.8	25.7	21.3	20.9	34.6	37.5	42.0	133.0	42.6	33.9	38.0	43.3	31.3	42.9	37.5	32.1
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	2.6	2.5	2.3	2.6	2.3	3.3	2.9	2.5	3.0	2.8	2.7	4.2	2.4	2.3	2.9	1.9	1.8	2.8	2.3	0.6	2.6
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	2	3	<1	15	<2	11	<1	8	<1	<5	<5	<5	16	<5	<5	1	<5	<5	45	<5	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	11	11	11	10	10	10	9	10	9	7	9	11	27	7	7	8	9	9	12	7	10
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	0.8	0.7	0.6	1.0	0.8	0.4	0.4	3.4	0.5	0.7	1.0	3.3	2.6	0.7	1.0	0.9	1.9	1.3	9.4	1.1	1.4
Conductivity (uS/cm)	uS/cm	1	--	--	--	--	--	240	250	230	230	230	210	170	170	150	213	254	277	777	273	212	260	251	246	263	319	190
Calculated Parameters																											
Anion Sum	me/L	N/A	--	--	--	--	--	2.11	2.17	1.99	2.07	2.01	1.77	1.46	1.58	1.30	2.13	1.98	2.19	8.12	1.77	1.86	2.13	1.97	1.95	2.29	2.24	1.79
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	5	7	7	6	8	7	<1	8	7	21	<5	8	32	10	26	<1.0	5	7	7	10	8
Calculated TDS	mg/L	1	--	--	--	--	--	123	131	117	120	120	110	91	89	79	119	119	137	448	118	109	130	127	112	139	129	108
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<1.0	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	1.94	2.23	1.88	1.88	2.03	1.86	1.48	1.28	1.27	1.94	2.09	2.55	6.96	2.47	1.95	2.14	2.44	1.84	2.53	2.17	1.92
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	20.00	22.00	20.00	23.00	24.00	25.00	17.00	15.00	16.00	19.30	20.80	25.00	54.90	27.70	21.30	23.00	25.80	20.40	27.20	25.20	23.80
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	4.20	1.36	2.84	4.81	0.50	2.48	0.68	10.50	1.17	4.80	2.80	7.50	7.70	16.50	2.20	0.23	10.60	3.00	5.10	1.70	3.40
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-3.33	-2.83	-2.93	-3.06	-2.55	-2.80	NC	-3.18	-3.17	-2.89	-3.39	-3.08	-1.73	-2.61	-2.57	NC	-3.00	-2.97	-2.98	-2.46	-2.89
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-3.59	-3.08	-3.18	-3.31	-2.80	-3.05	NC	-3.43	-3.42	-3.21	-3.71	-3.40	-2.05	-2.93	-2.89	NC	-3.32	-3.29	-3.30	-2.78	-3.21
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	9.83	9.64	9.75	9.72	9.57	9.63	NC	9.78	9.77	9.49	10.10	9.81	8.86	9.65	9.34	NC	9.98	9.95	9.81	9.69	9.82
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	10.10	9.89	10.00	9.97	9.82	9.88	NC	10.00	10.00	9.81	10.40	10.10	9.18	9.97	9.66	NC	10.30	10.30	10.10	10.00	10.10
Metals (ICP-MS)																											
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	**130**	--	--	**1,030**	**56**	--	**202**	--	--	**189**	**131**	**107**	**181**	**52**	**122**	**130**	--	**278**	**610**	--	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	16	--	--	23	12	--	23	--	--	22	22	37	50	27	19	25	--	24	35	--	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	<2
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	5	--	--	8	9	--	<50	--	--	6	6	9	7	13	11	<50	--	<5	8	--	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	<0.300	--	--	**0.037**	<0.017	--	**0.028**	--	--	**0.023**	**0.039**	**0.060**	**0.062**	**0.019**	**0.018**	**0.023**	--	**0.145**	**0.042**	--	--
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1.0	--	<1	<1	--	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1	--	--	<0.4	<0.4	--	<0.4	--	--	<1	<1	2	<1	<1	<1	<0.40	--	<1	<1	--	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	<2	--	--	**3**	<2	<2	<2	<2	<2	<2	<2	**1,380**	1	<1	2	<2.0	2	2	<1	<1	1
Total Iron (Fe)	µg/L	50	300	300	--	300	--	100	--	--	**1,090**	151	76	143	**699**	181	178	181	**1,760**	264	**316**	134	170	**334**	**368**	**647**	174	123
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	<0.5	--	--	**2.4**	<0.5	--	<0.5	--	--	<0.5	<0.5	**49.7**	0.7	<0.5	<0.5	<0.5	--	0.5	**1.1**	--	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	58	--	--	159	81	28	34	89	31	22	87	**866**	206	278	24	43	67	61	109	36	23
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	2	--	--	2	<2.0	--	<2.0	--	--	<2	<2	3	<2	<2	<2	<2.0	--	2	<2	--	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1.0	--	<1	<1	--	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.5	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	0.100	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	30	--	--	35	33	--	26	--	--	27	31	35	68	37	29	34	--	21	38	--	--
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	--	--	<2	<2	--	<2	--	--	<2	<2	3	<2	<2	<2	<2	--	<2	<2	--	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	<2	--	--	21	<2	--	4	--	--	<2	<2	2	3	<2	<2	2	--	4	7	--	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	--	--	0.1	<0.1	--	<0.1	--	--	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	<2	<2	<2	--	<2	<2	--	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	12	--	--	18	<5.0	6	7	8	10	8	11	**762**	<5	<5	5	14	<5	8	7	<5	<5
MICROBIOLOGICAL																											
Total Coliform	MPN/100mL	1	--	--	--	--	--	49	40	--	>250	46	97	64	>250	--	261	1,410	411	291	517	>2420	---	>2420	1,120	687	>2420	>2420
E. coli	MPN/100mL	1	--	--	400	--	--	10	31	--	69	<1	6	17	**>250**	<100	1	12	2	<1	3	16	<0.10	5	2	4	47	30
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	1.15	1.36	0.59	3.50	1.54	0.53	0.55	2.48	1.33	0.76	1.18	0.25	0.99	0.48	0.72	1.67	4.79	1.50	3.82	1.09	2.02
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	1.22	1.33	0.66	3.39	1.51	0.42	0.51	2.26	1.13	0.76	1.34	0.27	1.13	0.44	0.70	1.56	4.59	0.74	5.04	1.42	2.12

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
* -- * = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).

[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.

(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - PML-2

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Paper Mill Lake															
Sample Site PML-2								PML-2															
Sampling Date	yyyy-mm-dd							2017-06-08	2017-08-15	2017-10-18	2018-05-09	2018-08-17	2018-10-17	05/09/2019	08-20-19	2019-11-08	02-Jul-20	17-Aug-20	29-Oct-20	27-May-21	09-Aug-21	22-Oct-21	31-May-22	18-Aug-22	21-Oct-22
Sampling Time	hh:mm							14:30	14:30	14:00	13:30	12:10	14:15 PM	12:50PM	3:40 PM	3:15 PM	8:50 AM	9:27 AM	10:25 AM	8:25 AM	8:56 AM	8:59 AM	9:25 AM	8:10 AM	9:00 AM
FIELD DATA																							
Secchi Depth	Meters	--	--	--	1.2	--	--	2.5	2.5	2.9	2.9	3.0	2.2	2.4	2.20	N/A	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*
Water Temp	Celsius	--	--	--	--	--	--	17.1	24.0	14.0	15.3	5.4	12.2	12.7	27.4	11.3	23.9	23.7	10.4	17.0	21.9	14.1	18.5	22.6	15.2
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	10.44	8.89	6.56	9.91	6.97	8.70	**	6.06	9.80	7.79	7.58	10.16	16.06	9.01	11.88	8.36	7.53	9.04
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.73	7.01	6.87	8.33	24.70	7.00	6.76	6.39	7.40	6.07	6.08	6.55	6.41	5.53	6.22	6.95	7.54	10.44
Specific Conductance	uS/cm	--	--	--	--	--	--	242.0	285.0	252.0	214.4	293.8	297.3	6.1	239.0	193.0	275.0	270.0	228.7	209.0	219.0	207.0	333.4	76.0	287.7
INORGANICS																							
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	5	12	11	5	11	8	<5	11	8	9.0	10.0	7.0	6	10	13	8	11	10
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	67	72	60	46	55	43	50	64	64	76	72	61	58	47	59	94	82	69
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.12	--	<0.12	<0.12
Colour	TCU	5	--	--	--	--	--	18	7	19	31	21	21	43	14	19	<5	12	15	12.4	5.50	12.00	15.5	6.1	15.9
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.27	0.07	0.16	0.17	0.13	0.20	0.14	0.07	0.38	<0.05	<0.05	0.18	0.17	0.25	0.22	0.20	0.07	0.18
Nitrate (N)	mg/L	0.05	--	13	--	13	--	0.16	0.07	0.16	0.17	<0.05	0.20	0.14	0.07	0.38	<0.05	<0.05	0.18	0.17	0.25	0.22	0.20	0.07	0.18
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	0.11	<0.05	<0.05	<0.05	0.13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.03	<0.03	<0.03	<0.03	0.04	0.05	0.06	0.08	0.06	0.06	0.08	<0.03	<0.03	<0.03	<0.03	0.07	0.05	<0.03
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	0.6	0.6	<0.4	<0.4	<0.4	<0.4	1.3	<0.4	1.9	<0.4	1.40	<0.4	0.12	<0.10	<0.10	0.16	0.33	0.18
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	5.5	5.4	4.1	4.9	3.5	4.0	4.3	4.4	4.5	3.00	4.10	4.20	4.7	3.0	2.8	3.6	3.7	4.2
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.13	<0.01	0.01
pH (units)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.86	7.23	6.99	6.81	7.29	7.05	6.78	7.20	6.89	7.00	7.11	6.85	6.84	6.54	7.17	6.98	6.64	6.29
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	8.1	8.5	8.1	6.7	8.1	7.7	7.1	9.1	5.6	8.6	7.2	8.3	8.5	8.2	8.8	9.0	10.2	9.4
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	1.3	1.1	1.2	1.1	1.2	1.3	1.2	1.4	0.9	1.3	40.0	1.3	1.2	1.3	1.3	1.4	1.6	1.4
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	0.018	0.013	0.006	0.047	0.005	0.012	0.008	0.005	0.008	<0.006	0.017	0.004	0.006	0.022	0.009	0.027	0.010	0.030
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	0.9	1.4	1.1	0.9	1.1	1.1	0.9	1.2	0.8	0.9	1.1	1.2	1.0	1.5	1.2	1.4	1.5	1.4
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	41.5	47.2	35.5	37.5	37.7	39.6	42.9	46.7	29.9	40.7	50.2	39.6	38.6	34.8	34.2	52.0	49.0	41.0
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	1.7	0.8	2.0	2.5	1.0	2.3	2.0	0.9	2.4	0.9	0.6	2.4	2.6	4.2	1.8	2.1	1.6	2.7
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	<5	14	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	10	8	11	7	7	8	7	9	11	9.0	8.0	10.0	9	9	11	10	9	10
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	1.9	1.9	1.8	1.4	0.7	1.2	1.0	1.2	2.2	1.1	0.8	0.7	1.0	0.6	0.6	0.7	0.8	0.6
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	259	286	255	249	289	227	261	268	189	302	335	249	241	238	252	349	328	271
Calculated Parameters																							
Anion Sum	me/L	N/A	--	--	--	--	--	2.22	2.44	2.15	1.56	1.93	1.6	1.57	2.2	2.2	2.51	2.40	2.08	1.96	1.73	2.17	3.03	2.73	2.37
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	5	12	11	5	11	8.0	<5	11.0	8.0	9	10	7	6	10	13	8	11	10
Calculated TDS	mg/L	1	--	--	--	--	--	133	146	124	103	118	107.0	110	139.0	119.0	142	146	127	121	109	125	174	160	139
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	2.37	2.62	2.09	2.10	2.19	2.3	2.37	2.7	1.7	2.35	2.69	2.29	2.24	2.08	2.08	2.88	2.82	2.41
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	25.60	25.80	25.20	21.3	25.2	24.6	22.70	28.5	17.7	26.8	22.9	26.1	26.2	25.8	27.3	28.2	32.1	29.2
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	3.20	3.50	1.60	14.9	6.4	18.7	20.40	9.0	13.6	3.3	5.7	4.7	6.9	9.1	2.2	2.6	1.7	0.9
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-3.13	-2.37	-2.66	-3.25	-2.35	-2.8	-3.26	-2.4	-3.1	-2.71	-2.64	-2.98	-3.05	-3.14	-2.37	-2.77	-2.92	-3.34
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-3.45	-2.69	-2.98	-3.57	-2.67	-3.1	-3.58	-2.7	-3.4	-3.03	-2.96	-3.30	-3.37	-3.46	-2.69	-3.09	-3.24	-3.66
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	9.99	9.60	9.65	10.1	9.64	9.8	10.00	9.6	9.9	9.71	9.75	9.83	9.89	9.68	9.54	9.75	9.56	9.63
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	10.30	9.92	9.97	10.4	9.96	10.1	10.40	9.9	10.3	10.0	10.1	10.2	10.2	10.0	9.86	10.1	9.9	10.0
Metals (ICP-MS)																							
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	215	40	34	141	75	--	134	27	79	36	--	--	93	--	--	63	--	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	27	--	23	21	8	--	25	19	17	28.0	--	--	25	--	--	42	--	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	<5	--	11	6	10	--	6	11	6	8.0	--	--	8	--	--	8	--	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	<0.017	--	<0.017	<0.09	<0.09	--	<0.09	<0.09	<0.09	<0.017	--	--	<0.09	--	--	<0.09	--	--
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	<1	--	<1	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1	--	<1	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	<1	<1	1	<1	<1	2	<1	1	1	<1	<1	<1	2	2	2	<1	<1	<1
Total Iron (Fe)	µg/L	50	300	300	--	300	--	<50	203	145	104	163	165	128	258	<50	172	224	124	142	74	213	134	93	76
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	<0.5	--	<0.5	<0.5	<0.5	--	<0.5	<0.5	<0.5	<0.5	--	--	<0.5	--	--	<0.5	--	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	85	68	26	20	42	74	28	139	30	192	40	32	48	20	33	78	58	28
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	4	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<1	--	<1	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.1	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	35	--	39	29	38	--	35	42	27	40.0	--	--	36	--	--	45	--	--
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.2	--	--	<0.2	--	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	<2	--	<2	<2	<2	--	2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	8	9	5	5	<5	6	7	<5	<5	<5	<5	<5	5	<5	7	<5	6	<5
MICROBIOLOGICAL																							
Total Coliform	MPN/100mL	1	--	--	--	--	--	1,990	>2420	1,730	1	4000	3,030.0	106.0	NDOGT	1134	249	192	285	>200	>200	>200	>200	2,600	1,700
E. coli	MPN/100mL	1	--	--	400	--	--	1	11	5	<1	1	30	<1	3	20	2	7	2	2	19	9	6	10	50
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	--	--	--	0.47	1.89	1.1	0.95	2.84	0.64	1.05	1.3	1.3	0.6
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	5.31	4.30	1.27	1.37	1.28	1.78	1.58	1.62	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	6.60	4.23	1.47	2.22	--	*	1.50	1.44	--	--	--	--	--	--	--	--	--	--

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).

[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.

(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - PML-1

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Paper Mill Lake																				
Sample Site - PML-1								PML-1																				
Sampling Date	yyyy-mm-dd							2009-06-29	2009-08-13	2009-10-01	2010-05-31	2010-08-24	2010-11-01	2011-05-13	2011-08-14	2011-10-16	2012-05-01	2012-10-11	2013-05-15	2013-08-15	2013-10-16	2014-05-15	2014-08-14	2014-10-27	2015-05-20	2015-08-25	2015-10-22	2016-05-16	2016-08-16	2016-10-25
Sampling Time	hh:mm							13:45	13:00	13:00	13:35	15:15	13:00	13:00	16:50	17:00	12:50	10:55	10:51	11:35	10:45	10:30	14:45	12:35	12:45	08:45	8:20	13:15	9:30	9:15
FIELD DATA																												
Secchi Depth	Meters	--	--	--	1.2	--	--	3.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NCC	N/A	2.9	2.7	4.2	3.8
Water Temp	Celsius	--	--	--	--	--	--	15.7	17.1	16.2	13.2	22.7	9.1	10.3	22.1	13.6	8.3	14.9	11.6	22.5	12.3	12.1	23.6	12.4	15.1	24.0	9.3	12.8	21.6	12.1
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	10.58	8.10	6.90	8.76	7.83	10.43	10.39	8.17	9.54	8.41	8.60	9.98	7.65	9.90	12.08	7.49	8.06	7.16	8.04	8.63	8.84	6.53	12.96
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	7.39	6.57	6.64	7.06	7.35	6.69	6.28	6.20	6.11	7.58	6.63	6.39	7.20	6.32	6.60	7.42	6.60	6.90	6.34	7.98	7.57	5.94	4.63
Specific Conductance	uS/cm	--	--	--	--	--	--	561.0	279.0	223.0	265.0	234.0	124.5	176.6	173.6	105.5	366.0	186.4	215.1	199.0	250.5	431.0	263.0	210.0	0.2	432.1	289.1	231.0	289.0	234.3
INORGANICS																												
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	6	7	7	7	9	5	6	7	7	20	<5	<5	6	7	31	7	7	5	6	6	<5	8	7
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	39	64	58	67	61	24	44	43	18	55	45	57	57	48	63	50	46	65	57	56	59	67	50
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Colour	TCU	5	--	--	--	--	--	54	15	21	19	12	57	32	38	65	38	29	8	15	11	17	10	30	31	7	15	18	16	20
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	0.49	0.10	0.17	0.42	0.27	0.66	0.55	0.15	0.62	0.22	0.14	0.21	0.18	0.18	0.22	0.24	0.18	0.18	0.14	0.24	0.19	0.09	0.16
Nitrate (N)	mg/L	0.05	--	13	--	13	--	0.49	--	--	0.42	0.27	--	0.55	--	--	0.22	0.14	0.21	0.18	0.18	0.22	0.24	0.18	0.18	0.14	0.24	0.19	<0.05	0.16
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	<0.01	--	--	<0.01	<0.01	--	<0.01	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.010	<0.05	<0.05	<0.05	0.09	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	--	1.15 note [5]	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	0.06	<0.03	<0.03	0.04	<0.03	0.04	<0.03	<0.03	<0.050	<0.03	0.03	0.06	<0.03	<0.03
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.4	0.4	--	0.4	0.8	0.4	0.4	<5	0.5	1.2	6.0	2.6	3.4	0.4
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	6.5	3.6	4.7	0.7	3.3	6.7	4.6	5.0	8.3	5.7	5.3	4.2	4.1	5.1	4.0	2.0	4.4	2.7	5.4	5.8	7.1	6.1	8.7
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01
pH (units)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	6.36	6.75	6.79	6.63	7.04	6.58	6.54	6.83	6.67	6.60	6.80	6.71	6.92	6.88	6.66	7.00	6.64	6.67	6.95	6.84	6.36	6.86	6.87
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	4.5	6.9	6.4	8.4	9.0	5.9	6.0	5.0	4.6	6.0	6.0	6.8	6.6	6.9	6.9	9.1	7.0	6,900.0	7.8	4.8	7.9	10.5	7.6
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	0.6	1.1	1.0	1.3	1.2	0.8	1.0	0.9	0.8	1.0	1.1	1.0	0.9	1.5	1.3	1.4	1.0	970.0	1.4	0.9	1.5	1.8	1.3
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	<0.02	<0.02	0.002	0.018	0.002	<0.002	0.014	0.011	0.030	0.019	0.030	0.006	0.007	0.047	0.012	0.030	0.021	0.005	0.060	0.018	0.173	0.104	0.013
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	0.9	0.9	0.9	1.2	1.1	1.3	1.2	0.8	1.4	0.8	1.0	0.8	1.0	1.5	0.9	1.3	0.9	800.0	1.0	0.6	1.0	1.3	1.1
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	25.0	38.0	34.0	35.2	40.2	18.4	26.8	22.8	13.7	33.6	29.8	35.3	28.5	32.2	38.1	41.6	33.7	35.0	38.6	25.6	37.6	35.1	32.1
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	4.5	2.6	2.8	3.8	3.4	5.9	3.7	2.6	5.4	2.9	3.2	2.8	2.6	2.6	2.5	2.3	2.7	2.4	2.4	2.5	2.5	0.8	2.7
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	<2	3	9	7	<2	<1	1	<2	5	9	6	<5	<5	23	6	<5	<5	1	149	6	531	10	18
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	13	11	11	13	12	12	12	10	12	7	10	8	10	10	10	8	8	8	9	8	11	11	11
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	0.4	0.5	0.6	8.2	0.9	0.5	0.6	1.0	1.2	0.7	1.0	0.7	1.1	19.2	1.4	0.9	1.5	0.5	3.8	24.2	199.0	112.0	2.6
Conductivity (uS/cm)	uS/cm	1	--	--	--	--	--	170	250	230	260	250	130	180	170	100	214	179	227	218	209	230	261	224	240	246	241	224	310	189
Calculated Parameters																												
Anion Sum	me/L	N/A	--	--	--	--	--	1.51	2.18	1.99	2.34	2.15	1.09	1.62	1.56	0.92	2.11	1.49	1.79	1.95	1.71	2.62	1.73	1.62	2.11	1.93	1.88	1.91	2.29	1.79
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	6	7	7	7	9	5	6	7	7	20	<5	<5	6	7	31	7	7	5	6	6	<5	8	7
Calculated TDS	mg/L	1	--	--	--	--	--	93	129	118	137	134	75	100	90	63	117	95	110	109	115	140	117	102	120	126	109	141	148	108
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1	<10	<10	<10	<10	<10	<10	<10	<10	<1.0	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	1.40	2.11	1.89	2.11	2.33	1.20	1.58	1.35	0.95	1.89	1.78	2.00	1.69	2.56	2.18	2.45	1.94	1.98	2.61	1.93	3.54	3.33	1.93
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	14.00	22.00	20.00	26.00	28.00	18.00	19.00	16.00	15.00	19.10	19.50	21.10	20.20	23.40	22.60	28.50	21.60	21.00	25.20	15.70	25.90	33.60	24.30
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	3.78	1.63	2.58	5.17	4.02	4.80	1.25	7.22	1.60	5.50	9.00	5.50	7.00	19.80	9.20	17.00	9.20	3.18	15.20	1.20	30.00	18.60	3.80
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	-3.57	-2.90	-2.94	-2.96	-2.43	-3.25	-3.27	-2.94	-3.13	-3.35	-3.07	-3.31	-3.03	-2.61	-2.79	-3.26	-3.13	-2.98	-3.29	-3.65	-2.82	-2.99	
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	-3.82	-3.15	-3.19	-3.21	-2.68	-3.50	-3.53	-3.19	-3.38	-3.23	-3.63	-3.67	-3.39	-3.35	-2.93	-3.11	-3.58	-3.38	-3.30	-3.61	-3.97	-3.14	-3.31
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	9.93	9.65	9.73	9.59	9.47	9.83	9.81	9.77	9.80	9.51	10.10	10.10	9.99	9.91	9.27	9.79	9.90	9.80	9.93	10.10	10.00	9.68	9.86
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	10.20	9.90	9.98	9.84	9.72	10.10	10.10	10.00	10.10	9.83	10.40	10.40	10.30	10.20	9.59	10.10	10.20	10.10	10.20	10.50	10.30	10.00	10.20
Metals (ICP-MS)																												
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	260	--	--	665	46	--	233	--	--	177	306	141	103	3,920	305	129	142	140	--	2,320	7,690	--	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	2	<2	<2	<2	<1.0	--	<2	4	--	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	23	--	--	35	24	--	27	--	--	22	19	20	12	40	23	23	18	21	--	34	60	--	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<1.0	--	<2	<2	--	<2
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	8	--	--	11	9	--	<50	--	--	6	9	6	8	9	8	13	11	<50	--	<5	10	--	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	<0.300	--	--	0.032	<0.017	--	<0.017	--	--	<0.017	0.066	0.021	0.018	0.430	<0.017	0.020	<0.017	0.025	--	0.146	0.227	--	--
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	3	<1	<1	<1	<1.0	--	2	6	--	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	<1	--	--	1	<0.4	--	<0.4	--	--	<1	2	<1	<1	9	<1	<1	<1	<0.40	--	3	6	--	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	<2	--	--	2	<2.0	<2.0	4	<2.0	2	<2	<2	<2	1	5	1	<1	2	<2.0	3	4	10	<1	--
Total Iron (Fe)	µg/L	50	300	300	--	300	--	140	--	--	837	89	161	141	315	528	137	742	130	205	5,300	239	296	182	93	4,460	6,020	13,600	8,250	171
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	<0.5	--	--	1.7	<0.5	--	<0.5	--	--	<0.5	0.9	<0.5	<0.5	13.5	0.9	<0.5	<0.5	<0.5	--	6.3	13.9	--	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	17	--	--	142	69	41	14	128	62	48	214	33	58	693	54	260	49	34	296	278	424	281	53
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	2	<2	<2	9	<2	<2	<2	<2.0	--	5	7	--	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	<2	--	--	<1.0	<1.0	--	<1.0	--	--	<1	<1	<1	<1	<1	<1	<1	<1	<1.0	--	1	1	--	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	<0.5	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	18	--	--	36	37	--	25	--	--	26	30	31	25	34	35	37	30	32	--	22	40	--	--
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	<2	--	--	<2.0	<2.0	--	<2.0	--	--	<2	<2	<2	<2	<2	<2	<2	<2	<2.0	--	<2	<2	--	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	<2	--	--	8	<2.0	--	4	--	--	<2	4	<2	<2	65	4	<2	3	<2	--	25	106	--	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	<0.1	--	--	<0.1	<0.1	--	<0.1	--	--	0.1	<0.1	<0.1	<0.1	0.6	<0.1	<0.1	<0.1	<0.1	--	0.6	0.9	--	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	<2	--	--	<2	<2	--	<2	--	--	<2	<2	<2	<2	10	<2	<2	<2	<2	--	7	16	--	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	8	--	--	10	5	6	6	6	5	<5	13	8	<5	62	<5	<5	6	11	13	12	34	20	<5
MICROBIOLOGICAL																												
Total Coliform	MPN/100mL	1	--	--	--	--	--	200	73	--	>250	>250	>250	85	>250	--	411	2,420	866	1,730	1,011	613	2,420	>2420	---	>2420	>2420	>2420	1,410	>2420
E. coli	MPN/100mL	1	--	--	400	--	--	33	45	--	19	>250	2	2	34	<100	2	20	12	4	6	6	10	10	<10	3	6	>2420	34	10
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	0.62	2.31	0.57	0.82	1.12	0.07	2.85	0.86	0.15	1.03	0.69	1.17	1.10	5.07	0.67	0.64	0.91	0.57	8.84	4.67	8.00	4.71	1.70
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	0.64	2.21	0.64	0.74	1.04	0.06	2.75	0.76	0.15	1.10	0.91	1.37	1.10	6.39	0.65	0.65	0.87	0.54	9.54	3.69	12.31	10.82	1.76

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
* -- * = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).

[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.

(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded) = Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded) = Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded) = Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations

Blue shaded = Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

Table C2: Statistical Presentation of Key Water Quality Parameters - PML-1

Tested Parameters	Units	RDL (2021)	NSE ESQs for Surface Water 2016 [1]	NSE ESQs for Surface Water September 2021 [2]	Health Canada Guideline for Recreational Water Quality [3]	CCME Guideline FWAL [4]	HRM Phosphorus Trigger Range [6]	Paper Mill Lake														
Sample Site - PML-1								PML-1														
Sampling Date	yyyy-mm-dd							2017-06-08	2017-08-15	2017-10-18	2018-05-08	2018-08-17	2018-10-17	05/09/2019	08-20-19	2019-11-08	02-Jul-20	17-Aug-20	29-Oct-20	27-May-21	09-Aug-21	22-Oct-21	31-May-22	18-Aug-22	21-Oct-22
Sampling Time	hh:mm							13:40	13:45	13:25	13:00	11:40	14:45 PM	1:10PM	4:20 PM	2:45 PM	8:20 AM	9:07 AM	10:02 AM	8:13 AM	8:39 AM	8:44 AM	9:04 AM	8:35 AM	9:15 AM
FIELD DATA																							
Secchi Depth	Meters	--	--	--	--	1.2	--	--	4.1	4.7	3.9	4.1	2.4	2.9	1.9	4.30	N/A	NA*	NA*	NA*	NA*	NA*	NA*	NA*	NA*
Water Temp	Celsius	--	--	--	--	--	--	--	17.2	23.0	14.4	14.4	24.7	12.3	12.0	28.1	11.1	23.1	23.5	10.5	15.8	21.9	13.7	17.0	22.5	14.3
Dissolved Oxygen	mg/L	--	--	--	--	5.5 - 9.5	--	--	6.97	7.76	8.19	9.44	5.57	8.36	**	6.07	9.20	8.35	6.72	10.80	16.27	9.16	20.65	8.67	6.70	9.57
pH (in Situ)	pH	--	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	--	6.91	6.74	7.31	8.29	6.75	7.19	7.38	6.53	7.05	5.77	5.63	6.56	6.10	5.35	5.60	7.61	7.53	*9.61*
Specific Conductance	uS/cm	--	--	--	--	--	--	--	234.0	273.0	255.0	203.7	203.8	208.1	177.9	257.0	201.0	267.0	271.0	224.5	199.0	219.0	266.0	308.0	75.0	275.3
INORGANICS																									
Total Alkalinity (as CaCO3)	mg/L	5	--	--	--	--	--	--	<5	13	9	<5	10	8	<5	11	6	8.0	9.0	5.0	6	9	13	7	14	11
Dissolved Chloride (Cl)	mg/L	1	--	120	--	120	--	--	66	63	59	57	54	47	55	64	53	74	72	60	55	50	55	86	78	62
Fluoride	mg/L	0.12	--	--	--	0.12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	<0.12	--	<0.12	<0.12
Colour	TCU	5	--	--	--	--	--	--	20	18	24	28	7	31	46	16	21	14	15	14	15.0	8.19	7.50	19	7.76	13.5
Nitrite + Nitrate	mg/L	0.05	--	--	--	--	--	--	0.28	0.28	0.20	0.51	0.15	0.24	0.18	0.05	0.49	0.13	<0.05	0.19	0.20	0.21	0.25	0.23	0.11	0.21
Nitrate (N)	mg/L	0.05	--	13	--	13	--	--	0.17	0.13	0.20	0.40	0.05	0.24	0.18	0.05	0.49	0.13	<0.05	0.19	0.20	0.21	0.25	0.23	0.11	0.21
Nitrite (N)	mg/L	0.05	--	0.06	--	0.06	--	--	0.11	0.15	<0.05	0.11	0.10	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen (Ammonia Nitrogen)	mg/L	0.03	--	--	--	1.15 note [5]	--	--	<0.03	<0.03	0.05	<0.03	0.04	<0.03	<0.03	0.10	0.08	0.07	0.10	<0.03	0.04	<0.03	<0.03	<0.03	0.2	0.04
Total Kjeldahl Nitrogen as N	mg/L	0.4	--	--	--	--	--	--	0.5	0.8	1.1	<0.4	<0.4	<0.4	0.6	<0.4	0.7	<0.4	1.00	0.60	0.11	<0.10	<0.10	0.18	0.29	0.16
Total Organic Carbon	mg/L	0.5	--	--	--	--	--	--	5.7	4.7	6.3	4.9	3.2	4.0	4.2	4.2	4.4	3.10	4.10	4.30	4.6	2.9	14.8	3.8	3.5	4.1
Orthophosphate (as P)	mg/L	0.01	--	--	--	--	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.13	<0.01	<0.01
pH (units)	pH	N/A	--	6.5 - 9.0	5.0-9.0	6.5 - 9.0	--	--	6.80	7.15	6.75	6.84	7.28	7.16	6.78	7.22	6.85	7.01	7.11	6.85	6.80	6.50	7.15	6.98	7.12	7.18
Total Calcium (Ca)	mg/L	0.1	--	--	--	--	--	--	8.0	8.2	9.5	6.3	8.7	8.4	7.0	8.3	5.3	8.8	8.2	7.4	8.9	7.8	9.9	9.2	9.8	8.5
Total Magnesium (Mg)	mg/L	0.1	--	--	--	--	--	--	1.3	1.2	1.5	1.1	1.4	1.4	1.2	1.3	0.9	1.3	61.0	1.1	1.2	1.3	1.3	1.4	1.6	1.4
Total Phosphorus	mg/L	0.002	--	--	--	0.01 note [6]	0.010	--	0.041	0.036	0.099	0.032	0.011	0.012	0.007	0.008	0.012	<0.006	0.011	0.020	0.017	0.01	0.010	0.015	0.070	0.030
Total Potassium (K)	mg/L	0.1	--	--	--	--	--	--	1.0	1.1	1.3	0.9	1.2	1.1	0.9	1.2	0.8	0.9	1.1	1.0	1.0	0.9	1.1	1.3	1.4	1.3
Total Sodium (Na)	mg/L	0.1	--	--	--	--	--	--	40.9	45.3	36.0	35.5	37.5	39.2	42.6	45.4	27.8	41.6	8.2	36.3	35.4	32.8	31.6	49	49	38
Reactive Silica (SiO2)	mg/L	0.5	--	--	--	--	--	--	1.9	1.3	1.8	2.7	1.2	2.3	2.3	0.9	2.5	0.9	0.7	2.3	2.7	4.3	2.1	3.2	2.2	1.8
Total Suspended Solids	mg/L	5	--	--	--	note [7]	--	--	20	5	104	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Dissolved Sulphate (SO4)	mg/L	2	--	128	--	--	--	--	10	9	11	9	7	9	7	9	10	9.0	19.0	10.0	8	9	11	10	9	10
Turbidity (NTU)	NTU	0.1	--	--	50	--	--	--	3.3	3.2	31.3	0.7	0.5	2.1	1.2	1.2	1.7	1.1	1.0	0.6	0.6	0.7	<0.5	0.7	0.5	0.7
Conductivity (uS/cm)	µS/cm	1	--	--	--	--	--	--	256	277	248	242	274	232	256	264	156	298	334	243	227	238	238	320	323	256
Calculated Parameters																									
Anion Sum	me/L	N/A	--	--	--	--	--	--	2.09	2.24	2.09	1.83	1.88	1.7	1.7	2.2	1.9	2.44	2.61	2.01	1.85	1.79	2.06	2.79	2.68	2.19
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	5	--	--	--	--	--	--	<5	13	9	<5	10	8.0	<5	11.0	6.0	8	9	5	6	9	13	7	14	11
Calculated TDS	mg/L	1	--	--	--	--	--	--	129	137	142	112	117	112.0	115.0	136.0	104.0	141	156	120	114	108	119	162	158	129
Carb. A kalinity (calc. as CaCO3)	mg/L	10	--	--	--	--	--	--	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cation Sum	me/L	N/A	--	--	--	--	--	--	2.35	2.53	3.15	1.99	2.23	2.3	2.4	2.6	1.6	2.40	2.68	2.08	2.14	1.96	2.01	2.76	2.81	2.24
Hardness (CaCO3)	mg/L	N/A	--	--	--	--	--	--	25.30	25.40	29.90	20.3	27.5	26.7	22.4	26.1	16.9	27.3	26.7	23.0	27.2	24.8	30.1	28.7	31.1	27.0
Ion Balance (% Difference)	%	N/A	--	--	--	--	--	--	5.80	6.10	20.30	4.2	8.4	14.9	15.7	6.9	7.7	0.9	1.4	1.5	7.1	4.3	1.2	0.6	2.5	1.0
Langelier Index (@ 20C)	N/A	N/A	--	--	--	--	--	--	-3.20	-2.42	-2.92	-3.26	-2.37	-2.6	-3.3	-2.4	-3.2	-2.74	-2.63	-3.18	-3.07	-3.24	-2.34	-2.82	-2.35	-2.45
Langelier Index (@ 4C)	N/A	N/A	--	--	--	--	--	--	-3.52	-2.74	-3.24	-3.58	-2.69	-2.9	-3.6	-2.7	-3.6	-3.06	-2.95	-3.50	-3.39	-3.56	-2.66	-3.14	-2.67	-2.77
Saturation pH (@ 20C)	N/A	N/A	--	--	--	--	--	--	10.00	9.57	9.67	10.1	9.65	9.8	10.1	9.6	10.1	9.75	9.74	10.00	9.87	9.74	9.49	9.80	9.47	9.63
Saturation pH (@ 4C)	N/A	N/A	--	--	--	--	--	--	10.30	9.89	9.99	10.4	9.97	10.1	10.4	10.0	10.4	10.1	10.1	10.3	10.2	10.1	9.81	10.1	9.8	10.0
Metals (ICP-MS)																									
Total Aluminum (Al)	µg/L	5	5	5	--	100 (pH based)	--	--	250	94	4,190	151	26	--	139	25	133	35	--	--	114	--	--	91	--	--
Total Antimony (Sb)	µg/L	2	20	9	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Arsenic (As)	µg/L	2	5.0	5.0	--	5	--	--	<2	--	3	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Barium (Ba)	µg/L	5	1000	1000	--	--	--	--	22	--	58	19	12	--	21	16	17	25.0	--	--	22	--	--	34	--	--
Total Beryllium (Be)	µg/L	2	5.3	0.15	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Bismuth (Bi)	µg/L	2	--	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Boron (B)	µg/L	5	1200	1500	--	1500	--	--	<5	--	12	6	11	--	7	10	7	8.0	--	--	14	--	--	8	--	--
Total Cadmium (Cd)	µg/L	0.017	0.01	0.09	--	0.04 - 0.16 note [8]	--	--	0.041	--	0.179	<0.09	<0.09	--	<0.09	<0.09	<0.09	<0.017	--	--	<0.09	--	--	<0.09	--	--
Total Chromium (Cr)	µg/L	1	---	8.9	--	--	--	--	<1	--	5	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Cobalt (Co)	µg/L	1	10	1	--	--	--	--	<1	--	6	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Copper (Cu)	µg/L	1	2	2	--	2 - 2.41 note [8]	--	--	<1	<1	8	<1	<1	1	1	<1	1	<1	<1	<1	1	1	2	<1	<1	<1
Total Iron (Fe)	µg/L	50	300	300	--	300	--	--	206	359	12,600	93	184	82	136	187	108	164	224	108	169	74	65	121	139	86
Total Lead (Pb)	µg/L	0.5	1	1	--	1 - 3.26 note [8]	--	--	<0.5	--	9.1	1.2	<0.5	--	<0.5	<0.5	<0.5	<0.5	--	--	<0.5	--	--	<0.5	--	--
Total Manganese (Mn)	µg/L	2	820	430	--	--	--	--	64	125	894	21	64	22	26	115	28	220	61	21	52	25	19	64	126	21
Total Molybdenum (Mo)	µg/L	2	73	73	--	73	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Nickel (Ni)	µg/L	2	25	25	--	25 - 97.03 note [8]	--	--	22	--	6	2	<2	--	5	2	<2	<2	--	--	60	--	--	<2	--	--
Total Selenium (Se)	µg/L	1	1.0	1.0	--	1	--	--	<1	--	<1	<1	<1	--	<1	<1	<1	<1	--	--	<1	--	--	<1	--	--
Total Silver (Ag)	µg/L	0.1	0.1	0.25	--	0.25	--	--	<0.1	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<2	--	--
Total Strontium (Sr)	µg/L	5	21000	21000	--	--	--	--	34	--	47	27	42	--	35	37	30	38.0	--	--	37	--	--	41	--	--
Total Thallium (Tl)	µg/L	0.1	0.8	0.8	--	0.8	--	--	<0.1	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.1	--	--	<0.1	--	--
Total Tin (Sn)	µg/L	2	--	--	--	--	--	--	<2	--	<2	<2	<2	--	<2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Titanium (Ti)	µg/L	2	--	--	--	--	--	--	2	--	75	<2	<2	--	<2	<2	2	<2	--	--	<2	--	--	<2	--	--
Total Uranium (U)	µg/L	0.1	300	15	--	15	--	--	<0.1	--	0.6	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1	--	--	<0.2	--	--	<0.2	--	--
Total Vanadium (V)	µg/L	2	6	120	--	--	--	--	<2	--	12	<2	<2	--	2	<2	<2	<2	--	--	<2	--	--	<2	--	--
Total Zinc (Zn)	µg/L	5	30	7	--	30	--	--	11	<5	29	6	6	<5	7	<5	<5	<5	<5	<5	120	<5	<5	<5	<5	<5
MICROBIOLOGICAL																									
Total Coliform	MPN/100mL	1	--	--	--	--	--	--	665	>2420	166	9	400	4,000.0	128	500	864	166	548	250	>200	>200	>200	>200	2,500	5,500
E. coli	MPN/100mL	1	--	--	400	--	--	--	6	2	<1	1	10	13	<1	4	14	3	10	2	2	23	2	29	48	44
Chlorophyll A - Spectrophotometer	µg/L	0.25	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.32	1.89	1.1	0.63	0.47	1.1	<0.25	0.9	2.9	<0.3
Chlorophyll A - Acidification method	µg/L	0.05	--	--	--	--	--	--	4.97	4.40	4.86	1.93	1.14	1.12	1.53	1.84	--	--	--	--	--	--	--	--	--	--
Chlorophyll A - Welschmeyer method	µg/L	0.05	--	--	--	--	--	--	6.45	4.96	6.58	0.98	--	*	1.44	1.56	--	--	--	--	--	--	--	--	--	--

Notes:
N/A - Not Applicable; NC - Not Calculable; NCC Not Collected
RDL = Reported Detection Limit (represents most recent sampling event)
" -- " = no guideline available / Not Tested.

[1] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE 2016) Table A2 Reference for Pathway Specific Standards for Surface Water (ug/L) - Fresh Water.

[2] Nova Scotia Environmental Quality Standards (EQS) for Contaminated Sites (NSE September 2021) Tier 1 Table 3 Surface Water Standards (ug/L) for Fresh Water.

[3] Health Canada Guidelines for Canadian Recreational Water Quality (Third Edition 2012).

[4] CCME FAL Canadian Council of Ministers of the Environment Guidelines for the Protection of Aquatic Life - Freshwater (Updated 2015).

[5] CCME FAL Guideline for Ammonia-N varies based on water pH and Temperature. The most stringent guideline is shown (calculated using the highest water pH and temperature). The value is converted to mg/L total ammonia-N by multiplying by 0.8224.

[6] CCME FAL Phosphorus Trigger Range (Applied) of 0.01 mg/L.

[7] CCME FAL TSS reference values between 25-250 mg/L, and >250 mg/L.

[8] CCME FAL Guidelines for cadmium, copper, lead, and nickel are related to water hardness. The range shown represents the guideline range based on the hardness results. If a results was exceeding the minimum value of the range, the specific hardness for that location was used to determine the exceedance.

(*) Chlorophyll A - Welschmeyer Method not completed due to laboratory's instrument failure.

(**) Dissolved oxygen field data not recorded - Post-cal bration failure of field equipment for DO sensor.

Bold (black shaded)	= Present Result - Parameter concentration exceeds CCME FWAL Guideline.
Underlined (black shaded)	= Present Result - Parameter concentration exceeds Health Canada Guideline for Recreational Water Quality
Italics (black shaded)	= Present Result - Parameter concentration exceeds NSE EQS Contaminated Sites Regulations
Blue shaded	= Past Result - Parameter concentration exceeds CCME FWAL Guideline and/or NSE EQS Contaminated Sites Regulations and/or Health Canada Guideline for Recreational Water Quality

APPENDIX

D LABORATORY CERTIFICATES OF ANALYSIS

11 Morris Drive, Unit 122
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http://www.agatlabs.com

CLIENT NAME: WSP E&I CANADA LIMITED
50 TROOP AVENUE, UNIT 300
DARTMOUTH, NS B3B1Z1
(902) 468-2848
ATTENTION TO: Joyce MacDonald
PROJECT: TE201017.1000
AGAT WORK ORDER: 23X035482
MICROBIOLOGY ANALYSIS REVIEWED BY: Ashleigh Dussault, Inorganics Laboratory Supervisor
WATER ANALYSIS REVIEWED BY: Ashleigh Dussault, Inorganics Laboratory Supervisor
DATE REPORTED: Jun 22, 2023
PAGES (INCLUDING COVER): 17
VERSION*: 2

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*Notes

VERSION 2:Version 2 supersedes Version 1. Workorder 23X035482, Version 1 issued June 22, 2023. The complete total metals scan was added to all samples. June 28, 2023 BS.

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 23X035482

PROJECT: TE201017.1000

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

Total Coliforms and E.coli Membrane Filtration

DATE RECEIVED: 2023-06-13

DATE REPORTED: 2023-06-22

				SAMPLE DESCRIPTION:	PML-2	PML-1	HWY101-1	LU	KL-5	KL-1	KL-3	KL-4
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2023-06-13 08:00	2023-06-13 08:20	2023-06-13 09:30	2023-06-13 10:10	2023-06-13 10:42	2023-06-13 10:57	2023-06-13 11:20	2023-06-13 11:35
Parameter	**Unit**	**G / S**	**RDL**		**5062474**	**5062495**	**5062496**	**5062497**	**5062498**	**5062499**	**5062500**	**5062501**
Total Coliforms (MF)	CFU/100 mL		1		>200	>200	>200	>200	>200	>200	>200	>200
E. Coli (MF)	CFU/100 mL		1		3	3	24	9	2	17	11	12

				SAMPLE DESCRIPTION:	KL-2	LSD	HWY101-2
				SAMPLE TYPE:	Water	Water	Water
				DATE SAMPLED:	2023-06-13 12:05	2023-06-13 12:46	2023-06-13 13:30
Parameter	**Unit**	**G / S**	**RDL**		**5062502**	**5062503**	**5062504**
Total Coliforms (MF)	CFU/100 mL		1		>200	>200	>200
E. Coli (MF)	CFU/100 mL		1		20	4	3

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X035482

PROJECT: TE201017.1000

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

AGAT Halifax - Low Level Total Phosphorous- 0.002mg/L

DATE RECEIVED: 2023-06-13

DATE REPORTED: 2023-06-22

		SAMPLE DESCRIPTION:		PML-2	PML-1	HWY101-1	LU	KL-5	KL-1	KL-3	KL-4
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2023-06-13 08:00	2023-06-13 08:20	2023-06-13 09:30	2023-06-13 10:10	2023-06-13 10:42	2023-06-13 10:57	2023-06-13 11:20	2023-06-13 11:35
Parameter	Unit	G / S	RDL	5062474	5062495	5062496	5062497	5062498	5062499	5062500	5062501
Total Phosphorus	mg/L		0.002	0.008	0.007	0.007	0.008	0.008	0.008	0.008	0.008

		SAMPLE DESCRIPTION:		KL-2	LSD	HWY101-2
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2023-06-13 12:05	2023-06-13 12:46	2023-06-13 13:30
Parameter	Unit	G / S	RDL	5062502	5062503	5062504
Total Phosphorus	mg/L		0.002	0.008	0.008	0.007

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

5062474-5062504 Total Phosphorous RDL is the calculated MDL.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X035482

PROJECT: TE201017.1000

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-06-13

DATE REPORTED: 2023-06-22

SAMPLE DESCRIPTION:				PML-2	PML-1		HWY101-1		LU		KL-5
SAMPLE TYPE:				Water	Water		Water		Water		Water
DATE SAMPLED:				2023-06-13 08:00	2023-06-13 08:20		2023-06-13 09:30		2023-06-13 10:10		2023-06-13 10:42
Parameter	Unit	G / S	RDL	5062474	5062495	RDL	5062496	RDL	5062497	RDL	5062498
pH				6.33	6.24		6.46		6.45		6.26
Reactive Silica as SiO2	mg/L		0.5	2.2	1.9	0.5	1.7	0.5	3.2	0.5	2.0
Chloride	mg/L		1	61	59	2	125	5	164	1	60
Fluoride	mg/L		0.12	<0.12	<0.12	0.12	<0.12	0.60	<0.60	0.12	<0.12
Sulphate	mg/L		2	8	8	2	17	10	26	2	8
Alkalinity	mg/L		5	7	6	5	21	5	13	5	6
True Color	TCU		5.00	11.5	17.4	5.00	9.16	5.00	10.0	5.00	10.8
Turbidity	NTU		0.50	0.79	0.93	0.50	0.77	0.50	1.27	0.50	0.95
Electrical Conductivity	umho/cm		1	248	238	1	479	1	666	1	230
Nitrate + Nitrite as N	mg/L		0.05	0.26	0.26	0.05	0.36	0.05	2.81	0.05	0.14
Nitrate as N	mg/L		0.05	0.26	0.26	0.05	0.30	0.25	2.81	0.05	0.14
Nitrite as N	mg/L		0.05	<0.05	<0.05	0.05	0.06	0.25	<0.25	0.05	<0.05
Ammonia as N	mg/L		0.03	<0.03	<0.03	0.03	<0.03	0.03	<0.03	0.03	<0.03
Total Organic Carbon	mg/L		0.5	6.5	6.2	0.5	10.6	0.5	8.1	0.5	6.0
Ortho-Phosphate as P	mg/L		0.01	0.01	0.01	0.01	0.01	0.01	<0.01	0.01	0.01
Total Sodium	mg/L		0.1	36.5	37.5	0.1	68.3	0.1	105	0.1	35.5
Total Potassium	mg/L		0.1	1.1	1.0	0.1	2.2	0.1	2.8	0.1	0.8
Total Calcium	mg/L		0.1	7.2	6.8	0.1	18.7	0.1	18.3	0.1	6.0
Total Magnesium	mg/L		0.1	1.1	1.2	0.1	2.7	0.1	2.6	0.1	1.0
Bicarb. Alkalinity (as CaCO3)	mg/L		5	7	6	5	21	5	13	5	6
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	10	<10	10	<10	10	<10
Hydroxide	mg/L		5	<5	<5	5	<5	5	<5	5	<5
Calculated TDS	mg/L		1	121	119	1	248	1	339	1	116
Hardness	mg/L			22.5	21.9		57.8		56.4		19.1
Langelier Index (@20C)	NA			-3.56	-3.74		-2.57		-2.81		-3.78
Langelier Index (@ 4C)	NA			-3.88	-4.06		-2.89		-3.13		-4.10
Saturation pH (@ 20C)	NA			9.89	9.98		9.03		9.26		10.0
Saturation pH (@ 4C)	NA			10.2	10.3		9.35		9.58		10.4
Anion Sum	me/L			2.05	1.97		4.33		5.63		1.99

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X035482

PROJECT: TE201017.1000

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-06-13

DATE REPORTED: 2023-06-22

SAMPLE DESCRIPTION:				PML-2	PML-1		HWY101-1		LU		KL-5
SAMPLE TYPE:				Water	Water		Water		Water		Water
DATE SAMPLED:				2023-06-13 08:00	2023-06-13 08:20		2023-06-13 09:30		2023-06-13 10:10		2023-06-13 10:42
Parameter	Unit	G / S	RDL	5062474	5062495	RDL	5062496	RDL	5062497	RDL	5062498
Cation sum	me/L			2.09	2.12		4.20		5.78		1.97
% Difference/ Ion Balance	%			1.0	3.6		1.5		1.4		0.5
Total Aluminum	ug/L		5	154	154	5	84	5	111	5	171
Total Antimony	ug/L		2	<2	<2	2	<2	2	<2	2	<2
Total Arsenic	ug/L		2	<2	<2	2	<2	2	<2	2	<2
Total Barium	ug/L		5	23	21	5	112	5	99	5	13
Total Beryllium	ug/L		2	<2	<2	2	<2	2	<2	2	<2
Total Bismuth	ug/L		2	<2	<2	2	<2	2	<2	2	<2
Total Boron	ug/L		5	9	7	5	14	5	16	5	6
Total Cadmium	ug/L		0.09	<0.09	<0.09	0.09	<0.09	0.09	0.10	0.09	<0.09
Total Chromium	ug/L		2	<2	<2	2	<2	2	<2	2	<2
Total Cobalt	ug/L		1	<1	<1	1	<1	1	<1	1	<1
Total Copper	ug/L		2	<2	<2	2	<2	2	3	2	<2
Total Iron	ug/L		50	93	87	50	144	50	124	50	90
Total Lead	ug/L		0.5	<0.5	<0.5	0.5	<0.5	0.5	<0.5	0.5	<0.5
Total Manganese	ug/L		2	31	27	2	14	2	27	2	36
Total Molybdenum	ug/L		2	<2	<2	2	<2	2	<2	2	<2
Total Nickel	ug/L		2	<2	<2	2	<2	2	<2	2	<2
Total Phosphorous	mg/L		0.07	0.46	0.46	0.07	0.40	0.07	0.80	0.07	0.40
Total Selenium	ug/L		1	<1	<1	1	<1	1	<1	1	<1
Total Silver	ug/L		0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.1	0.1	<0.1
Total Strontium	ug/L		5	33	34	5	95	5	83	5	30
Total Thallium	ug/L		0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.1	0.1	<0.1
Total Tin	ug/L		2	<2	<2	2	<2	2	<2	2	<2
Total Titanium	ug/L		3	9	<3	3	<3	3	<3	3	<3
Total Uranium	ug/L		0.2	<0.2	<0.2	0.2	<0.2	0.2	<0.2	0.2	<0.2
Total Vanadium	ug/L		2	<2	<2	2	<2	2	<2	2	<2
Total Zinc	ug/L		5	<5	5	5	8	5	30	5	6

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X035482

PROJECT: TE201017.1000

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-06-13

DATE REPORTED: 2023-06-22

SAMPLE DESCRIPTION:				KL-1	KL-3	KL-4	KL-2	LSD		HWY101-2
SAMPLE TYPE:				Water	Water	Water	Water	Water		Water
DATE SAMPLED:				2023-06-13 10:57	2023-06-13 11:20	2023-06-13 11:35	2023-06-13 12:05	2023-06-13 12:46		2023-06-13 13:30
Parameter	Unit	G / S	RDL	5062499	5062500	5062501	5062502	5062503	RDL	5062504
pH				6.20	6.22	6.22	6.33	6.40		6.25
Reactive Silica as SiO2	mg/L		0.5	1.7	2.0	2.0	2.3	1.6	0.5	2.4
Chloride	mg/L		1	60	60	59	17	41	2	87
Fluoride	mg/L		0.12	<0.12	<0.12	<0.12	<0.12	<0.12	0.12	<0.12
Sulphate	mg/L		2	8	8	8	6	5	2	11
Alkalinity	mg/L		5	6	6	6	7	13	5	6
True Color	TCU		5.00	10.5	10.4	17.5	53.7	13.5	5.00	14.7
Turbidity	NTU		0.50	1.30	1.09	1.26	0.91	2.89	0.50	0.72
Electrical Conductivity	umho/cm		1	227	228	227	95	175	1	456
Nitrate + Nitrite as N	mg/L		0.05	0.12	0.21	0.23	0.08	0.11	0.05	0.05
Nitrate as N	mg/L		0.05	0.12	0.21	0.23	0.08	0.11	0.05	0.05
Nitrite as N	mg/L		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05
Ammonia as N	mg/L		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.03	<0.03
Total Organic Carbon	mg/L		0.5	6.3	6.4	6.5	10.9	8.8	0.5	7.6
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Total Sodium	mg/L		0.1	37.0	34.3	34.6	12.0	24.3	0.1	71.3
Total Potassium	mg/L		0.1	0.7	0.9	0.9	0.8	1.1	0.1	1.3
Total Calcium	mg/L		0.1	6.0	6.9	6.6	4.4	6.4	0.1	11.7
Total Magnesium	mg/L		0.1	1.0	1.1	1.1	1.0	1.4	0.1	1.8
Bicarb. Alkalinity (as CaCO3)	mg/L		5	6	6	6	7	13	5	6
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	5	<5
Calculated TDS	mg/L		1	117	116	115	46	88	1	188
Hardness	mg/L			19.1	21.8	21.0	15.1	21.7		36.6
Langelier Index (@20C)	NA			-3.84	-3.76	-3.78	-3.74	-3.26		-3.52
Langelier Index (@ 4C)	NA			-4.16	-4.08	-4.10	-4.06	-3.58		-3.84
Saturation pH (@ 20C)	NA			10.0	9.98	10.0	10.1	9.66		9.77
Saturation pH (@ 4C)	NA			10.4	10.3	10.3	10.4	9.98		10.1
Anion Sum	me/L			1.99	1.99	1.97	0.75	1.53		2.81

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X035482

PROJECT: TE201017.1000

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-06-13

DATE REPORTED: 2023-06-22

SAMPLE DESCRIPTION:				KL-1	KL-3	KL-4	KL-2	LSD		HWY101-2
SAMPLE TYPE:				Water	Water	Water	Water	Water		Water
DATE SAMPLED:				2023-06-13 10:57	2023-06-13 11:20	2023-06-13 11:35	2023-06-13 12:05	2023-06-13 12:46		2023-06-13 13:30
Parameter	Unit	G / S	RDL	5062499	5062500	5062501	5062502	5062503	RDL	5062504
Cation sum	me/L			2.04	1.97	1.97	0.89	1.57		3.89
% Difference/ Ion Balance	%			1.3	0.5	0.1	8.4	1.5		16.2
Total Aluminum	ug/L		5	216	167	165	295	335	5	117
Total Antimony	ug/L		2	<2	<2	<2	<2	<2	2	<2
Total Arsenic	ug/L		2	<2	<2	<2	<2	<2	2	<2
Total Barium	ug/L		5	13	18	19	17	12	5	115
Total Beryllium	ug/L		2	<2	<2	<2	<2	<2	2	<2
Total Bismuth	ug/L		2	<2	<2	<2	<2	<2	2	<2
Total Boron	ug/L		5	<5	6	<5	8	14	5	6
Total Cadmium	ug/L		0.09	<0.09	<0.09	<0.09	<0.09	<0.09	0.09	<0.09
Total Chromium	ug/L		2	<2	<2	<2	<2	<2	2	<2
Total Cobalt	ug/L		1	<1	<1	<1	<1	<1	1	<1
Total Copper	ug/L		2	<2	<2	<2	<2	<2	2	2
Total Iron	ug/L		50	154	93	121	248	410	50	348
Total Lead	ug/L		0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5
Total Manganese	ug/L		2	57	30	35	25	82	2	65
Total Molybdenum	ug/L		2	<2	<2	<2	<2	<2	2	<2
Total Nickel	ug/L		2	<2	<2	<2	<2	<2	2	<2
Total Phosphorous	mg/L		0.07	0.41	0.46	0.43	0.56	0.43	0.07	0.50
Total Selenium	ug/L		1	<1	<1	<1	<1	<1	1	<1
Total Silver	ug/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1
Total Strontium	ug/L		5	31	33	32	20	28	5	59
Total Thallium	ug/L		0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1
Total Tin	ug/L		2	<2	<2	<2	<2	<2	2	<2
Total Titanium	ug/L		3	<3	<3	<3	<3	6	3	<3
Total Uranium	ug/L		0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2
Total Vanadium	ug/L		2	<2	<2	<2	<2	<2	2	<2
Total Zinc	ug/L		5	7	7	5	<5	5	5	9

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X035482

PROJECT: TE201017.1000

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-06-13

DATE REPORTED: 2023-06-22

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

5062474-5062501 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.
pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result

5062502 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.
pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result
The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.

5062503 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.
pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result

5062504 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.
pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result
Ion Balance is biased high, contributing parameters have been confirmed.

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X035482

PROJECT: TE201017.1000

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

TKN

DATE RECEIVED: 2023-06-13

DATE REPORTED: 2023-06-22

		SAMPLE DESCRIPTION:		PML-2	PML-1	HWY101-1	LU	KL-5	KL-1	KL-3	KL-4
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2023-06-13 08:00	2023-06-13 08:20	2023-06-13 09:30	2023-06-13 10:10	2023-06-13 10:42	2023-06-13 10:57	2023-06-13 11:20	2023-06-13 11:35
Parameter	**Unit**	**G / S**	**RDL**	**5062474**	**5062495**	**5062496**	**5062497**	**5062498**	**5062499**	**5062500**	**5062501**
Total Kjeldahl Nitrogen	mg/L		0.10	<0.10	<0.10	0.16	0.28	<0.10	<0.10	<0.10	<0.10

		SAMPLE DESCRIPTION:		KL-2	LSD	HWY101-2
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2023-06-13 12:05	2023-06-13 12:46	2023-06-13 13:30
Parameter	**Unit**	**G / S**	**RDL**	**5062502**	**5062503**	**5062504**
Total Kjeldahl Nitrogen	mg/L		0.10	0.11	0.29	0.10

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X035482

PROJECT: TE201017.1000

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

TSS

DATE RECEIVED: 2023-06-13 **DATE REPORTED: 2023-06-22**

		SAMPLE DESCRIPTION:		PML-2	PML-1	HWY101-1	LU	KL-5	KL-1	KL-3	KL-4
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2023-06-13 08:00	2023-06-13 08:20	2023-06-13 09:30	2023-06-13 10:10	2023-06-13 10:42	2023-06-13 10:57	2023-06-13 11:20	2023-06-13 11:35
Parameter	Unit	G / S	RDL	5062474	5062495	5062496	5062497	5062498	5062499	5062500	5062501
Total Suspended Solids	mg/L		5	<5	<5	<5	<5	<5	<5	<5	<5

		SAMPLE DESCRIPTION:		KL-2	LSD	HWY101-2
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2023-06-13 12:05	2023-06-13 12:46	2023-06-13 13:30
Parameter	Unit	G / S	RDL	5062502	5062503	5062504
Total Suspended Solids	mg/L		5	<5	<5	<5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

5062474-5062504 pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: [redacted]

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Quality Assurance

CLIENT NAME: WSP E&I CANADA LIMITED

AGAT WORK ORDER: 23X035482

PROJECT: TE201017.1000

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

Microbiology Analysis

RPT Date: Jun 22, 2023			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Coliforms and E.coli Membrane Filtration															
Total Coliforms (MF)	1		>200	>200	0.0%	< 1									
E. Coli (MF)	1		12	10	18.2%	< 1									

Certified By: [redacted]

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Quality Assurance

CLIENT NAME: WSP E&I CANADA LIMITED

AGAT WORK ORDER: 23X035482

PROJECT: TE201017.1000

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

Water Analysis

RPT Date: Jun 22, 2023			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
TSS															
Total Suspended Solids	5064848		<5	<5	NA	< 5	105%	80%	120%				103%	80%	120%
Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.															
Standard Water Analysis + Total Metals															
pH	5064301		6.60	6.44	2.4%	<	101%	80%	120%						
Reactive Silica as SiO2	5062865		11.0	11.3	2.9%	< 0.5	89%	80%	120%	104%	80%	120%	99%	80%	120%
Chloride	5060217		40	41	4.5%	< 1	91%	80%	120%	NA	80%	120%	NA	70%	130%
Fluoride	5060217		<0.12	<0.12	NA	< 0.12	104%	80%	120%	NA	80%	120%	96%	70%	130%
Sulphate	5060217		<2	<2	NA	< 2	111%	80%	120%	NA	80%	120%	94%	70%	130%
Alkalinity	5064301		31	26	17.8%	< 5	88%	80%	120%						
True Color	5062788		<5.00	<5.00	NA	<5	105%	80%	120%	107%	80%	120%			
Turbidity	5064301		0.58	0.59	NA	< 0.5	NA	80%	120%						
Electrical Conductivity	5064301		124	124	0.2%	< 1	98%	90%	110%						
Nitrate as N	5060217		<0.05	<0.05	NA	< 0.05	100%	80%	120%	NA	80%	120%	87%	70%	130%
Nitrite as N	5060217		<0.05	<0.05	NA	< 0.05	101%	80%	120%	NA	80%	120%	90%	70%	130%
Ammonia as N	5062604		<0.03	<0.03	NA	< 0.03	97%	80%	120%	99%	80%	120%	112%	70%	130%
Total Organic Carbon	5062091		19.6	19.4	1.0%	< 0.5	94%	80%	120%	NA	80%	120%	NA	80%	120%
Ortho-Phosphate as P	5062865		0.01	<0.01	NA	< 0.01	107%	80%	120%	98%	80%	120%	104%	80%	120%
Total Sodium	5063657		14.6	15.0	3.3%	< 0.1	98%	80%	120%	99%	80%	120%	98%	70%	130%
Total Potassium	5063657		1.1	1.2	4.4%	< 0.1	98%	80%	120%	98%	80%	120%	97%	70%	130%
Total Calcium	5063657		32.9	33.3	1.2%	< 0.1	94%	80%	120%	96%	80%	120%	94%	70%	130%
Total Magnesium	5063657		3.1	3.2	3.8%	< 0.1	98%	80%	120%	100%	80%	120%	98%	70%	130%
Bicarb. Alkalinity (as CaCO3)	5064301		31	26	17.8%	< 5	NA	80%	120%						
Carb. Alkalinity (as CaCO3)	5064301		<10	<10	NA	< 10	NA	80%	120%						
Hydroxide	5064301		<5	<5	NA	< 5	NA	80%	120%						
Total Aluminum	5063657		20	14	NA	< 5	98%	80%	120%	99%	80%	120%	98%	70%	130%
Total Antimony	5063657		<2	<2	NA	< 2	87%	80%	120%	90%	80%	120%	90%	70%	130%
Total Arsenic	5063657		<2	<2	NA	< 2	98%	80%	120%	97%	80%	120%	99%	70%	130%
Total Barium	5063657		23	24	NA	< 5	95%	80%	120%	94%	80%	120%	96%	70%	130%
Total Beryllium	5063657		<2	<2	NA	< 2	93%	80%	120%	93%	80%	120%	96%	70%	130%
Total Bismuth	5063657		<2	<2	NA	< 2	101%	80%	120%	101%	80%	120%	100%	70%	130%
Total Boron	5063657		<5	6	NA	< 5	93%	80%	120%	94%	80%	120%	95%	70%	130%
Total Cadmium	5063657		<0.09	<0.09	NA	< 0.09	96%	80%	120%	95%	80%	120%	97%	70%	130%
Total Chromium	5063657		<2	<2	NA	< 1	99%	80%	120%	99%	80%	120%	98%	70%	130%
Total Cobalt	5063657		<1	<1	NA	< 1	100%	80%	120%	101%	80%	120%	98%	70%	130%
Total Copper	5063657		4	4	NA	< 1	100%	80%	120%	101%	80%	120%	99%	70%	130%
Total Iron	5063657		<50	<50	NA	< 50	99%	80%	120%	99%	80%	120%	99%	70%	130%
Total Lead	5063657		<0.5	<0.5	NA	< 0.5	100%	80%	120%	100%	80%	120%	99%	70%	130%
Total Manganese	5063657		<2	<2	NA	< 2	99%	80%	120%	99%	80%	120%	99%	70%	130%

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Quality Assurance

CLIENT NAME: WSP E&I CANADA LIMITED

AGAT WORK ORDER: 23X035482

PROJECT: TE201017.1000

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Jun 22, 2023			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Molybdenum	5063657		<2	<2	NA	< 2	95%	80%	120%	96%	80%	120%	96%	70%	130%
Total Nickel	5063657		<2	<2	NA	< 2	100%	80%	120%	101%	80%	120%	100%	70%	130%
Total Phosphorous	5063657		1.35	1.49	9.8%	< 0.02	95%	80%	120%	102%	80%	120%	108%	70%	130%
Total Selenium	5063657		<1	<1	NA	< 1	100%	80%	120%	95%	80%	120%	106%	70%	130%
Total Silver	5063657		<0.1	<0.1	NA	< 0.1	97%	80%	120%	97%	80%	120%	96%	70%	130%
Total Strontium	5063657		218	226	3.6%	< 5	98%	80%	120%	98%	80%	120%	96%	70%	130%
Total Thallium	5063657		<0.1	<0.1	NA	< 0.1	99%	80%	120%	98%	80%	120%	99%	70%	130%
Total Tin	5063657		<2	<2	NA	< 2	96%	80%	120%	98%	80%	120%	97%	70%	130%
Total Titanium	5063657		<3	<3	NA	< 2	100%	80%	120%	102%	80%	120%	98%	70%	130%
Total Uranium	5063657		0.3	0.3	NA	< 0.2	98%	80%	120%	97%	80%	120%	100%	70%	130%
Total Vanadium	5063657		<2	<2	NA	< 2	99%	80%	120%	98%	80%	120%	97%	70%	130%
Total Zinc	5063657		61	63	3.9%	< 5	99%	80%	120%	99%	80%	120%	100%	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.
TOC Matrix spike NA: Spike level < native concentration. Matrix spike acceptance limits do not apply and are not calculated.

TKN

Total Kjeldahl Nitrogen	5063068		0.71	0.71	1.0%	< 0.10	101%	70%	130%	102%	80%	120%	105%	70%	130%

Comments: If the RPD value is NA, the results of the duplicates are under 5X the RDL and will not be calculated.

AGAT Halifax - Low Level Total Phosphorous- 0.002mg/L

Total Phosphorus	5066272		0.030	0.031	3.3%	< 0.002	99%	70%	130%	100%	80%	120%	99%	70%	130%

AGAT Halifax - Low Level Total Phosphorous- 0.002mg/L

Total Phosphorus	5062500	5062500	0.008	0.008	NA	< 0.002	104%	70%	130%	96%	80%	120%	97%	70%	130%

Certified By:

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Method Summary

CLIENT NAME: WSP E&I CANADA LIMITED

AGAT WORK ORDER: 23X035482

PROJECT: TE201017.1000

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Microbiology Analysis			
Total Coliforms (MF)	MIC-121-7002	Sm 9222 H	MF/INCUBATOR
E. Coli (MF)	MIC-121-7002	SM 9222 H	MF/INCUBATOR

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Method Summary

CLIENT NAME: WSP E&I CANADA LIMITED

AGAT WORK ORDER: 23X035482

PROJECT: TE201017.1000

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Total Phosphorus	INOR-93-6022	modified from SM 4500-P B and SM 4500-P E	SPECTROPHOTOMETER
pH	INOR-121-6001	SM 4500 H+B	PC TITRATE
Reactive Silica as SiO2	INOR-121-6027	SM 4500-SiO2 F	COLORIMETER
Chloride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Fluoride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Alkalinity	INOR-121-6001	SM 2320 B	
True Color	INOR-121-6008	SM 2120 B	LACHAT FIA
Turbidity	INOR-121-6001	SM 2130 B	PC TITRATE
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC TITRATE
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-121-6047	SM 4500-NH3 H	COLORIMETER
Total Organic Carbon	INOR-121-6026	SM 5310 B	TOC ANALYZER
Ortho-Phosphate as P	INOR-121-6012	SM 4500-P G	COLORIMETER
Total Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Potassium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Hydroxide	INORG-121-6001	SM 2320 B	PC-TITRATE
Calculated TDS	CALCULATION	SM 1030E	CALCULATION
Hardness	CALCULATION	SM 2340B	CALCULATION
Langelier Index (@20C)	CALCULATION	CALCULATION	CALCULATION
Langelier Index (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 20C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Anion Sum	CALCULATION	SM 1030E	CALCULATION
Cation sum	CALCULATION	SM 1030E	CALCULATION
% Difference/ Ion Balance	CALCULATION	SM 1030E	CALCULATION
Total Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Antimony	MET121-6104 & MET-121-6105	SM 3125	ICP-MS
Total Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS

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Method Summary

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AGAT WORK ORDER: 23X035482

PROJECT: TE201017.1000

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Total Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Phosphorous	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Kjeldahl Nitrogen	INOR-93-6048	modified from EPA 351.2 and SM 4500-NORG D	LACHAT FIA
Total Suspended Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC

AGAT Laboratories

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Dartmouth, NS
B3B 1M2
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P: 902.468.8718 • F: 902.468.8924

Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: 14.4, 16.4, 9.6
Hold Time:
AGAT Job Number: 23X035482 23JUN13 2:48PM
Notes:

Report Information
Company: WSP E&I
Contact: Joyce MacDonald
Address: unit 300, 50 Troop Ave.
Phone: 902-468-2848 Fax:
Client Project #: TE201017.1000
AGAT Quotation:
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Joyce MacDonald
Email: joyce.macdonald@wsp.com
2. Name:
Email:

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☐ Excel Format Included
☐ Export

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No Salt Water Sample: ☐ Yes ☐ No
Reg. No.:

Invoice To Same Yes ☑ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☑ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☒ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☒ MPN	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Chlorophyll a (Innotech)	Other: Cation Scan (Ca, Mg, K, Na)	Hazardous (Y/N)
PML-2	08:00	Water	7	13 June, 2023		✓	✓				✓	✓	✓										✓		✓	✓	✓	
PML-1	08:20	↓	↓	↓		✓	✓				✓	✓	✓										✓		✓	✓	✓	
HWY102-1	09:30					✓	✓				✓	✓	✓										✓		✓	✓	✓	
LU	10:10					✓	✓				✓	✓	✓										✓		✓	✓	✓	
KL-5	10:42					✓	✓				✓	✓	✓										✓		✓	✓	✓	
KL-1	10:57					✓	✓				✓	✓	✓										✓		✓	✓	✓	
KL-3	11:20					✓	✓				✓	✓	✓										✓		✓	✓	✓	
KL-4	11:35					✓	✓				✓	✓	✓										✓		✓	✓	✓	
KL-2	12:05					✓	✓				✓	✓	✓										✓		✓	✓	✓	
LSD	12:46					✓	✓				✓	✓	✓										✓		✓	✓	✓	
HWY102-2	13:30					✓	✓				✓	✓	✓										✓		✓	✓	✓	

Samples Relinquished By (Print Name): Nicolas Graham / Jordan Murphy
Date/Time: 13 June, 2023
Samples Relinquished By (Sign): [redacted]
Date/Time: 14:40
Samples Received [redacted]
Date/Time:
Date/Time:

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

Page 1 of 1
Nº: 75597

Document ID: DIV-133-1502.002
Date revised: May 19, 2016

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Vegreville, Alberta
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Accounts Payable
AGAT Laboratories Ltd
11 Morris Dr. Unit 122

Dartmouth
NS B3B 1M2

INVOICE: Accounts Payable
11 Morris Dr. Unit 122

Dartmouth
NS B3B 1M2

CLIENT SAMPLE ID: HWY101-1

Matrix: Water

CANISTER ID:

PRIORITY: Normal

DESCRIPTION:

DATE SAMPLED: 13-Jun-23 9:30

DATE RECEIVED: 15-Jun-23

REPORT CREATED: 29-Jun-23

REPORT NUMBER: 23060230

VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23060230-003	Chlorophylla (Phytoplankton)		1.3	ug/L	0.3	AC-020	26-Jun-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: June 29, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
HWY101-2		Water	13-Jun-23 13:30

DESCRIPTION:

REPORT NUMBER: 23060230 **REPORT CREATED:** 29-Jun-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23060230-011	Chlorophylla (Phytoplankton)		0.4	ug/L	0.3	AC-020	26-Jun-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: June 29, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
KL-1		Water	13-Jun-23 10:57

DESCRIPTION:

REPORT NUMBER: 23060230 **REPORT CREATED:** 29-Jun-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23060230-006	Chlorophylla (Phytoplankton)		2.1	ug/L	0.3	AC-020	26-Jun-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: June 29, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
KL-2		Water	13-Jun-23 12:05

DESCRIPTION:

REPORT NUMBER: 23060230 **REPORT CREATED:** 29-Jun-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23060230-009	Chlorophylla (Phytoplankton)		0.6	ug/L	0.3	AC-020	26-Jun-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: June 29, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
KL-3		Water	13-Jun-23 11:20

DESCRIPTION:

REPORT NUMBER: 23060230 **REPORT CREATED:** 29-Jun-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23060230-007	Chlorophylla (Phytoplankton)		1.0	ug/L	0.3	AC-020	26-Jun-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: June 29, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
KL-4		Water	13-Jun-23 11:35

DESCRIPTION:

REPORT NUMBER: 23060230 **REPORT CREATED:** 29-Jun-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23060230-008	Chlorophylla (Phytoplankton)		2.0	ug/L	0.3	AC-020	26-Jun-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: June 29, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
KL-5		Water	13-Jun-23 10:42

DESCRIPTION:

REPORT NUMBER: 23060230 **REPORT CREATED:** 29-Jun-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23060230-005	Chlorophylla (Phytoplankton)		1.4	ug/L	0.3	AC-020	26-Jun-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: June 29, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LSD		Water	13-Jun-23 12:46

DESCRIPTION:

REPORT NUMBER: 23060230 **REPORT CREATED:** 29-Jun-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23060230-010	Chlorophylla (Phytoplankton)		11.0	ug/L	0.3	AC-020	26-Jun-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: June 29, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
LU		Water	13-Jun-23 10:10

DESCRIPTION:

REPORT NUMBER: 23060230 **REPORT CREATED:** 29-Jun-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23060230-004	Chlorophylla (Phytoplankton)		3.0	ug/L	0.3	AC-020	26-Jun-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: June 29, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
PML-1		Water	13-Jun-23 8:20

DESCRIPTION:

REPORT NUMBER: 23060230 **REPORT CREATED:** 29-Jun-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23060230-002	Chlorophylla (Phytoplankton)		1.2	ug/L	0.3	AC-020	26-Jun-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: June 29, 2023

Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
PML-2		Water	13-Jun-23 8:00

DESCRIPTION:

REPORT NUMBER: 23060230 **REPORT CREATED:** 29-Jun-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23060230-001	Chlorophylla (Phytoplankton)		1.6	ug/L	0.3	AC-020	26-Jun-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: June 29, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

Revision History

Order ID	Ver	Date	Reason
23060230	01	29-Jun-23	Report created

Methods

Method	Description
AC-020	Chlorophyll-a Phytoplankton (Fluorometric Analysis)

List of Analytical Method IDs within InnoTech's ISO/IEC 17025:2017 CALA Scope of Accreditation

Method ID	Description
AC-013	Mercury in Waters by Cold Vapor Atomic Fluorescence Detection (CVAFS)
AC-020	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-021	Elemental Analysis Methodology of Filter-collected Airborne Particulate Matter (PM) by ICP-MS
AC-026	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-035	Analysis of Glyphosate, Aminomethylphosphonic Acid and Glufosinate in Water
AC-038	Trace Metal Analysis of Water Samples by ICP-MS
AC-048	Specific Conductance (Conductivity Meter Method)
AC-049	pH (Meter Method)
AC-054	Alkalinity Total and Phenolphthalein
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
AC-060	Trace Metal Analysis of Soil Sediment and Industrial Waste Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-061	Trace Metal Analysis for Biological Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-065	Analysis of Naphthenic Acids in Water by HPLC-Orbitrap-MS analysis
AC-074	Pesticides in Water
AC-079	Alkylated PAH in Soil and Sediment
AC-080	Alkylated PAH in Water (SPE Extraction)
NA-006	Determination of BTEX, F1 Hydrocarbons and F2, F3 and F4 Hydrocarbons in Water
NA-024	Analysis of Reduced Sulfur Compounds in Air

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Qualifiers

Data Qualifier	Translation
B	Blank contamination; Analyte detected above the method reporting limit in an associated blank
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J1	Reported value is estimated; Surrogate recoveries limits were exceeded
J2	Reported value is estimated; No known QC criteria for this component
J3	Reported value is estimated; The value failed to meet QC criteria for either precision or accuracy
J4	Reported value is estimated; The sample matrix interfered with the analysis
K	Off-scale low. Actual value is known to be less than the value given
L	Off-scale high. Actual value is known to be greater than value given
N	Non-target analyte; Tentatively identified compound (using mass spectroscopy)
Q	Sample held beyond the accepted holding time
R	Rejected data; Not suitable for the projects intended use
T	Value reported is less than the laboratory method detection limit
U	Compound was analyzed for but not detected
V	Analyte was detected in both the sample and the associated method blank

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Vegreville, Alberta
Canada T9C 1T4
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Order Comments

23060230

Project #: 23X035482

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(780) 632-8211

Sample Comments

Result Comments

Note:

1. Results relate only to items tested and apply to the sample as received.

2. This report shall not be reproduced, except in full, without the explicit approval of the laboratory.

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

CLIENT NAME: WSP E&I CANADA LIMITED
50 TROOP AVENUE, UNIT 300
DARTMOUTH, NS B3B1Z1
(902) 468-2848
ATTENTION TO: JOYCE MCDONALD
PROJECT: TE201017
AGAT WORK ORDER: 23X062427
MICROBIOLOGY ANALYSIS REVIEWED BY: Ashleigh Dussault, Inorganics Laboratory Supervisor
MISCELLANEOUS ANALYSIS REVIEWED BY: Ashleigh Dussault, Inorganics Laboratory Supervisor
WATER ANALYSIS REVIEWED BY: Ashleigh Dussault, Inorganics Laboratory Supervisor
DATE REPORTED: Sep 11, 2023
PAGES (INCLUDING COVER): 19
VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
- This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.
- For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.

AGAT Laboratories

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TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 23X062427
PROJECT: TE201017

CLIENT NAME: WSP E&I CANADA LIMITED
SAMPLING SITE:

ATTENTION TO: JOYCE MCDONALD
SAMPLED BY:

Total Coliforms and E.coli Membrane Filtration

DATE RECEIVED: 2023-08-28

DATE REPORTED: 2023-09-11

				SAMPLE DESCRIPTION:	PML-2	PML-1	HWY102-1	LV	KL-1	KL-2	KL-3	KL-4
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2023-08-28 08:35	2023-08-28 08:55	2023-08-28 09:45	2023-08-28 10:15	2023-08-28 13:10	2023-08-28 12:00	2023-08-28 12:25	2023-08-28 12:35
Parameter	Unit	G / S	RDL		5244113	5244127	5244128	5244129	5244130	5244131	5244132	5244133
Total Coliforms (MF)	CFU/100 mL		1		>200	>200	>200	>200	>200	>200	>200	>200
E. Coli (MF)	CFU/100 mL		1		16	27	195	148	>200	93	24	23

				SAMPLE DESCRIPTION:	KL-5	LSD	HWY102-2
				SAMPLE TYPE:	Water	Water	Water
				DATE SAMPLED:	2023-08-28 12:55	2023-08-28 11:20	2023-08-28 13:30
Parameter	Unit	G / S	RDL		5244134	5244135	5244136
Total Coliforms (MF)	CFU/100 mL		1		>200	>200	>200
E. Coli (MF)	CFU/100 mL		1		4	73	20

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
Analysis performed at AGAT Halifax (unless marked by *)

Certified By: [redacted]

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
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TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 23X062427

PROJECT: TE201017

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: JOYCE MCDONALD

SAMPLING SITE:

SAMPLED BY:

Subcontracted Data Received

DATE RECEIVED: 2023-08-28

DATE REPORTED: 2023-09-11

				SAMPLE DESCRIPTION:	PML-2	PML-1	HWY102-1	LV	KL-1	KL-2	KL-3	KL-4
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2023-08-28 08:35	2023-08-28 08:55	2023-08-28 09:45	2023-08-28 10:15	2023-08-28 13:10	2023-08-28 12:00	2023-08-28 12:25	2023-08-28 12:35
Parameter	Unit	G / S	RDL		5244113	5244127	5244128	5244129	5244130	5244131	5244132	5244133
Subcontracted Data					Y	Y	Y	Y	Y	Y	Y	Y

				SAMPLE DESCRIPTION:	KL-5	LSD	HWY102-2
				SAMPLE TYPE:	Water	Water	Water
				DATE SAMPLED:	2023-08-28 12:55	2023-08-28 11:20	2023-08-28 13:30
Parameter	Unit	G / S	RDL		5244134	5244135	5244136
Subcontracted Data					Y	Y	Y

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: [redacted]

AGAT Laboratories
11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 23X062427

PROJECT: TE201017

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: JOYCE MCDONALD

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-08-28

DATE REPORTED: 2023-09-11

		SAMPLE DESCRIPTION:		PML-2	PML-1	HWY102-1	LV	KL-1	KL-2	KL-3	KL-4
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2023-08-28 08:35	2023-08-28 08:55	2023-08-28 09:45	2023-08-28 10:15	2023-08-28 13:10	2023-08-28 12:00	2023-08-28 12:25	2023-08-28 12:35
Parameter	Unit	G / S	RDL	5244113	5244127	5244128	5244129	5244130	5244131	5244132	5244133
pH		6.5-9		6.46	6.41	6.50	6.47	6.39	6.60	6.33	6.35
Reactive Silica as SiO2	mg/L		0.5	2.6	2.9	4.1	3.9	2.6	4.4	2.7	2.6
Chloride	mg/L	120	1	31	30	44	52	30	8	30	30
Fluoride	mg/L	0.12	0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Sulphate	mg/L	128	2	7	7	11	14	6	5	7	7
Alkalinity	mg/L		5	9	9	20	17	8	12	8	8
True Color	TCU		5.00	45.9	56.4	55.8	47.9	67.1	128	58.5	56.2
Turbidity	NTU		0.50	0.64	0.79	1.31	6.60	1.63	4.03	0.83	0.50
Electrical Conductivity	umho/cm		1	147	147	223	257	142	66	143	143
Nitrate + Nitrite as N	mg/L		0.05	0.24	0.39	0.29	1.48	0.17	0.10	0.21	0.23
Nitrate as N	mg/L	13	0.05	0.24	0.39	0.29	1.48	0.17	0.10	0.21	0.23
Nitrite as N	mg/L	0.06	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Total Organic Carbon	mg/L		0.50	8.6	8.8	9.9	9.5	8.7	15	8.3	8.3
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Sodium	mg/L		0.1	19.9	21.0	28.9	36.7	20.3	7.4	19.4	19.7
Total Potassium	mg/L		0.1	1.0	1.0	2.0	2.0	0.9	1.0	1.0	1.0
Total Calcium	mg/L		0.1	5.7	5.1	10.5	9.1	5.0	4.0	5.3	5.1
Total Magnesium	mg/L		0.1	0.8	0.9	1.6	1.4	0.8	0.9	0.8	0.8
Bicarb. Alkalinity (as CaCO3)	mg/L		5	9	9	20	17	8	12	8	8
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		1	72	73	112	133	69	35	70	70
Hardness	mg/L			17.5	16.4	32.8	28.5	15.8	13.7	16.5	16.0
Langelier Index (@20C)	NA			-3.40	-3.50	-2.77	-2.94	-3.58	-3.26	-3.61	-3.61
Langelier Index (@ 4C)	NA			-3.72	-3.82	-3.09	-3.26	-3.90	-3.58	-3.93	-3.93
Saturation pH (@ 20C)	NA			9.86	9.91	9.27	9.41	9.97	9.86	9.94	9.96
Saturation pH (@ 4C)	NA			10.2	10.2	9.59	9.73	10.3	10.2	10.3	10.3
Anion Sum	me/L			1.22	1.20	1.89	2.20	1.14	0.58	1.17	1.17

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X062427

PROJECT: TE201017

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: JOYCE MCDONALD

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-08-28

DATE REPORTED: 2023-09-11

		SAMPLE DESCRIPTION:		PML-2	PML-1	HWY102-1	LV	KL-1	KL-2	KL-3	KL-4
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2023-08-28 08:35	2023-08-28 08:55	2023-08-28 09:45	2023-08-28 10:15	2023-08-28 13:10	2023-08-28 12:00	2023-08-28 12:25	2023-08-28 12:35
Parameter	Unit	G / S	RDL	5244113	5244127	5244128	5244129	5244130	5244131	5244132	5244133
Cation sum	me/L			1.27	1.30	1.99	2.31	1.27	0.69	1.24	1.23
% Difference/ Ion Balance	%			2.1	4.0	2.6	2.3	5.1	8.7	2.8	2.7
Total Aluminum	ug/L	5	5	167	189	157	600	285	412	197	186
Total Antimony	ug/L	9	2	<2	<2	<2	<2	<2	<2	<2	<2
Total Arsenic	ug/L	5	2	<2	<2	<2	<2	<2	<2	<2	<2
Total Barium	ug/L	1000	5	16	16	54	69	11	15	13	14
Total Beryllium	ug/L	0.15	2	<2	<2	<2	<2	<2	<2	<2	<2
Total Bismuth	ug/L		2	<2	<2	<2	<2	<2	<2	<2	<2
Total Boron	ug/L	1500	5	12	7	11	11	7	11	8	5
Total Cadmium	ug/L	0.09	0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09
Total Chromium	ug/L	8.9	2	<2	<2	<2	<2	<2	<2	5	<2
Total Cobalt	ug/L	1	1	<1	<1	<1	<1	<1	<1	<1	<1
Total Copper	ug/L	2	2	<2	<2	<2	9	<2	2	<2	<2
Total Iron	ug/L	300	50	192	256	260	621	299	512	318	176
Total Lead	ug/L	1	0.5	0.9	<0.5	<0.5	1.3	<0.5	0.8	<0.5	<0.5
Total Manganese	ug/L	430	2	53	65	20	60	56	20	49	44
Total Molybdenum	ug/L	73	2	<2	<2	<2	<2	<2	<2	<2	<2
Total Nickel	ug/L	25	2	<2	<2	<2	<2	<2	<2	<2	<2
Total Phosphorous	mg/L		0.07	0.78	0.84	1.33	1.49	0.80	1.48	0.77	0.79
Total Selenium	ug/L	1	1	<1	<1	<1	<1	<1	<1	<1	<1
Total Silver	ug/L	0.25	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Strontium	ug/L	21000	5	24	26	50	40	23	17	24	24
Total Thallium	ug/L	0.8	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Tin	ug/L	-	2	<2	<2	<2	<2	<2	<2	<2	<2
Total Titanium	ug/L		3	<3	<3	<3	12	4	7	<3	<3
Total Uranium	ug/L	15	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total Vanadium	ug/L	120	2	<2	<2	<2	<2	<2	<2	<2	<2
Total Zinc	ug/L	7	5	15	<5	5	36	15	12	8	26

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X062427

PROJECT: TE201017

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: JOYCE MCDONALD

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-08-28

DATE REPORTED: 2023-09-11

		SAMPLE DESCRIPTION:		KL-5	LSD	HWY102-2
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2023-08-28 12:55	2023-08-28 11:20	2023-08-28 13:30
Parameter	Unit	G / S	RDL	5244134	5244135	5244136
pH		6.5-9		6.34	6.47	6.47
Reactive Silica as SiO2	mg/L		0.5	2.4	3.1	5.3
Chloride	mg/L	120	1	29	14	91
Fluoride	mg/L	0.12	0.12	<0.12	<0.12	<0.12
Sulphate	mg/L	128	2	6	4	10
Alkalinity	mg/L		5	32	12	18
True Color	TCU		5.00	58.3	52.6	107
Turbidity	NTU		0.50	0.50	1.54	3.77
Electrical Conductivity	umho/cm		1	141	91	366
Nitrate + Nitrite as N	mg/L		0.05	0.20	0.06	0.08
Nitrate as N	mg/L	13	0.05	0.20	0.06	0.08
Nitrite as N	mg/L	0.06	0.05	<0.05	<0.05	<0.05
Ammonia as N	mg/L		0.03	<0.03	<0.03	<0.03
Total Organic Carbon	mg/L		0.50	9.4	11	13
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01
Total Sodium	mg/L		0.1	20.1	11.9	59.6
Total Potassium	mg/L		0.1	1.0	1.1	1.4
Total Calcium	mg/L		0.1	4.9	4.2	7.4
Total Magnesium	mg/L		0.1	0.8	1.0	1.1
Bicarb. Alkalinity (as CaCO3)	mg/L		5	32	12	18
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5
Calculated TDS	mg/L		1	82	44	184
Hardness	mg/L			15.5	14.6	23.0
Langelier Index (@20C)	NA			-3.04	-3.38	-3.02
Langelier Index (@ 4C)	NA			-3.36	-3.70	-3.34
Saturation pH (@ 20C)	NA			9.38	9.85	9.49
Saturation pH (@ 4C)	NA			9.70	10.2	9.81
Anion Sum	me/L			1.60	0.72	3.14

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X062427

PROJECT: TE201017

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: JOYCE MCDONALD

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-08-28

DATE REPORTED: 2023-09-11

		SAMPLE DESCRIPTION:		KL-5	LSD	HWY102-2
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2023-08-28 12:55	2023-08-28 11:20	2023-08-28 13:30
Parameter	Unit	G / S	RDL	5244134	5244135	5244136
Cation sum	me/L			1.24	0.88	3.19
% Difference/ Ion Balance	%			12.6	9.6	0.8
Total Aluminum	ug/L	5	5	195	199	258
Total Antimony	ug/L	9	2	<2	<2	<2
Total Arsenic	ug/L	5	2	<2	<2	<2
Total Barium	ug/L	1000	5	12	9	61
Total Beryllium	ug/L	0.15	2	<2	<2	<2
Total Bismuth	ug/L		2	<2	<2	<2
Total Boron	ug/L	1500	5	7	15	7
Total Cadmium	ug/L	0.09	0.09	<0.09	<0.09	<0.09
Total Chromium	ug/L	8.9	2	<2	<2	<2
Total Cobalt	ug/L	1	1	<1	<1	<1
Total Copper	ug/L	2	2	<2	<2	4
Total Iron	ug/L	300	50	177	387	1950
Total Lead	ug/L	1	0.5	<0.5	<0.5	0.8
Total Manganese	ug/L	430	2	37	51	106
Total Molybdenum	ug/L	73	2	<2	<2	<2
Total Nickel	ug/L	25	2	<2	<2	<2
Total Phosphorous	mg/L		0.07	0.73	0.96	1.59
Total Selenium	ug/L	1	1	<1	<1	<1
Total Silver	ug/L	0.25	0.1	<0.1	<0.1	<0.1
Total Strontium	ug/L	21000	5	23	19	36
Total Thallium	ug/L	0.8	0.1	<0.1	<0.1	<0.1
Total Tin	ug/L	-	2	<2	<2	<2
Total Titanium	ug/L		3	<3	4	4
Total Uranium	ug/L	15	0.2	<0.2	<0.2	<0.2
Total Vanadium	ug/L	120	2	<2	<2	<2
Total Zinc	ug/L	7	5	<5	<5	5

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X062427
PROJECT: TE201017

CLIENT NAME: WSP E&I CANADA LIMITED
SAMPLING SITE:

ATTENTION TO: JOYCE MCDONALD
SAMPLED BY:

Standard Water Analysis + Total Metals

DATE RECEIVED: 2023-08-28

DATE REPORTED: 2023-09-11

Comments:	RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to EQS Surface water - Fresh, TPH (Fuel, Lube) - 2021 Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.
5244113-5244130	% Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited. pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result
5244131	% Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited. pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
5244132-5244133	% Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited. pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result
5244134	% Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited. pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result Ion Balance is biased high, contributing parameters have been confirmed.
5244135	% Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited. pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result The cation and anion sums are at, or below, 1 me/L, therefore the acceptable criteria is a difference of less than 0.3me/L.
5244136	% Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited. pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X062427
PROJECT: TE201017

CLIENT NAME: WSP E&I CANADA LIMITED
SAMPLING SITE:

ATTENTION TO: JOYCE MCDONALD
SAMPLED BY:

TKN & Low Level Total Phosphorous - 0.002 mg/L

DATE RECEIVED: 2023-08-28

DATE REPORTED: 2023-09-11

SAMPLE DESCRIPTION:				PML-2	PML-1	HWY102-1	LV	KL-1	KL-2	KL-3	KL-4
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2023-08-28 08:35	2023-08-28 08:55	2023-08-28 09:45	2023-08-28 10:15	2023-08-28 13:10	2023-08-28 12:00	2023-08-28 12:25	2023-08-28 12:35
Parameter	Unit	G / S	RDL	5244113	5244127	5244128	5244129	5244130	5244131	5244132	5244133
Total Phosphorus	mg/L		0.002	0.002	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	0.004
Total Kjeldahl Nitrogen	mg/L		0.10	<0.10	<0.10	<0.10	0.34	<0.10	0.14	<0.10	<0.10

SAMPLE DESCRIPTION:				KL-5	LSD	HWY102-2
SAMPLE TYPE:				Water	Water	Water
DATE SAMPLED:				2023-08-28 12:55	2023-08-28 11:20	2023-08-28 13:30
Parameter	Unit	G / S	RDL	5244134	5244135	5244136
Total Phosphorus	mg/L		0.002	0.008	<0.002	0.002
Total Kjeldahl Nitrogen	mg/L		0.10	0.12	0.16	0.25

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
5244113-5244136 Total Phosphorous RDL is the calculated MDL.
Analysis performed at AGAT Toronto (unless marked by *)

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X062427
PROJECT: TE201017

CLIENT NAME: WSP E&I CANADA LIMITED
SAMPLING SITE:

ATTENTION TO: JOYCE MCDONALD
SAMPLED BY:

TSS

DATE RECEIVED: 2023-08-28

DATE REPORTED: 2023-09-11

SAMPLE DESCRIPTION:				PML-2	PML-1	HWY102-1	LV	KL-1	KL-2	KL-3	KL-4
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2023-08-28 08:35	2023-08-28 08:55	2023-08-28 09:45	2023-08-28 10:15	2023-08-28 13:10	2023-08-28 12:00	2023-08-28 12:25	2023-08-28 12:35
Parameter	Unit	G / S	RDL	5244113	5244127	5244128	5244129	5244130	5244131	5244132	5244133
Total Suspended Solids	mg/L		5	<5	<5	<5	10	<5	5	<5	<5

SAMPLE DESCRIPTION:				KL-5	LSD	HWY102-2
SAMPLE TYPE:				Water	Water	Water
DATE SAMPLED:				2023-08-28 12:55	2023-08-28 11:20	2023-08-28 13:30
Parameter	Unit	G / S	RDL	5244134	5244135	5244136
Total Suspended Solids	mg/L		5	<5	<5	6

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
5244113-5244136 pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result
Analysis performed at AGAT Halifax (unless marked by *)

Certified By: [redacted]

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Exceedance Summary

AGAT WORK ORDER: 23X062427

PROJECT: TE201017

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: JOYCE MCDONALD

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
5244113	PML-2	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Aluminum	ug/L	5	167
5244113	PML-2	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Zinc	ug/L	7	15
5244113	PML-2	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	pH		6.5-9	6.46
5244127	PML-1	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Aluminum	ug/L	5	189
5244127	PML-1	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	pH		6.5-9	6.41
5244128	HWY102-1	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Aluminum	ug/L	5	157
5244129	LV	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Aluminum	ug/L	5	600
5244129	LV	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Copper	ug/L	2	9
5244129	LV	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Iron	ug/L	300	621
5244129	LV	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Lead	ug/L	1	1.3
5244129	LV	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Zinc	ug/L	7	36
5244129	LV	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	pH		6.5-9	6.47
5244130	KL-1	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Aluminum	ug/L	5	285
5244130	KL-1	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Zinc	ug/L	7	15
5244130	KL-1	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	pH		6.5-9	6.39
5244131	KL-2	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Aluminum	ug/L	5	412
5244131	KL-2	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Iron	ug/L	300	512
5244131	KL-2	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Zinc	ug/L	7	12
5244132	KL-3	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Aluminum	ug/L	5	197
5244132	KL-3	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Iron	ug/L	300	318
5244132	KL-3	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Zinc	ug/L	7	8
5244132	KL-3	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	pH		6.5-9	6.33
5244133	KL-4	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Aluminum	ug/L	5	186
5244133	KL-4	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Zinc	ug/L	7	26

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Exceedance Summary

AGAT WORK ORDER: 23X062427

PROJECT: TE201017

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: JOYCE MCDONALD

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
5244133	KL-4	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	pH		6.5-9	6.35
5244134	KL-5	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Aluminum	ug/L	5	195
5244134	KL-5	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	pH		6.5-9	6.34
5244135	LSD	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Aluminum	ug/L	5	199
5244135	LSD	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Iron	ug/L	300	387
5244135	LSD	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	pH		6.5-9	6.47
5244136	HWY102-2	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Aluminum	ug/L	5	258
5244136	HWY102-2	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Copper	ug/L	2	4
5244136	HWY102-2	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	Total Iron	ug/L	300	1950
5244136	HWY102-2	NS-ContSiteSW_FW_FL	Standard Water Analysis + Total Metals	pH		6.5-9	6.47

AGAT Laboratories

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Quality Assurance

CLIENT NAME: WSP E&I CANADA LIMITED

AGAT WORK ORDER: 23X062427

PROJECT: TE201017

ATTENTION TO: JOYCE MCDONALD

SAMPLING SITE:

SAMPLED BY:

Water Analysis

RPT Date: Sep 11, 2023			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Standard Water Analysis + Total Metals															
pH	5244131	5244131	6.60	6.40	3.2%	<	101%	80%	120%						
Reactive Silica as SiO2	5233041		5.6	6.1	7.7%	< 0.5	101%	80%	120%	NA	80%	120%	103%	80%	120%
Chloride	5242934		6	6	3.8%	< 1	91%	80%	120%	NA	80%	120%	91%	70%	130%
Fluoride	5242934		0.15	0.17	NA	< 0.12	98%	80%	120%	NA	80%	120%	100%	70%	130%
Sulphate	5242934		<2	<2	NA	< 2	99%	80%	120%	NA	80%	120%	99%	70%	130%
Alkalinity	5244131	5244131	12	9	NA	< 5	109%	80%	120%						
True Color	5239652		<5.00	<5.00	NA	< 5	96%	80%	120%	100%	80%	120%			
Turbidity	5244131	5244131	4.03	3.90	3.2%	< 0.5	119%	80%	120%						
Electrical Conductivity	5244131	5244131	66	66	0.0%	< 1	95%	90%	110%						
Nitrate as N	5242934		<0.05	<0.05	NA	< 0.05	107%	80%	120%	NA	80%	120%	96%	70%	130%
Nitrite as N	5242934		<0.05	<0.05	NA	< 0.05	99%	80%	120%	NA	80%	120%	94%	70%	130%
Ammonia as N	5242935		<0.03	<0.03	NA	< 0.03	103%	80%	120%	101%	80%	120%	107%	70%	130%
Total Organic Carbon	5244113	5244113	8.6	8.8	2.7%	<0.5	115%	80%	120%	NA	80%	120%	112%	80%	120%
Ortho-Phosphate as P	5239652		<0.01	<0.01	NA	< 0.01	109%	80%	120%	91%	80%	120%	96%	80%	120%
Total Sodium	5244182		14.0	14.8	5.4%	< 0.1	99%	80%	120%	101%	80%	120%	NA	70%	130%
Total Potassium	5244182		1.2	1.3	4.6%	< 0.1	97%	80%	120%	101%	80%	120%	103%	70%	130%
Total Calcium	5244182		12.9	13.3	2.6%	< 0.1	95%	80%	120%	100%	80%	120%	NA	70%	130%
Total Magnesium	5244182		4.1	4.4	5.9%	< 0.1	99%	80%	120%	104%	80%	120%	112%	70%	130%
Bicarb. Alkalinity (as CaCO3)	5244131	5244131	12	9	NA	< 5	NA	80%	120%						
Carb. Alkalinity (as CaCO3)	5244131	5244131	<10	<10	NA	< 10	NA	80%	120%						
Hydroxide	5244131	5244131	<5	<5	NA	< 5	NA	80%	120%						
Total Aluminum	5244182		29	30	1.2%	< 5	93%	80%	120%	99%	80%	120%	107%	70%	130%
Total Antimony	5244182		<2	<2	NA	< 2	92%	80%	120%	93%	80%	120%	91%	70%	130%
Total Arsenic	5244182		7	7	NA	< 2	95%	80%	120%	100%	80%	120%	99%	70%	130%
Total Barium	5244182		<5	<5	NA	< 5	92%	80%	120%	94%	80%	120%	92%	70%	130%
Total Beryllium	5244182		<2	<2	NA	< 2	94%	80%	120%	106%	80%	120%	103%	70%	130%
Total Bismuth	5244182		<2	<2	NA	< 2	96%	80%	120%	73%	80%	120%	95%	70%	130%
Total Boron	5244182		6	9	NA	< 5	80%	80%	120%	80%	80%	120%	100%	70%	130%
Total Cadmium	5244182		0.10	0.11	NA	< 0.09	96%	80%	120%	98%	80%	120%	93%	70%	130%
Total Chromium	5244182		<2	<2	NA	< 1	98%	80%	120%	101%	80%	120%	98%	70%	130%
Total Cobalt	5244182		4	4	NA	< 1	99%	80%	120%	102%	80%	120%	100%	70%	130%
Total Copper	5244182		4	5	NA	< 1	99%	80%	120%	104%	80%	120%	99%	70%	130%
Total Iron	5244182		14800	15800	7.0%	< 50	100%	80%	120%	104%	80%	120%	NA	70%	130%
Total Lead	5244182		0.5	0.5	NA	< 0.5	96%	80%	120%	97%	80%	120%	95%	70%	130%
Total Manganese	5244182		915	977	6.5%	< 2	99%	80%	120%	102%	80%	120%	NA	70%	130%
Total Molybdenum	5244182		<2	<2	NA	< 2	94%	80%	120%	91%	80%	120%	91%	70%	130%
Total Nickel	5244182		3	3	NA	< 2	99%	80%	120%	103%	80%	120%	98%	70%	130%
Total Phosphorous	5244182		2.77	3.04	9.1%	< 0.02	100%	80%	120%	83%	80%	120%	NA	70%	130%
Total Selenium	5244182		<1	<1	NA	< 1	98%	80%	120%	103%	80%	120%	96%	70%	130%

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Quality Assurance

CLIENT NAME: WSP E&I CANADA LIMITED
AGAT WORK ORDER: 23X062427
PROJECT: TE201017
ATTENTION TO: JOYCE MCDONALD
SAMPLING SITE:
SAMPLED BY:

Water Analysis (Continued)

RPT Date: Sep 11, 2023			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Total Silver	5244182		<0.1	<0.1	NA	< 0.1	126%	80%	120%	126%	80%	120%	121%	70%	130%
Total Strontium	5244182		57	62	6.8%	< 5	97%	80%	120%	102%	80%	120%	112%	70%	130%
Total Thallium	5244182		<0.1	<0.1	NA	< 0.1	95%	80%	120%	97%	80%	120%	93%	70%	130%
Total Tin	5244182		<2	<2	NA	< 2	94%	80%	120%	93%	80%	120%	92%	70%	130%
Total Titanium	5244182		<3	<3	NA	< 2	97%	80%	120%	100%	80%	120%	98%	70%	130%
Total Uranium	5244182		<0.2	<0.2	NA	< 0.2	96%	80%	120%	96%	80%	120%	94%	70%	130%
Total Vanadium	5244182		<2	<2	NA	< 2	96%	80%	120%	101%	80%	120%	99%	70%	130%
Total Zinc	5244182		25	18	NA	< 5	97%	80%	120%	95%	80%	120%	99%	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.
More than 90% of the elements met acceptance limits and overall data quality is acceptable for use. For a multi-element scan up to 10% of analytes may exceed the quoted limits by up to 10% absolute.
Matrix spike NA: Spike level < native concentration. Matrix spike acceptance limits do not apply and are not calculated.

TSS															
Total Suspended Solids	5247421		<5	<5	NA	< 5	99%	80%	120%	NA			102%	80%	120%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

TKN & Low Level Total Phosphorous - 0.002 mg/L															
Total Phosphorus	5246305		0.178	0.176	1.1%	< 0.002	99%	70%	130%	102%	80%	120%	NA	70%	130%
Total Kjeldahl Nitrogen	5247778		5.45	5.40	0.9%	< 0.10	102%	70%	130%	101%	80%	120%	96%	70%	130%

Comments: Matrix spike NA: Spike level < native concentration. Matrix spike acceptance limits do not apply and are not calculated.

Certified By:

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QC Exceedance

CLIENT NAME: WSP E&I CANADA LIMITED

AGAT WORK ORDER: 23X062427

PROJECT: TE201017

ATTENTION TO: JOYCE MCDONALD

RPT Date: Sep 11, 2023

PARAMETER	Sample Id	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
			Lower	Upper		Lower	Upper		Lower	Upper
Standard Water Analysis + Total Metals										
Total Bismuth		96%	80%	120%	73%	80%	120%	95%	70%	130%
Total Silver		126%	80%	120%	126%	80%	120%	121%	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.
More than 90% of the elements met acceptance limits and overall data quality is acceptable for use. For a multi-element scan up to 10% of analytes may exceed the quoted limits by up to 10% absolute.
Matrix spike NA: Spike level < native concentration. Matrix spike acceptance limits do not apply and are not calculated.

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Method Summary

CLIENT NAME: WSP E&I CANADA LIMITED

AGAT WORK ORDER: 23X062427

PROJECT: TE201017

ATTENTION TO: JOYCE MCDONALD

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Microbiology Analysis			
Total Coliforms (MF)	MIC-121-7002	Sm 9222 H	MF/INCUBATOR
E. Coli (MF)	MIC-121-7002	SM 9222 H	MF/INCUBATOR
Miscellaneous Analysis			
Subcontracted Data			

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Method Summary

CLIENT NAME: WSP E&I CANADA LIMITED

AGAT WORK ORDER: 23X062427

PROJECT: TE201017

ATTENTION TO: JOYCE MCDONALD

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
pH	INOR-121-6001	SM 4500 H+B	PC TITRATE
Reactive Silica as SiO2	INOR-121-6027	SM 4500-SiO2 F	COLORIMETER
Chloride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Fluoride	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Alkalinity	INOR-121-6001	SM 2320 B	
True Color	INOR-121-6008	SM 2120 B	LACHAT FIA
Turbidity	INOR-121-6001	SM 2130 B	PC TITRATE
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC TITRATE
Nitrate + Nitrite as N	INORG-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-121-6047	SM 4500-NH3 H	COLORIMETER
Total Organic Carbon	INOR-121-6026	SM 5310 B	TOC ANALYZER
Ortho-Phosphate as P	INOR-121-6012	SM 4500-P G	COLORIMETER
Total Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Potassium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Hydroxide	INORG-121-6001	SM 2320 B	PC-TITRATE
Calculated TDS	CALCULATION	SM 1030E	CALCULATION
Hardness	CALCULATION	SM 2340B	CALCULATION
Langelier Index (@20C)	CALCULATION	CALCULATION	CALCULATION
Langelier Index (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 20C)	CALCULATION	CALCULATION	CALCULATION
Saturation pH (@ 4C)	CALCULATION	CALCULATION	CALCULATION
Anion Sum	CALCULATION	SM 1030E	CALCULATION
Cation sum	CALCULATION	SM 1030E	CALCULATION
% Difference/ Ion Balance	CALCULATION	SM 1030E	CALCULATION
Total Aluminum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Antimony	MET121-6104 & MET-121-6105	SM 3125	ICP-MS
Total Arsenic	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Barium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Beryllium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Bismuth	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Boron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Cadmium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS

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Method Summary

CLIENT NAME: WSP E&I CANADA LIMITED

AGAT WORK ORDER: 23X062427

PROJECT: TE201017

ATTENTION TO: JOYCE MCDONALD

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Total Chromium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Cobalt	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Lead	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Molybdenum	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Nickel	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Phosphorous	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Selenium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Silver	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Strontium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Thallium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Tin	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Titanium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Uranium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Vanadium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Phosphorus	INOR-93-6022	modified from SM 4500-P B and SM 4500-P E	SPECTROPHOTOMETER
Total Kjeldahl Nitrogen	INOR-93-6048	modified from EPA 351.2 and SM 4500-NORG D	LACHAT FIA
Total Suspended Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC

AGAT Laboratories

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Chain of Custody Record

P: 902.468.8718 • F: 902.468.8924

Laboratory Use Only

Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: 6.2, 16.8, 19.4
Hold Time:
AGAT Job Number: 23X062427
Notes:

Report Information

Company: WSP E&I Canada Limited
Contact: Joyce MacDonald
Address: 300-50 Troop Ave
Dartmouth, NS, B3B 1Z1
Phone: 468-2848 Fax:
Client Project #: TE201617
AGAT Quotation:
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):

1. Name: Joyce MacDonald
   Email: joyce.macdonald@wsp.com
2. Name: Jordan Murphy
   Email: jordan.murphy@wsp.com

Report Format

☐ Single Sample per page
☑ Multiple Samples per page
☑ Excel Format Included
☐ Export

Turnaround Time Required (TAT)

Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required: '23AUG28 2:44PM

Regulatory Requirements (Check):

☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No Salt Water Sample ☐ Yes ☐ No
Reg. No.:

Invoice To Same Yes ☑ / No ☐

Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis	Metals: ☑ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☑ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☑ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Chlorophyll A (Welschmeyer)	Other: Cation Scan (Ca, Mg, K, Na)	Hazardous (Y/N)
PML-2	28/08/23 8:35	SW	8			✓	✓				✓	✓	✓										✓			✓	✓	
PML-1	8:55					✓	✓				✓	✓	✓										✓			✓	✓	
HWY102-1	9:45					✓	✓				✓	✓	✓										✓			✓	✓	
LU	10:15					✓	✓				✓	✓	✓										✓			✓	✓	
KL-1	13:10					✓	✓				✓	✓	✓										✓			✓	✓	
KL-2	12:00					✓	✓				✓	✓	✓										✓			✓	✓	
KL-3	12:25					✓	✓				✓	✓	✓										✓			✓	✓	
KL-4	12:35					✓	✓				✓	✓	✓										✓			✓	✓	
KL-5	12:55					✓	✓				✓	✓	✓										✓			✓	✓	
LSD	11:20					✓	✓				✓	✓	✓										✓			✓	✓	
HWY102-2	13:30					✓	✓				✓	✓	✓										✓			✓	✓	

Samples Relinquished By (Print Name): Jordan Murphy [redacted]
Samples Relinquished By (Sign):
Date/Time: 28/08/23 1443
Date/Time:
Samples Received By (Print Name):
Samples Received By (Sign): [redacted]
Date/Time:
Date/Time:

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

Page 1 of 1
Nº:

Document ID: DIV-133-1502.004
Date revised: Apr 19, 2021

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Brianna Sandau 902-468-2430
AGAT Laboratories Ltd
11 Morris Dr. Unit 122

Dartmouth
NS B3B 1M2

INVOICE: Accounts Payable
11 Morris Dr. Unit 122

Dartmouth
NS B3B 1M2

CLIENT SAMPLE ID: 5244113 - PML-2
Matrix: Water
CANISTER ID:
PRIORITY: Normal
DESCRIPTION: Client Project # 23X062427
DATE SAMPLED: 23-Aug-23 8:35
DATE RECEIVED: 31-Aug-23
REPORT CREATED: 08-Sep-23
REPORT NUMBER: 23090003
VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090003-001	Chlorophylla (Phytoplankton)		1.1	ug/L	0.3	AC-020	05-Sep-23

Report certified by: Graham Knox, Admin. & Ops. Supervisor On behalf of: Adam Malcolm, Manager, Chemical Testing
Date: September 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

InnoTech ALBERTA
PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5244127 - PML-1		Water	23-Aug-23 8:55

DESCRIPTION: Client Project # 23X062427

REPORT NUMBER: 23090003 **REPORT CREATED:** 08-Sep-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090003-002	Chlorophylla (Phytoplankton)		0.4	ug/L	0.3	AC-020	05-Sep-23

Report certified by: Graham Knox, Admin. & Ops. Supervisor On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: September 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

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Vegreville, Alberta
Canada T9C 1T4
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5244128 - HWY102-1		Water	23-Aug-23 9:45

DESCRIPTION: Client Project # 23X062427

REPORT NUMBER: 23090003 **REPORT CREATED:** 08-Sep-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090003-003	Chlorophylla (Phytoplankton)		1.7	ug/L	0.3	AC-020	05-Sep-23

Report certified by: Graham Knox, Admin. & Ops. Supervisor On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: September 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5244129 - LV		Water	23-Aug-23 10:15

DESCRIPTION: Client Project # 23X062427

REPORT NUMBER: 23090003 **REPORT CREATED:** 08-Sep-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090003-004	Chlorophylla (Phytoplankton)		9.3	ug/L	0.3	AC-020	05-Sep-23

Report certified by: Graham Knox, Admin. & Ops. Supervisor On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: September 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5244130 - KL-1		Water	23-Aug-23 13:10

DESCRIPTION: Client Project # 23X062427

REPORT NUMBER: 23090003 **REPORT CREATED:** 08-Sep-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090003-005	Chlorophylla (Phytoplankton)		2.1	ug/L	0.3	AC-020	05-Sep-23

Report certified by: Graham Knox, Admin. & Ops. Supervisor On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: September 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5244131 - KL-2		Water	23-Aug-23 12:00

DESCRIPTION: Client Project # 23X062427

REPORT NUMBER: 23090003 **REPORT CREATED:** 08-Sep-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090003-006	Chlorophylla (Phytoplankton)		0.3	ug/L	0.3	AC-020	05-Sep-23

Report certified by: Graham Knox, Admin. & Ops. Supervisor On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: September 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5244132 - KL-3		Water	23-Aug-23 12:25

DESCRIPTION: Client Project # 23X062427

REPORT NUMBER: 23090003 **REPORT CREATED:** 08-Sep-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090003-007	Chlorophylla (Phytoplankton)		1.3	ug/L	0.3	AC-020	05-Sep-23

Report certified by: Graham Knox, Admin. & Ops. Supervisor On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: September 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5244133 - KL-4		Water	23-Aug-23 12:35

DESCRIPTION: Client Project # 23X062427

REPORT NUMBER: 23090003 **REPORT CREATED:** 08-Sep-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090003-008	Chlorophylla (Phytoplankton)		0.9	ug/L	0.3	AC-020	05-Sep-23

Report certified by: Graham Knox, Admin. & Ops. Supervisor On behalf of: Adam Malcolm, Manager, Chemical Testing
Date: September 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5244134 - KL-5		Water	23-Aug-23 12:55

DESCRIPTION: Client Project # 23X062427

REPORT NUMBER: 23090003 **REPORT CREATED:** 08-Sep-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090003-009	Chlorophylla (Phytoplankton)		3.1	ug/L	0.3	AC-020	05-Sep-23

Report certified by: Graham Knox, Admin. & Ops. Supervisor On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: September 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5244135 - LSD		Water	23-Aug-23 11:20

DESCRIPTION: Client Project # 23X062427

REPORT NUMBER: 23090003 **REPORT CREATED:** 08-Sep-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090003-010	Chlorophylla (Phytoplankton)		0.9	ug/L	0.3	AC-020	05-Sep-23

Report certified by: Graham Knox, Admin. & Ops. Supervisor On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: September 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5244136 - HWY102-2		Water	23-Aug-23 13:30

DESCRIPTION: Client Project # 23X062427

REPORT NUMBER: 23090003 **REPORT CREATED:** 08-Sep-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23090003-011	Chlorophylla (Phytoplankton)		0.3	ug/L	0.3	AC-020	05-Sep-23

Report certified by: Graham Knox, Admin. & Ops. Supervisor On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: September 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

Revision History

Order ID	Ver	Date	Reason
23090003	01	08-Sep-23	Report created

Methods

Method	Description
AC-020	Chlorophyll-a Phytoplankton (Fluorometric Analysis)

List of Analytical Method IDs within InnoTech's ISO/IEC 17025:2017 CALA Scope of Accreditation

Method ID	Description
AC-013	Mercury in Waters by Cold Vapor Atomic Fluorescence Detection (CVAFS)
AC-020	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-021	Elemental Analysis Methodology of Filter-collected Airborne Particulate Matter (PM) by ICP-MS
AC-026	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-035	Analysis of Glyphosate, Aminomethylphosphonic Acid and Glufosinate in Water
AC-038	Trace Metal Analysis of Water Samples by ICP-MS
AC-048	Specific Conductance (Conductivity Meter Method)
AC-049	pH (Meter Method)
AC-054	Alkalinity Total and Phenolphthalein
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
AC-060	Trace Metal Analysis of Soil Sediment and Industrial Waste Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-061	Trace Metal Analysis for Biological Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-065	Analysis of Naphthenic Acids in Water by HPLC-Orbitrap-MS analysis
AC-074	Pesticides in Water
AC-079	Alkylated PAH in Soil and Sediment
AC-080	Alkylated PAH in Water (SPE Extraction)
NA-006	Determination of BTEX, F1 Hydrocarbons and F2, F3 and F4 Hydrocarbons in Water
NA-024	Analysis of Reduced Sulfur Compounds in Air

Qualifiers

Data Qualifier	Translation
B	Blank contamination; Analyte detected above the method reporting limit in an associated blank
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J1	Reported value is estimated; Surrogate recoveries limits were exceeded
J2	Reported value is estimated; No known QC criteria for this component
J3	Reported value is estimated; The value failed to meet QC criteria for either precision or accuracy
J4	Reported value is estimated; The sample matrix interfered with the analysis
K	Off-scale low. Actual value is known to be less than the value given
L	Off-scale high. Actual value is known to be greater than value given
N	Non-target analyte; Tentatively identified compound (using mass spectroscopy)
Q	Sample held beyond the accepted holding time
R	Rejected data; Not suitable for the projects intended use
T	Value reported is less than the laboratory method detection limit
U	Compound was analyzed for but not detected
V	Analyte was detected in both the sample and the associated method blank

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Order Comments

23090003

Client Project # 23X062427

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Sample Comments

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Result Comments

Note:

1. Results relate only to items tested and apply to the sample as received.

2. This report shall not be reproduced, except in full, without the explicit approval of the laboratory.

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FAX (902)468-8924
http://www.agatlabs.com

CLIENT NAME: WSP E&I CANADA LIMITED
50 TROOP AVENUE, UNIT 300
DARTMOUTH, NS B3B1Z1
(902) 468-2848
ATTENTION TO: Joyce MacDonald
PROJECT: TE201017 - Fall Sample Event 2023
AGAT WORK ORDER: 23X081042
MICROBIOLOGY ANALYSIS REVIEWED BY: Kaliegh Cullen, Report Writer
WATER ANALYSIS REVIEWED BY: Kaliegh Cullen, Report Writer
DATE REPORTED: Oct 27, 2023
PAGES (INCLUDING COVER): 13
VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
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- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.
- For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.

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Certificate of Analysis

AGAT WORK ORDER: 23X081042

PROJECT: TE201017 - Fall Sample Event 2023

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

Total Coliforms and E.coli Membrane Filtration

DATE RECEIVED: 2023-10-16

DATE REPORTED: 2023-10-27

				SAMPLE DESCRIPTION:	PML-1	PML-2	HWY 102-1	HWY 102-2	LU	LSD	KL-1	KL-2
				SAMPLE TYPE:	Water	Water	Water	Water	Water	Water	Water	Water
				DATE SAMPLED:	2023-10-16 09:53	2023-10-16 09:45	2023-10-16 10:45	2023-10-16 14:40	2023-10-16 11:15	2023-10-16 12:40	2023-10-16 14:25	2023-10-16 13:20
Parameter	Unit	G / S	RDL		5367562	5367615	5367616	5367617	5367618	5367619	5367620	5367621
Total Coliforms (MF)	CFU/100 mL		1		>200	>200	>200	>200	>200	>200	>200	>200
E. Coli (MF)	CFU/100 mL		1		12	15	13	4	38	30	95	12

				SAMPLE DESCRIPTION:	KL-3	KL-4	KL-5
				SAMPLE TYPE:	Water	Water	Water
				DATE SAMPLED:	2023-10-16 13:40	2023-10-16 13:50	2023-10-16 14:10
Parameter	Unit	G / S	RDL		5367622	5367623	5367624
Total Coliforms (MF)	CFU/100 mL		1		>200	>200	>200
E. Coli (MF)	CFU/100 mL		1		12	29	11

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X081042

PROJECT: TE201017 - Fall Sample Event 2023

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

Low Level Total Phosphorous - 0.002 mg/L, TKN

DATE RECEIVED: 2023-10-16

DATE REPORTED: 2023-10-27

SAMPLE DESCRIPTION:				PML-1	PML-2	HWY 102-1	HWY 102-2	LU	LSD	KL-1	KL-2
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2023-10-16 09:53	2023-10-16 09:45	2023-10-16 10:45	2023-10-16 14:40	2023-10-16 11:15	2023-10-16 12:40	2023-10-16 14:25	2023-10-16 13:20
Parameter	Unit	G / S	RDL	5367562	5367615	5367616	5367617	5367618	5367619	5367620	5367621
Total Phosphorus	mg/L		0.002	0.011	0.003	0.004	0.004	0.004	0.146	0.005	0.007
Total Kjeldahl Nitrogen	mg/L		0.10	0.27	0.26	0.35	0.32	0.65	0.31	0.25	0.31

SAMPLE DESCRIPTION:				KL-3	KL-4	KL-5
SAMPLE TYPE:				Water	Water	Water
DATE SAMPLED:				2023-10-16 13:40	2023-10-16 13:50	2023-10-16 14:10
Parameter	Unit	G / S	RDL	5367622	5367623	5367624
Total Phosphorus	mg/L		0.002	0.006	0.006	0.006
Total Kjeldahl Nitrogen	mg/L		0.10	0.30	0.26	0.29

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

5367562-5367624 Total Phosphorous RDL is the calculated MDL.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X081042

PROJECT: TE201017 - Fall Sample Event 2023

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis (Total)

DATE RECEIVED: 2023-10-16

DATE REPORTED: 2023-10-27

		SAMPLE DESCRIPTION:		PML-1	PML-2	HWY 102-1	HWY 102-2	LU	LSD	KL-1	KL-2
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2023-10-16 09:53	2023-10-16 09:45	2023-10-16 10:45	2023-10-16 14:40	2023-10-16 11:15	2023-10-16 12:40	2023-10-16 14:25	2023-10-16 13:20
Parameter	Unit	G / S	RDL	5367562	5367615	5367616	5367617	5367618	5367619	5367620	5367621
pH	pH Units			7.42	6.33	6.22	6.00	6.27	6.28	6.16	6.12
Reactive Silica as SiO2	mg/L		0.5	3.4	3.1	4.5	5.5	5.6	3.7	2.6	4.6
Chloride	mg/L		1	33	36	48	64	52	20	31	12
Fluoride	mg/L		0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12	<0.12
Sulphate	mg/L		2	7	8	14	7	18	4	6	6
Alkalinity as CaCO3	mg/L		5	13	13	23	9	24	17	10	11
True Color	TCU		5.00	40.3	40.1	39.6	44.8	19.8	30.0	45.8	62.1
Turbidity	NTU		0.5	0.8	1.1	1.4	1.6	12.1	6.0	4.0	1.3
Electrical Conductivity	umho/cm		1	153	153	234	267	294	112	140	79
Nitrate + Nitrite as N	mg/L		0.05	0.59	0.57	0.68	0.54	3.44	0.29	0.52	0.16
Nitrate as N	mg/L		0.05	0.27	0.27	0.33	0.07	3.01	0.09	0.21	0.07
Nitrite as N	mg/L		0.05	0.32	0.30	0.35	0.47	0.43	0.20	0.31	0.09
Ammonia as N	mg/L		0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Total Organic Carbon	mg/L		0.5	6.2	6.2	6.9	7.0	5.5	6.4	6.4	8.4
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Sodium	mg/L		0.1	21.9	21.4	29.2	42.5	39.5	13.1	19.5	8.8
Total Potassium	mg/L		0.1	1.1	1.1	2.1	1.3	2.5	1.3	0.9	1.1
Total Calcium	mg/L		0.1	5.7	5.6	11.3	7.1	12.1	4.8	4.5	4.7
Total Magnesium	mg/L		0.1	0.9	0.9	1.8	1.2	1.8	1.2	0.8	1.2
Bicarb. Alkalinity (as CaCO3)	mg/L		5	13	13	23	9	24	17	10	11
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10	<10	<10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5	<5	<5	<5	<5	<5
Calculated TDS	mg/L		1	80	84	124	132	157	57	71	42
Hardness	mg/L		0.7	17.9	17.7	35.6	22.7	37.6	16.9	14.5	16.7
Langelier Index (@20C)	NA			-2.37	-3.46	-3.02	-3.90	-2.96	-3.49	-3.84	-3.82
Langelier Index (@ 4C)	NA			-2.61	-3.71	-3.28	-4.11	-3.19	-3.69	-4.08	-4.04
Saturation pH (@ 20C)	NA			9.79	9.79	9.24	9.90	9.23	9.77	10.0	9.94
Saturation pH (@ 4C)	NA			10.0	10.0	9.50	10.1	9.46	9.97	10.2	10.2
Anion Sum	me/L			1.38	1.48	2.15	2.17	2.57	1.01	1.24	0.69

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X081042

PROJECT: TE201017 - Fall Sample Event 2023

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis (Total)

DATE RECEIVED: 2023-10-16

DATE REPORTED: 2023-10-27

SAMPLE DESCRIPTION:				PML-1	PML-2	HWY 102-1	HWY 102-2	LU	LSD	KL-1	KL-2
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2023-10-16 09:53	2023-10-16 09:45	2023-10-16 10:45	2023-10-16 14:40	2023-10-16 11:15	2023-10-16 12:40	2023-10-16 14:25	2023-10-16 13:20
Parameter	Unit	G / S	RDL	5367562	5367615	5367616	5367617	5367618	5367619	5367620	5367621
Cation sum	me/L			1.37	1.34	2.06	2.40	2.61	0.99	1.19	0.78
% Difference/ Ion Balance	%			0.5	5.1	2.3	5.0	0.7	0.7	1.9	5.6
Total Copper	ug/L		2	<2	2	2	<2	4	<2	<2	<2
Total Iron	ug/L		50	182	181	180	1040	456	369	192	246
Total Phosphorus	mg/L		0.02	0.87	0.92	1.34	1.54	1.97	1.23	0.79	1.55
Total Manganese	ug/L		2	33	36	9	118	36	37	22	11
Total Zinc	ug/L		5	22	18	20	14	29	10	25	<5

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X081042

PROJECT: TE201017 - Fall Sample Event 2023

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis (Total)

DATE RECEIVED: 2023-10-16

DATE REPORTED: 2023-10-27

		SAMPLE DESCRIPTION:		KL-3	KL-4	KL-5
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2023-10-16 13:40	2023-10-16 13:50	2023-10-16 14:10
Parameter	Unit	G / S	RDL	5367622	5367623	5367624
pH	pH Units			6.15	6.16	6.19
Reactive Silica as SiO2	mg/L		0.5	2.9	2.8	2.8
Chloride	mg/L		1	33	33	34
Fluoride	mg/L		0.12	<0.12	<0.12	<0.12
Sulphate	mg/L		2	7	7	7
Alkalinity as CaCO3	mg/L		5	10	10	11
True Color	TCU		5.00	48.5	42.9	46.1
Turbidity	NTU		0.5	1.7	1.8	0.9
Electrical Conductivity	umho/cm		1	149	150	157
Nitrate + Nitrite as N	mg/L		0.05	0.54	0.51	0.50
Nitrate as N	mg/L		0.05	0.23	0.21	0.18
Nitrite as N	mg/L		0.05	0.31	0.30	0.32
Ammonia as N	mg/L		0.03	<0.03	<0.03	<0.03
Total Organic Carbon	mg/L		0.5	6.3	6.3	6.3
Ortho-Phosphate as P	mg/L		0.01	<0.01	<0.01	<0.01
Total Sodium	mg/L		0.1	20.5	22.4	22.9
Total Potassium	mg/L		0.1	1.0	1.1	1.0
Total Calcium	mg/L		0.1	4.9	5.5	5.8
Total Magnesium	mg/L		0.1	0.9	1.0	0.9
Bicarb. Alkalinity (as CaCO3)	mg/L		5	10	10	11
Carb. Alkalinity (as CaCO3)	mg/L		10	<10	<10	<10
Hydroxide	mg/L		5	<5	<5	<5
Calculated TDS	mg/L		1	76	79	81
Hardness	mg/L		0.7	15.9	17.9	18.2
Langelier Index (@20C)	NA			-3.81	-3.76	-3.65
Langelier Index (@ 4C)	NA			-4.06	-4.00	-3.90
Saturation pH (@ 20C)	NA			9.96	9.92	9.84
Saturation pH (@ 4C)	NA			10.2	10.2	10.1
Anion Sum	me/L			1.32	1.31	1.36

Certified By: [redacted]

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 23X081042

PROJECT: TE201017 - Fall Sample Event 2023

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

Standard Water Analysis (Total)

DATE RECEIVED: 2023-10-16

DATE REPORTED: 2023-10-27

				SAMPLE DESCRIPTION:	KL-3	KL-4	KL-5
				SAMPLE TYPE:	Water	Water	Water
				DATE SAMPLED:	2023-10-16 13:40	2023-10-16 13:50	2023-10-16 14:10
Parameter	Unit	G / S	RDL		5367622	5367623	5367624
Cation sum	me/L				1.26	1.39	1.41
% Difference/ Ion Balance	%				2.2	2.8	1.8
Total Copper	ug/L		2		<2	<2	<2
Total Iron	ug/L		50		155	189	150
Total Phosphorus	mg/L		0.02		0.82	0.94	0.78
Total Manganese	ug/L		2		23	45	16
Total Zinc	ug/L		5		10	17	8

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

5367562-5367624 % Difference / Ion Balance, Hardness, Langelier Index, Nitrate + Nitrite, Hydroxide and Saturation pH are calculated parameters. The calculated parameters are non-accredited. The component parameters of the calculations are accredited.
pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: [redacted]

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Certificate of Analysis

AGAT WORK ORDER: 23X081042

PROJECT: TE201017 - Fall Sample Event 2023

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

TSS

DATE RECEIVED: 2023-10-16

DATE REPORTED: 2023-10-27

		SAMPLE DESCRIPTION:		PML-1	PML-2	HWY 102-1	HWY 102-2	LU	LSD	KL-1	KL-2
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2023-10-16 09:53	2023-10-16 09:45	2023-10-16 10:45	2023-10-16 14:40	2023-10-16 11:15	2023-10-16 12:40	2023-10-16 14:25	2023-10-16 13:20
Parameter	Unit	G / S	RDL	5367562	5367615	5367616	5367617	5367618	5367619	5367620	5367621
Total Suspended Solids	mg/L		5	<5	<5	<5	<5	5	<5	<5	<5

		SAMPLE DESCRIPTION:		KL-3	KL-4	KL-5
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2023-10-16 13:40	2023-10-16 13:50	2023-10-16 14:10
Parameter	Unit	G / S	RDL	5367622	5367623	5367624
Total Suspended Solids	mg/L		5	<5	<5	<5

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

5367562-5367624 pH has been analyzed past the recommended holding time of 15 minutes from sampling. Field measurement recommended for most accurate result

Analysis performed at AGAT Halifax (unless marked by *)

Certified By: [redacted]

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Quality Assurance

CLIENT NAME: WSP E&I CANADA LIMITED
AGAT WORK ORDER: 23X081042
PROJECT: TE201017 - Fall Sample Event 2023
ATTENTION TO: Joyce MacDonald
SAMPLING SITE:
SAMPLED BY:

Water Analysis

RPT Date: Oct 27, 2023

PARAMETER	Batch	Sample Id	DUPLICATE Dup #1	Dup #2	RPD	Method Blank	REFERENCE MATERIAL Measured Value	Acceptable Limits Lower	Upper	METHOD BLANK SPIKE Recovery	Acceptable Limits Lower	Upper	MATRIX SPIKE Recovery	Acceptable Limits Lower	Upper
Standard Water Analysis (Total)															
pH	5367615	5367615	6.33	6.13	3.2%	<	100%	80%	120%	NA	80%	120%	NA	80%	120%
Reactive Silica as SiO2	5369060		14.4	15.2	5.4%	< 0.5	103%	80%	120%	102%	80%	120%	99%	80%	120%
Chloride	5367621	5367621	12	14	9.5%	< 1	102%	80%	120%	NA	80%	120%	NA	70%	130%
Fluoride	5367621	5367621	<0.12	<0.12	NA	< 0.12	100%	80%	120%	NA	80%	120%	110%	70%	130%
Sulphate	5367621	5367621	6	6	NA	< 2	115%	80%	120%	NA	80%	120%	104%	70%	130%
Alkalinity as CaCO3	5367615	5367615	13	12	NA	< 5	97%	80%	120%						
True Color	5369060		<5.00	<5.00	NA	< 5	97%	80%	120%						
Turbidity	5367619	5367619	5.7	6.0	5.1%	< 0.5	96%	80%	120%						
Electrical Conductivity	5367615	5367615	153	152	0.5%	< 1	98%	90%	110%						
Nitrate as N	5367621	5367621	0.07	0.06	NA	< 0.05	105%	80%	120%	NA	80%	120%	90%	70%	130%
Nitrite as N	5367621	5367621	0.09	<0.05	NA	< 0.05	83%	80%	120%	NA	80%	120%	94%	70%	130%
Ammonia as N	5372882		<0.03	<0.03	NA	< 0.03	102%	80%	120%	101%	80%	120%	108%	70%	130%
Total Organic Carbon	5366805		<0.50	<0.50	NA	< 0.5	89%	80%	120%	NA	80%	120%	97%	80%	120%
Ortho-Phosphate as P	5369060		0.02	0.02	NA	< 0.01	95%	80%	120%	100%	80%	120%	105%	80%	120%
Total Sodium	5368691		154	136	11.9%	< 0.1	101%	80%	120%	91%	80%	120%	NA	70%	130%
Total Potassium	5368691		3.3	3.1	8.3%	< 0.1	95%	80%	120%	93%	80%	120%	100%	70%	130%
Total Calcium	5368691		0.3	0.2	NA	< 0.1	93%	80%	120%	94%	80%	120%	87%	70%	130%
Total Magnesium	5368691		<0.1	<0.1	NA	< 0.1	97%	80%	120%	93%	80%	120%	91%	70%	130%
Bicarb. Alkalinity (as CaCO3)	5367615	5367615	13	12	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Carb. Alkalinity (as CaCO3)	5367615	5367615	<10	<10	NA	< 10	NA	80%	120%	NA	80%	120%	NA	80%	120%
Hydroxide	5367615	5367615	<5	<5	NA	< 5	NA	80%	120%	NA	80%	120%	NA	80%	120%
Total Copper	5368691		220	205	7.2%	< 2	91%	80%	120%	87%	80%	120%	NA	70%	130%
Total Iron	5368691		54	<50	NA	< 50	94%	80%	120%	87%	80%	120%	88%	70%	130%
Total Phosphorus	5368691		1.91	1.67	12.9%	< 0.02	91%	80%	120%	83%	80%	120%	NA	70%	130%
Total Manganese	5368691		1190	1110	6.2%	< 2	93%	80%	120%	90%	80%	120%	NA	70%	130%
Total Zinc	5368691		128	108	16.8%	< 5	91%	80%	120%	92%	80%	120%	117%	70%	130%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

TSS															
Total Suspended Solids	5374018		<5	<5	NA	< 5	98%	80%	120%	NA			101%	80%	120%

Comments: If RPD value is NA, the results of the duplicates are less than 5x the RDL and the RPD will not be calculated.

Low Level Total Phosphorous - 0.002 mg/L, TKN															
Total Phosphorus	5369449		0.004	0.005	NA	< 0.002	101%	70%	130%	104%	80%	120%	99%	70%	130%
Total Kjeldahl Nitrogen	5361305		4.15	4.28	3.1%	< 0.10	100%	70%	130%	99%	80%	120%	78%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.

Low Level Total Phosphorous - 0.002 mg/L, TKN															
Total Kjeldahl Nitrogen	5367620	5367620	0.25	0.24	NA	< 0.10	100%	70%	130%	99%	80%	120%	78%	70%	130%

AGAT Laboratories

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Quality Assurance

CLIENT NAME: WSP E&I CANADA LIMITED
AGAT WORK ORDER: 23X081042
PROJECT: TE201017 - Fall Sample Event 2023
ATTENTION TO: Joyce MacDonald
SAMPLING SITE:
SAMPLED BY:

Water Analysis (Continued)

RPT Date: Oct 27, 2023			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.

Certified By: [redacted]

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Method Summary

CLIENT NAME: WSP E&I CANADA LIMITED

AGAT WORK ORDER: 23X081042

PROJECT: TE201017 - Fall Sample Event 2023

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Microbiology Analysis			
Total Coliforms (MF)	MIC-121-7002	Sm 9222 H	MF/INCUBATOR
E. Coli (MF)	MIC-121-7002	SM 9222 H	MF/INCUBATOR

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Method Summary

CLIENT NAME: WSP E&I CANADA LIMITED

AGAT WORK ORDER: 23X081042

PROJECT: TE201017 - Fall Sample Event 2023

ATTENTION TO: Joyce MacDonald

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Total Phosphorus	INOR-93-6022	modified from SM 4500-P B and SM 4500-P E	SPECTROPHOTOMETER
Total Kjeldahl Nitrogen	INOR-93-6048	modified from EPA 351.2 and SM 4500-NORG D	LACHAT FIA
pH	INOR-121-6001	SM 4500 H+B	PC TITRATE
Reactive Silica as SiO2	INOR-121-6027	SM 4500-SiO2 F	COLORIMETER
Chloride	INOR-121-6005	SM 4110 B	ION CHROMATOGRAPH
Fluoride	INOR-121-6005	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INORG-121-6005	SM 4110 B	ION CHROMATOGRAPH
Alkalinity as CaCO3	INOR-121-6001	SM 2320 B	PC TITRATE
True Color	INOR-121-6008	SM 2120 B	LACHAT FIA
Turbidity	INOR-121-6001	SM 2130 B	PC TITRATE
Electrical Conductivity	INOR-121-6001	SM 2510 B	PC TITRATE
Nitrate + Nitrite as N	INOR-121-6005	SM 4110 B	CALCULATION
Nitrate as N	INOR-121-6005	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-121-6005	SM 4110 B	ION CHROMATOGRAPH
Ammonia as N	INOR-121-6047	SM 4500-NH3 H	COLORIMETER
Total Organic Carbon	INOR-121-6026	SM 5310 B	TOC ANALYZER
Ortho-Phosphate as P	INOR-121-6012	SM 4500-P G	COLORIMETER
Total Sodium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Potassium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Calcium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Magnesium	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Bicarb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Carb. Alkalinity (as CaCO3)	INORG-121-6001	SM 2320 B	PC TITRATE
Hydroxide	INORG-121-6001	SM 2320 B	PC-TITRATE
Calculated TDS		SM 1030E	CALCULATION
Hardness		SM 2340B	CALCULATION
Langelier Index (@20C)			CALCULATION
Langelier Index (@ 4C)			CALCULATION
Saturation pH (@ 20C)			CALCULATION
Saturation pH (@ 4C)			CALCULATION
Anion Sum		SM 1030E	CALCULATION
Cation sum		SM 1030E	CALCULATION
% Difference/ Ion Balance		SM 1030E	CALCULATION
Total Copper	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Iron	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Phosphorus	MET-121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Manganese	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Zinc	MET121-6104 & MET-121-6105	modified from SM 3125/SM 3030 B/SM 3030 D	ICP-MS
Total Suspended Solids	INOR-121-6024, 6025	SM 2540C, D	GRAVIMETRIC

AGAT Laboratories

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Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: 11.4, 11.4, 11.9
Hold Time:
AGAT Job Number: 23X081042
Notes: '23OCT16 3:52PM

Report Information
Company: WSP E & T
Contact: Joyce Macdonald
Address: 50 Troop Ave Unit 300
[illegible] NS B3B 1Z1
Phone: [illegible] 2948 Fax:
Client Project #: [illegible] Fall Sampling [illegible]
AGAT Quotation: [illegible] 2023
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Joyce MacDonald
   Email: joyce.macdonald@wsp.com
2. Name:
   Email:

Report Format
☐ Single Sample per page
☑ Multiple Samples per page
☑ Excel Format Included
☐ Export

Turnaround Time Required (TAT)
Regular TAT ☑ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No Salt Water Sample: ☐ Yes ☐ No
Reg. No.:

Invoice To
Same Yes ☑ / No ☐
Company:
Contact:
Address:
Phone: Fax:
PO/Credit Card#: TE201017.****.****.5290.573[illegible]

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment	Field Filtered/Preserved	Standard Water Analysis (Total)	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☑ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus (low level)	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other: Total Coliform	Other: Chlorophyll A/Phaeophytin	Hazardous (Y/N)
PML-1	Oct 16/23 9:55	Surface Water				✓					✓	✓	✓												✓	✓	✓	
PML-2	" 9:45	"				✓					✓	✓	✓												✓	✓	✓	
HW4102-1	" 1045	"				✓					✓	✓	✓												✓	✓	✓	
HW4102-2	" 1440	"				✓					✓	✓	✓												✓	✓	✓	
LU	" 1115	"				✓					✓	✓	✓												✓	✓	✓	
LSD	" 1240	"				✓					✓	✓	✓												✓	✓	✓	
KL-1	" 1425	"				✓					✓	✓	✓												✓	✓	✓	
KL-2	" 1320	"				✓					✓	✓	✓												✓	✓	✓	
KL-3	" 1340	"				✓					✓	✓	✓												✓	✓	✓	
KL-4	" 1350	"				✓					✓	✓	✓												✓	✓	✓	
KL-5	" 1416	"				✓					✓	✓	✓												✓	✓	✓	

Samples Relinquished By (Print Name): Kasey Orevic
Samples Relinquished By (Sign):
Date/Time: Oct 16 / 1345
Samples Received By [redacted]
Date/Time
Date/Time

Pink Copy - Client
Yellow Copy - AGAT
White Copy- AGAT

Page 1 of 1
Nº:

Document ID: DIV-133-1502.004
Date revised: Apr 19, 2021

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

RESULTS: Brianna Sandau 902-468-2430
AGAT Laboratories Ltd
11 Morris Dr. Unit 122

Dartmouth
NS B3B 1M2

INVOICE: Accounts Payable
11 Morris Dr. Unit 122

Dartmouth
NS B3B 1M2

CLIENT SAMPLE ID: 5367562 PML-1
Matrix: Water
CANISTER ID:
PRIORITY: Normal
DESCRIPTION: Project # 23X081042
DATE SAMPLED: 16-Oct-23
DATE RECEIVED: 19-Oct-23
REPORT CREATED: 08-Nov-23
REPORT NUMBER: 23100202
VERSION: Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100202-001	Chlorophylla (Phytoplankton)		0.4	ug/L	0.3	AC-020	24-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing
Date: November 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

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Canada T9C 1T4
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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5367615 PML-2		Water	16-Oct-23

DESCRIPTION: Project # 23X081042

REPORT NUMBER: 23100202 **REPORT CREATED:** 08-Nov-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100202-002	Chlorophylla (Phytoplankton)		0.6	ug/L	0.3	AC-020	24-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: November 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5367616 HWY 102-1		Water	16-Oct-23

DESCRIPTION: Project # 23X081042

REPORT NUMBER: 23100202 **REPORT CREATED:** 08-Nov-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100202-003	Chlorophylla (Phytoplankton)		0.8	ug/L	0.3	AC-020	24-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: November 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5367617 HWY 102-2		Water	16-Oct-23

DESCRIPTION: Project # 23X081042

REPORT NUMBER: 23100202 **REPORT CREATED:** 08-Nov-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100202-004	Chlorophylla (Phytoplankton)		0.3	ug/L	0.3	AC-020	24-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: November 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

InnoTech ALBERTA
PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5367618 LU		Water	16-Oct-23

DESCRIPTION: Project # 23X081042

REPORT NUMBER: 23100202 **REPORT CREATED:** 08-Nov-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100202-005	Chlorophylla (Phytoplankton)		5.0	ug/L	0.3	AC-020	24-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: November 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5367619 LSD		Water	16-Oct-23

DESCRIPTION: Project # 23X081042

REPORT NUMBER: 23100202 **REPORT CREATED:** 08-Nov-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100202-006	Chlorophylla (Phytoplankton)	K, T, U	< 0.3	ug/L	0.3	AC-020	24-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: November 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

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(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5367620 KL-1		Water	16-Oct-23

DESCRIPTION: Project # 23X081042

REPORT NUMBER: 23100202 **REPORT CREATED:** 08-Nov-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100202-007	Chlorophylla (Phytoplankton)		1.1	ug/L	0.3	AC-020	24-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: November 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

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Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5367621 KL-2		Water	16-Oct-23

DESCRIPTION: Project # 23X081042

REPORT NUMBER: 23100202 **REPORT CREATED:** 08-Nov-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100202-008	Chlorophylla (Phytoplankton)		1.0	ug/L	0.3	AC-020	24-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: November 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

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Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5367622 KL-3		Water	16-Oct-23

DESCRIPTION: Project # 23X081042

REPORT NUMBER: 23100202 **REPORT CREATED:** 08-Nov-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100202-009	Chlorophylla (Phytoplankton)		1.0	ug/L	0.3	AC-020	24-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: November 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

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Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5367623 KL-4		Water	16-Oct-23

DESCRIPTION: Project # 23X081042

REPORT NUMBER: 23100202 **REPORT CREATED:** 08-Nov-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100202-010	Chlorophylla (Phytoplankton)		1.2	ug/L	0.3	AC-020	24-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: November 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

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Canada T9C 1T4
(780) 632-8211

ENVIRONMENTAL ANALYTICAL SERVICES

TEST REPORT

CLIENT SAMPLE ID	CANISTER ID	Matrix	DATE SAMPLED
5367624 KL-5		Water	16-Oct-23

DESCRIPTION: Project # 23X081042

REPORT NUMBER: 23100202 **REPORT CREATED:** 08-Nov-23 **VERSION:** Version 01

Lab ID	Parameter	Qualifier	Result	Units	RDL	Method	Analysis Date
23100202-011	Chlorophylla (Phytoplankton)		0.9	ug/L	0.3	AC-020	24-Oct-23

Report certified by: Andrea Conner, Admin Assistant On behalf of: Adam Malcolm, Manager, Chemical Testing

Date: November 8, 2023 Inquiries: (780) 632 8403 E-mail: EAS.Results@innotechalberta.ca

InnoTech's ISO/IEC 17025:2017 scope of accreditation can be located at https://directory.cala.ca//

Revision History

Order ID	Ver	Date	Reason
23100202	01	08-Nov-23	Report created

Methods

Method	Description
AC-020	Chlorophyll-a Phytoplankton (Fluorometric Analysis)

List of Analytical Method IDs within InnoTech's ISO/IEC 17025:2017 CALA Scope of Accreditation

Method ID	Description
AC-013	Mercury in Waters by Cold Vapor Atomic Fluorescence Detection (CVAFS)
AC-020	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-021	Elemental Analysis Methodology of Filter-collected Airborne Particulate Matter (PM) by ICP-MS
AC-026	Ion Chromatographic Procedures using the Dionex ICS 3000 and 5000 Systems
AC-029	Procedure for the Equilibration and Weighing of Membrane Filters and PUFs on the Mettler Toledo Micro Balance
AC-035	Analysis of Glyphosate, Aminomethylphosphonic Acid and Glufosinate in Water
AC-038	Trace Metal Analysis of Water Samples by ICP-MS
AC-048	Specific Conductance (Conductivity Meter Method)
AC-049	pH (Meter Method)
AC-054	Alkalinity Total and Phenolphthalein
AC-058	Determination of Volatile Organic Compounds in Ambient Air by Gas Chromatography Mass Spectrometry
AC-060	Trace Metal Analysis of Soil Sediment and Industrial Waste Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-061	Trace Metal Analysis for Biological Samples by Inductively Coupled Plasma Mass Spectrometry (ICP-MS)
AC-065	Analysis of Naphthenic Acids in Water by HPLC-Orbitrap-MS analysis
AC-074	Pesticides in Water
AC-079	Alkylated PAH in Soil and Sediment
AC-080	Alkylated PAH in Water (SPE Extraction)
NA-006	Determination of BTEX, F1 Hydrocarbons and F2, F3 and F4 Hydrocarbons in Water
NA-024	Analysis of Reduced Sulfur Compounds in Air

Qualifiers

Data Qualifier	Translation
B	Blank contamination; Analyte detected above the method reporting limit in an associated blank
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit
J1	Reported value is estimated; Surrogate recoveries limits were exceeded
J2	Reported value is estimated; No known QC criteria for this component
J3	Reported value is estimated; The value failed to meet QC criteria for either precision or accuracy
J4	Reported value is estimated; The sample matrix interfered with the analysis
K	Off-scale low. Actual value is known to be less than the value given
L	Off-scale high. Actual value is known to be greater than value given
N	Non-target analyte; Tentatively identified compound (using mass spectroscopy)
Q	Sample held beyond the accepted holding time
R	Rejected data; Not suitable for the projects intended use
T	Value reported is less than the laboratory method detection limit
U	Compound was analyzed for but not detected
V	Analyte was detected in both the sample and the associated method blank

Order Comments

23100202

Project # 23X081042

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

Sample Comments

PO Bag 4000
Vegreville, Alberta
Canada T9C 1T4
(780) 632-8211

Result Comments

Note:

1. Results relate only to items tested and apply to the sample as received.

2. This report shall not be reproduced, except in full, without the explicit approval of the laboratory.

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

CLIENT NAME: WSP E&I CANADA LIMITED
50 TROOP AVENUE, UNIT 300
DARTMOUTH, NS B3B1Z1
(902) 468-2848
ATTENTION TO: Kelsey Cheverie
PROJECT: TE201017.****.****.5290
AGAT WORK ORDER: 23X095506
WATER ANALYSIS REVIEWED BY: Sukhwinder Randhawa, Inorganic Team Lead
DATE REPORTED: Nov 29, 2023
PAGES (INCLUDING COVER): 5
VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (902) 468-8718

*Notes

Disclaimer:

- All work conducted herein has been done using accepted standard protocols, and generally accepted practices and methods. AGAT test methods may incorporate modifications from the specified reference methods to improve performance.
- All samples will be disposed of within 30 days after receipt unless a Long Term Storage Agreement is signed and returned. Some specialty analysis may be exempt, please contact your Client Project Manager for details.
- AGAT's liability in connection with any delay, performance or non-performance of these services is only to the Client and does not extend to any other third party. Unless expressly agreed otherwise in writing, AGAT's liability is limited to the actual cost of the specific analysis or analyses included in the services.
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- The test results reported herewith relate only to the samples as received by the laboratory.
- Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability, fitness for a particular purpose, or non-infringement. AGAT assumes no responsibility for any errors or omissions in the guidelines contained in this document.
- All reportable information as specified by ISO/IEC 17025:2017 is available from AGAT Laboratories upon request.
- For environmental samples in the Province of Quebec: The analysis is performed on and results apply to samples as received. A temperature above 6°C upon receipt, as indicated in the Sample Reception Notification (SRN), could indicate the integrity of the samples has been compromised if the delay between sampling and submission to the laboratory could not be minimized.

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http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 23X095506

PROJECT: TE201017.****.****.5290

CLIENT NAME: WSP E&I CANADA LIMITED

ATTENTION TO: Kelsey Cheverie

SAMPLING SITE:

SAMPLED BY:

Low Level Total Phosphorous - 0.002 mg/L

DATE RECEIVED: 2023-11-21

DATE REPORTED: 2023-11-29

				SAMPLE DESCRIPTION:	PML-1	LSD
				SAMPLE TYPE:	Water	Water
				DATE SAMPLED:	2023-11-21 11:30	2023-11-21 12:30
Parameter	Unit	G / S	RDL		5477471	5477472
Total Phosphorus	mg/L		0.002		0.021	0.042

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

5477471-5477472 Total Phosphorous RDL is the calculated MDL.

Analysis performed at AGAT Toronto (unless marked by *)

Certified By:

AGAT Laboratories

11 Morris Drive, Unit 122
Dartmouth, Nova Scotia
CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: WSP E&I CANADA LIMITED

AGAT WORK ORDER: 23X095506

PROJECT: TE201017.****.****.5290

ATTENTION TO: Kelsey Cheverie

SAMPLING SITE:

SAMPLED BY:

Water Analysis

RPT Date: Nov 29, 2023			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Low Level Total Phosphorous - 0.002 mg/L															
Total Phosphorus	5477771		0.009	0.010	NA	< 0.002	93%	70%	130%	99%	80%	120%	85%	70%	130%

Comments: NA signifies Not Applicable.
Duplicate NA: results are under 5X the RDL and will not be calculated.

Certified By: [redacted]

11 Morris Drive, Unit 122
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CANADA B3B 1M2
TEL (902)468-8718
FAX (902)468-8924
http://www.agatlabs.com

Method Summary

CLIENT NAME: WSP E&I CANADA LIMITED

AGAT WORK ORDER: 23X095506

PROJECT: TE201017.****.****.5290

ATTENTION TO: Kelsey Cheverie

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Total Phosphorus	INOR-93-6022	modified from SM 4500-P B and SM 4500-P E	SPECTROPHOTOMETER

AGAT Laboratories

Have feedback? Scan here for a quick survey!

Unit 122 • 11 Morris Drive
Dartmouth, NS
B3B 1M2
P: 902.468.8718
webearth.agatlabs.com • www.agatlabs.com

Chain of Custody Record

Laboratory Use Only
Arrival Condition: ☐ Good ☐ Poor (see notes)
Arrival Temperature: 7.1, 8.5
Hold Time:
AGAT Job Number: 23X095506
Notes: '23NOV21 1:25pm

Report Information
Company: WSP E&I (Kelsey Chevrier)
Contact: 50 Troop Ave
Address: Dartmouth NS
Phone: Fax:
Client Project #: TE20017 ****.****.5190.
AGAT Quotation: 335022BP 573000
Please Note: If quotation number is not provided client will be billed full price for analysis.

Report Information (Please print):
1. Name: Kelsey Chevrier
Email: kelsey.chevrier@wsp.com
2. Name: Justin Butler
Email: justin.butler@wsp.com

Report Format
☐ Single Sample per page
☐ Multiple Samples per page
☐ Excel Format Included
☐ Export

Turnaround Time Required (TAT)
Regular TAT ☐ 5 to 7 working days
Rush TAT ☐ Same day ☐ 1 day ☐ 2 days ☐ 3 days
Date Required:

Invoice To Same Yes ☐ / No ☐
Company: APinvoice.canada@wsp.com
Contact:
Address:
Phone: Fax:
PO/Credit Card#:

Regulatory Requirements (Check):
☐ List Guidelines on Report ☐ Do not list Guidelines on Report
☐ PIRI
☐ Tier 1 ☐ Res ☐ Pot ☐ Coarse
☐ Tier 2 ☐ Com ☐ N/Pot ☐ Fine
☐ Gas ☐ Fuel ☐ Lube
☐ CCME ☐ CDWQ
☐ Industrial ☐ NSEQS-Cont Sites
☐ Commercial ☐ HRM 101
☐ Res/Park ☐ Storm Water
☐ Agricultural ☐ Waste Water
☐ FWAL
☐ Sediment ☐ Other

Drinking Water Sample: ☐ Yes ☐ No Salt Water Sample ☐ Yes ☐ No
Reg. No.:

Sample Identification	Date/Time Sampled	Sample Matrix	# Containers	Comments – Site/Sample Info. Sample Containment
PMC-1	Nov 21 23 1130	SW	1	
LSD	" 1230	SW	1	

Field Filtered/Preserved	Standard Water Analysis	Metals: ☐ Total ☐ Diss ☐ Available	Mercury	☐ BOD ☐ CBOD	pH	☐ TSS ☐ TDS ☐ VSS	TKN	Total Phosphorus (low level)	Phenols	Tier 1: TPH/BTEX (PIRI) ☐ low level	Tier 2: TPH/BTEX Fractionation	CCME-CWS TPH/BTEX	VOC	THM	HAA	PAH	PCB	TC + EC ☐ P/A ☐ MPN ☐ MF	☐ HPC ☐ Pseudomonas	Fecal Coliform ☐ MPN ☐ MF	Other:	Other:	Hazardous (Y/N)
								-														
								-														

Samples Relinquished By (Print Name): Kelsey Chevrier [redacted] Date/Time: Nov 21/23
Samples Relinquished By (Sign):
Samples Received By (Print Name): Date/Time:
Samples Received By (Sign): [redacted] Date/Time:

Pink Copy - Client
Yellow Copy - AGAT
White Copy - AGAT

Page of
N°: 77328

APPENDIX

E FIELD PHOTOGRAPHS

SPRING EVENT

PML-2 – View of sampling station PML-2 during the spring event (photo taken on June 13, 2023).

PML-1 – View of sampling station PML-1 during the spring event (photo taken on June 13, 2023).

HWY-102-1 – View of sampling station HWY-102-1 during the spring event (photo taken on June 13, 2023).

LU – View of sampling station LU taken during the spring event (photo taken June 13, 2023).

KL-5 – View of sampling station KL-5 during the spring event (photo taken June 13, 2023).

KL-1 – View of sampling station KL-1 during the spring event (photo taken June 13, 2023).

KL-3 – View of sampling station KL-3 during the spring event (photo taken June 13, 2023).

KL-4 – View of sampling station KL-4 during the spring event (photo taken June 13, 2023).

KL-2 – View of sampling station KL-2 during the spring event (photo taken June 13, 2023).

LSD – View of sampling station LSD during the spring event (photo taken June 13, 2023).

HWY-102-2 – View of sampling station HWY-102-2 during the spring event (photo taken June 13, 2023).

SUMMER EVENT

PML-2 – View of sampling station PML-2 during the summer event (photo taken August 28, 2023).

PML-1 – View of sampling station PML-1 during the summer event (photo taken August 28, 2023)

HWY-102-1 – View of sampling station HWY-102-1 during the summer event (photo taken August 28, 2023).

LSD – View of sampling station LSD during the summer event (photo taken August 28, 2023).

KL-2 – View of KL-2 during the summer event (photo taken August 28,, 2023).

KL-3 – View of sampling station KL-3 during the summer event (photo taken August 28, 2023).

KL-4 – View of sampling station KL-4 during the summer event (photo taken August 28, 2023).

KL-5 – View of sampling station KL-5 during the summer event (photo taken August 28, 2023).

KL-1 – View of sampling station KL-1 during the summer event (photo taken August 28, 2023).

HWY-102-2 – View of sampling station HWY-102-2 during the summer event (photo taken August 28, 2023).

*Note: No photo is available for monitoring station LU for the summer monitoring event.

FALL EVENT

HWY-102-1 – View of sampling station HWY-102-1 during the fall event (photo taken October 16, 2023).

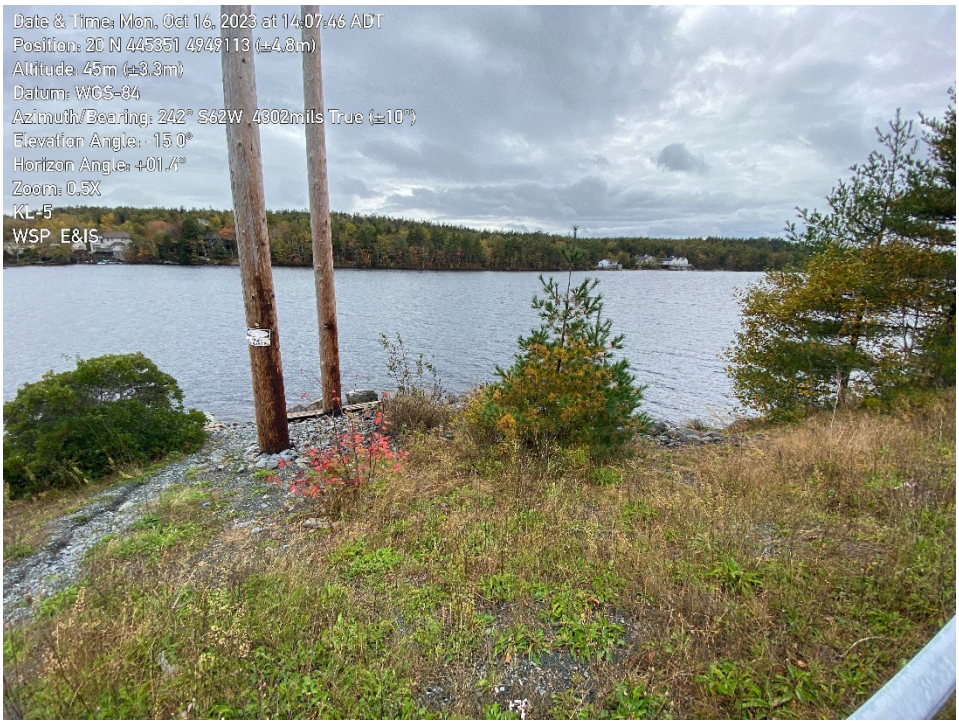
LU – View of sampling station LU during the fall event (photo taken October 16, 2023).

LSD – View of sampling station LSD during the fall event (photo taken October 16, 2023).

KL-2 – View of sampling station KL-2 during the fall event (photo taken October 16, 2023).

KL-3 – View of sampling station KL-3 during the fall event (photo taken October 16, 2023).

KL-4 – View of sampling station KL-4 during the fall event (photo taken October 16, 2023).



KL-5 – View of sampling station KL-5 during the fall event (photo taken October 16, 2023).

KL-1 – View of sampling station KL-1 during the fall event (photo taken October 16, 2023).

HWY-102-2 – View of sampling station HWY-102-2 during the fall event (photo taken October 16, 2023).

*Note: No photos are available for monitoring stations PML-1 and PML-2 for the fall monitoring event.

APPENDIX

F CALIBRATION CERTIFICATES

HOSKIN SCIENTIFIC

HOSKIN SCIENTIFIC

Pro Quatro Verification Work Sheet

Date of Verification: Sep 20 2023

Technician: EP

DO membrane changed: Yes

DO Type: Galvanic with 1.25 mil PE

Galvanic sensors provide for an instant-on sensor without the need for warm-up time, but this affects the life of the sensor. To extend life of sensor store dry with no electrolyte
Polarographic sensors last longer and have a longer warranty but require a 5–15-minute warm-up time before use or calibration.

	Sensor Readings	Pass/Fail
Reference Temperature	30.0 °C	
HH Temperature +/- .21 from Calibrated Thermometer	30.0°C	Pass
Conductivity < 3us in air	0	Pass
Conductivity Cell Constant 5 +/- 1.0	5.019	Pass
pH 7 mv 0 +/- 50 mv	-4.1	Pass
pH 4 mv	169.8	Pass
pH 10 mv	-174.1	Pass
ORP offset should be <100	Yes	Pass
DO calibrates to 100%	Yes	Pass
GLP DO Sensor Value or DO Gain	6.1	Pass
DO drops below 2% in 0 environment (Background Current)	0.4	Pass
Barometer Reading (if equipped)	757.2	Pass

NOTE: An ORP probe that is producing an offset greater than 80 should be replaced as it is nearing the end of its life span.

1.25 ml PE membrane: Average 6.15uA (min. 4.31uA, max. 8.00uA), 2.0 mil PE membrane, Average 3.38uA (min. 2.37uA, max. 4.40uA)
1 ml Teflon R membrane, Average 16.29uA (min. 11.40uA, max. 21.18uA

Customer: Open Road Environmental
Unit S/N: 21C103720
Ca[redacted]
Sig

HOSKIN SCIENTIFIC

Hoskin Log Test

YSI

Date	Time	Temp(C)	Pressure(mmHg)	DO(%L)	DO(mg/L)	COND(uS/cm)	TDS(mg/L)	pH	ORP(mV)
09/28/23	15:33:34	21.6	755.7	71.4	6.24	670	466	8.61	267.1
09/28/23	16:33:34	21.6	755.5	67.2	5.87	671	466	8.61	268.5
09/28/23	17:33:34	21.7	755.6	67.7	5.91	671	466	8.6	269.6
09/28/23	18:33:34	21.7	755.5	71.9	6.27	672	466	8.6	270.8
09/28/23	19:33:34	21.7	755.6	67.5	5.89	672	466	8.6	272
09/28/23	20:33:34	21.8	755.8	68.6	5.98	672	466	8.6	273
09/28/23	21:33:34	21.8	755.6	70.7	6.16	673	466	8.6	273.9
09/28/23	22:33:34	21.8	755.4	65.8	5.73	673	466	8.6	274.6
09/28/23	23:33:34	21.8	755.3	70.2	6.11	673	466	8.6	275.3
09/29/23	0:33:34	21.8	755.4	65.8	5.72	674	466	8.6	275.7
09/29/23	1:33:34	21.8	755.6	68.3	5.94	674	466	8.6	276.5
09/29/23	2:33:34	21.9	755.3	69.2	6.01	674	466	8.6	277.3
09/29/23	3:33:34	21.9	755.2	68.9	5.99	674	466	8.6	277.9
09/29/23	4:33:34	21.9	755.4	68.4	5.94	675	466	8.6	278.5
09/29/23	5:33:34	21.9	755.5	66.3	5.77	675	466	8.6	279.1
09/29/23	6:33:34	21.8	755.7	65.7	5.71	674	466	8.61	279.6
09/29/23	7:33:34	21.8	756.2	70.7	6.16	674	466	8.61	280.2
09/29/23	8:33:34	21.8	756.3	69.4	6.05	674	467	8.61	280.7
09/29/23	9:33:34	21.8	756.3	68.9	6.01	673	467	8.61	281.3
09/29/23	10:33:34	21.7	756.3	67.9	5.92	673	467	8.61	282.4
09/29/23	11:33:34	21.7	756.4	63.3	5.53	673	467	8.61	282.7
09/29/23	12:33:34	21.7	756.4	66.3	5.79	673	467	8.61	283.7
09/29/23	13:33:34	21.7	756.2	66.8	5.83	673	467	8.61	285.3
09/29/23	14:33:34	21.7	755.9	68.5	5.98	673	467	8.6	284.9
09/29/23	15:33:34	21.7	755.9	66.1	5.77	673	467	8.6	285.2

Customer:	Open Road Enviromental
Model:	ProQuatro
S/N:	21C103720
Technician:	Ernesto [redacted]

APPENDIX

G STANDARD OPERATING PROCEDURES

Standard Operation Procedure No.1

Surface Water Sampling

Owner: Halifax Regional Municipality	Issue No.: 1	Creation Date: May 2021
		Revision Date:

1.0 Objective

This document describes the required procedures for collecting surface water samples from a water body during environmental monitoring.

2.0 Scope

This procedure applies to all Wood personnel who conduct environmental monitoring for the Halifax Regional Municipality as part of the Bedford West Surface Water Monitoring Program.

3.0 Introduction

To ensure complete and accurate data, surface water samples must be properly collected, handled and stored prior to analysis. Records of the sampling must also be kept for reporting and auditing purposes.

4.0 Preparation

Hazards	Water hazard, falling into stream, pond or lake. Slips, trips, and falls. Splashes from contaminated water.
Tools	Water meter (for field-measured parameters), secchi disk, camera, sample bottles, cooler/ice packs, field data sheets. For water depth measurements: measuring stick or tape. For boat accessed sample locations: canoe, paddles, life jackets, boat safety kit including bailer bucket, rope with floatation devises, whistle, and flashlight.
Requirements	Review required field QA/QC procedures for any sampling to be completed at this property **(See: T-1 QA-QC Table.)** Experience completing environmental monitoring including using various types of environmental monitoring equipment.

5.0 Tasks

1. Preparation for Sampling	• Conduct site inspection and monitoring prior to sampling. • On arriving at the location, perform an inspection noting any conditions that may have changed since the last visit. Look for indications of new or continuing impacts such as seeps, stressed vegetation, staining or new contaminant sources such as debris or discarded materials. Inspect shoreline, water level and water surface. Note any sheen / colour / odour / snow cover/ changes / damage on the Field Report. • Take photographs to document conditions and/or changes at the site. • Record time of sampling and weather conditions. Provide comments regarding weather or other events/conditions that may affect sample results. Record observations and results on the field report including air temperature and cloud cover. Record any wildlife sightings. • Wear fresh disposable latex or other suitable gloves and safety glasses when collecting and preserving samples for each location. • Measure pH, dissolved oxygen (mg/L), water temperature (°) and electrical conductivity using calibrated meters. Observe meter readings until field parameters become steady. Take secchi depth using secchi disk on metered line. Record final readings on Field Report. • Record field observations (color, odour [include type of odour], turbidity, sheen [include type of sheen], surface water depth), on the Field Report.
2. Sample Labelling	• Label each sample container prior to filling. See: **T-2 Sample Labelling Table.**
3. Collecting a Sample	• Collect the surface water sample in mid-stream (if steam-like condition) or collect grab sample at least 1m from shore line. • Avoid stirring up sediments or debris during sampling. Avoid collecting any floating debris and do not sample immediately downstream of a bridge, etc. • Remain downstream of the sampling location in order to prevent contamination of sample and point the mouth of the bottle upstream. • Unless the preservative is supplied in the container, rinse the bottle and cap in the water by inserting the bottle with closed cap into the water. Immerse the bottle orientated vertically to 50 to 100 mm below the water surface. Remove the cap, collect some water and recap the bottle before removing from the water. Shake, rinse and empty. Repeat the rinsing process twice more before collecting the sample for analysis. Add preservative if required. • If the preservative is supplied in the bottle, do not pre-rinse the bottle. Rinse a laboratory-supplied disposable syringe three

	times by submerging the tip to between 50 mm and 100 mm below surface and drawing in water by pulling up on the plunger. Remove the sample bottle cap and use the rinsed syringe to collect the sample for analysis.
5. QA/QC Requirements	• Complete required field QA/QC procedures for any sampling at this sample location. **See: T-2 QA-QC Table.** • Duplicate samples should be collected as sequential samples; the first bottle from each set should be filled sequentially followed by the second bottle from each set, etc.
6. Sample Storage and Delivery	• Immediately following collection, all samples are to be placed in a chilled cooler with ice. • Samples should be delivered under chain of custody documentation to the analytical laboratory as soon as possible (i.e. bacteria samples must be submitted to laboratory before 3 p.m. and other samples preferably the same day).

Table T-1: QA/QC Table

QA/QC Protocol	Purpose	Procedures
Quality Assurance (QA) Protocol	To ensure accuracy and precision of samples collected.	• Use of Standard Operating Procedures (SOP). • Use of Laboratory supplied sterile collection containers and Laboratory preservatives. • Decontamination of all sampling equipment between wells and other sample locations. • Dedicated sterile gloves for each well worn during sample collection. • Dedicated inline disposable filters for each sample that requires filtering. • Control of external contaminate sources when sampling such as; running motors, location of sampling equipment, wind direction, container handling.
Quality Control (QC) Protocol	To evaluate the reproducibility, accuracy and level of contamination introduced by field procedures.	• Laboratory receiving samples will follow their own internal QA / QC program. A copy of the results to be included with results for samples submitted.

Table T-1: Sample Labelling

Label Requirement	Comments
A specific identification code used for each site	Specific HRM nomenclature for each site.
Site or Property ID	Identify to which of multiple sites or properties the sample belongs.
Sample Location or Monitoring Well ID	Identify which of multiple sampling locations within a site or property the sample represents.
Date Collected	Include date in a standard format to eliminate confusion (e.g. DD/MMM/YYYY or 02MAR2009).
Time Collected	Important for parameters with a very short holding time.
Filtering	Identify whether sample was field-filtered, needs lab filtering or does not require any filtering.
Preservatives Added	Identify any preservatives added.
Sampler Initials	Identify sampler.
This information is to be included on sample bottles or the chain of custody as appropriate.	