Keeyask Generation Project

Aquatic Effects Monitoring Plan

Water Quality Monitoring Report

AEMP-2018-07

KEEYASK

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KEEYASK GENERATION PROJECT

AQUATIC EFFECTS MONITORING PLAN

REPORT #AEMP-2018-07

RESULTS OF WATER QUALITY MONITORING IN THE NELSON RIVER, 2017: YEAR 4 OF CONSTRUCTION

Prepared for

Manitoba Hydro

By

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SUMMARY

Background

The Keeyask Hydropower Limited Partnership (KHLP) was required to prepare a plan to monitor the effects of construction and operation of the Keeyask Generating Station (GS) on the environment. Besides measuring the accuracy of the predictions made and actual effects of the GS on the environment, monitoring results will provide information on how construction and operation of the GS will affect the environment and if more needs to be done to reduce harmful effects.

Construction of the Keeyask GS began in mid-July 2014 with the construction of cofferdams that blocked flow in the north and central channels of Gull Rapids (see map). During the winter of 2015/2016, the Spillway Cofferdam, which partially blocks the south channel, was constructed. Beginning late in 2016 and continuing in 2017, the Tailrace Cofferdam was constructed. Work was completed in fall 2017 with the exception of an opening that was left to allow fish movement into and out of the cofferdam over the 2017/18 winter.

Water quality is a key part of the monitoring program because it determines whether water is suitable to support aquatic life, including fish. Many human activities, including the construction and operation of the GS, can affect water quality.

This report describes the results of water quality monitoring conducted during the fourth year of construction at Gull Rapids. Samples were collected at sites in Clark or Split lakes (*i.e.*, upstream of the high water effects observed in 2014), the Nelson River upstream of construction, and at sites in Stephens Lake downstream of construction (the “local study area”) to see whether the water quality changed as it passed the construction site. Monitoring included parameters such as suspended solids (such as sand and clay, *etc.*) and turbidity (*i.e.*, “muddiness of the water”) that are expected to increase during construction. The program also measured other substances that are not expected to increase, but are measured just in case.

Map of instream structures at the Keeyask Generating Station site, September 2017.

Why is the monitoring being done?

The monitoring is being done to address one main question:

Are construction activities changing water quality near Gull Rapids and in Stephens Lake to the point that fish and other aquatic life may be harmed?

The main effect of constructing the GS is that it can lead to more sand, silt, clay and other "suspended solids" entering the Nelson River, which may impair water quality. This can be caused by building structures such as cofferdams in the river, or loss of soils and other material from the land caused by clearing vegetation or flooding shorelines. Construction may also result in the release of other potentially harmful substances, such as fuels and oils used in construction equipment (hydrocarbons), to the river. Water quality monitoring will determine whether construction is causing changes to water quality that could harm aquatic life and determine if additional measures are required to prevent effects from occurring in the future.

Suspended solids concentrations in the water are measured continuously downstream during construction and the results are relayed to the work site so that construction activities can be adjusted if the suspended solids become too high. These results are reported annually under the *Keeyask Generation Project Sediment Management Plan for In-Stream Construction* (SMP).

The water quality monitoring described in this report is much broader than what is done for the SMP. It examines water quality over a much larger area and measures other aspects of water quality besides suspended solids, such as nutrients (which are necessary for aquatic life), metals, and oil and gas (*i.e.*, hydrocarbons).

What was done?

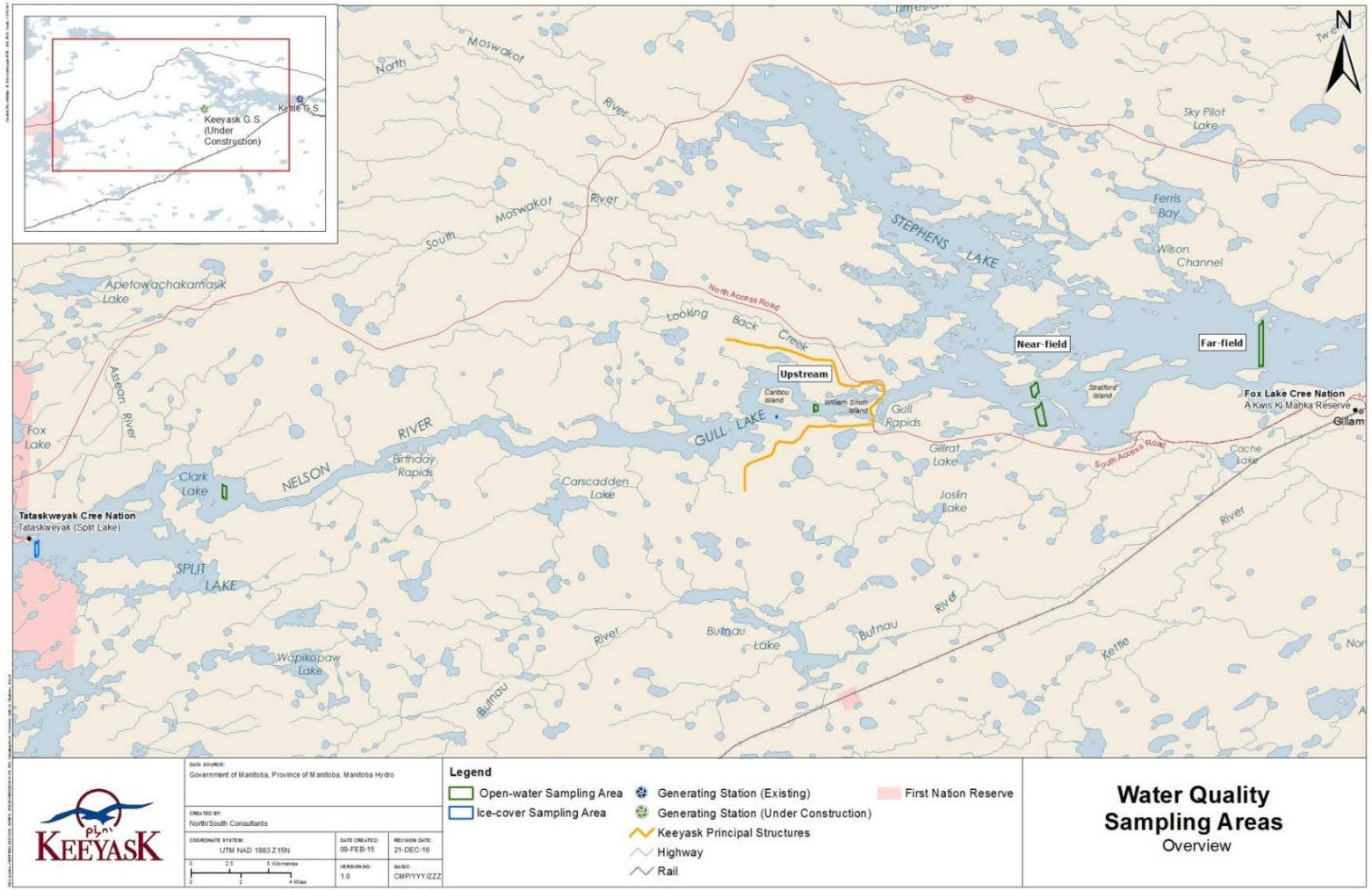
In 2017, water quality sampling was conducted five times in the local study area in Clark or Split lakes, upstream of Gull Rapids, and in Stephens Lake in early April (winter period), and late June, July, August, and September (open-water period). Samples were collected to measure a number of substances in the water, including:

- total suspended solids and turbidity;
- pH;
- oxygen;
- nutrients (compounds that may increase the amount of algae present);
- chlorophyll a (representing the amount of algae);
- metals and major ions (some of which are essential to aquatic life but some may also be harmful to aquatic life); and
- hydrocarbons.

Filling water quality sample bottles.

During monitoring in the local study area, samples were collected in four areas of Clark/Split lakes, the Nelson River, and Stephens Lake. One area at Gull Rapids ("upstream area") was intended to serve as a reference for conditions in the Nelson River upstream of construction, but high water levels in 2014 prompted the addition of sites further upstream in Split Lake (during winter) and Clark Lake (during summer) (see local study area map below). The third area sampled in 2017 was in Stephens Lake approximately 9 km downstream of the construction activities ("near-field area"). This represents an area where some effects on water quality from construction are expected. The fourth area was also in Stephens Lake, approximately 25 km downstream of the construction site ("far-field area"). This area was used to determine whether effects observed at the near-field area extended farther downstream.

Five sites were sampled in each of the Clark/Split Lake, upstream, near-field, and far-field areas to make sure enough samples were taken so the results would give an accurate account of what was happening at a given location.



Water quality monitoring areas during the ice-cover and open-water seasons, 2017. Green areas show areas sampled in open-water periods and blue areas show winter sampling locations. Sampling areas in the near-field and far-field of Stephens Lake were the same in open-water and ice-cover seasons. Five sites were sampled in each area.

What was found?

Water quality was similar upstream and downstream of the construction activities, indicating there was minimal effect of construction on water quality and its suitability for aquatic life.

What does it mean?

The information collected so far during the project indicates that construction activities have had a minimal effect on water quality and its suitability to support aquatic life.

What will be done next?

Water quality monitoring will be continued in 2018. Results of monitoring conducted in 2018 will be presented in the Year 5 construction report.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF MAPS

LIST OF APPENDICES

1.0 INTRODUCTION

The Keeyask Generation Project (the Project) is a 695-megawatt (MW) hydroelectric generating station (GS) at Gull (Keeyask) Rapids on the lower Nelson River in northern Manitoba. The Project is approximately 725 kilometres (km) northeast of Winnipeg, 35 km upstream of the existing Kettle Generating Station, where Gull Lake flows into Stephens Lake, 60 km east of the community of Split Lake, 180 km east-northeast of Thompson and 30 km west of Gillam (Map 1). Construction of the Project began in July 2014.

The *Keeyask Generation Project: Response to EIS Guidelines*, completed in June 2012, provides a summary of predicted effects and planned mitigation for the Project. Technical supporting information for the aquatic environment, including a description of the environmental setting, effects and mitigation, and a summary of proposed monitoring and follow-up programs is provided in the *Keeyask Generation Project Environmental Impact Statement: Aquatic Environment Supporting Volume* (AE SV). As part of the licensing process for the Project, an Aquatic Effects Monitoring Plan (AEMP) was developed detailing the monitoring activities of various components of the aquatic environment including the focus of this report, water quality.

During the construction phase, the primary effect of the Project on water quality was predicted to be related to increases in total suspended solids (TSS), notably in relation to river management and cofferdam placement/removal. The primary mechanism for monitoring effects of construction activities on TSS/turbidity in the Nelson River is through monitoring that is being conducted under the *Keeyask Generation Project Sediment Management Plan for In-Stream Construction* (SMP) and the *Keeyask Generation Project Physical Environment Monitoring Plan* (PEMP), which include monitoring of TSS and turbidity in the Nelson River. TSS data collected under the SMP and PEMP are reported in the annual reports associated with those plans. Other pathways of effects (*i.e.*, discharge of point sources) are expected to result in highly localized and negligible to small effects on water quality, including TSS (*e.g.*, discharge of concrete batch plant effluent). The water quality monitoring program implemented during construction is intended to monitor effects on a broader array of water quality parameters in addition to TSS. This program, therefore, provides the means to monitor for potential unforeseen effects.

The study area for the water quality component of the AEMP during the construction period is composed of a local study area (LSA), which includes Clark Lake (open-water season) or Split Lake (ice-cover season), the reach of the Nelson River upstream of Gull Rapids, and the southern area of Stephens Lake, and a regional study area (RSA) which includes the lower Nelson River downstream of Stephens Lake (Map 1). The 2017 (Year 4) construction water quality monitoring program included monitoring in the LSA only. As described in Table 2-6 of the AEMP, monitoring in the RSA is to be conducted during periods when TSS is predicted to be elevated due to certain in-stream construction activities; however, none of these were carried out in 2017.

Key questions presented in the AEMP to be answered about water quality during construction of the Keeyask GS are:

- Has the Project resulted in exceedances of water quality objectives or guidelines for the protection of aquatic life?
- What are the magnitude and spatial extent of effects of construction on water quality?

The objectives of monitoring during the construction period are to: determine if the Project caused or contributed to exceedances of benchmarks; determine the spatial and temporal extent of effects; confirm predictions presented in the AE SV; and monitor for unforeseen effects. The overall objective of construction monitoring is to record the net effect of various construction activities on a suite of water quality parameters along the mainstem of the Nelson River.

The AEMP identified key indicators and benchmarks for the water quality monitoring program to focus the program and provide an adaptive management framework (AMF). Key indicators were identified as those most likely to be affected by the Project, for which there is the greatest risk for direct effects on aquatic life, and for which there are objectives or guidelines for the protection of aquatic life (PAL). Benchmarks were identified based on baseline water quality conditions, Manitoba Water Quality Standards, Objectives, and Guidelines (MWQSOGs) for PAL (MWS 2011), and the Canadian Council of Ministers of the Environment (CCME) phosphorus guidance framework for freshwater systems (CCME 1999; updated to 2014[1]). Monitoring was also designed to include measurement of additional parameters for which no benchmarks were developed.

The construction monitoring program is designed to facilitate comparisons of water quality spatially (*i.e.*, upstream versus downstream of construction activities) to delineate Project-related effects. Specifically, the program is designed to facilitate statistical comparisons of water quality in an upstream reference area to water quality monitored downstream of construction activities. The reference area is an area located upstream of Project activities in the lower Nelson River. The Nelson River upstream of Gull Rapids served as the reference during years 1 and 2 of the program; however, sites further upstream (*i.e.,* in Clark or Split lakes) were added after high water levels in 2014 caused backwater effects within the Nelson River upstream of Gull Rapids.

An AMF was developed for the water quality monitoring program, as presented in the AEMP. In brief, the framework entails initially comparing monitoring results to pre-established benchmarks (Step 1). If a benchmark is not exceeded, the assessment would proceed to Response Level 1 – trend analysis. If a benchmark is exceeded, the assessment would proceed to Step 2 – determination of whether there is a statistical difference between upstream and downstream areas (*i.e.*, control-impact). If a statistical difference is not observed, the assessment would

[1] All guidelines were those current at that time of AEMP development.

proceed to Response Level 1. Where statistical differences are identified for key indicators, the assessment would proceed to Step 3, in which a determination of cause (*i.e.*, is the difference Project-related) would be undertaken (see Figure 1).

The following report presents the results of water quality monitoring completed in the ice-cover and open-water seasons of 2017 during Year 4 of construction. Results are assessed using the adaptive management framework as summarized above and detailed in the AEMP.

2.0 STUDY SETTING

The study area encompasses an approximately 110 km long reach of the Nelson River from Clark Lake to the upstream end of the Limestone reservoir (Map 1). This section of river offers a diversity of physical habitat conditions, including a variety of substrate types, and variable water depths (ranging from 0 to 30 m) and velocities.

Clark Lake is located immediately downstream of Split Lake, and approximately 42 km upstream of Gull Rapids (Map 1). Current is restricted to the main section of the lake, with off-current bays outside the main channel. The Assean River is the only major tributary to Clark Lake, and flows into the north side. Downstream from the outlet of Clark Lake, the Nelson River narrows and water velocity increases for a 3 km stretch, known as Long Rapids. For the next 7 km, the river widens, and water velocity decreases.

Birthday Rapids is located approximately 10 km downstream of Clark Lake and 30 km upstream of Gull Rapids (Map 1). The drop in elevation from the upstream to downstream side of Birthday Rapids is approximately 2 m. The 14 km reach of the Nelson River between Birthday Rapids and Gull Lake is characterized as a large, somewhat uniform channel with medium to high water velocities. There are a few large bays with reduced water velocity and a number of small tributaries that drain into the Nelson River.

Gull Lake is a section of the Nelson River where the river widens, with moderate to low water velocity. Gull Lake is herein defined as the reach of the Nelson River beginning approximately 17 km upstream of Gull Rapids and 14 km downstream of Birthday Rapids, where the river widens to the north into a bay around a large point of land (Map 1), and extending to the downstream end of Caribou Island, approximately 3 km upstream of Gull Rapids. Gull Lake has three distinct basins, the first extending from the upstream end of the lake downstream approximately 6 km to a large island; the second extending from the large island to Morris Point (a constriction in the river immediately upstream of Caribou Island); and the third extending from Morris Point to the downstream end of Caribou Island.

Gull Rapids is located approximately 3 km downstream of Caribou Island on the Nelson River (Map 1). The rapids are approximately 2 km in length, and the river elevation drops approximately 11 m over this distance. Two large islands and several small islands occur within the rapids, prior to the river narrowing; these features are within the project footprint and have been substantially altered during construction (Map 2).Gull Rapids is the site of the Keeyask Generation Project. A summary of construction activities is provided in Section 2.1.

Just below Gull Rapids, the Nelson River enters Stephens Lake. Stephens Lake was formed in 1971 by construction of the Kettle GS. Between Gull Rapids and Stephens Lake there is an approximately 6 km long reach of the Nelson River that, although affected by water regulation at the Kettle GS, remains riverine habitat with moderate velocity. Construction has altered the flow distribution immediately downstream of Gull Rapids as all flow now passes via the south channel of Gull Rapids.

Construction of the Kettle GS flooded Moose Nose Lake (north arm) and several other small lakes that previously drained into the Nelson River, as well as the old channels of the Nelson River that now lie within the southern portion of the lake (Map 4). Major tributaries of Stephens Lake include the North and South Moswakot rivers that enter the north arm of the lake. Looking Back Creek is a second order stream that drains into the north arm of Stephens Lake (Map 1). Kettle GS is located approximately 40 km downstream of Gull Rapids.

Long Spruce reservoir was formed in 1979 by the construction of the Long Spruce GS. It is a 16 km reach of the Nelson River extending from Long Spruce GS upstream to Kettle GS (Manitoba Hydro Public Affairs 1999). Kettle River and Boots Creek are the only major tributaries flowing into Long Spruce reservoir, with both tributaries entering the reservoir on the south shore (Map 1).

The Limestone reservoir was formed in 1990 by the construction of the Limestone GS. It is a 23 km reach of the Nelson River extending from Limestone GS upstream to Long Spruce GS. Four tributaries of the Nelson River enter the reservoir; Wilson Creek and Brooks Creek enter from the south, and Sky Pilot Creek and Leslie Creek enter from the north. Aquatic habitat within the reservoir ranges from a riverine environment in the upper reach, to more lacustrine conditions just upstream of the Limestone GS.

2.1 CONSTRUCTION SUMMARY

Construction of the Keeyask GS began in mid-July 2014 with the construction of cofferdams in the north and central channels of Gull Rapids (Map 2). These cofferdams resulted in the dewatering of the north and central channels and the diversion of all flow to the south channel. Construction of the spillway cofferdam, which extends into the south channel of Gull Rapids, was completed in 2015. During 2016 there was little instream construction until placement of rock for the Tailrace Cofferdam began in late fall and continued into 2017. Large rocks were placed in the Nelson River to form the inner and outer groins of the Tailrace Cofferdam. An opening was left in the rock groins to allow fish to move into and out of the cofferdam. Placement of fine material between the two sections of the cofferdam began and was completed in late-2017. An opening was created to allow fish to move freely over the winter of 2017/18. The opening will be closed in spring 2018.

2.2 FLOWS AND WATER LEVELS

From October 2016 to October 2017, Split Lake outflows ranged from about 3,200–6,600 m^3/s. Flow exceeded the historical annual median flow of approximately 3,300 m^3/s each month except for October 2017 when it dropped to about 3,200 m^3/s. From about October 2016 through mid-September 2017, the flow exceeded the historical 75th percentile flow of about 3,780 m^3/s, and from about May to mid-August 2017 the flow exceeded the 95th percentile flow

of approximately 5,230 m^3/s. During the spring melt in May 2017, flow rose to about 6,590 m^3/s, which is near the historical maximum flow observed in August 2005. Water levels varied in conjunction with flow, ranging from about 154.9–156.6 m ASL on Gull Lake, with the highest level observed during the near historical maximum flow in May.

3.0 METHODS

The following provides a description of the study design, sampling sites, sampling methods, and data analysis methods employed during the 2017 monitoring program.

3.1 STUDY DESIGN

The construction monitoring program is designed to facilitate comparisons of water quality spatially (*i.e.*, upstream and downstream of construction activities) to delineate Project-related effects. Specifically, the program is designed to facilitate statistical comparisons of water quality in an upstream reference area to water quality monitored downstream of construction activities (*i.e.*, areas that are predicted to be most affected by the Project); this area is defined as the local study area. Sampling in the LSA includes monitoring at replicate sites upstream and downstream of construction activities and is to be conducted annually during the construction period.

The objective of monitoring during the construction period is to determine if the Project caused or contributed to exceedances of benchmarks and to confirm predictions in the AE SV.

3.2 SAMPLING SITES

The construction water quality monitoring program incorporated monitoring at replicate sampling sites upstream and downstream of construction activities within the LSA (Map 3) as follows:

- Clark/Split Lake (Map 4): Clark and Split lakes are situated upstream of the construction site and are not affected by water level increases related to the Project;
- Nelson River Upstream Area (Map 5): the Nelson River upstream of Gull Rapids. This area served as the reference area in 2014 and 2015. However, high flows in combination with Phase 1 river management beginning in July 2014 raised water levels to above the 95th percentile periodically;
- Near-Field Area (Map 5): this area is located approximately 9 km downstream of all construction activities in Stephens Lake; and
- Far-Field Area (Map 5): this area is located approximately 25 km downstream of construction activities in Stephens Lake.

Five replicate sites were sampled in each of the sampling areas (*i.e.*, sampling polygons) during the open-water and ice-cover seasons. During the ice-cover season, sites were relocated to areas with sufficient ice formation to facilitate safe access. Universal Transverse Mercator (UTM) coordinates for the water quality sites are provided in Table 1.

The locations of the replicate stations were defined differently for the upstream areas (*i.e.*, Nelson River upstream of Gull Rapids and Split and Clark lakes) and the downstream near-field and far-field areas due to the lack of detailed bathymetric information for Stephens Lake. As there are detailed bathymetry data for the areas upstream of Gull Rapids up to and including Split Lake, the polygon boundary was defined based on open-water depths (> 5 m in depth at the 50th percentile water level), distance from shore (*i.e.*, > 100 m from shore), and length (*i.e.*, 250 m in length) (Maps 6 to 8). As shown on Map 7, the polygon in Clark Lake contained some shallower areas that were excluded.

Due to the lack of detailed bathymetry for the two downstream sampling areas in Stephens Lake, these polygons were defined based on distance from shorelines. Specifically, the polygons were located 250 m from shorelines (including islands) and were 250 m in length (Maps 9 and 10).

These boundaries were identified to ensure sites were located in relatively deep areas even under low water levels and to avoid nearshore areas where localized differences in water quality may occur (*e.g.*, localized shoreline erosion), while also being sufficiently large to accommodate five sampling sites with sufficient separation (*i.e.*, minimum of 20 m separation between sites).

3.3 SAMPLING METHODS

Sampling was conducted during the ice-cover season on April 3–6 and four times during the open-water season in 2017: June 26–July 2[2], July 24–26, August 27–30, and September 17–19. Sites were accessed by boat during the open-water season and by snowmobile or helicopter and on foot during winter.

UTMs were recorded at each site using a hand-held Global Positioning System (GPS) unit and total water depth was measured using a HawkEye H22PX handheld depth sounder. General information recorded at each site included:

- Date and time of sample collection;
- Cloud cover and precipitation, including the occurrence of precipitation prior to sampling where possible;
- Sampling equipment used;
- Site conditions and/or observations relevant to the sampling program;
- Any deviations from field sampling protocols; and
- Snow and ice thickness (ice-cover season only).

[2] The June sampling event was extended into early July due to the prevalence of winds and unsafe sampling conditions.

Sampling consisted of collection of *in situ* water quality measurements and collection of grab samples for laboratory analysis, as described below.

3.3.1 *IN SITU* MEASUREMENTS

Secchi disk depth was measured during the open-water season at the Clark Lake and near-field and far-field locations in Stephens Lake; high velocities precluded reliable measurement of Secchi disk depth in the area upstream of Gull Rapids. Secchi disk depth was measured from the shady side of the boat by lowering the disk until it was no longer visible; the disk was then lowered approximately 1 m deeper than the previous reading, and raised until it was visible again. The Secchi disk depth was recorded as the average of the two readings.

In situ measurements of dissolved oxygen (DO), turbidity, pH, specific conductance, turbidity, and temperature were collected at each sampling site in each season using a YSI EXO2 water quality multi-meter. *In situ* parameters were measured at 1.0 m or 0.5 m intervals (for sites > 5.0 m and < 5.0 m, respectively) at each site beginning with a near surface measurement (*i.e.*, 0.3 m). High velocities in the sampling area upstream of Gull Rapids during the open-water season precluded measurement of *in situ* parameters across the entire water column and measurements were limited to near-surface depths.

3.3.2 SAMPLING FOR LABORATORY ANALYSES

At each site, grab samples of surface water were collected for laboratory analysis. Laboratory parameters included “routine” parameters (*e.g.*, nutrients, TSS, pH), total metals, and total mercury at all sites. Benzene, toluene, ethylbenzene, and xylene (BTEX), and F1-F4 hydrocarbons were also measured in the upstream and near-field areas to monitor for potential hydrocarbon contamination downstream of construction activities.

With the exception of sample collection for ultra-trace mercury, sampling during the open-water season was conducted by wearing gloves and submerging each sample bottle (provided by the analytical laboratory) to elbow depth (*i.e.*, approximately 0.3 m depth) then uncapping, filling, recapping, and retrieving the bottle to the surface, where preservatives were added as required. During the ice-cover season, near-surface water was collected using a Kemmerer water sampler deployed approximately 0.3 m below the ice; the sampler was retrieved to the surface and sample bottles were filled. Samples were then preserved as instructed by the analytical laboratory while wearing nitrile gloves.

During all seasons, samples for ultra-trace mercury were collected using the “clean hands-dirty hands” protocol (U.S. Environmental Protection Agency 1996). All sample bottles were filled with minimal headspace, except where instructed, to prevent chemical alteration and loss of compounds. Samples were subsequently kept cool (but not frozen) and in the dark until

submission to a Canadian Association for Laboratory Accreditation (CALA) accredited laboratory (ALS Laboratories, Winnipeg, MB).

3.4 QUALITY ASSURANCE / QUALITY CONTROL

The quality control/quality assurance (QA/QC) program included application of standard procedures to limit sample contamination in the field, submission of QA/QC samples to the analytical laboratory, and QA/QC verifications of the water quality meter.

3.4.1 GENERAL QA / QC

Standard procedures for the control of sample contamination were adhered to throughout the sampling program, including:

- Use of gloves during sampling;
- Collecting samples facing in an upstream direction to minimize sample contamination. Where possible, sites were also approached moving in an upstream direction to avoid site disturbance and contamination;
- Avoiding contact with the insides of sample bottles, including lids;
- Limiting exposure of the insides of sample bottles to the atmosphere;
- Regular cleaning, calibration, inspection, and accuracy verifications of field meters and equipment; and
- Adherence to sampling protocols wherever possible.

3.4.2 TRIPLICATE SAMPLES

The sampling program incorporated the collection of one triplicate sample at a randomly selected sampling site during each sample collection period. The triplicates were collected at the same location and as close in time as practically feasible. Triplicate samples were identified with the Site ID followed by “A”, “B”, or “C”.

3.4.3 FIELD BLANKS

One field blank was submitted to the analytical laboratory (ALS Laboratories) during each sampling period. Field blanks were prepared by filling one set of sample bottles (provided by the

analytical laboratory) with deionized water (also provided by the analytical laboratory) in the field and treating the blanks in exactly the same manner as environmental samples.

Bottles were blindly labeled, stored and transported according to sampling and handling protocols, and submitted along with environmental samples.

3.4.4 TRIP BLANKS

One trip blank was also submitted to the analytical laboratory (ALS Laboratories) during each sampling period. Trip blanks were prepared by the analytical laboratory by filling one set of sample bottles with deionized water and adding preservatives where appropriate.

The trip blank samples were transported to the field site, using the same handling and transport protocols as for environmental samples, and submitted along with environmental samples to the analytical laboratory for analysis. Trip blanks were treated similarly to field blanks but the bottles were not opened at any point in the field and thus were not exposed to the environment. Trip blanks were also blindly labelled.

3.4.5 WATER QUALITY METER QA/QC

The water quality meter was calibrated and inspected prior to departure for the field for each sampling trip. In the field, the functioning and accuracy of the meter was also assessed at the end of each sampling day by verifying meter measurements in standards of known values for turbidity, pH, and specific conductance. Any discrepancies from the standard values were documented in the field notes.

3.5 DATA ANALYSIS

Prior to analysis, all environmental data were evaluated qualitatively for potential outliers and transcription or analytical errors. Suspect results were noted and requests were made to the analytical laboratory to verify the values.

QA/QC samples were assessed according to standard criteria to evaluate precision and identify potential sample contamination issues (British Columbia Ministry of Environment, Lands, and Parks [BCMELP] 1998). Field and trip blank results were evaluated for evidence of sample contamination. Blank results that exceeded five times the analytical detection limit (DL) were considered to be indicative of sample contamination and/or laboratory error. Percent relative standard deviation (PRSD) was calculated for triplicate samples as follows:

PRSD = Standard deviation of the triplicate values/Mean of the triplicate values x 100.

Precision of the QA/QC samples was evaluated using the “rule of thumb” criteria for precision of 18% for triplicate samples (BCMELP 1998). Where one or more of the measurements being compared was less than five times the analytical DL, an analysis of precision was not undertaken, in accordance with guidance provided in BCMELP (1998).

Mean and standard error (SE) were also calculated for all five sampling sites within each sampling area during each sampling period. Results that were reported below the analytical DL were assigned a value of one half the DL.

As summarized in Section 1.0, and detailed in the AEMP, results of the water quality monitoring program are subject to the steps identified within the AMF (Figure 1). This framework prescribes data analysis methods and other tasks to be undertaken based on results of the monitoring program. Step 1 of the AMF entails comparison of the mean values of replicate samples for key indicators measured during a single sampling period to the benchmarks identified in the AEMP. If a benchmark is not exceeded, the assessment would proceed to Response Level 1 – trend analysis. If a benchmark is exceeded, the assessment would proceed to Step 2 – determination of whether there is a statistical difference between upstream and downstream areas (*i.e.*, control-impact) and/or relative to baseline conditions (before-after). If a statistical difference is not observed, the assessment would proceed to Response Level 1. Where statistical differences are identified for key indicators, the assessment would proceed to Step 3, in which a determination of cause (*i.e.*, is the difference Project-related) would be undertaken.

For data collected in 2017, means for key indicators were first compared to benchmarks (Table 2). For each key indicator measured in the LSA that exceeded a benchmark, a statistical comparison between upstream and downstream sampling areas was undertaken during the respective sampling period. Data subject to statistical analyses, as per the AMF, were analysed by a two-way analysis of variance ($\alpha = 0.05$).

Hydrocarbon data were screened upon receipt of results from the analytical laboratory to identify if there was any indication of potential contamination; results were evaluated for occurrence of detections and comparisons to MWQSOGs for PAL (MWS 2011; Table A1-4) where available.

In addition to the key water quality indicators, monitoring results for other water quality parameters (*e.g.,* parameters for which there are no PAL objectives or guidelines but may be indicative of general changes in water quality, such as conductivity) were also summarized to provide supporting information regarding potential effects of construction and to assist with development of trend monitoring over the long-term.

4.0 RESULTS

Results of the water quality monitoring program for the 2017 ice-cover and open-water seasons are summarized below, and presented in Tables 2 and 3, and Figures 2 to 38. Raw data are provided in Appendix 1 and results of the QA/QC samples are presented in Appendix 2.

4.1 KEY INDICATORS

4.1.1 NUTRIENTS

Mean ammonia, nitrate/nitrite, and total phosphorus (TP) concentrations measured in Split Lake/Clark Lake, the Nelson River upstream of Gull Rapids, and the near-field and far-field areas of the LSA were within the benchmark values during each of the sampling events in April (winter), June, July, August, and September (Table 2; Figures 2 to 4).

4.1.2 CHLOROPHYLL *a*

Mean chlorophyll *a* concentrations measured in Split Lake/Clark Lake, the Nelson River upstream area, and the near-field and far-field areas of the LSA in April, June, August and September were below the benchmark of 10.00 µg/L (Table 2; Figure 5). In July, although the mean chlorophyll *a* concentration measured in each LSA polygons was below the benchmark of 10.00 µg/L, the benchmark was exceeded at one of the five replicate sites in Clark Lake (11.0 µg/L). Elevated concentrations in the upstream reference area in Clark Lake are unrelated to potential effects of the Project; therefore, analysis did not proceed to Step 2 (*i.e.*, statistical analysis of differences between sampling areas).

4.1.3 TOTAL SUSPENDED SOLIDS

Mean TSS concentrations measured in the Nelson River upstream area, and the near-field and far-field areas of the LSA in April, July, and August were within the chronic benchmark values, defined as a 5 mg/L increase above background (calculated from measurements collected at Clark or Split lakes) (Table 2; Figure 6).

Mean concentrations in June and September were also within the chronic benchmark, although two of five samples from the near-field area in June (26.8 and 29.0 mg/L; benchmark = 26.4 mg/L) and two of five samples from the upstream area in September (16.6 and 16.8 mg/L; benchmark = 16.4 mg/L) exceeded the benchmark. In June, mean TSS in the near-field area was significantly higher than that of the far-field area; however, conditions in the near-field area

were not significantly different from those in the reference area (*i.e.*, Clark Lake). The exceedances of the TSS benchmark observed in the upstream area in September would have been unrelated to instream construction activities (*e.g.*, cofferdam installation); therefore analysis did not proceed to Step 2 (*i.e.*, statistical analysis of differences between sampling areas).

4.1.4 DISSOLVED OXYGEN

Mean DO concentrations measured in all sampling areas in the LSA were within the benchmark values during each of the sampling events in April, June, July, August, and September (Table 2; Figure 7). Although slight variation in DO concentrations were observed across water depth during some sampling periods, all sites in the study area were well oxygenated with DO saturation exceeding 87%. Thus, all measurements collected across the water column at every site and sampling time exceeded the DO benchmarks.

4.1.5 pH

Mean laboratory and *in situ* pH measurements collected in Split Lake/Clark Lake, the Nelson River upstream of Gull Rapids, and the near-field and far-field areas of the LSA were within the benchmark values during each of the sampling events in April, June, July, August, and September (Table 2; Figure 8).

4.1.6 METALS

Mean concentrations of total metals measured in each of the LSA sampling areas were within the benchmark values during each sampling event, including: aluminum, arsenic, boron, cadmium, chromium, copper, iron, lead, mercury, molybdenum, nickel, selenium, silver, thallium, uranium, and zinc (Table 2; Figures 9 to 24).

4.1.7 HYDROCARBONS AND BTEX

F1-F4 hydrocarbons and BTEX were below the analytical detection limits in all samples collected in the LSA in 2017 (Table A1-4). As the DLs were lower than PAL guidelines, all measurements were also within the PAL guidelines.

4.2 ADDITIONAL PARAMETERS

Results for parameters that are not key indicators (Table 3) are presented as follows: dissolved phosphorous (Figure 25), total nitrogen (Figure 26), dissolved organic carbon (Figure 27), true colour (Figure 28), *in situ* and laboratory turbidity (Figure 29), *in situ* and laboratory specific conductance (Figure 30), total dissolved solids (Figure 31), hardness (Figures 32), and major ions (chloride, sulphate, calcium, magnesium, potassium, and sodium; Figures 33–38).

5.0 DISCUSSION

The mean concentrations of all key indicators were within the benchmark values during the April, June, July, August, and September sampling events in 2017. As per Step 1 of the AMF, no further analysis was required for parameters within the benchmarks.

During the June sampling period, TSS was slightly below the benchmark of 26.4 mg/L in the Stephens Lake near-field area (mean = 23.6 mg/L) and therefore, further analyses were not triggered under the AMF. However, data were explored further due to the exceedance observed in two of the five replicate samples. Although the mean concentration in the near-field area was significantly higher than that measured in the Stephens Lake far-field area (mean = 15.7 mg/L), it was similar to and not statistically different from Clark Lake (mean = 21.4 mg/L), indicating that the difference between the near-field and far-field sites was similar to that observed under background conditions. Collectively, the information illustrates that there is no indication of a project-related effect on TSS in the downstream environment.

F1-F4 hydrocarbons and BTEX were below the analytical detection limits, and within the MWQSOGs for PAL, in all samples collected from the lower Nelson River upstream of the construction site and the downstream near-field area during each of the sampling events.

6.0 SUMMARY AND CONCLUSIONS

Key questions presented in the AEMP to be answered about water quality during construction of the Keeyask GS are:

- Has the Project resulted in exceedances of water quality objectives or guidelines for the protection of aquatic life?
- What are the magnitude and spatial extent of effects of construction on water quality?

Water quality measured in the local study area along the lower Nelson River indicated that conditions measured during the ice-cover and open-water seasons of 2017 were generally similar upstream and downstream of the construction activities. Specifically, any upstream to downstream differences in water quality were consistent with spatial trends observed during baseline studies.

Overall, information collected thus far indicates that construction activities have not affected water quality and its suitability to support aquatic life.

7.0 LITERATURE CITED

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TABLES

Table 1: Coordinates of water quality monitoring sites sampled in 2017.

Region	Site ID	Zone	Easting	Northing
Split Lake	SPL-10	14V	680835	6236759
	SPL-11	14V	680881	6236612
	SPL-12	14V	680927	6236889
	SPL-13	14V	680742	6236683
	SPL-14	14V	680970	6236502
Clark Lake	CL-1	15V	321208	6240797
	CL-2	15V	321109	6240831
	CL-3	15V	321176	6240608
	CL-4	15V	321221	6240972
	CL-5	15V	321182	6240991
Nelson River Upstream of Gull Rapids	US-1	15V	359578	6246174
	US-2	15V	359501	6246182
	US-3	15V	359364	6246145
	US-4	15V	359389	6246190
	US-5	15V	359438	6246070
	US-6	15V	356915	6245414
	US-8	15V	356925	6245437
	US-9	15V	356848	6245500
	US-10	15V	356882	6245493
	US-11	15V	356941	6245490
Stephens Lake Near-field	NF-1	15V	373744	6247187
	NF-2	15V	373907	6245447
	NF-3	15V	373840	6247144
	NF-4	15V	374305	6245234
	NF-5	15V	373826	6247488
Stephens Lake Far-field	FF-1	15V	388137	6250849
	FF-2	15V	388245	6249831
	FF-3	15V	388371	6249139
	FF-4	15V	388174	6249632
	FF-5	15V	388386	6250446

Table 2: Benchmark values and means of key water quality parameters measured during the water quality monitoring program, 2017.

Indicator	Unit	Benchmark[1]	April			
			Split Lake	Upstream	Near-Field	Far-Field
Ammonia	(mg N/L)	1.13	0.010	<0.010	<0.010	0.011
Nitrate/ Nitrite	(mg N/L)	2.93	0.0578	0.0557	0.0560	0.0571
Total Phosphorous	(mg/L)	0.058	0.028	0.028	0.028	0.034
Chlorophyll *a*	(µg/L)	10.0	2.41	2.97	2.85	2.38
Total Suspended Solids	(mg/L)	5/25 mg/L higher than upstream	4.12	6.63	6.32	5.20
Laboratory pH	-	6.5/9.0	7.95	8.00	8.03	7.96
Dissolved Oxygen	(mg/L)	6.5/9.5[2]	14.81	14.51	14.49	14.55
Aluminum	(mg/L)	1.98	0.544	0.523	0.547	0.430
Arsenic	(mg/L)	0.150	0.00112	0.00128	0.00129	0.00121
Boron	(mg/L)	1.5	0.0254	0.0275	0.0268	0.0248
Cadmium[3]	(mg/L)	0.00031	<0.000010	<0.000010	<0.000010	<0.000010
Chromium[3]	(mg/L)	0.100	<0.0010	<0.0010	<0.0010	<0.0010
Copper	(mg/L)	0.0109	0.00207	0.00182	0.00173	0.00190
Iron	(mg/L)	1.45	0.478	0.432	0.455	0.402
Lead	(mg/L)	0.00403	0.000250	0.000230	0.000211	0.000197
Mercury	(mg/L)	0.000026	0.0000017	0.0000019	0.0000014	0.0000014
Molybdenum	(mg/L)	0.073	0.00063	0.00077	0.00075	0.00073
Nickel[3]	(mg/L)	0.061	<0.0020	<0.0020	<0.0020	<0.0020
Selenium[3]	(mg/L)	0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Silver	(mg/L)	0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Thallium	(mg/L)	0.0008	<0.00010	<0.00010	<0.00010	<0.00010
Uranium	(mg/L)	0.0330	0.00061	0.00075	0.00073	0.00075
Zinc	(mg/L)	0.140	<0.0020	<0.0020	<0.0020	<0.0020

1. Benchmark values are based on the most stringent calculation measured from the 2017 monitoring program.
2. 6.5 mg/L represents the benchmark for the open-water season; 9.5 mg/L is the benchmark for the ice-cover season.
3. DL was increased two to ten times in April and June compared to other sampling events; therefore, means are artificially elevated during the former events.

Table 2: Benchmark values and means of key water quality parameters measured during the water quality monitoring program, 2017 (continued).

Indicator	Unit	Benchmark	June			
			Clark Lake	Upstream	Near-Field	Far-Field
Ammonia	(mg N/L)	1.13	0.034	0.012	0.024	0.028
Nitrate/ Nitrite	(mg N/L)	2.93	<0.0051	<0.0051	<0.0051	<0.0051
Total Phosphorous	(mg/L)	0.058	0.049	0.049	0.050	0.045
Chlorophyll *a*	(µg/L)	10.0	7.00	5.92	7.04	7.67
Total Suspended Solids	(mg/L)	5/25 mg/L higher than upstream	21.4	18.2	23.6	15.7
Laboratory pH		6.5/9.0	8.18	8.16	8.23	8.19
Dissolved Oxygen	(mg/L)	6.5/9.5[2]	9.66	9.82	10.20	10.24
Aluminum	(mg/L)	1.98	0.869	0.795	1.02	0.909
Arsenic	(mg/L)	0.150	0.00114	0.00116	0.00124	0.00117
Boron	(mg/L)	1.5	0.0252	0.0248	0.0240	0.0268
Cadmium[3]	(mg/L)	0.00031	<0.000010	<0.000010	<0.000010	<0.000010
Chromium[3]	(mg/L)	0.100	0.0015	0.0013	0.0016	0.0013
Copper	(mg/L)	0.0109	0.00188	0.00180	0.00190	0.00194
Iron	(mg/L)	1.45	0.758	0.738	0.894	0.779
Lead	(mg/L)	0.00403	0.000410	0.000371	0.000421	0.000353
Mercury	(mg/L)	0.000026	0.0000017	0.0000020	0.0000014	0.0000013
Molybdenum	(mg/L)	0.073	0.00071	0.00065	0.00069	0.00066
Nickel[3]	(mg/L)	0.061	<0.0020	<0.0020	<0.0020	<0.0020
Selenium[3]	(mg/L)	0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Silver	(mg/L)	0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Thallium	(mg/L)	0.0008	<0.00010	<0.00010	<0.00010	<0.00010
Uranium	(mg/L)	0.0330	0.00074	0.00065	0.00069	0.00069
Zinc	(mg/L)	0.140	<0.0020	0.0035	0.0023	0.0022

Table 2: Benchmark values and means of key water quality parameters measured during the water quality monitoring program, 2017 (continued).

Indicator	Unit	Benchmark	July			
			Clark Lake	Upstream	Near-Field	Far-Field
Ammonia	(mg N/L)	1.13	<0.010	<0.010	0.026	0.024
Nitrate/ Nitrite	(mg N/L)	2.93	<0.0051	<0.0051	<0.0051	<0.0051
Total Phosphorous	(mg/L)	0.058	0.042	0.041	0.042	0.042
Chlorophyll *a*	(µg/L)	10.0	9.32	7.98	6.28	6.39
Total Suspended Solids	(mg/L)	5/25 mg/L higher than upstream	16.0	16.6	13.7	11.6
Laboratory pH	-	6.5/9.0	8.21	8.25	8.24	8.21
Dissolved Oxygen	(mg/L)	6.5/9.5[2]	9.37	9.17	9.34	9.22
Aluminum	(mg/L)	1.98	0.756	0.422	0.628	0.545
Arsenic	(mg/L)	0.150	0.00131	0.00122	0.00123	0.00122
Boron	(mg/L)	1.5	0.0278	0.0278	0.0291	0.0286
Cadmium[3]	(mg/L)	0.00031	0.0000078	0.0000083	0.0000073	0.0000068
Chromium[3]	(mg/L)	0.100	0.00118	0.00073	0.00104	0.00089
Copper	(mg/L)	0.0109	0.00195	0.00170	0.00184	0.00175
Iron	(mg/L)	1.45	0.666	0.414	0.581	0.494
Lead	(mg/L)	0.00403	0.000342	0.000281	0.000287	0.000252
Mercury	(mg/L)	0.000026	0.0000011	0.0000011	0.0000012	0.0000010
Molybdenum	(mg/L)	0.073	0.00063	0.00056	0.00061	0.00059
Nickel[3]	(mg/L)	0.061	0.00177	0.00140	0.00163	0.00153
Selenium[3]	(mg/L)	0.0010	0.000120	0.000107	0.000113	0.000106
Silver	(mg/L)	0.0001	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	(mg/L)	0.0008	<0.000010	<0.000010	<0.000010	<0.000010
Uranium	(mg/L)	0.0330	0.00062	0.00061	0.00061	0.00060
Zinc	(mg/L)	0.140	<0.0030	<0.0030	<0.0030	<0.0030

Table 2: Benchmark values and means of key water quality parameters measured during the water quality monitoring program, 2017 (continued).

Indicator	Unit	Benchmark	August			
			Clark Lake	Upstream	Near-Field	Far-Field
Ammonia	(mg N/L)	1.13	0.017	0.017	0.028	0.025
Nitrate/ Nitrite	(mg N/L)	2.93	0.0222	0.0243	0.0238	0.0226
Total Phosphorous	(mg/L)	0.058	0.046	0.048	0.042	0.038
Chlorophyll *a*	(µg/L)	10.0	4.48	3.24	5.92	4.58
Total Suspended Solids	(mg/L)	5/25 mg/L higher than upstream	14.6	13.9	11.6	9.68
Laboratory pH	-	6.5/9.0	8.25	8.22	8.26	8.25
Dissolved Oxygen	(mg/L)	6.5/9.5[2]	8.87	8.99	9.51	9.69
Aluminum	(mg/L)	1.98	0.755	0.763	0.709	0.696
Arsenic	(mg/L)	0.150	0.00149	0.00154	0.00156	0.00160
Boron	(mg/L)	1.5	0.0230	0.0262	0.0267	0.0274
Cadmium[3]	(mg/L)	0.00031	0.0000066	0.0000070	<0.0000050	0.0000067
Chromium[3]	(mg/L)	0.100	0.00122	0.00121	0.00110	0.00110
Copper	(mg/L)	0.0109	0.00181	0.00187	0.00197	0.00187
Iron	(mg/L)	1.45	0.699	0.684	0.625	0.608
Lead	(mg/L)	0.00403	0.000344	0.000334	0.000305	0.000291
Mercury	(mg/L)	0.000026	0.0000016	0.0000015	0.0000014	0.0000015
Molybdenum	(mg/L)	0.073	0.00065	0.00065	0.00068	0.00070
Nickel[3]	(mg/L)	0.061	0.00163	0.00170	0.00162	0.00166
Selenium[3]	(mg/L)	0.0010	0.000119	0.000123	0.000126	0.000135
Silver	(mg/L)	0.0001	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	(mg/L)	0.0008	<0.000010	0.000010	0.000010	0.000010
Uranium	(mg/L)	0.0330	0.00055	0.00061	0.00061	0.00063
Zinc	(mg/L)	0.140	<0.0030	<0.0030	<0.0030	<0.0030

Table 2: Benchmark values and means of key water quality parameters measured during the water quality monitoring program, 2017 (continued).

Indicator	Unit	Benchmark	September			
			Clark Lake	Upstream	Near-Field	Far-Field
Ammonia	(mg N/L)	1.13	<0.010	<0.010	<0.010	<0.010
Nitrate/ Nitrite	(mg N/L)	2.93	0.0562	0.0591	0.0591	0.0612
Total Phosphorous	(mg/L)	0.058	0.055	0.054	0.055	0.051
Chlorophyll *a*	(µg/L)	10.0	4.91	4.17	5.98	4.08
Total Suspended Solids	(mg/L)	5/25 mg/L higher than upstream	11.4	14.3	12.2	10.2
Laboratory pH	-	6.5/9.0	8.15	8.16	8.16	8.16
Dissolved Oxygen	(mg/L)	6.5/9.5[2]	10.12	10.10	10.15	10.26
Aluminum	(mg/L)	1.98	0.942	0.973	0.880	0.819
Arsenic	(mg/L)	0.150	0.00142	0.00140	0.00145	0.00145
Boron	(mg/L)	1.5	0.0222	0.0213	0.0222	0.0228
Cadmium[3]	(mg/L)	0.00031	0.0000078	0.0000076	0.0000070	0.0000067
Chromium[3]	(mg/L)	0.100	0.00202	0.00171	0.00159	0.00143
Copper	(mg/L)	0.0109	0.00207	0.00213	0.00205	0.00197
Iron	(mg/L)	1.45	0.967	0.950	0.884	0.786
Lead	(mg/L)	0.00403	0.000451	0.000439	0.000387	0.000351
Mercury	(mg/L)	0.000026	0.0000009	0.0000010	0.0000009	0.0000008
Molybdenum	(mg/L)	0.073	0.00066	0.00056	0.00053	0.00053
Nickel[3]	(mg/L)	0.061	0.00204	0.00216	0.00194	0.00181
Selenium[3]	(mg/L)	0.0010	0.000107	0.000100	0.000117	0.000103
Silver	(mg/L)	0.0001	<0.000010	<0.000010	<0.000010	<0.000010
Thallium	(mg/L)	0.0008	0.000014	0.000014	0.000013	0.000010
Uranium	(mg/L)	0.0330	0.00058	0.00052	0.00054	0.00053
Zinc	(mg/L)	0.140	0.0057	0.0063	0.0067	0.0068

Table 2: Benchmark values and means of key water quality parameters measured during the water quality monitoring program, 2017 (continued).

Indicator	Unit	Benchmark	Open-water Season			
			Clark Lake	Upstream	Near-Field	Far-Field
Ammonia	(mg N/L)	1.13	0.016	0.013	0.021	0.021
Nitrate/ Nitrite	(mg N/L)	2.93	0.0209	0.0221	0.0223	0.0227
Total Phosphorous	(mg/L)	0.058	0.048	0.048	0.047	0.044
Chlorophyll *a*	(µg/L)	10.0	6.43	5.32	6.31	5.68
Total Suspended Solids	(mg/L)	5/25 mg/L higher than upstream	15.9	15.7	15.3	11.8
Laboratory pH	-	6.5/9.0	8.20	8.20	8.22	8.21
Dissolved Oxygen	(mg/L)	6.5/9.5[2]	9.51	9.52	9.80	9.86
Aluminum	(mg/L)	1.98	0.830	0.738	0.808	0.742
Arsenic	(mg/L)	0.150	0.00134	0.00133	0.00137	0.00136
Boron	(mg/L)	1.5	0.0246	0.0250	0.0255	0.0264
Cadmium[3]	(mg/L)	0.00031	<0.000010	<0.000010	<0.000010	<0.000010
Chromium[3]	(mg/L)	0.100	0.0015	0.0012	0.0013	0.0012
Copper	(mg/L)	0.0109	0.00193	0.00187	0.00194	0.00188
Iron	(mg/L)	1.45	0.773	0.697	0.746	0.667
Lead	(mg/L)	0.00403	0.000387	0.000356	0.000350	0.000312
Mercury	(mg/L)	0.000026	0.0000013	0.0000014	0.0000012	0.0000012
Molybdenum	(mg/L)	0.073	0.00066	0.00060	0.00063	0.00062
Nickel[3]	(mg/L)	0.061	<0.0020	<0.0020	<0.0020	<0.0020
Selenium[3]	(mg/L)	0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Silver	(mg/L)	0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Thallium	(mg/L)	0.0008	<0.00010	<0.00010	<0.00010	<0.00010
Uranium	(mg/L)	0.0330	0.00062	0.00060	0.00061	0.00061
Zinc	(mg/L)	0.140	<0.0030	0.0032	0.0033	0.0030

Table 3: Mean values of additional parameters measured during the water quality monitoring program, 2017.

Indicator	Unit	April				June			
		Split Lake	Upstream	Near-Field	Far-Field	Clark Lake	Upstream	Near-Field	Far-Field
Dissolved Phosphorous	(mg/L)	0.016	0.016	0.016	0.017	0.012	0.012	0.019	0.013
Total Nitrogen	(mg/L)	0.49	0.55	0.56	0.40	0.50	0.42	0.53	0.55
Dissolved Organic Carbon	(mg/L)	9.45	9.53	9.45	8.69	9.50	9.36	9.39	9.24
In situ Turbidity	(NTU)	9.86	9.05	10.21	9.41	25.3	26.3	28.3	23.4
Laboratory Turbidity	(NTU)	11.8	10.9	11.2	10.9	27.9	28.8	31.0	26.0
In situ Specific Conductance	(µS/cm)	264	273	299	291	325	319	322	323
Laboratory Specific Conductance	(µmhos/cm)	307	340	335	335	290	308	292	318
Total Dissolved Solids	(mg/L)	191	217	215	211	200	215	215	220
True Color	(TCU)	18.9	16.3	17.2	16.5	27.0	23.6	23.8	21.5
In situ pH	-	7.88	7.91	7.96	8.01	8.18	8.00	8.10	7.97
Hardness as $CaCO_3$	(mg/L)	120	140	138	129	129	127	130	138
Chloride	(mg/L)	14.3	17.7	17.3	17.5	15.3	16.4	16.9	16.8
Sulphate	(mg/L)	30.2	36.8	36.2	36.5	32.0	34.5	35.3	35.3
Calcium	(mg/L)	27.8	32.1	31.5	29.6	30.2	30.1	31.0	32.0
Magnesium	(mg/L)	12.4	14.5	14.5	13.4	12.9	12.6	12.7	14.0
Potassium	(mg/L)	2.80	3.29	3.28	3.03	2.88	2.87	2.98	3.18
Sodium	(mg/L)	16.5	20.0	19.6	18.3	17.2	17.2	16.4	19.0

Table 3: Mean values of additional parameters measured during the water quality monitoring program, 2017 (continued).

Indicator	Unit	July				August			
		Clark Lake	Upstream	Near-Field	Far-Field	Clark Lake	Upstream	Near-Field	Far-Field
Dissolved Phosphorous	(mg/L)	0.018	0.012	0.014	0.015	0.019	0.017	0.017	0.017
Total Nitrogen	(mg/L)	0.40	0.48	0.53	0.62	0.45	0.49	0.35	0.35
Dissolved Organic Carbon	(mg/L)	9.44	9.16	9.47	9.44	8.52	8.48	9.71	9.65
In situ Turbidity	(NTU)	30.3	29.7	28.2	26.3	28.9	27.8	25.3	23.9
Laboratory Turbidity	(NTU)	22.2	23.5	21.6	20.6	22.5	21.4	19.2	18.1
In situ Specific Conductance	(µS/cm)	331	338	341	339	340	345	344	349
Laboratory Specific Conductance	(µmhos/cm)	276	284	280	293	293	284	277	288
Total Dissolved Solids	(mg/L)	196	192	201	199	191	194	203	204
True Color	(TCU)	21.6	21.9	21.2	21.6	19.2	19.9	18.0	16.0
In situ pH	-	8.24	8.12	8.34	8.34	8.30	8.20	8.34	8.27
Hardness as $CaCO_3$	(mg/L)	145	130	128	127	131	131	133	134
Chloride	(mg/L)	15.1	15.8	16.0	16.0	15.7	16.2	15.9	16.3
Sulphate	(mg/L)	30.9	32.3	32.7	32.8	31.9	32.3	32.1	33.0
Calcium	(mg/L)	34.6	30.7	30.6	30.5	33.1	31.5	31.6	31.6
Magnesium	(mg/L)	14.2	12.9	12.5	12.5	11.8	12.6	13.0	13.3
Potassium	(mg/L)	2.72	2.83	2.96	2.94	2.63	2.73	2.78	2.83
Sodium	(mg/L)	16.8	16.8	16.7	16.8	15.2	16.2	16.7	17.2

Table 3: Mean values of additional parameters measured during the water quality monitoring program, 2017 (continued).

Indicator	Unit	September				Open-water Season			
		Clark Lake	Upstream	Near-Field	Far-Field	Clark Lake	Upstream	Near-Field	Far-Field
Dissolved Phosphorous	(mg/L)	0.021	0.022	0.023	0.022				
Total Nitrogen	(mg/L)	0.54	0.52	0.47	0.49	0.47	0.48	0.47	0.50
Dissolved Organic Carbon	(mg/L)	9.12	9.07	8.76	8.76	9.15	9.02	9.33	9.27
In situ Turbidity	(NTU)	38.9	36.7	34.4	31.2	30.8	30.1	29.1	26.2
Laboratory Turbidity	(NTU)	27.3	26.8	24.5	22.9	25.0	25.1	24.1	21.9
In situ Specific Conductance	(µS/cm)	305	304	308	313	320	327	329	331
Laboratory Specific Conductance	(µmhos/cm)	263	262	264	268	281	285	278	292
Total Dissolved Solids	(mg/L)	202	192	186	190	197	198	202	203
True Color	(TCU)	16.6	16.1	17.1	17.6	21.1	20.4	20.0	19.1
In situ pH	-	8.18	8.19	8.33	8.23	8.22	8.13	8.28	8.20
Hardness as $CaCO_3$	(mg/L)	117	117	124	124	131	126	129	131
Chloride	(mg/L)	12.9	12.7	13.0	13.4	14.8	15.3	15.5	15.6
Sulphate	(mg/L)	25.4	25.2	25.8	26.5	30.1	31.1	31.5	31.9
Calcium	(mg/L)	28.5	26.7	29.4	29.2	31.6	29.8	30.7	30.8
Magnesium	(mg/L)	11.3	12.2	12.3	12.5	12.5	12.6	12.6	13.1
Potassium	(mg/L)	2.59	2.36	2.52	2.52	2.71	2.70	2.81	2.87
Sodium	(mg/L)	14.1	14.1	14.5	15.0	15.8	16.1	16.1	17.0

FIGURES

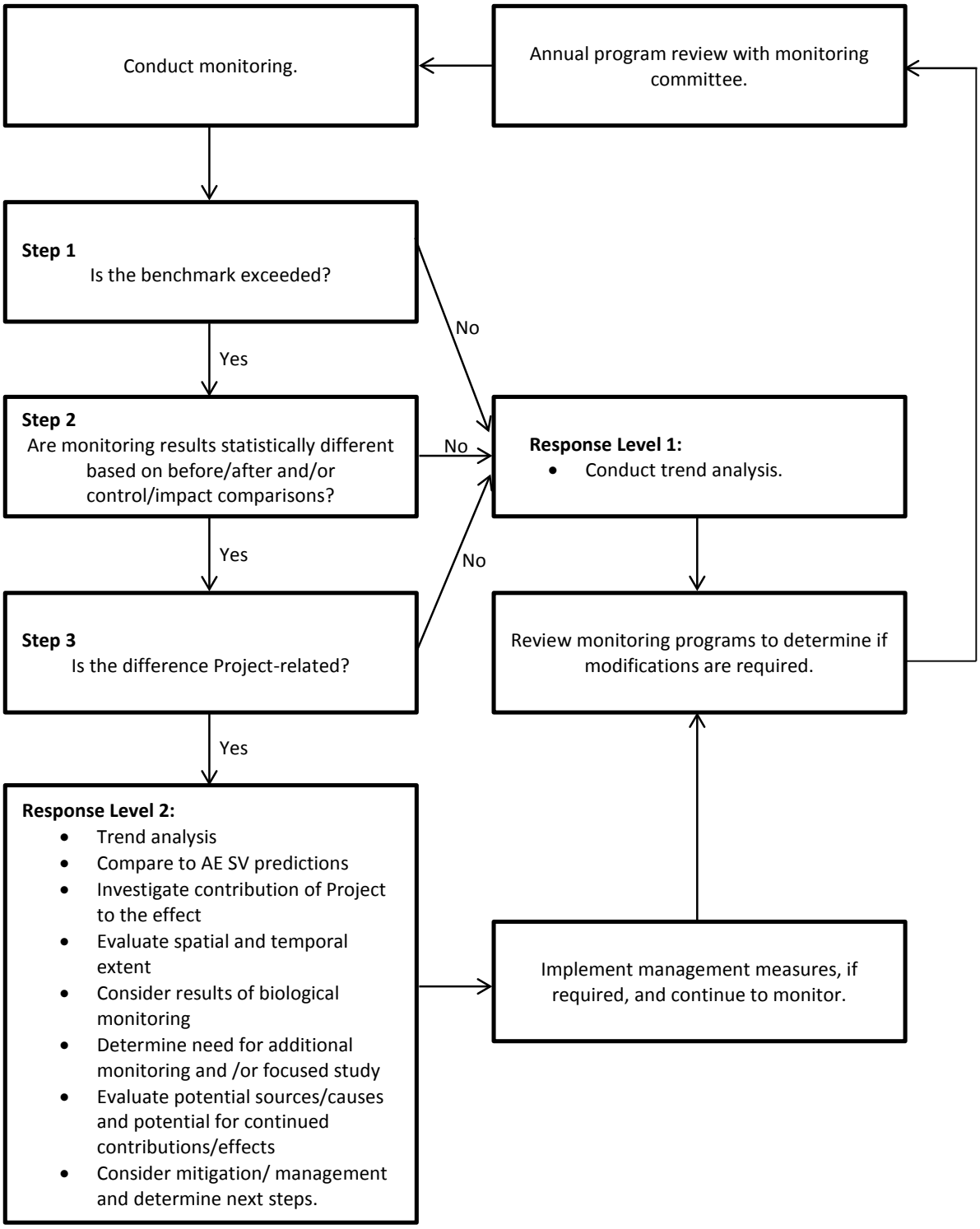


Figure 1: Water quality assessment management framework (AMF).

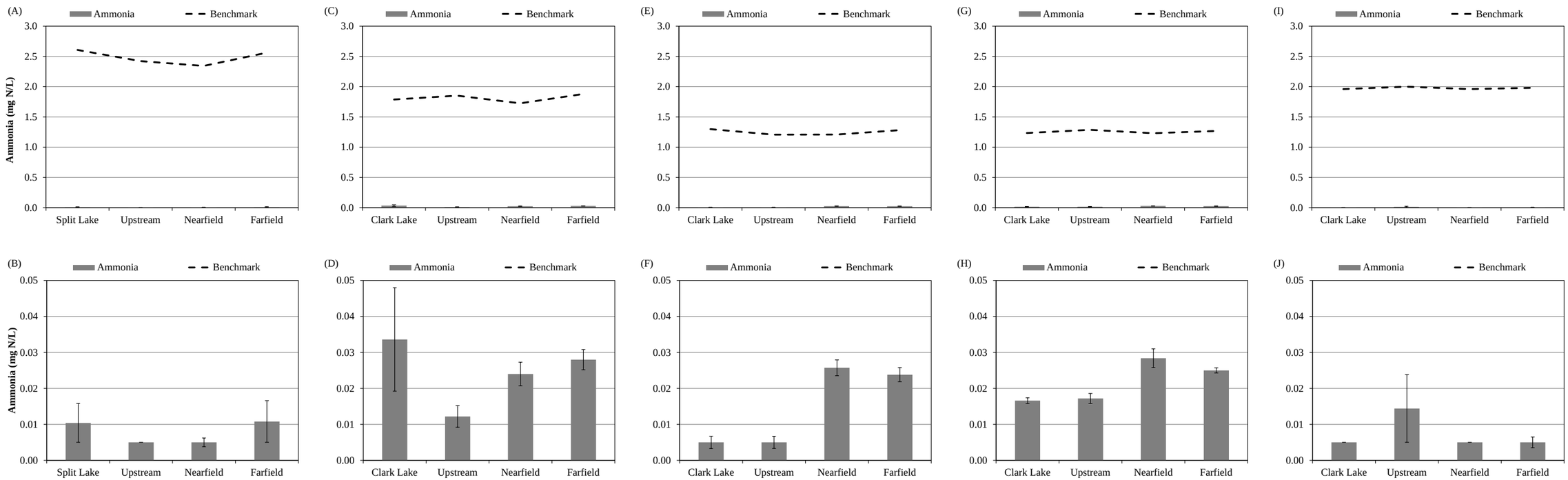


Figure 2: **Mean (± SE) ammonia concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**

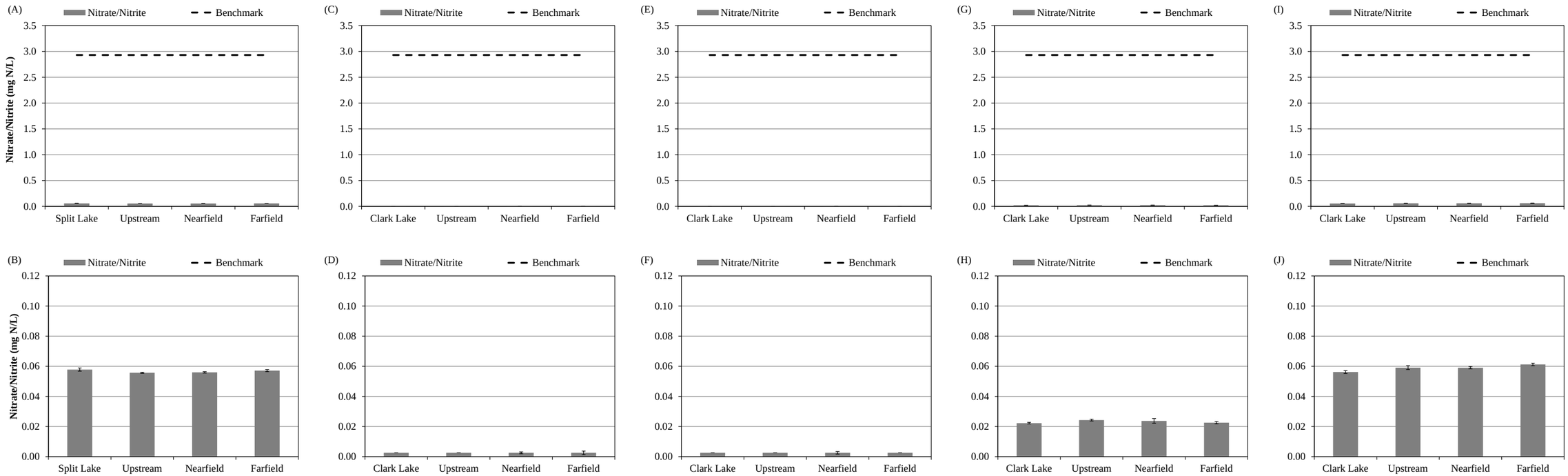


Figure 3: **Mean (± SE) nitrate/nitrite concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**

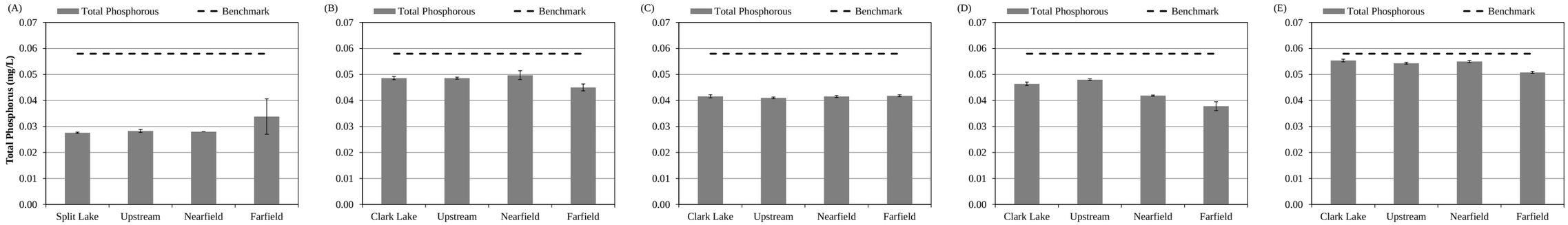


Figure 4: **Mean (± SE) concentrations of total phosphorous measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.**

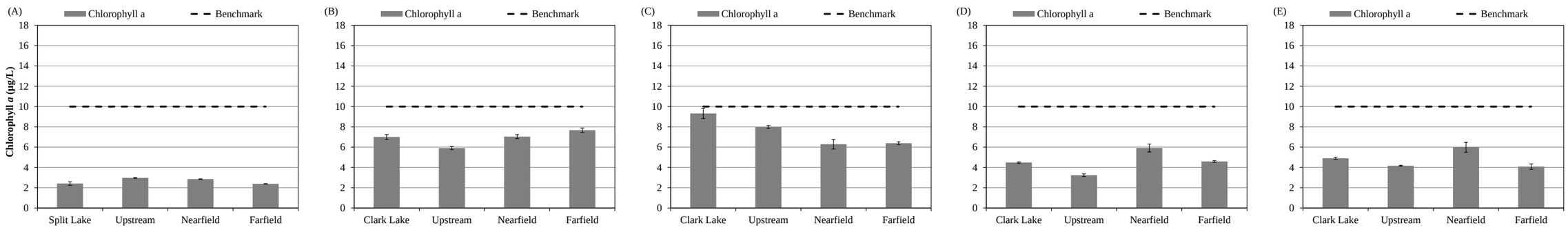


Figure 5: **Mean (± SE) chlorophyll *a* concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.**

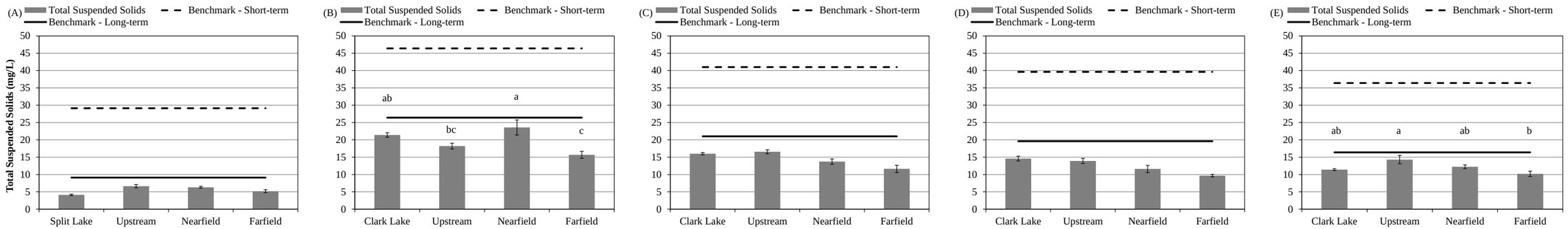


Figure 6: **Mean (± SE) total suspended solid concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017. Letters in (B) and (E) indicate significantly (α = 0.05) different results between sampling areas.**

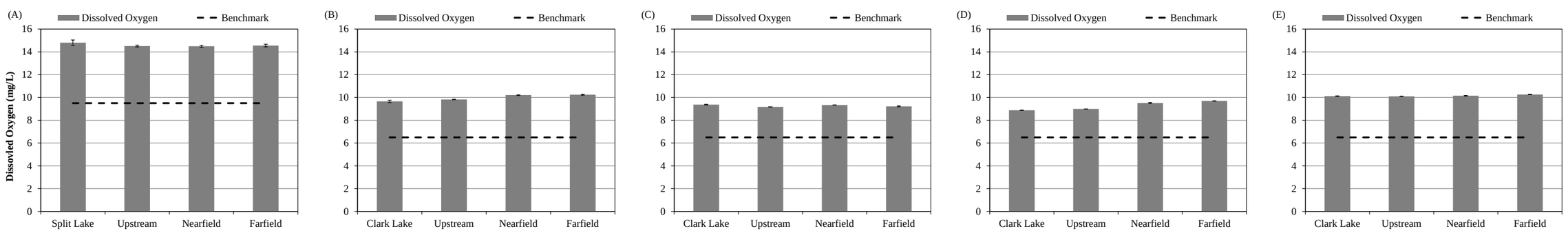


Figure 7: **Mean (± SE) surface dissolved oxygen concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.**

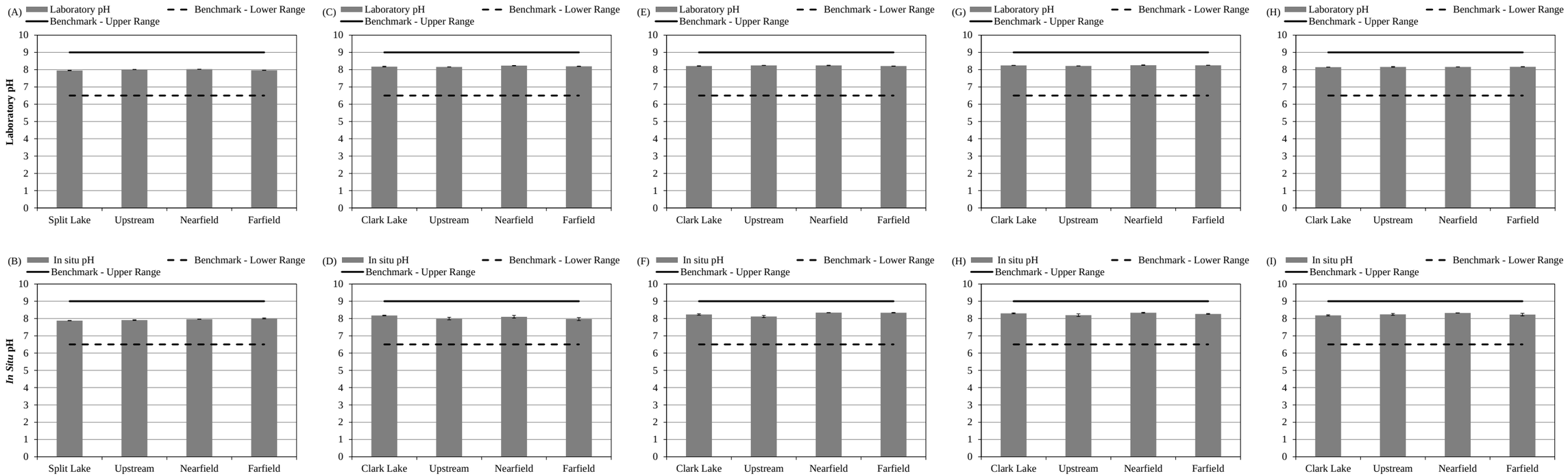


Figure 8: **Mean (± SE) laboratory (top) and *in situ* (bottom) pH measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.**

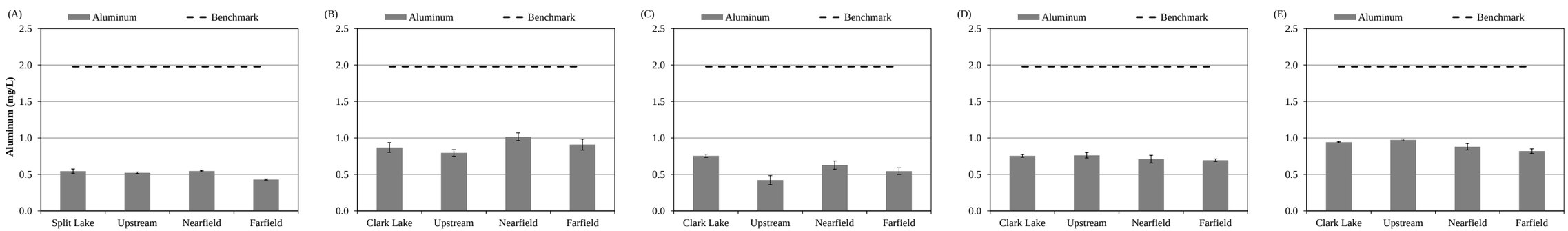


Figure 9: **Mean (± SE) aluminum concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.**

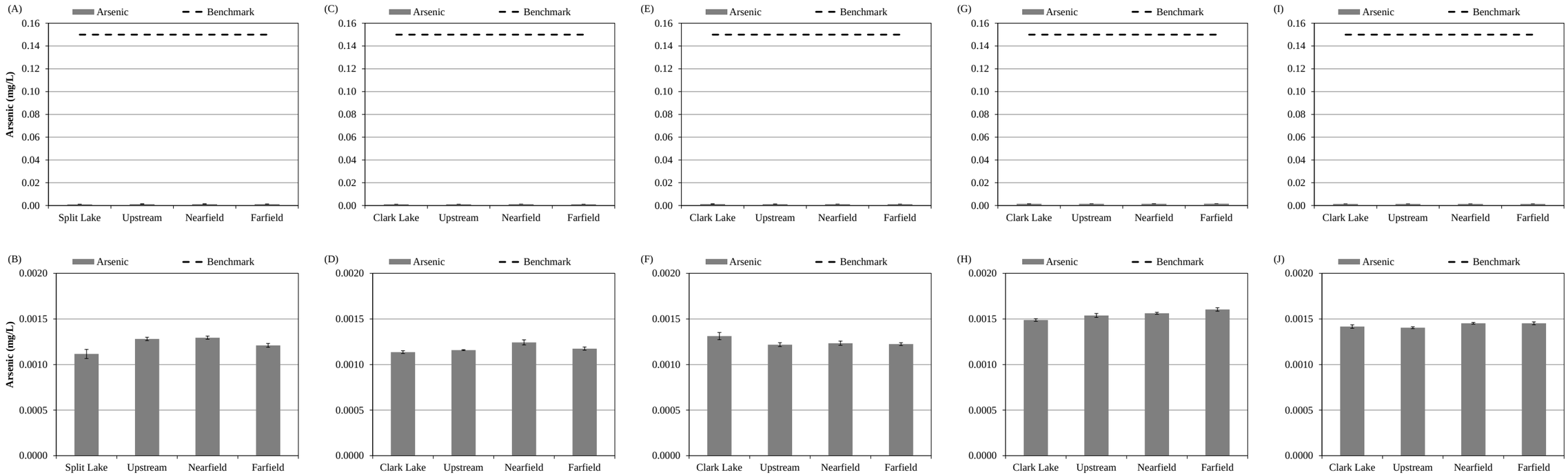


Figure 10: **Mean (± SE) arsenic concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**

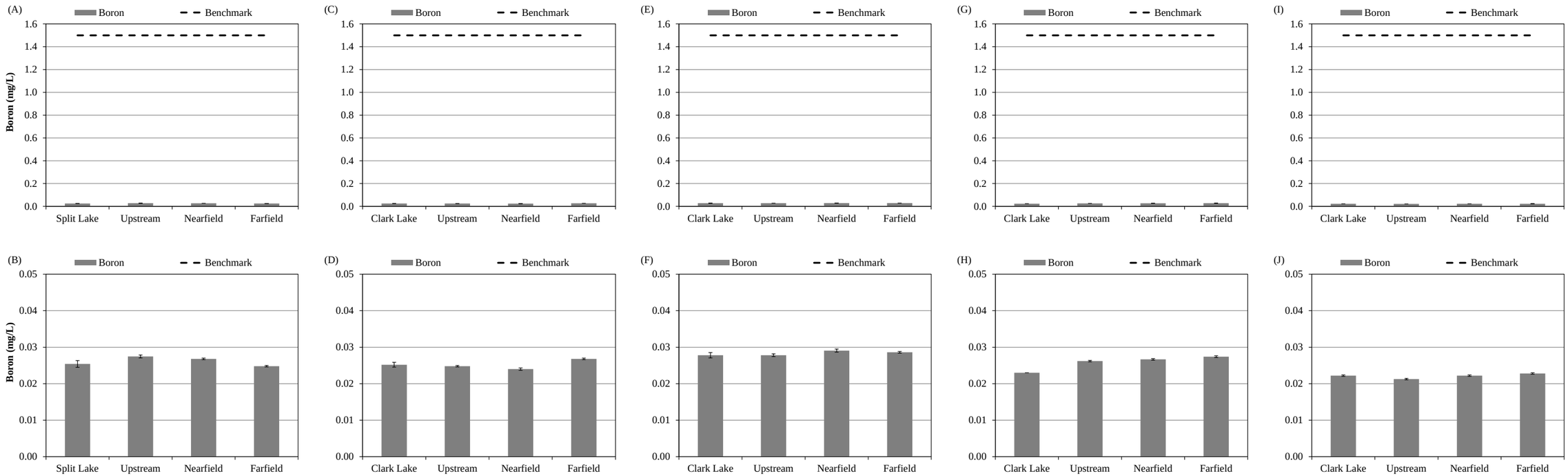


Figure 11: Mean (± SE) total boron concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.

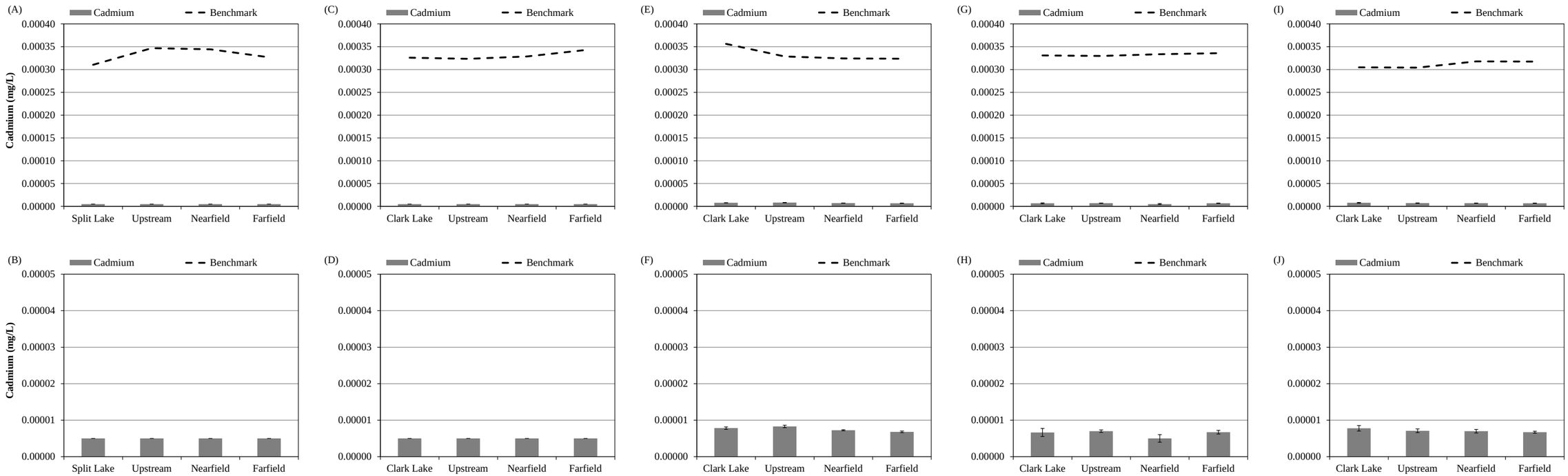


Figure 12: **Mean (± SE) cadmium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**

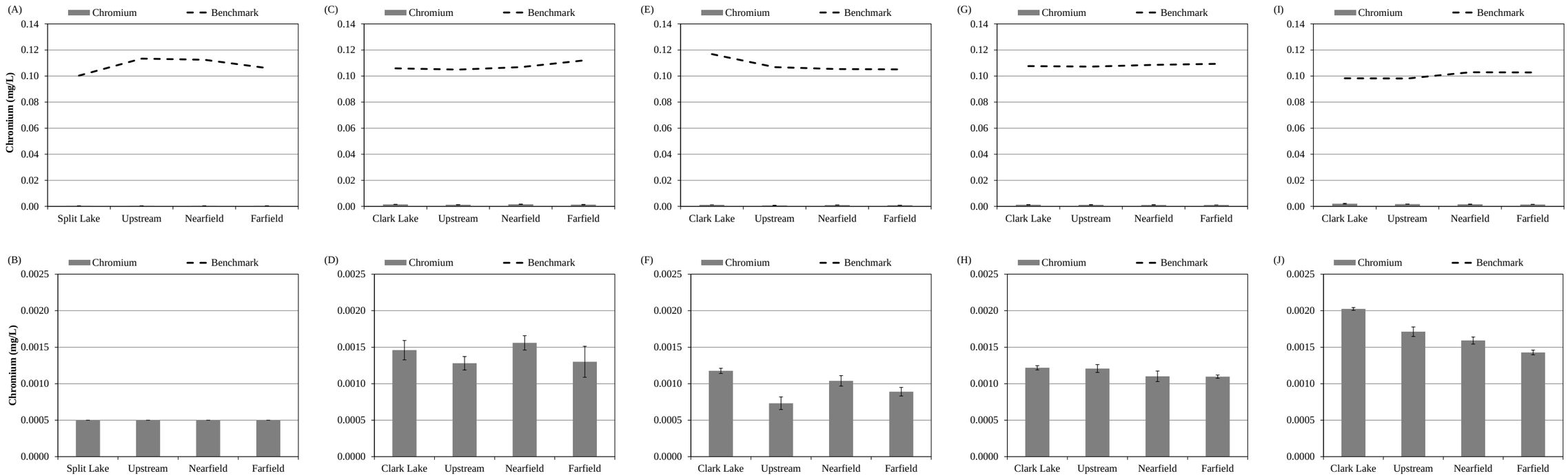


Figure 13: **Mean (± SE) chromium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**

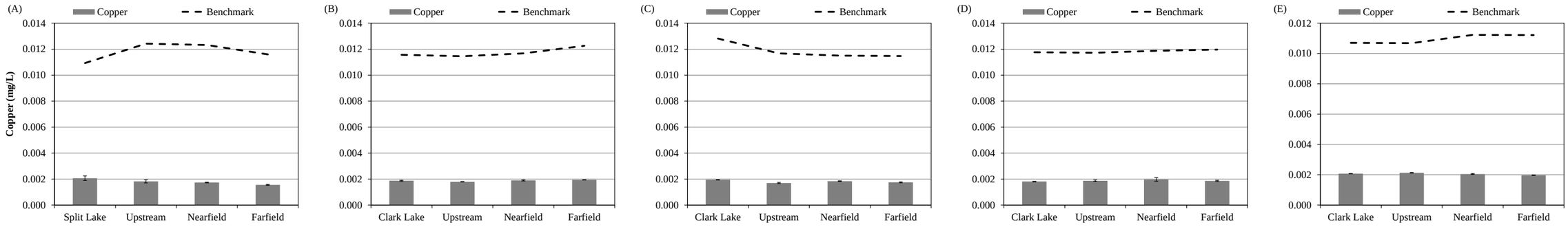


Figure 14: **Mean (± SE) copper concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.**

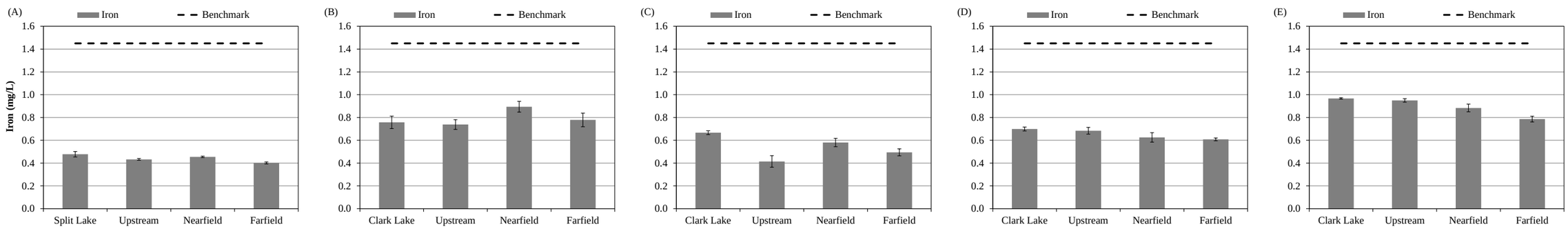


Figure 15: **Mean (± SE) iron concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.**

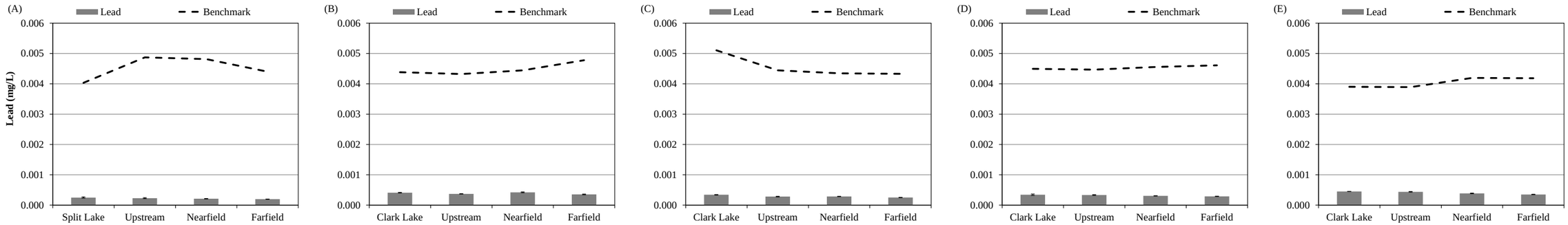


Figure 16: Mean (± SE) lead concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.

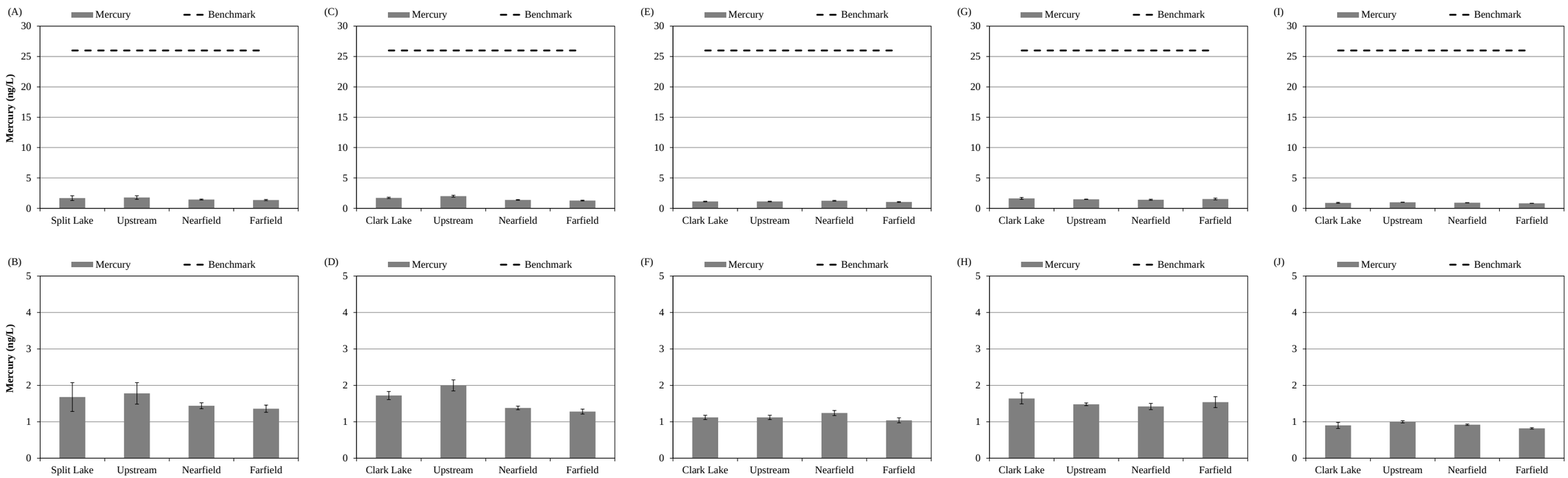


Figure 17: Mean (± SE) mercury concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.

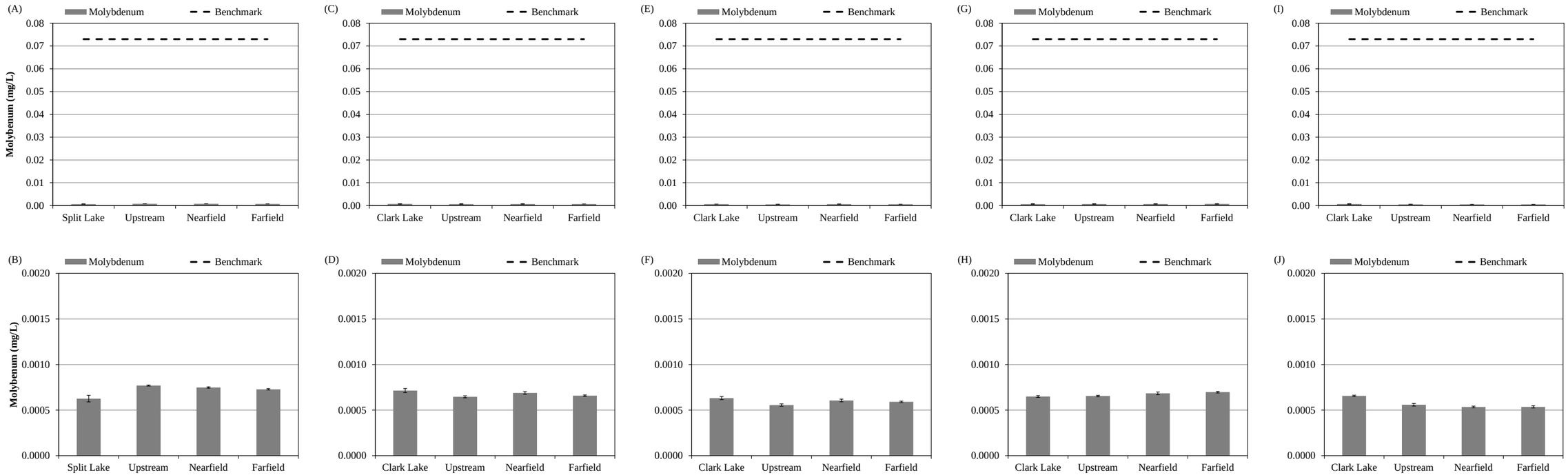


Figure 18: **Mean (± SE) molybdenum concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**

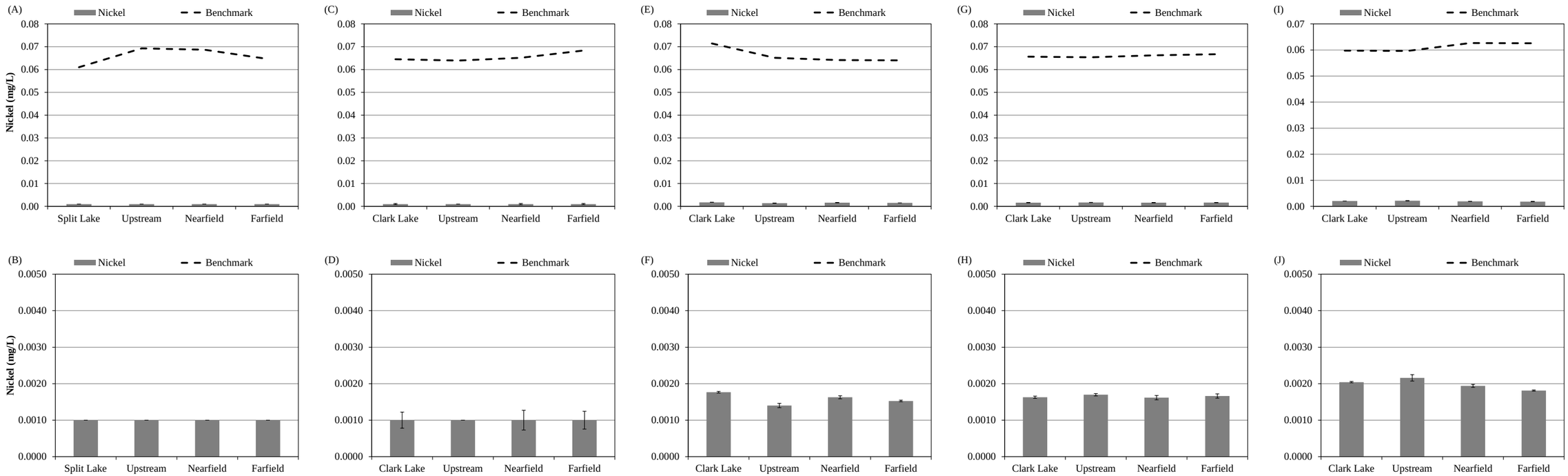


Figure 19: **Mean (± SE) nickel concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**

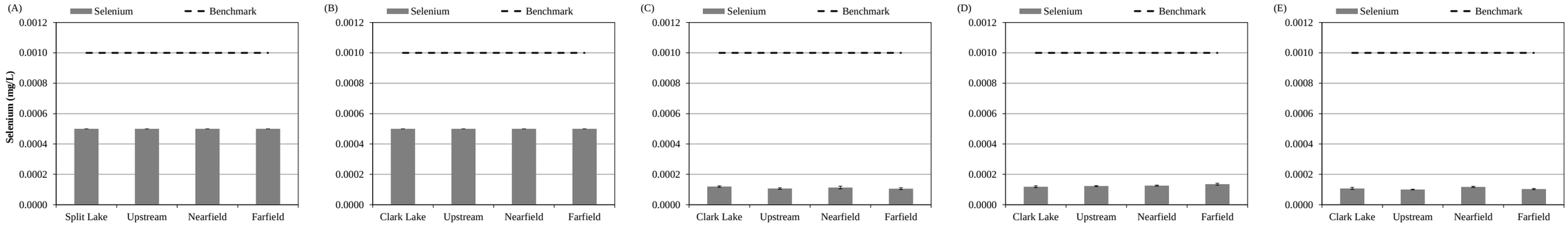


Figure 20: **Mean (± SE) selenium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.**

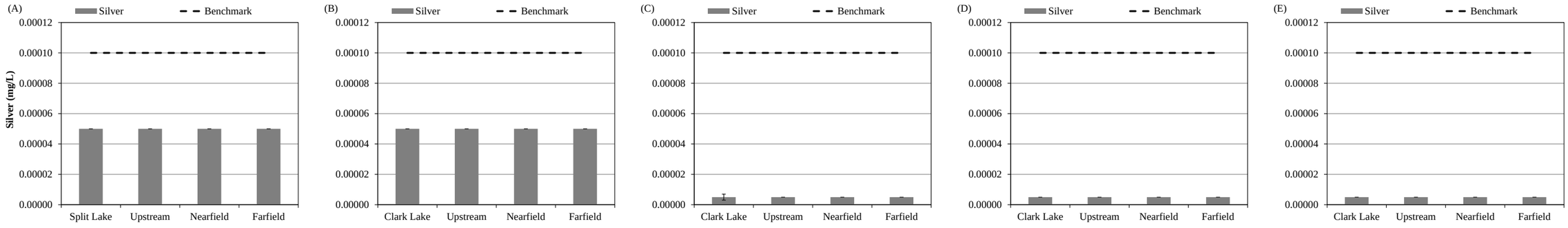


Figure 21: **Mean (± SE) silver concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.**

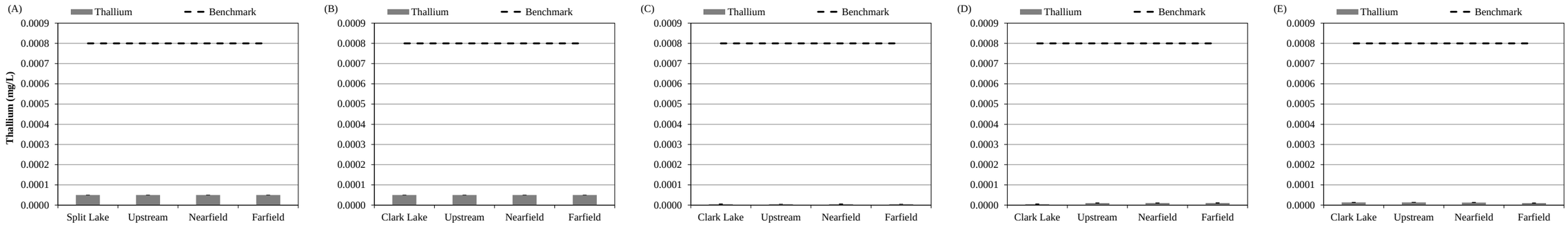


Figure 22: **Mean (± SE) thallium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.**

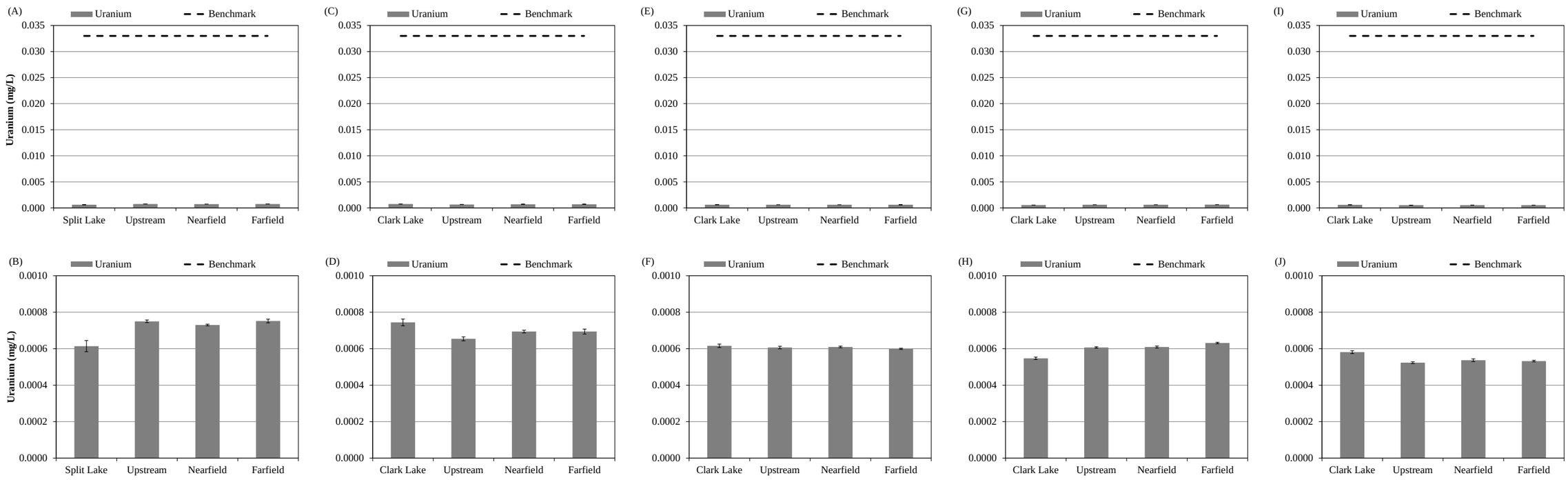


Figure 23: **Mean (± SE) uranium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**

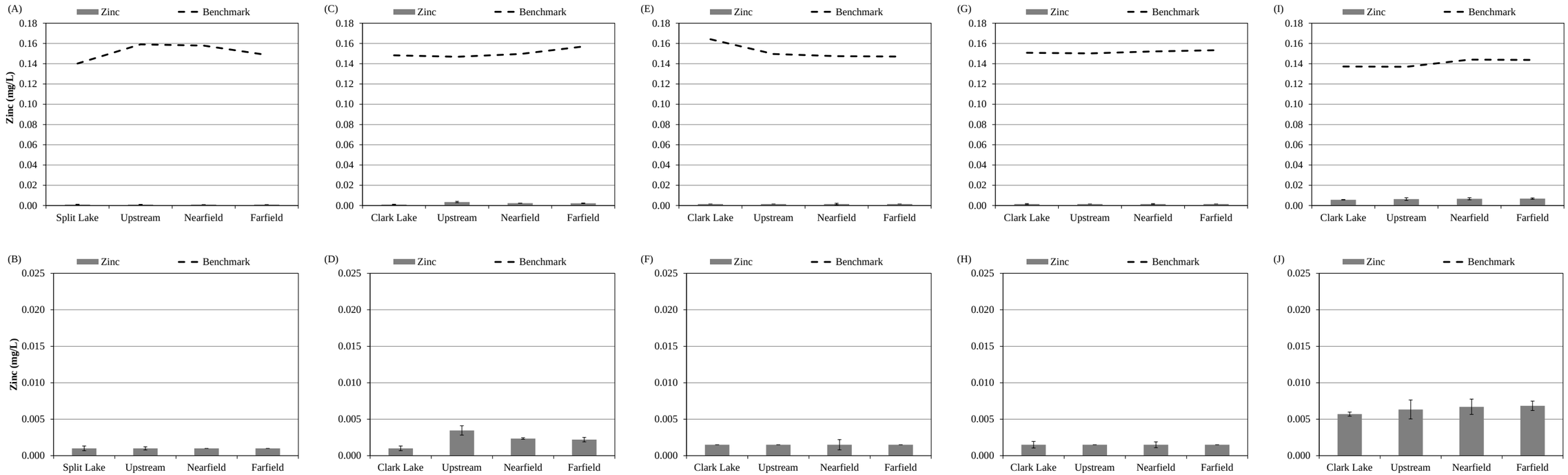


Figure 24: **Mean (± SE) zinc concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017. Scales are plotted to show the comparison of the data to benchmark values on the top, and the differences in mean values on the bottom.**

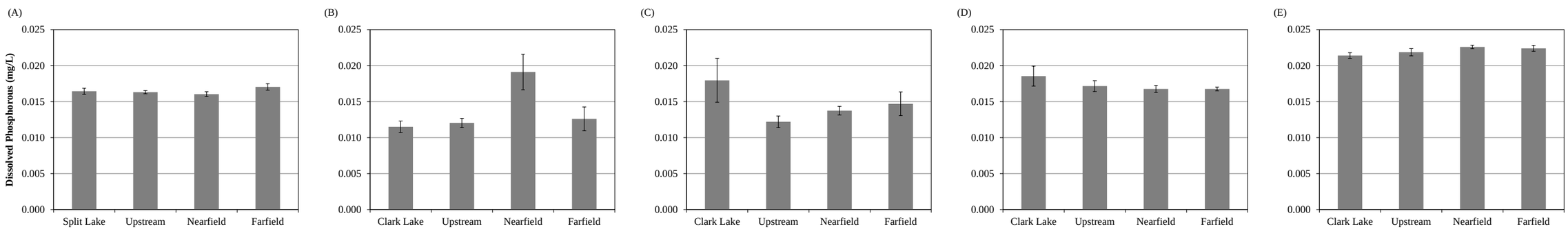


Figure 25: **Mean (± SE) dissolved phosphorous concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.**

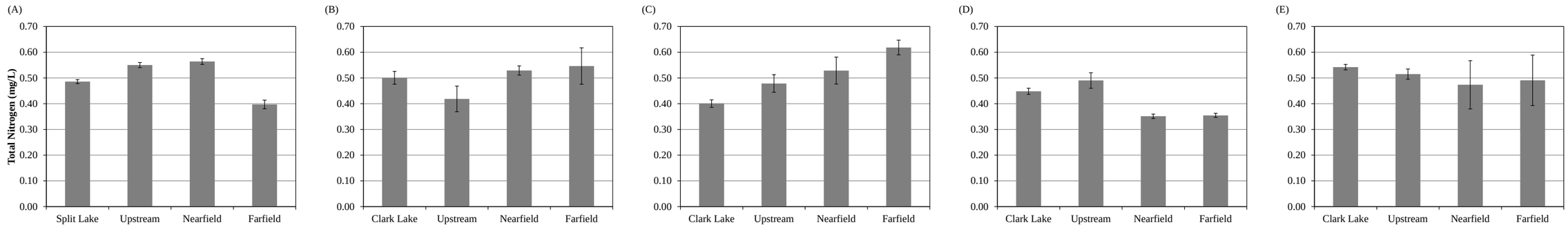


Figure 26: **Mean (± SE) concentrations of total nitrogen measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.**

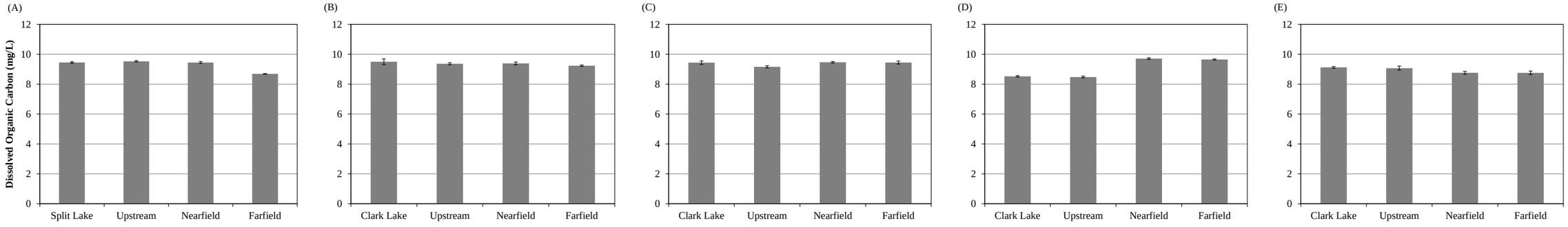


Figure 27: **Mean (± SE) concentrations of dissolved organic carbon measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.**

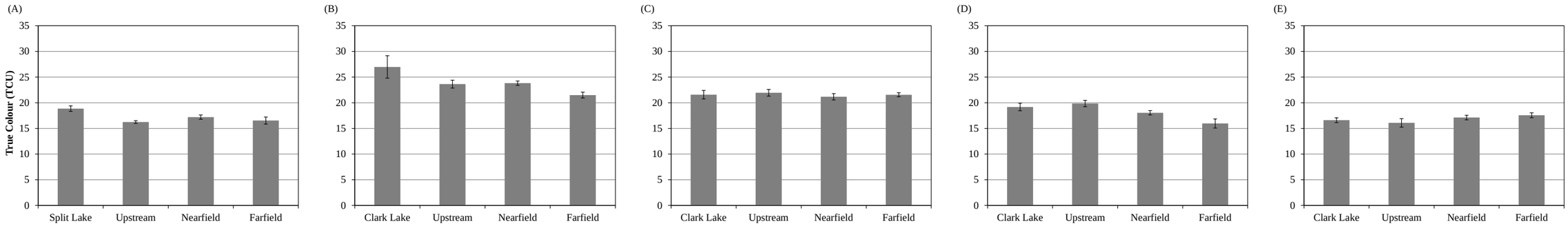


Figure 28: Mean (± SE) colour measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.

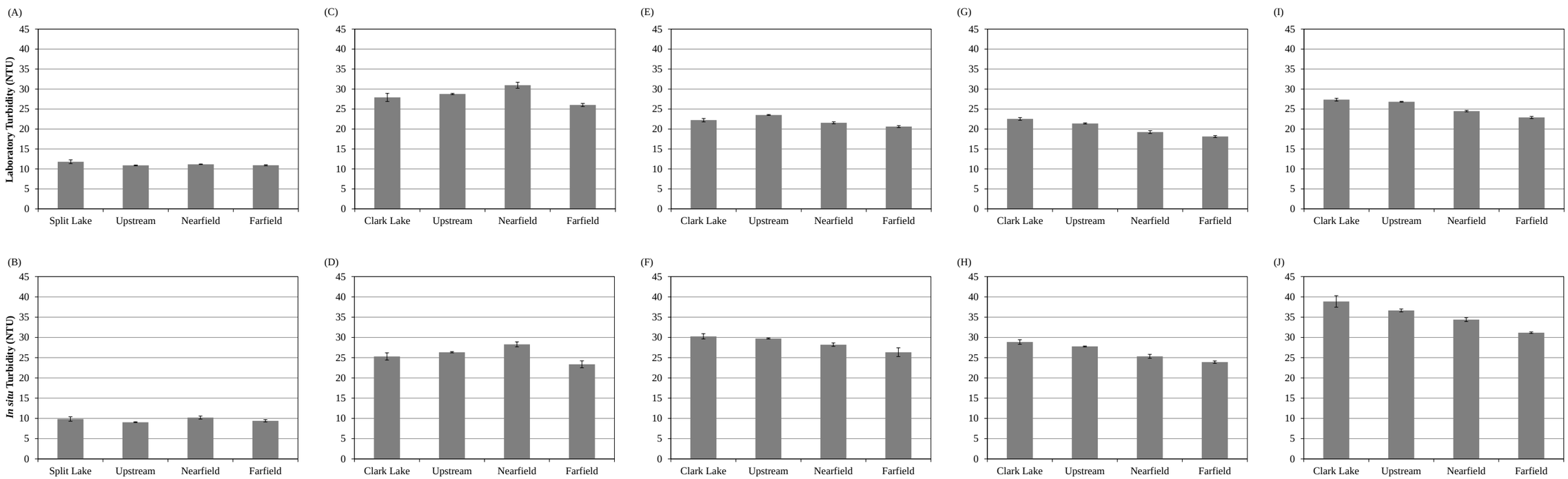


Figure 29: Mean (± SE) laboratory (top) and *in situ* (bottom) turbidity measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.

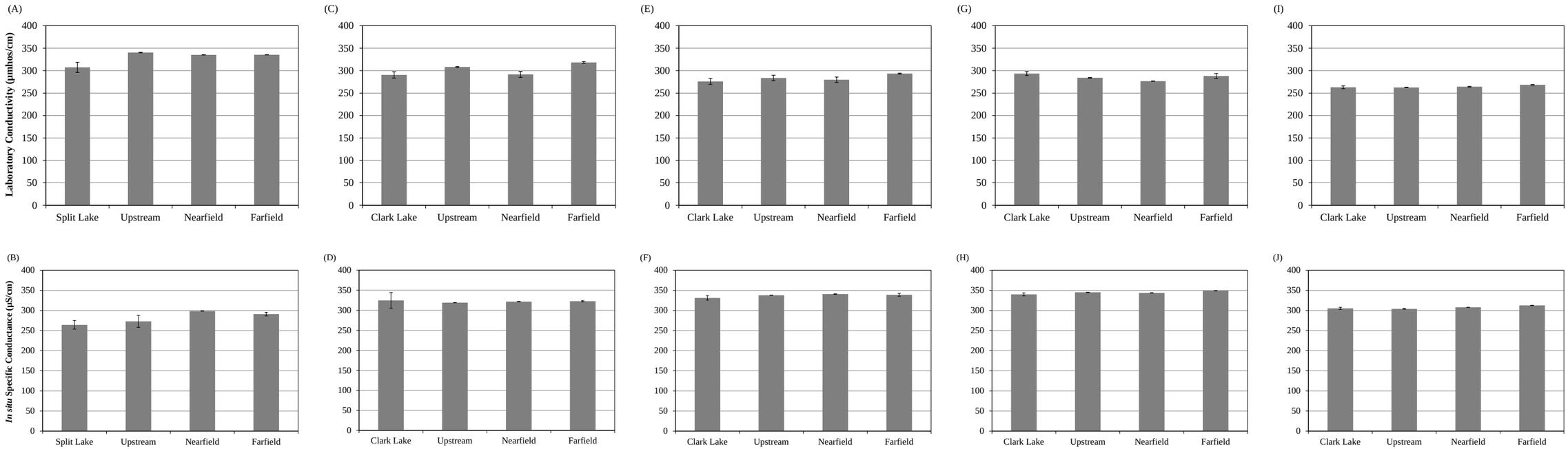


Figure 30: Mean (± SE) laboratory (top) and *in situ* (bottom) specific conductance measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.

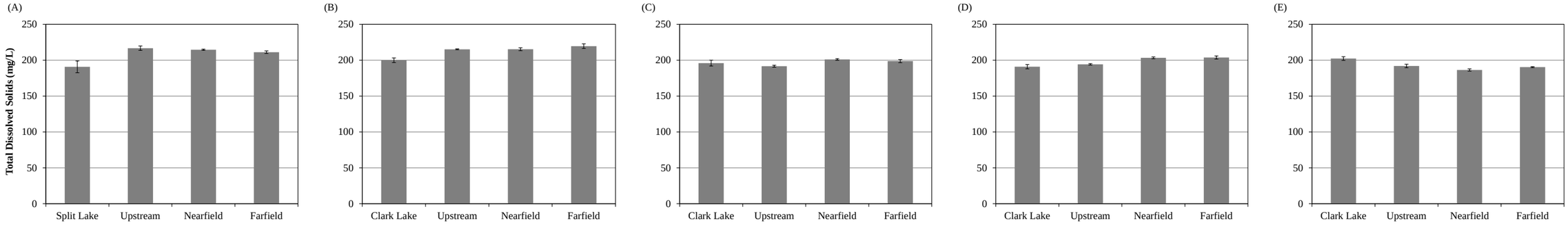


Figure 31: **Mean (± SE) concentrations of total dissolved solids measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.**

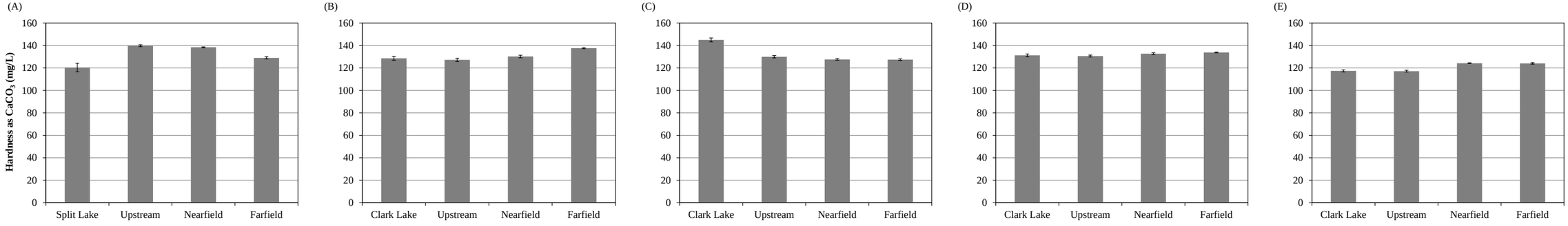


Figure 32: **Mean (± SE) hardness measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.**

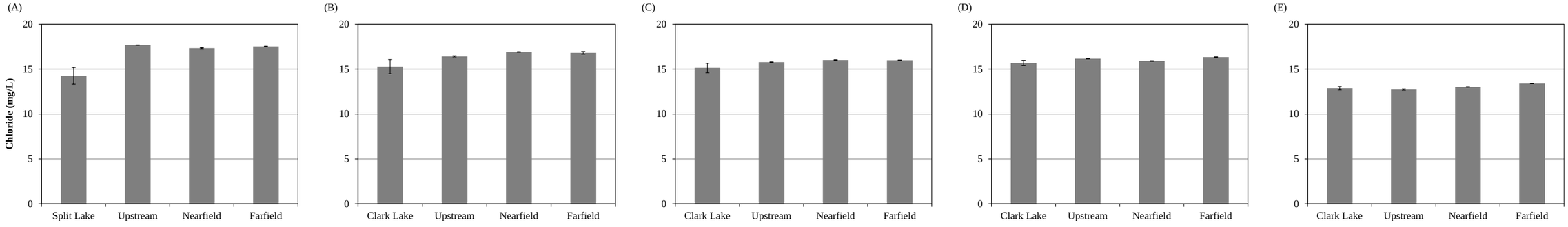


Figure 33: Mean (± SE) chloride concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.

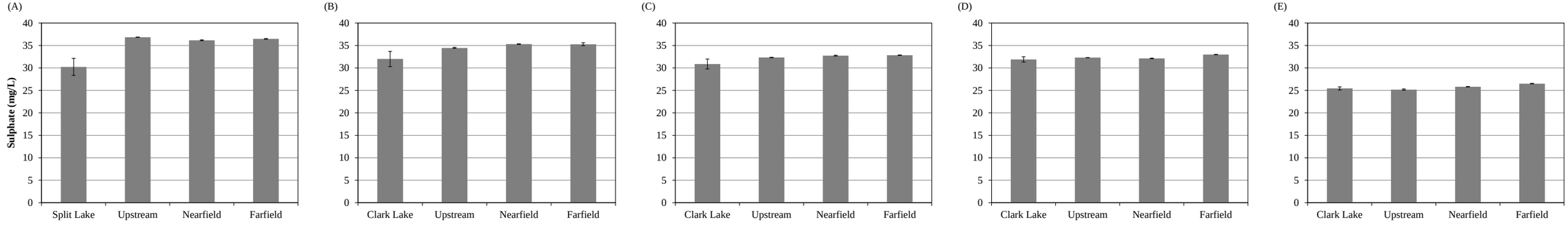


Figure 34: Mean (± SE) sulphate concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.

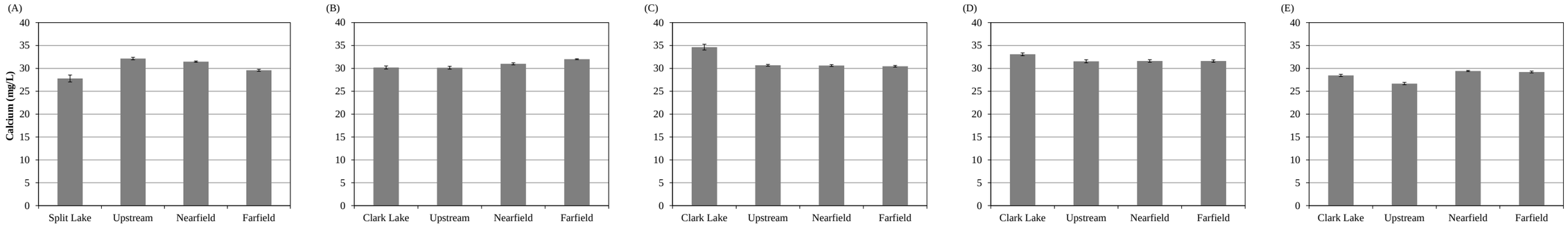


Figure 35: Mean (± SE) calcium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.

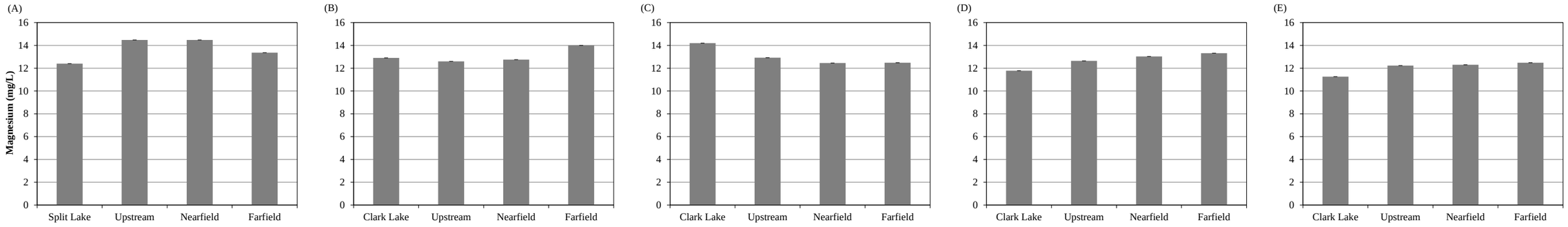


Figure 36: Mean (± SE) magnesium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.

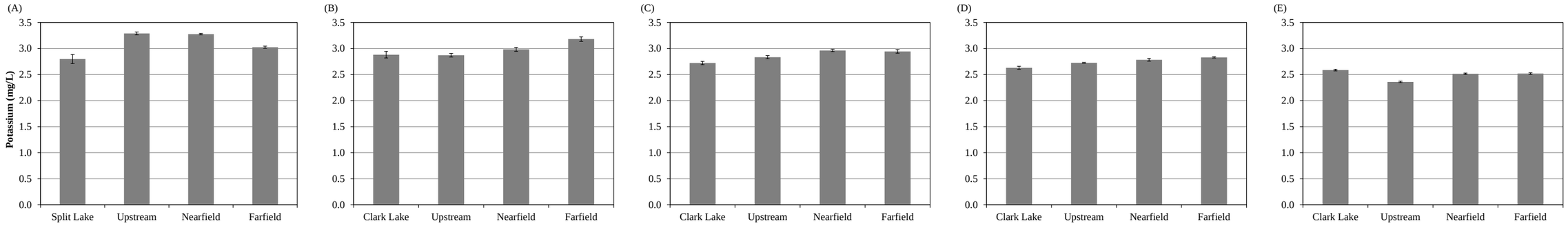


Figure 37: Mean (± SE) potassium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.

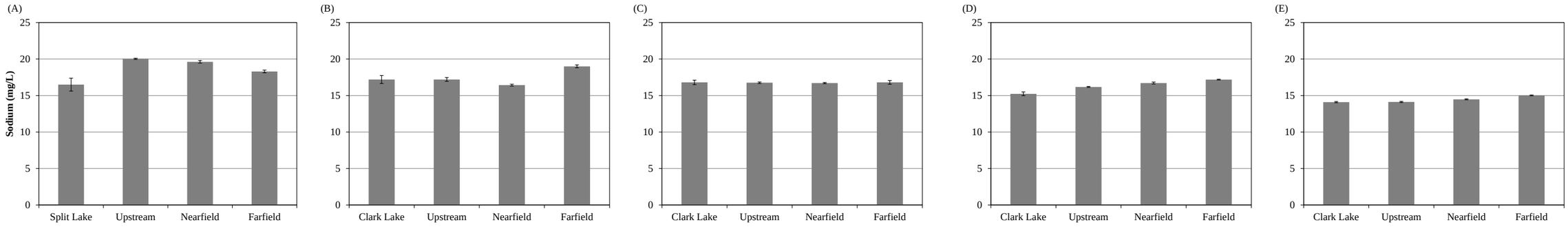
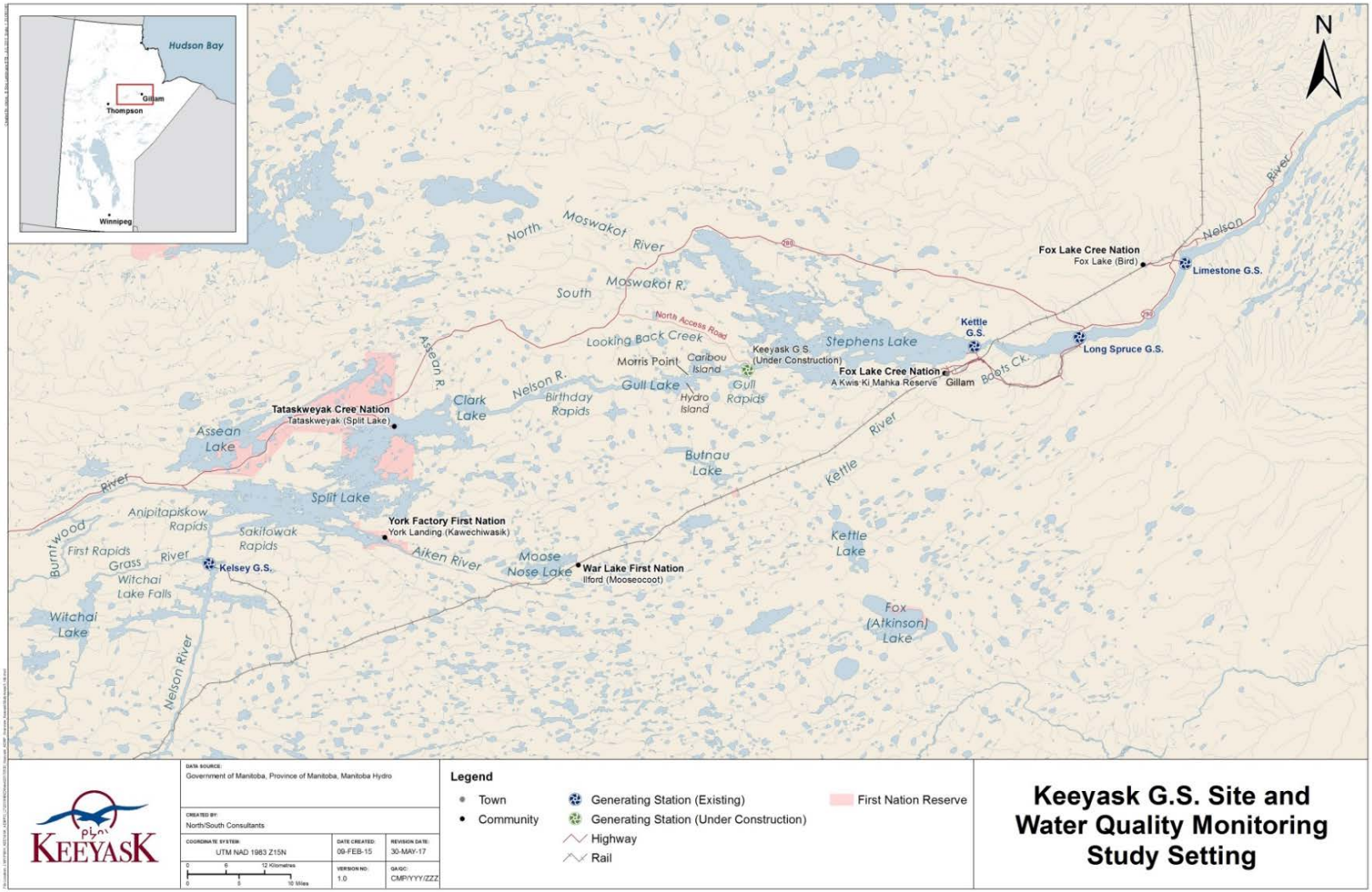


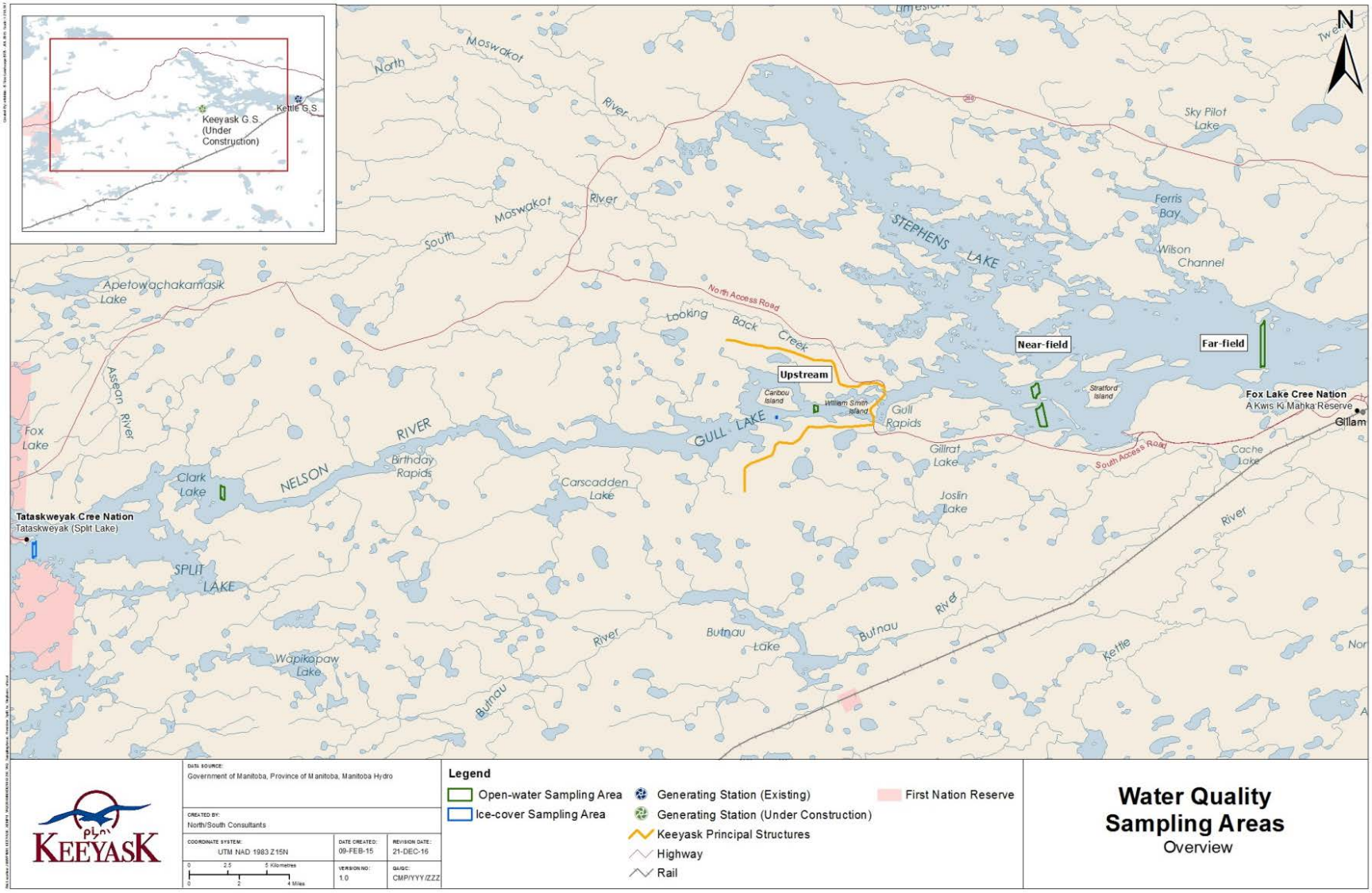
Figure 38: Mean (± SE) sodium concentrations measured in Split Lake, Clark Lake, and the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS construction site on April 3-6 (A,B), June 26-July 2 (C,D), July 24-26 (E,F), August 27-30 (G,H), and September 17-19 (I,J), 2017.

MAPS

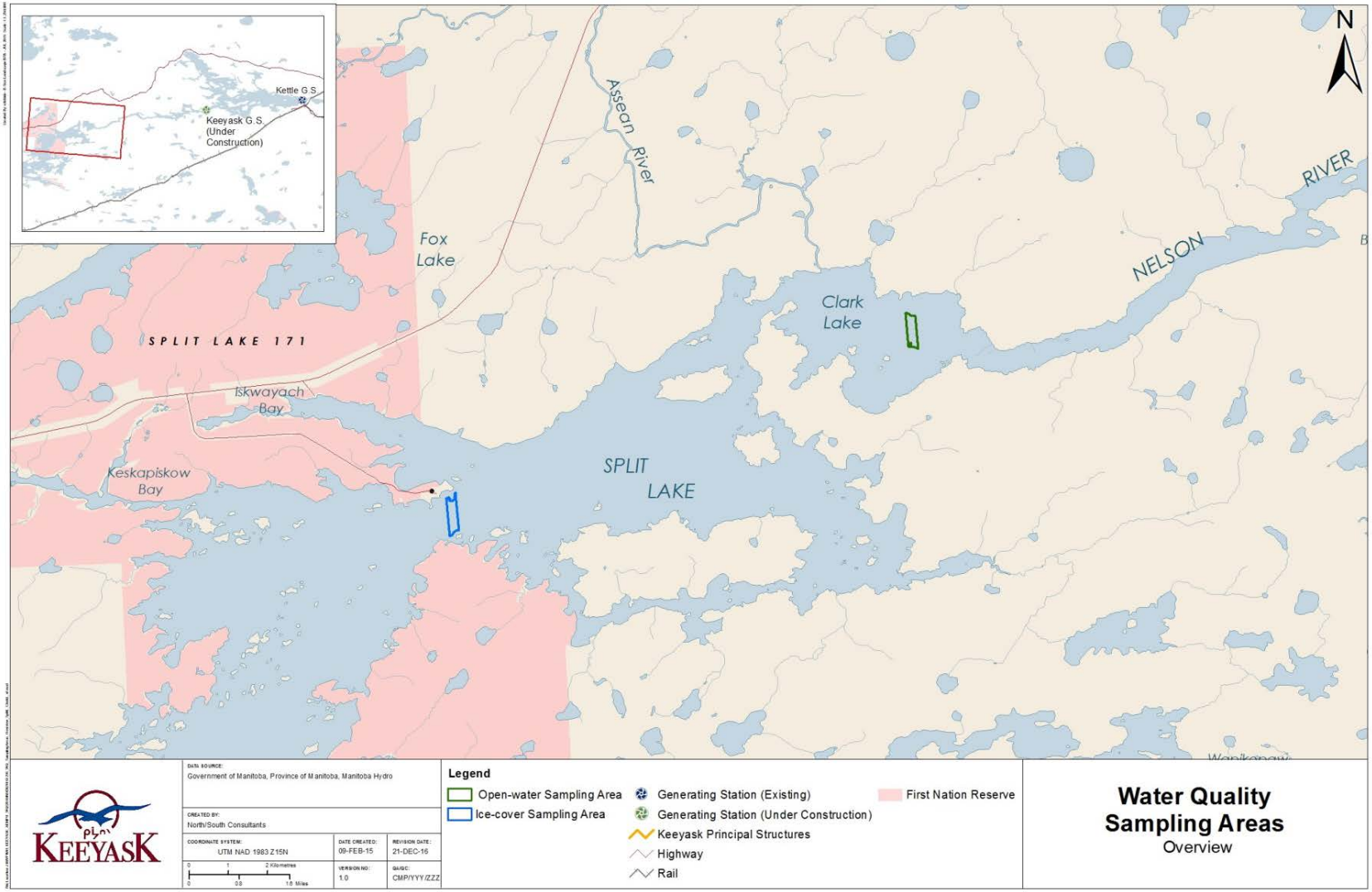


Map 1: Map of the Nelson River showing the site of the Keeyask Generating Station and the water quality monitoring study setting.

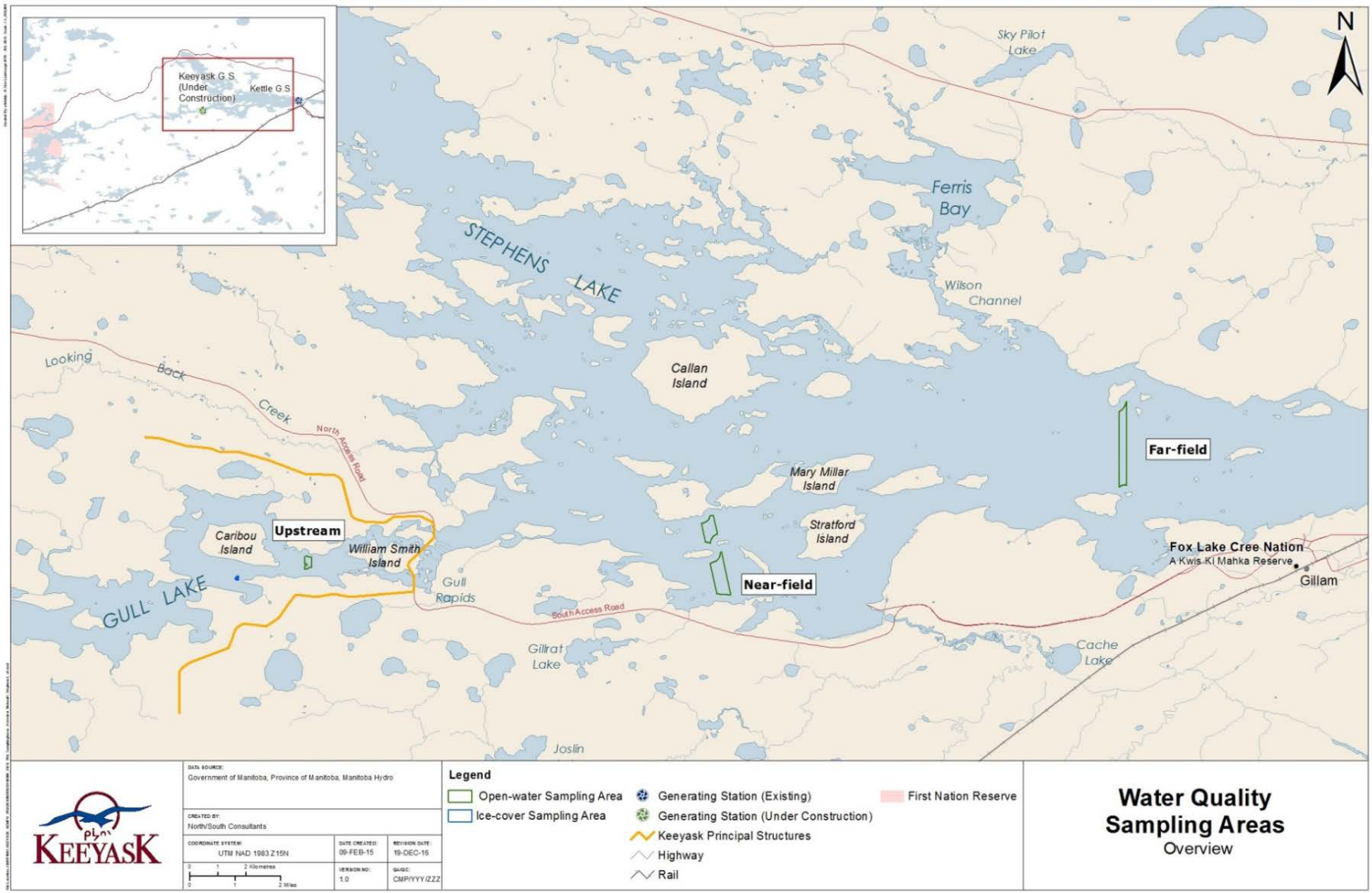
Map 2: Map of instream structures at the Keeyask Generating Station site, September 2017.



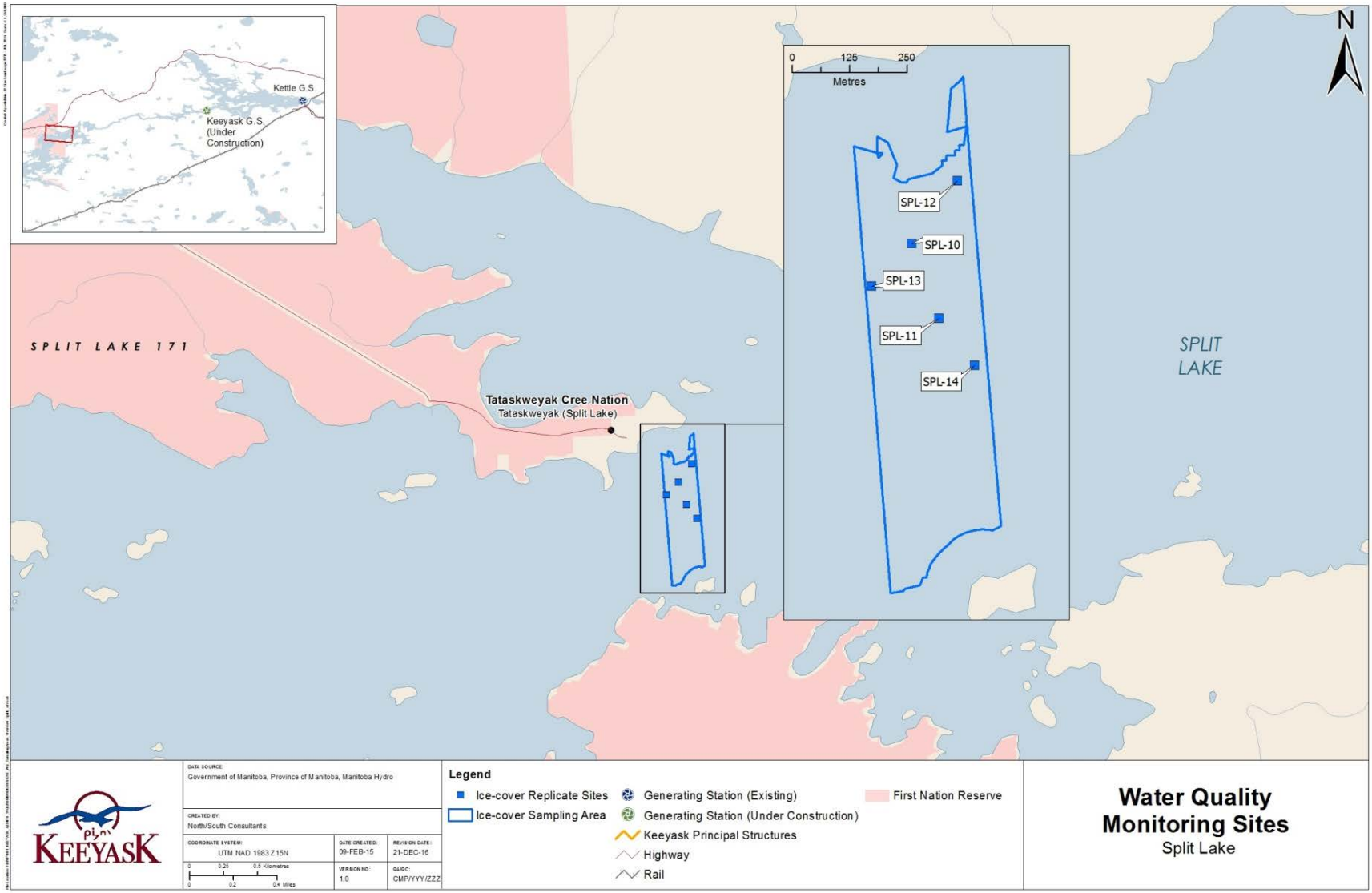
Map 3: Overview of water quality monitoring areas during the ice-cover and open-water seasons, 2017.



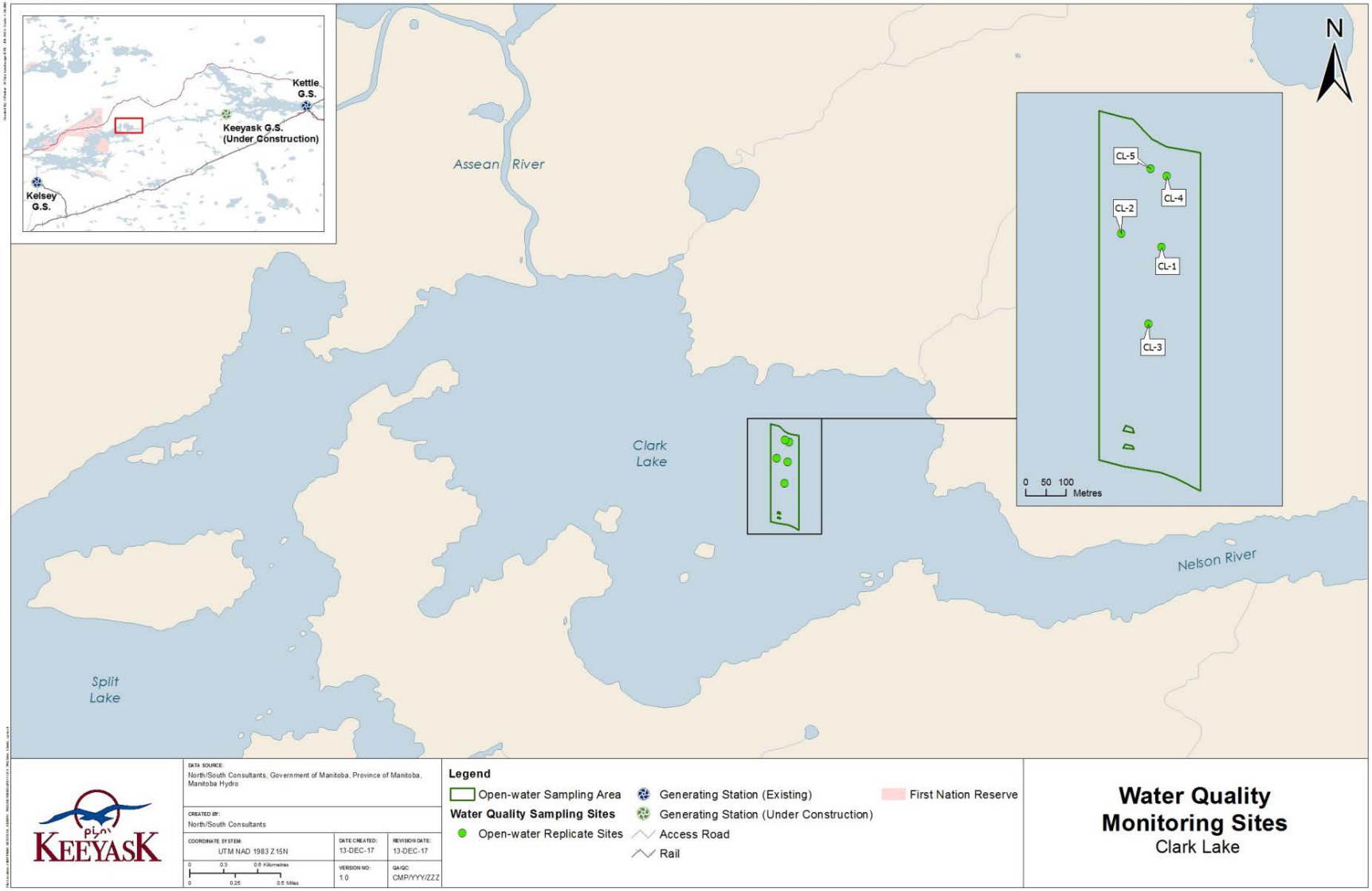
Map 4: Overview of furthest upstream reference water quality monitoring areas during the ice-cover (Split Lake) and open-water seasons (Clark Lake), 2017.



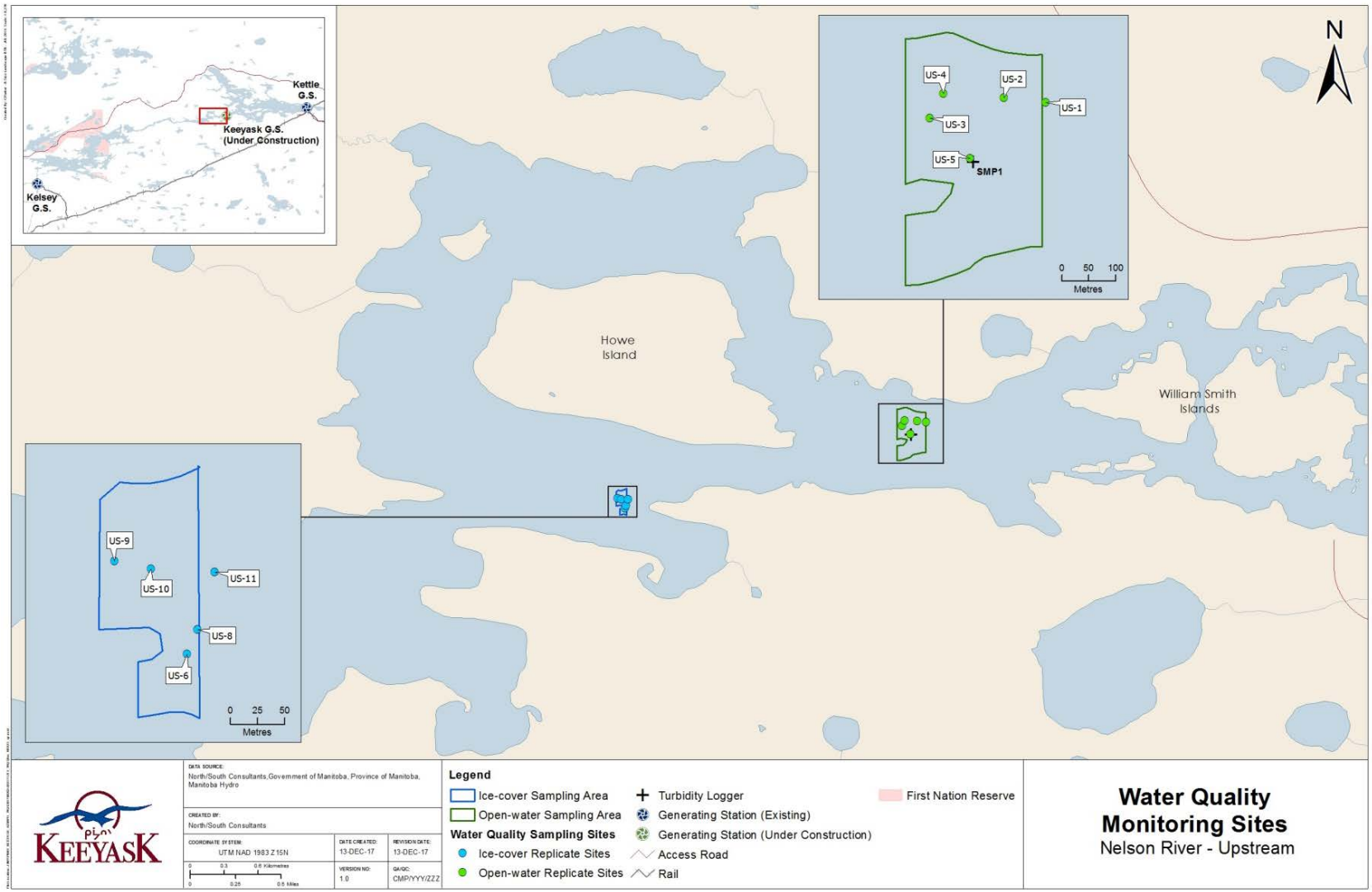
Map 5: Overview of the Nelson River upstream of Gull Rapids and Stephens Lake water quality monitoring areas during the ice-cover and open-water seasons, 2017.



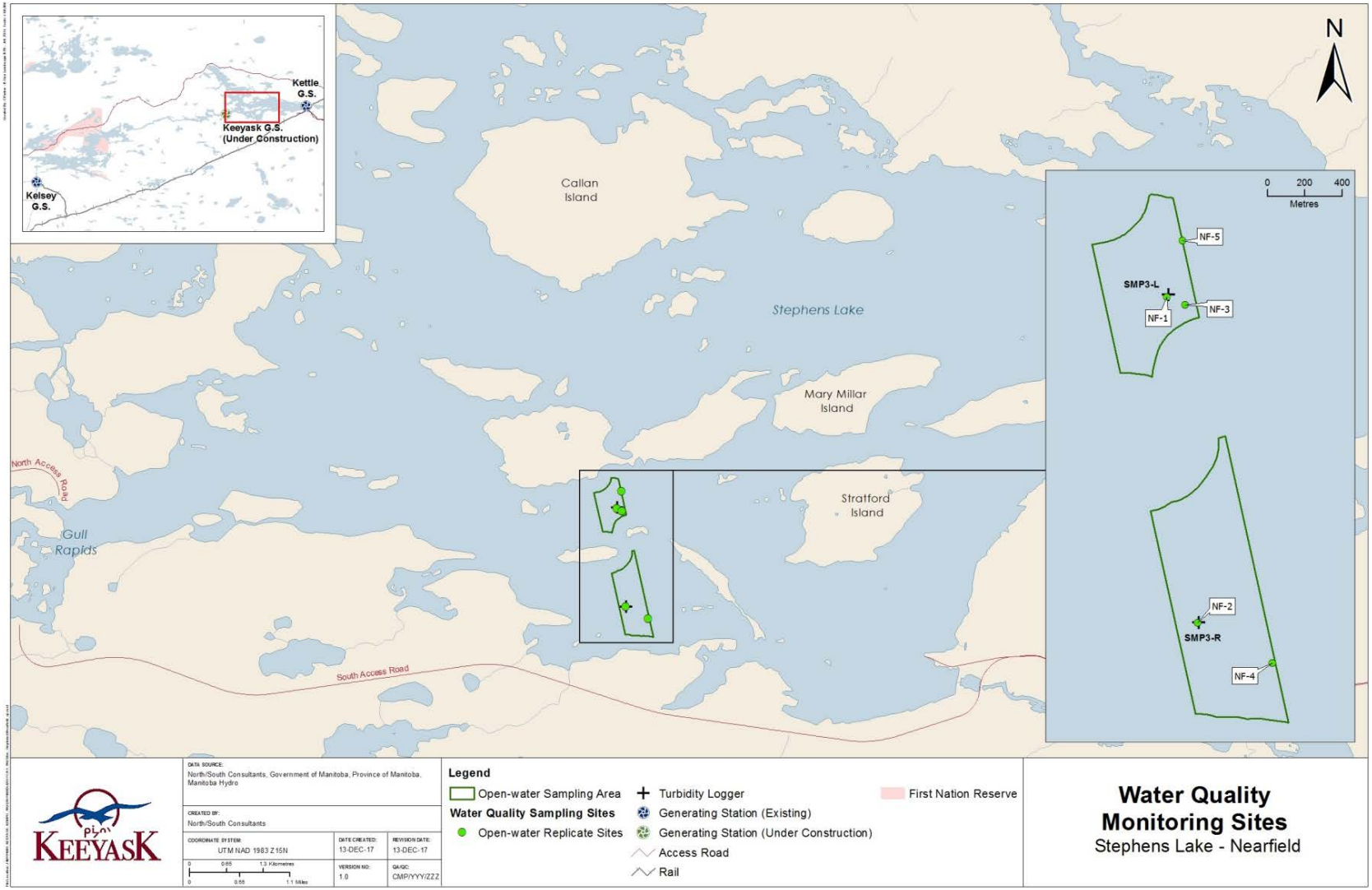
Map 6: Water quality sampling locations in Split Lake during the ice-cover season, 2017.



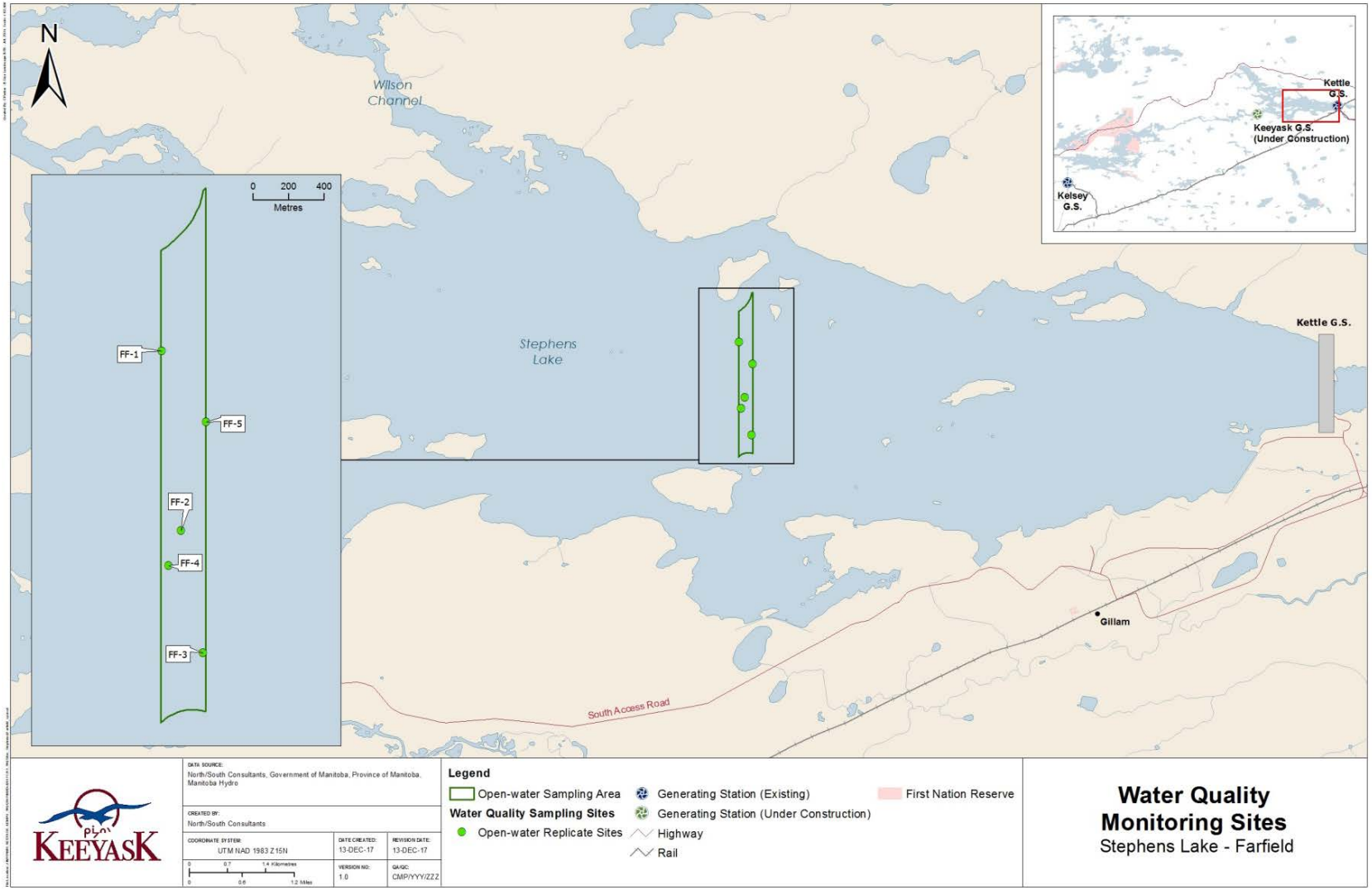
Map 7: Water quality sampling locations in Clark Lake during the open-water season, 2017.



Map 8: Water quality sampling locations in the Nelson River upstream of Gull Rapids during the ice-cover and open-water seasons, 2017.



Map 9: Water quality sampling locations in the near-field sampling area of Stephens Lake during the ice-cover and open-water seasons, 2017.



Map 10: Water quality sampling locations in the far-field sampling area of Stephens Lake during the ice-cover and open-water seasons, 2017.

APPENDICES

APPENDIX 1:
RESULTS OF WATER QUALITY MONITORING, 2017

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Split Lake # 10	SPL-10	3-Apr-17	11:30	7.8	0.45	0.76	0.3	0.031	7.93	13.92	96.6	245.6	10.69	N/A
							1.0	0.00	7.85	14.63	100.3	246.0	11.13	
							2.0	0.00	7.83	14.84	101.6	247.6	10.51	
							3.0	0.00	7.82	14.92	102.3	253.9	10.19	
							4.0	0.00	7.81	14.97	102.5	249.9	10.25	
							5.0	0.00	7.82	15.01	102.8	252.0	10.31	
							6.0	0.00	7.82	15.02	102.8	265.8	9.92	
							7.0	0.00	7.83	15.03	102.9	258.2	10.26	
Split Lake # 11	SPL-11	3-Apr-17	12:24	17.5	0.40	0.83	0.3	0.00	7.84	15.09	103.3	259.3	9.87	N/A
							1.0	0.00	7.84	15.12	103.5	258.9	10.33	
							2.0	0.00	7.83	15.14	103.6	258.8	10.11	
							3.0	0.00	7.82	15.14	103.7	258.3	10.18	
							4.0	0.00	7.79	15.15	103.7	258.4	10.09	
							5.0	0.00	7.74	15.19	104.0	258.8	10.03	
							6.0	0.00	7.74	15.19	104.0	260.8	9.92	
							7.0	0.00	7.73	15.19	104.0	261.7	9.91	
							8.0	0.00	7.72	15.18	103.9	266.5	9.97	
							9.0	0.00	7.71	15.18	103.8	268.0	9.45	
							10.0	0.00	7.78	15.02	102.9	277.3	9.25	
							11.0	0.00	7.75	15.08	103.2	272.7	8.98	
							12.0	-0.01	7.72	15.09	103.3	290.9	8.40	
							13.0	-0.01	7.72	15.07	103.2	294.6	8.46	
							14.0	-0.01	7.71	15.07	103.1	293.6	8.33	
							15.0	-0.01	7.71	15.06	103.1	296.8	8.20	
							16.0	-0.01	7.70	15.05	103.0	296.7	8.46	
Split Lake # 12	SPL-12	3-Apr-17	14:45	11.9	0.41	0.68	0.3	0.00	7.88	15.05	103.1	260.7	10.45	N/A
							1.0	0.00	7.88	15.09	103.3	263.7	10.21	
							2.0	0.00	7.87	15.11	103.5	262.3	11.36	
							3.0	0.01	7.87	15.12	103.5	257.7	9.75	
							4.0	0.00	7.86	15.13	103.6	263.7	9.79	
							5.0	0.00	7.86	15.14	103.6	273.5	9.61	
							6.0	0.00	7.86	15.14	103.6	277.1	9.44	
							7.0	0.00	7.86	15.13	103.6	277.4	10.12	
							8.0	0.00	7.86	15.13	103.5	277.1	9.51	
							9.0	0.00	7.86	15.12	103.5	277.6	9.58	
							10.0	0.00	7.85	15.12	103.5	278.8	9.36	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Split Lake # 13	SPL-13	3-Apr-17	14:00	20.5	0.53	0.68	0.3	0.00	7.85	15.23	104.2	250.2	10.59	N/A
							1.0	0.00	7.85	15.23	104.2	251.8	10.30	
							2.0	0.00	7.85	15.23	104.2	252.8	10.66	
							3.0	0.00	7.84	15.22	104.2	254.8	10.58	
							4.0	0.00	7.83	15.22	104.1	254.7	10.65	
							5.0	0.00	7.82	15.21	104.1	254.1	10.11	
							6.0	0.00	7.82	15.21	104.1	254.4	10.50	
							7.0	0.00	7.82	15.20	104.1	255.7	10.30	
							8.0	0.00	7.81	15.20	104.0	256.2	10.30	
							9.0	0.00	7.81	15.20	104.0	254.0	10.55	
							10.0	0.00	7.80	15.19	104.0	256.8	10.62	
							11.0	0.00	7.80	15.18	103.9	259.6	11.70	
							12.0	0.00	7.79	15.17	103.8	265.1	10.02	
							13.0	0.00	7.80	15.16	103.7	269.0	10.12	
							14.0	-0.01	7.79	15.12	103.5	280.3	9.27	
							15.0	-0.01	7.80	15.11	103.4	278.4	9.23	
							16.0	-0.01	7.79	15.10	103.3	283.1	8.70	
							17.0	-0.01	7.79	15.09	103.3	280.6	9.24	
							18.0	-0.01	7.79	15.08	103.2	282.2	9.12	
							19.0	-0.01	7.79	15.07	103.2	284.7	9.40	
Split Lake # 14	SPL-14	3-Apr-17	13:13	17.2	0.50	0.82	0.3	0.00	7.89	14.76	101.2	305.3	7.68	N/A
							1.0	-0.01	7.88	14.88	101.9	305.1	7.87	
							2.0	-0.01	7.88	14.94	102.3	304.7	8.20	
							3.0	-0.01	7.87	14.98	102.5	304.4	8.01	
							4.0	-0.01	7.86	15.00	102.7	304.5	7.99	
							5.0	-0.01	7.84	15.01	102.7	306.6	7.85	
							6.0	-0.01	7.83	15.01	102.7	306.6	7.83	
							7.0	-0.01	7.82	15.01	102.7	307.4	7.76	
							8.0	-0.01	7.81	15.01	102.7	306.7	8.02	
							9.0	-0.01	7.80	15.00	102.7	306.8	7.87	
							10.0	-0.01	7.80	15.00	102.7	308.0	7.73	
							11.0	-0.01	7.79	15.00	102.7	309.6	7.90	
							12.0	-0.01	7.79	14.99	102.6	310.6	7.77	
							13.0	-0.01	7.79	14.99	102.6	311.3	7.60	
							14.0	-0.01	7.78	14.98	102.5	311.5	7.76	
							15.0	-0.01	7.78	14.98	102.5	311.7	7.85	
							16.0	-0.01	7.78	14.98	102.5	312.4	7.71	
Nelson River Upstream # 6	US-6	5-Apr-17	11:10	3.1	0.40	1.00	0.3	-0.01	7.94	14.61	100.0	240.0	9.16	N/A
							1.0	-0.01	7.94	14.65	100.2	245.1	9.39	
							1.5	-0.01	7.93	14.66	100.3	247.8	9.33	
Nelson River Upstream # 8	US-8	5-Apr-17	10:40	3.0	0.45	1.20	0.3	-0.01	7.92	14.66	100.3	*198.1*	9.20	N/A
							1.0	-0.01	7.91	14.66	100.3	*199.0*	9.60	
							1.5	-0.01	7.91	14.66	100.3	*199.5*	9.81	
Nelson River Upstream # 9	US-9	5-Apr-17	11:45	3.5	0.48	1.05	0.3	-0.01	7.95	14.42	98.9	302.1	8.74	N/A
							1.0	-0.01	7.93	14.60	99.9	302.2	8.71	
							1.5	-0.01	7.92	14.63	100.1	302.3	8.86	
							2.0	-0.01	7.91	14.64	100.2	302.4	8.89	
							2.5	-0.01	7.91	14.64	100.2	302.3	8.96	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Nelson River Upstream # 10	US-10	5-Apr-17	8:45	3.5	0.48	1.20	0.3	0.00	7.86	14.24	97.7	301.7	8.95	N/A
							1.0	-0.01	7.81	14.49	99.2	301.9	9.11	
							1.5	-0.01	7.79	14.56	99.6	302.1	9.35	
							2.0	-0.01	7.75	14.58	99.8	302.2	9.33	
Nelson River Upstream # 11	US-11	5-Apr-17	9:39	4.6	0.33	1.30	0.3	-0.01	7.87	14.63	100.1	248.2	9.22	N/A
							1.0	-0.01	7.86	14.65	100.2	255.2	9.37	
							2.0	-0.01	7.85	14.65	100.2	254.9	9.48	
							3.0	-0.01	7.85	14.65	100.2	255.1	9.65	
Stephens Lake - Near-field # 1	NF-1	5-Apr-17	13:35	20.3	0.39	1.15	0.3	-0.01	7.97	14.20	97.7	299.7	9.47	N/A
							1.0	-0.01	7.96	14.62	100.1	298.7	9.51	
							2.0	-0.02	7.95	14.74	100.9	298.6	9.68	
							3.0	-0.02	7.94	14.77	101.1	298.5	9.53	
							4.0	-0.02	7.93	14.79	101.2	298.7	9.24	
							5.0	-0.02	7.93	14.79	101.2	298.2	9.44	
							6.0	-0.02	7.93	14.78	101.1	298.2	9.74	
							7.0	-0.02	7.93	14.77	101.1	298.4	11.35	
							8.0	-0.02	7.93	14.77	101.1	298.4	9.68	
							9.0	-0.02	7.93	14.77	101.0	298.5	9.91	
							10.0	-0.02	7.93	14.76	101.0	298.6	11.47	
							11.0	-0.02	7.92	14.75	100.9	298.6	9.91	
							12.0	-0.02	7.92	14.75	100.9	298.3	9.88	
							13.0	-0.02	7.92	14.74	100.9	298.6	9.86	
							14.0	-0.02	7.92	14.74	100.8	298.5	10.19	
							15.0	-0.02	7.92	14.74	100.8	298.5	11.14	
							16.0	-0.02	7.91	14.72	100.7	298.6	9.70	
							17.0	-0.02	7.91	14.72	100.7	298.8	9.71	
							18.0	-0.02	7.91	14.71	100.7	298.7	10.69	
							19.0	-0.02	7.91	14.71	100.7	298.8	9.95	
Stephens Lake - Near-field # 2	NF-2	5-Apr-17	15:00	11.4	0.25	1.20	0.3	0.01	7.95	14.72	100.8	298.9	10.06	N/A
							1.0	0.00	7.95	14.75	100.9	299.1	12.27	
							2.0	-0.01	7.94	14.76	101.0	299.1	13.41	
							3.0	-0.02	7.94	14.76	101.0	299.1	8.95	
							4.0	-0.02	7.94	14.76	101.0	299.3	9.86	
							5.0	-0.02	7.93	14.75	101.0	299.3	9.67	
							6.0	-0.02	7.93	14.75	100.9	299.4	9.97	
							7.0	-0.02	7.93	14.75	100.9	299.4	10.27	
							8.0	-0.02	7.93	14.74	100.9	299.3	10.06	
							9.0	-0.02	7.93	14.73	100.8	299.4	9.77	
							10.0	-0.02	7.92	14.73	100.8	299.4	9.81	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Near-field # 3	NF-3	5-Apr-17	14:20	19.4	0.45	0.98	0.3	-0.01	7.95	14.62	100.2	298.1	10.45	N/A
							1.0	-0.01	7.94	14.75	101.0	298.0	13.01	
							2.0	-0.01	7.94	14.77	101.1	298.2	9.65	
							3.0	-0.02	7.93	14.78	101.2	298.3	9.48	
							4.0	-0.02	7.93	14.79	101.2	298.2	9.74	
							5.0	-0.02	7.92	14.78	101.1	298.2	9.51	
							6.0	-0.02	7.92	14.78	101.1	298.3	11.79	
							7.0	-0.02	7.92	14.77	101.1	298.2	11.15	
							8.0	-0.02	7.92	14.77	101.0	298.3	9.46	
							9.0	-0.02	7.92	14.76	101.0	298.3	9.60	
							10.0	-0.02	7.91	14.76	101.1	298.3	10.30	
							11.0	-0.02	7.91	14.75	100.9	298.3	9.72	
							12.0	-0.02	7.91	14.75	100.9	298.3	10.01	
							13.0	-0.02	7.90	14.74	100.9	298.3	9.62	
							14.0	-0.02	7.90	14.74	100.8	298.4	11.03	
							15.0	-0.02	7.89	14.73	100.8	298.3	11.50	
							16.0	-0.02	7.89	14.72	100.7	298.3	10.21	
							17.0	-0.02	7.89	14.72	100.7	298.3	10.95	
							18.0	-0.02	7.88	14.72	100.7	298.3	11.89	
Stephens Lake - Near-field # 4	NF-4	5-Apr-17	15:35	5.7	0.60	0.88	0.3	0.00	7.98	14.50	99.6	299.5	9.52	N/A
							1.0	-0.01	7.96	14.65	100.3	299.5	9.47	
							2.0	-0.01	7.94	14.71	100.7	299.4	9.23	
							3.0	-0.01	7.93	14.72	100.7	299.5	9.82	
							4.0	-0.01	7.92	14.72	100.8	299.5	10.07	
							5.0	-0.02	7.93	14.72	100.8	299.4	9.71	
Stephens Lake - Near-field # 5	NF-5	5-Apr-17	13:10	18.9	0.58	1.10	0.3	-0.01	7.95	14.41	98.8	296.7	11.56	N/A
							1.0	-0.01	7.93	14.60	100.0	296.7	12.01	
							2.0	-0.01	7.92	14.66	100.4	296.7	11.24	
							3.0	-0.01	7.92	14.69	100.6	296.7	9.52	
							4.0	-0.01	7.92	14.73	100.8	296.7	9.42	
							5.0	-0.01	7.91	14.75	100.9	296.7	9.91	
							6.0	-0.02	7.90	14.75	100.9	296.7	9.99	
							7.0	-0.02	7.91	14.76	101.0	296.7	10.06	
							8.0	-0.02	7.91	14.75	101.0	296.7	9.41	
							9.0	-0.02	7.91	14.75	100.9	296.8	9.64	
							10.0	-0.02	7.91	14.75	100.9	296.7	9.84	
							11.0	-0.02	7.91	14.75	100.9	296.8	11.84	
							12.0	-0.02	7.91	14.75	100.9	296.8	12.23	
							13.0	-0.02	7.91	14.73	100.8	296.7	9.59	
							14.0	-0.02	7.91	14.73	100.0	296.8	9.76	
							15.0	-0.02	7.91	14.73	100.8	296.8	9.72	
							16.0	-0.02	7.91	14.72	100.7	296.8	9.79	
							17.0	-0.01	7.91	14.71	100.7	296.8	10.23	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Far-field # 1	FF-1	6-Apr-17	8:35	22.0	0.77	1.10	0.3	0.23	8.05	14.10	97.1	291.6	9.26	N/A
							1.0	0.02	7.96	14.39	98.7	295.2	9.23	
							2.0	0.00	7.92	14.49	99.2	295.2	9.44	
							3.0	0.00	7.91	14.53	99.5	295.2	9.54	
							4.0	0.00	7.91	14.55	99.6	295.2	9.02	
							5.0	0.00	7.90	14.55	99.6	295.2	9.02	
							6.0	0.00	7.90	14.55	99.6	295.2	10.10	
							7.0	0.00	7.90	14.56	99.6	295.2	9.16	
							8.0	-0.01	7.90	14.56	99.7	295.2	8.64	
							9.0	0.00	7.90	14.57	99.7	295.3	9.37	
							10.0	-0.01	7.90	14.58	99.8	295.4	9.32	
							11.0	-0.01	7.90	14.58	99.8	295.3	9.06	
							12.0	-0.01	7.90	14.58	99.8	295.4	9.00	
							13.0	-0.01	7.90	14.57	99.7	295.3	9.12	
							14.0	-0.01	7.90	14.57	99.7	295.3	8.70	
							15.0	-0.01	7.91	14.57	99.7	295.3	9.42	
							16.0	-0.01	7.90	14.56	99.6	295.3	9.31	
							17.0	-0.01	7.90	14.56	99.6	295.4	9.18	
							18.0	-0.01	7.91	14.55	99.6	295.3	10.90	
							19.0	-0.01	7.91	14.56	99.6	295.4	8.90	
							20.0	-0.01	7.91	14.55	99.6	295.4	9.17	
							21.0	-0.01	7.91	14.55	99.6	295.4	9.30	
Stephens Lake - Far-field # 2	FF-2	6-Apr-17	10:00	15.8	0.37	1.05	0.3	-0.01	7.96	14.70	100.6	276.9	9.23	N/A
							1.0	-0.01	7.95	14.71	100.7	276.6	9.18	
							2.0	-0.01	7.92	14.72	100.8	276.8	9.14	
							3.0	-0.01	7.91	14.72	100.8	277.1	10.56	
							4.0	-0.01	7.91	14.72	100.7	277.3	9.77	
							5.0	-0.01	7.90	14.72	100.7	277.9	9.40	
							6.0	-0.01	7.90	14.72	100.7	278.1	9.33	
							7.0	-0.01	7.90	14.71	100.7	278.5	9.44	
							8.0	-0.01	7.90	14.70	100.6	279.0	9.02	
							9.0	-0.01	7.89	14.70	100.6	278.8	9.13	
							10.0	-0.01	7.89	14.69	100.5	279.0	9.54	
							11.0	-0.01	7.89	14.69	100.5	280.3	9.30	
							12.0	-0.01	7.89	14.68	100.5	280.6	9.09	
							13.0	-0.01	7.89	14.68	100.4	280.8	9.47	
							14.0	-0.01	7.88	14.68	100.4	281.2	8.84	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Far-field # 3	FF-3	6-Apr-17	11:15	26.9	0.45	1.10	0.3	-0.01	7.98	14.60	100.0	297.9	10.31	N/A
							1.0	-0.01	7.97	14.66	100.4	297.9	10.18	
							2.0	-0.01	7.97	14.68	100.5	297.9	9.43	
							3.0	-0.01	7.96	14.72	100.8	297.9	9.46	
							4.0	-0.01	7.96	14.73	100.8	297.9	9.57	
							5.0	-0.01	7.95	14.73	100.8	298.0	9.13	
							6.0	-0.01	7.94	14.74	100.9	297.9	9.30	
							7.0	-0.01	7.94	14.74	100.9	298.0	9.35	
							8.0	-0.01	7.93	14.74	100.9	298.0	9.54	
							9.0	-0.01	7.93	14.73	100.8	298.0	9.80	
							10.0	-0.01	7.92	14.73	100.8	298.0	9.77	
							11.0	-0.01	7.92	14.73	100.8	298.1	9.62	
							12.0	-0.01	7.91	14.72	100.7	298.1	9.85	
							13.0	-0.01	7.92	14.71	100.7	298.1	9.66	
							14.0	-0.01	7.91	14.71	100.7	298.1	9.72	
							15.0	-0.01	7.90	14.70	100.6	298.1	9.77	
							16.0	-0.01	7.90	14.69	100.6	298.2	9.71	
							17.0	-0.01	7.89	14.69	100.5	298.3	9.38	
							18.0	-0.01	7.89	14.68	100.5	298.2	9.45	
							19.0	-0.01	7.89	14.68	100.5	298.2	9.31	
							20.0	-0.01	7.89	14.67	100.4	298.2	9.90	
							22.0	-0.01	7.88	14.66	100.3	298.3	9.64	
							24.0	-0.01	7.88	14.65	100.3	298.3	9.28	
Stephens Lake - Far-field # 4	FF-4	6-Apr-17	10:34	13.7	0.40	0.96	0.3	-0.01	7.97	14.70	100.7	297.3	8.55	N/A
							1.0	-0.01	7.96	14.72	100.8	297.3	9.98	
							2.0	-0.01	7.96	14.73	100.9	297.3	10.21	
							3.0	-0.01	7.95	14.74	100.9	297.4	9.10	
							4.0	-0.01	7.94	14.75	100.9	297.4	9.35	
							5.0	-0.01	7.94	14.75	100.9	297.4	9.10	
							6.0	-0.01	7.93	14.74	100.9	297.4	9.39	
							7.0	-0.01	7.93	14.74	100.9	297.4	10.84	
							8.0	-0.01	7.92	14.73	100.8	297.4	9.92	
							9.0	-0.01	7.92	14.73	100.8	297.4	9.36	
							10.0	-0.01	7.91	14.72	100.7	297.4	9.70	
							11.0	-0.01	7.91	14.71	100.7	297.4	9.14	
							12.0	-0.01	7.91	14.71	100.7	297.4	9.84	
Stephens Lake - Far-field # 5	FF-5	6-Apr-17	9:30	12.0	0.50	0.96	0.3	-0.01	8.08	14.67	100.4	*250.8*	9.68	N/A
							1.0	-0.01	7.94	14.70	100.6	*250.8*	8.72	
							2.0	-0.01	7.92	14.71	100.7	*249.0*	8.97	
							3.0	-0.01	7.92	14.71	100.6	*249.4*	9.15	
							4.0	-0.01	7.91	14.70	100.6	*249.9*	9.09	
							5.0	-0.01	7.90	14.70	100.6	*249.6*	9.35	
							6.0	-0.01	7.90	14.70	100.6	*254.8*	9.13	
							7.0	-0.01	7.90	14.70	100.6	*252.7*	9.30	
							8.0	-0.01	7.90	14.69	100.5	*251.8*	9.29	
							9.0	-0.01	7.90	14.68	100.5	*255.9*	9.16	
							10.0	-0.01	7.90	14.68	100.4	*256.4*	9.34	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Clark Lake # 1	CL-1	26-Jun-17	11:25	12.7	N/A	N/A	0.3	15.08	8.12	9.79	97.4	312.9	26.71	0.35
							1.0	15.05	8.11	9.80	97.4	313.5	26.63	
							2.0	15.04	8.09	9.80	97.4	314.7	27.17	
							3.0	15.03	8.06	9.80	97.3	315.5	27.02	
							4.0	15.04	8.05	9.80	97.3	316.3	26.65	
							5.0	15.04	8.02	9.79	97.2	316.6	26.34	
							6.0	15.03	8.01	9.78	97.1	316.4	27.27	
							7.0	15.03	8.00	9.77	97.1	316.6	26.94	
							8.0	15.03	7.98	9.77	97.0	317.0	26.44	
							9.0	15.03	7.97	9.76	96.9	317.0	26.72	
							10.0	15.03	7.97	9.75	96.8	317.0	26.64	
							11.0	15.03	7.96	9.74	96.7	316.8	26.89	
Clark Lake # 2	CL-2	26-Jun-17	11:54	14.2	N/A	N/A	0.3	15.11	8.17	9.81	97.6	315.8	26.37	0.35
							1.0	15.08	8.15	9.78	97.3	315.8	26.52	
							2.0	15.06	8.13	9.79	97.3	315.8	26.55	
							3.0	15.05	8.12	9.79	97.3	315.8	27.04	
							4.0	15.05	8.11	9.79	97.2	316.3	27.18	
							5.0	15.05	8.09	9.78	97.2	315.8	26.50	
							6.0	15.05	8.07	9.77	97.1	315.7	26.84	
							7.0	15.05	8.07	9.76	97.0	315.6	26.89	
							8.0	15.05	8.06	9.75	96.9	315.8	26.74	
							9.0	15.05	8.06	9.75	96.9	315.2	26.32	
							10.0	15.06	8.06	9.73	96.7	314.7	26.81	
							11.0	15.05	8.06	9.73	96.7	315.7	26.78	
							12.0	15.05	8.06	9.72	96.6	315.8	26.50	
Clark Lake # 3	CL-3	26-Jun-17	12:55	8.1	N/A	N/A	0.3	15.13	8.21	9.81	97.6	322.3	26.66	0.35
							1.0	15.11	8.19	9.81	97.6	322.4	26.51	
							2.0	15.08	8.19	9.80	97.5	322.4	26.68	
							3.0	15.09	8.18	9.80	97.5	322.5	26.49	
							4.0	15.09	8.17	9.79	97.3	322.7	26.48	
							5.0	15.08	8.16	9.78	97.3	322.7	26.66	
							6.0	15.08	8.15	9.77	97.2	322.6	26.62	
							7.0	15.08	8.14	9.77	97.1	322.6	26.52	
							8.0	15.08	8.14	9.76	97.0	322.6	26.84	
Clark Lake # 4	CL-4	26-Jun-17	12:20	7.4	N/A	N/A	0.3	15.13	8.20	9.27	92.3	276.1	22.15	0.35
							1.0	15.11	8.17	9.42	93.8	281.3	23.78	
							2.0	15.17	8.17	9.51	94.8	295.0	24.91	
							3.0	15.15	8.17	9.59	95.5	300.0	24.61	
							4.0	15.16	8.15	9.59	95.5	299.6	25.78	
							5.0	15.14	8.13	9.63	95.9	302.7	26.41	
							6.0	15.14	8.12	9.65	96.1	304.4	25.97	
							7.0	15.14	8.10	9.65	96.1	304.4	26.15	
Clark Lake # 5	CL-5	26-Jun-17	12:25	8.9	N/A	N/A	0.3	15.23	8.18	9.60	95.7	296.0	24.57	0.35
							1.0	15.21	8.13	9.64	96.1	294.4	24.08	
							2.0	15.16	8.14	9.66	96.2	301.4	24.22	
							3.0	15.17	8.12	9.69	96.5	305.5	25.40	
							4.0	15.15	8.10	9.70	96.6	311.2	26.55	
							5.0	15.13	8.09	9.74	96.9	310.1	26.22	
							6.0	15.15	8.08	9.70	96.6	307.8	26.88	
							7.0	15.14	8.08	9.72	96.7	310.1	26.67	
							8.0	15.13	8.08	9.71	96.7	311.0	27.70	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Nelson River Upstream # 1	US-1	27-Jun-17	12:40	12.6	N/A	N/A	0.3	15.04	7.85	9.73	96.7	318.5	26.53	N/A
							1.0	15.04	7.96	9.73	96.6	318.6	25.66	
							2.0	15.04	7.93	9.74	96.7	318.7	25.80	
							3.0	15.04	7.88	9.73	96.7	318.6	25.87	
							4.0	15.04	7.83	9.73	96.7	318.7	25.80	
							5.0	15.04	7.81	9.73	96.7	318.7	25.81	
							6.0	15.05	7.81	9.73	96.6	318.8	25.80	
							7.0	15.04	7.81	9.71	96.5	318.8	26.01	
Nelson River Upstream # 2	US-2	27-Jun-17	13:07	12.9	N/A	N/A	0.3	15.05	7.90	9.79	97.3	318.6	26.25	N/A
							1.0	15.05	7.91	9.79	97.2	318.6	25.92	
							2.0	15.05	7.91	9.78	97.1	318.7	25.98	
							3.0	15.05	7.92	9.77	97.0	318.8	25.85	
							4.0	15.05	7.93	9.76	96.9	318.8	25.93	
							5.0	15.05	7.93	9.74	96.8	318.7	26.01	
							6.0	15.05	7.94	9.74	96.8	318.9	26.03	
							7.0	15.06	7.94	9.73	96.7	318.9	25.97	
							8.0	15.06	7.95	9.72	96.6	318.9	25.82	
Nelson River Upstream # 3	US-3	27-Jun-17	14:01	11.2	N/A	N/A	0.3	15.07	8.12	9.87	98.0	319.0	26.61	N/A
							1.0	15.08	8.11	9.83	97.8	319.3	25.96	
							2.0	15.08	8.11	9.82	97.6	319.3	26.10	
							3.0	15.08	8.11	9.80	97.4	319.2	25.72	
							4.0	15.08	8.12	9.78	97.3	319.3	25.73	
							5.0	15.08	8.13	9.77	97.1	319.5	25.99	
							6.0	15.08	8.14	9.75	96.9	319.4	25.93	
							7.0	15.08	8.15	9.74	96.8	319.4	26.08	
							8.0	15.08	8.16	9.72	96.6	319.4	26.37	
							9.0	15.08	8.17	9.71	96.5	319.4	26.30	
							10.0	15.08	8.18	9.71	96.5	319.5	26.47	
Nelson River Upstream # 4	US-4	27-Jun-17	14:21	13.0	N/A	N/A	0.3	15.05	8.22	9.86	97.9	318.6	25.75	N/A
							1.0	15.06	8.20	9.83	97.7	318.7	25.50	
							2.0	15.06	8.20	9.81	97.4	318.7	25.69	
							3.0	15.06	8.20	9.79	97.3	318.6	25.92	
							4.0	15.06	8.22	9.75	97.0	318.6	25.72	
							5.0	15.06	8.22	9.75	96.9	318.7	25.63	
							6.0	15.06	8.23	9.74	96.8	318.6	25.77	
							7.0	15.06	8.23	9.72	96.6	318.6	25.90	
							8.0	15.06	8.24	9.71	96.5	318.7	25.93	
Nelson River Upstream # 5	US-5	27-Jun-17	13:30	12.9	N/A	N/A	0.3	15.06	7.89	9.84	97.8	320.1	26.48	N/A
							1.0	15.07	7.90	9.80	97.4	319.9	25.95	
							2.0	15.07	7.91	9.80	97.4	320.0	26.24	
							3.0	15.07	7.92	9.79	97.3	320.1	26.21	
							4.0	15.06	7.93	9.77	97.1	320.6	25.80	
							5.0	15.06	7.95	9.75	96.9	320.5	26.09	
							6.0	15.06	7.96	9.74	96.8	320.7	26.52	
							7.0	15.06	7.98	9.72	96.6	320.7	26.49	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Near-field # 1	NF-1	29-Jun-17	10:45	21.5	N/A	N/A	0.3	14.32	8.24	10.26	100.3	321.1	29.51	0.40
							1.0	14.32	8.25	10.25	100.2	321.2	28.56	
							2.0	14.31	8.25	10.24	100.1	321.2	28.73	
							3.0	14.31	8.25	10.23	100.0	321.2	29.24	
							4.0	14.31	8.25	10.21	99.8	321.2	29.16	
							5.0	14.31	8.25	10.20	99.8	321.2	28.76	
							6.0	14.31	8.25	10.19	99.6	321.2	28.99	
							7.0	14.31	8.25	10.18	99.5	321.3	29.37	
							8.0	14.31	8.25	10.17	99.4	321.2	29.20	
							9.0	14.31	8.25	10.16	99.3	321.2	29.23	
							10.0	14.31	8.25	10.15	99.2	321.2	29.74	
							11.0	14.31	8.26	10.14	99.1	321.2	29.17	
							12.0	14.31	8.25	10.13	99.0	321.3	29.24	
							13.0	14.31	8.25	10.12	99.0	321.3	29.00	
							14.0	14.31	8.25	10.12	98.9	321.3	30.11	
							15.0	14.31	8.25	10.10	98.8	321.3	28.95	
							16.0	14.31	8.26	10.09	98.7	321.3	29.77	
							17.0	14.31	8.26	10.08	98.6	321.4	29.98	
							18.0	14.31	8.25	10.08	98.5	321.4	29.65	
							19.0	14.31	8.25	10.07	98.4	321.4	29.77	
Stephens Lake - Near-field # 2	NF-2	29-Jun-17	9:15	11.9	N/A	N/A	0.3	14.29	8.04	10.14	99.1	322.9	28.06	0.40
							1.0	14.28	8.18	10.14	99.1	322.8	27.44	
							2.0	14.30	8.20	10.14	99.1	322.9	27.65	
							3.0	14.302	8.19	10.13	99.0	322.9	28.86	
							4.0	14.30	8.19	10.12	99.0	322.9	28.25	
							5.0	14.30	8.19	10.12	98.9	322.9	28.71	
							6.0	14.30	8.19	10.11	98.8	322.9	27.67	
							7.0	14.30	8.18	10.10	98.7	322.9	28.52	
							8.0	14.28	8.17	10.08	98.5	323.1	28.64	
							9.0	14.29	8.17	10.07	98.4	323.0	29.75	
							10.0	14.27	8.16	10.05	98.2	323.1	29.18	
							11.0	14.28	8.15	10.04	98.1	323.1	30.04	
Stephens Lake - Near-field # 3	NF-3	29-Jun-17	10:25	20.5	N/A	N/A	0.3	14.32	8.13	10.27	100.4	321.2	28.34	0.43
							1.0	14.32	8.14	10.25	100.3	321.4	29.94	
							2.0	14.32	8.14	10.24	100.1	321.4	28.35	
							3.0	14.32	8.15	10.23	100.1	321.5	28.00	
							4.0	14.32	8.16	10.22	100.0	321.5	28.62	
							5.0	14.32	8.16	10.22	99.9	321.4	28.29	
							6.0	14.32	8.17	10.20	99.8	321.5	28.26	
							7.0	14.32	8.17	10.18	99.6	321.5	28.71	
							8.0	14.32	8.18	10.18	99.5	321.4	28.85	
							9.0	14.32	8.18	10.17	99.4	321.3	29.11	
							10.0	14.32	8.19	10.15	99.3	321.3	29.03	
							11.0	14.32	8.19	10.15	99.2	321.4	28.88	
							12.0	14.32	8.19	10.13	99.1	321.3	29.11	
							13.0	14.33	8.20	10.12	99.0	321.5	29.12	
							14.0	14.32	8.20	10.11	98.9	321.4	26.47	
							15.0	14.32	8.20	10.10	98.8	321.4	29.33	
							16.0	14.32	8.20	10.09	98.7	321.5	29.46	
							17.0	14.32	8.20	10.09	98.7	321.5	29.99	
							18.0	14.33	8.21	10.08	98.5	321.4	30.51	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Near-field # 4	NF-4	29-Jun-17	9:45	6.8	N/A	N/A	0.3	14.29	7.83	10.11	98.8	322.6	26.13	0.40
							1.0	14.29	7.85	10.10	98.7	322.6	27.10	
							2.0	14.29	7.86	10.08	98.5	322.7	29.20	
							3.0	14.29	7.87	10.07	98.4	322.7	25.32	
							4.0	14.29	7.90	10.06	98.4	322.7	26.85	
							5.0	14.29	7.91	10.06	98.3	322.6	25.85	
							6.0	14.30	7.92	10.04	98.1	322.7	23.48	
Stephens Lake - Near-field # 5	NF-5	29-Jun-17	11:15	19.7	N/A	N/A	0.3	14.32	8.27	10.24	100.1	320.8	29.36	0.40
							1.0	14.32	8.26	10.23	100.0	320.8	27.10	
							2.0	14.32	8.26	10.21	99.8	320.8	29.76	
							3.0	14.31	8.26	10.19	99.6	320.8	29.06	
							4.0	14.31	8.26	10.19	99.6	320.8	28.62	
							5.0	14.31	8.26	10.18	99.5	320.9	29.03	
							6.0	14.29	8.26	10.16	99.3	320.9	24.54	
							7.0	14.29	8.26	10.15	99.2	320.9	32.11	
							8.0	14.28	8.26	10.13	99.0	320.8	31.25	
							9.0	14.28	8.26	10.12	98.9	320.9	30.00	
							10.0	14.28	8.26	10.11	98.8	320.9	28.77	
							11.0	14.28	8.26	10.10	98.7	320.9	26.00	
							12.0	14.28	8.26	10.09	98.6	320.8	29.78	
							13.0	14.28	8.26	10.08	98.5	320.9	28.33	
							14.0	14.28	8.26	10.06	98.3	320.9	31.63	
							15.0	14.28	8.26	10.06	98.2	320.9	30.42	
							16.0	14.28	8.26	10.05	98.2	320.8	26.69	
							17.0	14.28	8.26	10.04	98.1	320.9	30.72	
							18.0	14.28	8.26	10.03	98.0	320.9	29.09	
Stephens Lake - Far-field # 1	FF-1	2-Jul-17	9:30	23.5	N/A	N/A	0.3	13.83	7.85	10.10	97.8	317.7	23.64	0.35
							1.0	13.84	7.87	10.11	97.8	317.7	24.14	
							2.0	13.81	7.83	10.09	97.6	317.9	24.89	
							3.0	13.78	7.80	10.07	97.3	318.0	23.99	
							4.0	13.81	7.77	10.07	97.4	317.9	24.84	
							5.0	13.79	7.75	10.06	97.2	318.0	24.82	
							6.0	13.76	7.72	10.04	97.8	318.2	24.41	
							7.0	13.75	7.71	10.03	96.8	318.3	25.80	
							8.0	13.75	7.71	10.02	96.7	318.4	25.64	
							9.0	13.76	7.71	10.01	96.7	318.4	25.55	
							10.0	13.74	7.70	10.00	96.5	318.5	26.14	
							11.0	13.75	7.70	9.99	96.5	318.4	25.29	
							12.0	13.73	7.70	9.98	96.3	318.6	24.38	
							13.0	13.71	7.70	9.97	96.2	318.8	26.53	
							14.0	13.69	7.70	9.97	96.1	319.1	25.96	
							15.0	13.69	7.70	9.96	96.1	319.0	24.94	
							16.0	13.70	7.70	9.95	96.0	318.9	25.41	
							17.0	13.70	7.70	9.94	95.9	318.9	28.53	
							18.0	13.68	7.70	9.93	95.8	319.2	25.59	
							19.0	13.68	7.70	9.93	95.7	319.3	22.23	
							20.0	13.67	7.70	9.92	95.6	319.4	23.64	
							22.0	13.67	7.70	9.91	95.5	319.5	24.55	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Far-field # 2	FF-2	2-Jul-17	10:15	12.4	N/A	N/A	0.3	14.00	7.93	10.26	99.7	324.9	19.99	0.35
							1.0	14.00	7.95	10.26	99.6	325.0	25.07	
							2.0	13.97	7.96	10.25	99.5	325.0	26.05	
							3.0	13.97	7.97	10.24	99.3	325.0	26.92	
							4.0	13.90	7.97	10.19	98.7	325.0	25.95	
							5.0	13.88	7.97	10.17	98.5	324.9	27.32	
							6.0	13.87	7.98	10.15	98.3	324.9	26.47	
							7.0	13.87	7.98	10.13	98.1	324.9	26.26	
							8.0	13.88	7.99	10.12	98.0	324.9	26.87	
							9.0	13.88	7.99	10.12	98.0	325.0	26.11	
							10.0	13.88	7.99	10.10	97.8	325.0	26.15	
							11.0	13.87	8.00	10.09	97.7	324.9	24.96	
							12.0	13.87	8.00	10.08	97.6	325.0	26.74	
							13.0	13.87	8.00	10.07	97.5	324.9	26.80	
							14.0	13.87	8.01	10.06	97.4	325.0	26.97	
							15.0	13.87	8.01	10.05	97.3	325.0	26.53	
Stephens Lake - Far-field # 3	FF-3	2-Jul-17	10:55	27.2	N/A	N/A	0.3	14.03	8.23	10.33	100.4	325.1	24.67	0.35
							1.0	14.00	8.20	10.31	100.1	325.2	24.66	
							2.0	14.03	8.20	10.31	100.2	325.2	26.14	
							3.0	13.97	8.19	10.28	100.0	325.2	24.03	
							4.0	13.97	8.19	10.27	99.7	325.2	25.56	
							5.0	13.94	8.19	10.24	99.3	325.1	25.80	
							6.0	13.92	8.19	10.22	99.0	325.2	25.80	
							7.0	13.88	8.19	10.19	98.7	325.2	25.60	
							8.0	13.84	8.19	10.17	98.4	325.4	26.21	
							9.0	13.85	8.19	10.15	98.3	325.3	25.66	
							10.0	13.84	8.19	10.14	98.2	325.3	24.90	
							11.0	13.83	8.19	10.13	98.0	325.5	26.80	
							12.0	13.83	8.19	10.12	97.9	325.4	26.69	
							13.0	13.84	8.19	10.11	97.9	325.3	26.97	
							14.0	13.83	8.19	10.11	97.8	325.4	26.32	
							15.0	13.83	8.19	10.10	97.7	325.4	26.56	
							16.0	13.83	8.20	10.09	97.6	325.4	27.01	
							17.0	13.82	8.20	10.08	97.5	325.4	26.78	
							18.0	13.82	8.20	10.07	97.4	325.5	24.14	
							19.0	13.83	8.20	10.06	97.4	325.5	26.17	
							20.0	13.83	8.20	10.06	97.3	325.5	26.78	
							22.0	13.83	8.20	10.04	97.1	325.5	26.75	
							24.0	13.83	8.20	10.03	97.0	325.5	27.24	
							26.0	13.83	8.20	10.01	96.9	325.5	27.49	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Far-field # 4	FF-4	2-Jul-17	10:32	15.5	N/A	N/A	0.3	14.12	8.09	10.33	100.6	325.1	23.89	0.40
							1.0	14.10	8.09	10.32	100.5	325.2	24.17	
							2.0	14.10	8.09	10.30	100.2	325.3	24.15	
							3.0	14.06	8.10	10.27	99.9	325.2	25.91	
							4.0	14.05	8.10	10.26	99.7	325.1	22.68	
							5.0	14.01	8.10	10.22	99.3	325.3	25.21	
							6.0	13.96	8.10	10.19	98.9	325.2	25.32	
							7.0	13.96	8.10	10.17	98.7	325.2	27.19	
							8.0	13.94	8.10	10.15	98.5	325.3	25.58	
							9.0	13.93	8.10	10.14	98.3	325.3	26.45	
							10.0	13.93	8.11	10.12	98.1	325.3	26.06	
							11.0	13.93	8.11	10.10	97.9	325.3	26.72	
							12.0	13.92	8.11	10.09	97.8	325.3	24.77	
							13.0	13.92	8.11	10.08	97.7	325.3	25.15	
							14.0	13.92	8.11	10.07	97.6	325.2	25.65	
Stephens Lake - Far-field # 5	FF-5	2-Jul-17	9:55	13.3	N/A	N/A	0.3	13.77	7.74	10.20	98.6	319.8	24.56	0.35
							1.0	13.76	7.80	10.19	98.4	319.9	24.98	
							2.0	13.74	7.87	10.18	98.2	319.9	24.21	
							3.0	13.73	7.83	10.16	98.1	319.9	25.42	
							4.0	13.71	7.84	10.13	97.7	320.4	25.81	
							5.0	13.66	7.85	10.11	97.4	320.9	26.07	
							6.0	13.65	7.85	10.10	97.3	321.1	26.97	
							7.0	13.65	7.86	10.09	97.2	321.2	26.31	
							8.0	13.65	7.86	10.08	97.1	321.3	26.88	
							9.0	13.64	7.86	10.07	97.0	321.6	26.73	
							10.0	13.64	7.87	10.06	96.9	321.5	27.84	
							11.0	13.64	7.87	10.04	96.7	322.0	28.40	
							12.0	13.64	7.87	10.03	96.6	322.0	27.73	
Clark Lake # 1	CL-1	24-Jul-17	10:45	12.6	N/A	N/A	0.3	19.25	8.25	9.40	101.9	333.2	30.74	0.38
							1.0	19.24	8.20	9.40	101.9	332.3	30.79	
							2.0	19.24	8.18	9.39	101.9	334.2	31.11	
							3.0	19.24	8.16	9.40	101.8	338.8	30.69	
							4.0	19.24	8.16	9.39	101.8	339.0	30.52	
							5.0	19.24	8.16	9.80	101.7	338.9	31.09	
							6.0	19.24	8.16	9.37	101.6	339.1	29.15	
							7.0	19.24	8.19	9.37	101.6	341.5	29.36	
							8.0	19.24	8.19	9.36	101.5	341.5	30.25	
							9.0	19.24	8.20	9.35	101.4	339.7	30.75	
							10.0	19.24	8.19	9.35	101.4	341.5	26.90	
							11.0	19.24	8.20	9.34	101.3	340.8	30.30	
							12.0	19.24	8.20	9.33	101.2	340.0	30.87	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Clark Lake # 2	CL-2	24-Jul-17	11:20	13.3	N/A	N/A	0.3	19.29	8.25	9.42	102.3	340.7	29.54	0.28
							1.0	19.30	8.24	9.42	102.2	339.0	30.64	
							2.0	19.26	8.23	9.41	102.0	340.3	30.74	
							3.0	19.25	8.23	9.39	101.9	339.7	30.70	
							4.0	19.26	8.23	9.38	101.8	336.8	30.87	
							5.0	19.25	8.22	9.37	101.6	335.7	30.77	
							6.0	19.25	8.22	9.36	101.5	336.6	31.21	
							7.0	19.25	8.22	9.36	101.5	335.0	31.04	
							8.0	19.25	8.22	9.35	101.4	334.5	30.74	
							9.0	19.25	8.22	9.34	101.3	335.3	30.70	
							10.0	19.25	8.22	9.34	101.3	337.4	30.65	
							11.0	19.25	8.22	9.33	101.1	336.2	30.20	
							12.0	19.25	8.22	9.32	101.1	336.3	29.92	
Clark Lake # 3	CL-3	24-Jul-17	11:55	10.2	N/A	N/A	0.3	19.33	8.36	9.39	102.0	344.2	29.33	0.35
							1.0	19.28	8.30	9.39	101.9	344.3	29.57	
							2.0	19.29	8.26	9.39	101.9	344.2	29.94	
							3.0	19.28	8.22	9.39	101.9	344.2	29.65	
							4.0	19.28	8.21	9.39	101.9	344.2	29.89	
							5.0	19.28	8.18	9.37	101.8	344.1	29.48	
							6.0	19.28	8.16	9.37	101.7	344.1	29.54	
							7.0	19.28	8.15	9.37	101.7	344.1	29.45	
							8.0	19.28	8.14	9.36	101.6	344.0	29.50	
							9.0	19.28	8.11	9.35	101.5	343.9	29.53	
Clark Lake # 4	CL-4	24-Jul-17	9:20	8.4	N/A	N/A	0.3	19.19	8.22	9.38	101.5	322.9	32.59	0.38
							1.0	19.19	8.21	9.40	101.8	333.0	31.16	
							2.0	19.19	8.17	9.39	101.7	332.8	30.94	
							3.0	19.19	8.16	9.39	101.7	333.3	31.14	
							4.0	19.19	8.17	9.38	101.6	330.5	32.10	
							5.0	19.19	8.18	9.38	101.4	329.1	31.67	
							6.0	19.20	8.19	9.36	101.4	331.9	31.45	
							7.0	19.19	8.19	9.34	101.2	330.6	31.17	
							8.0	19.19	8.20	9.34	101.1	330.4	30.98	
Clark Lake # 5	CL-5	24-Jul-17	10:00	8.7	N/A	N/A	0.3	19.17	8.10	9.27	100.2	314.8	29.11	0.50
							1.0	19.13	8.10	9.23	99.9	313.0	30.02	
							2.0	19.13	8.11	9.20	99.5	310.0	29.52	
							3.0	19.15	8.13	9.25	100.1	317.2	30.97	
							4.0	19.19	8.16	9.31	100.8	324.1	31.19	
							5.0	19.21	8.17	9.31	100.9	325.9	31.36	
							6.0	19.22	8.17	9.30	100.8	322.6	30.81	
							7.0	19.21	8.18	9.31	100.8	326.5	31.51	
							8.0	19.21	8.18	9.30	100.8	327.4	31.32	
Nelson River Upstream # 1	US-1	25-Jul-17	13:20	12.6	N/A	N/A	0.4	19.37	8.07	9.17	99.7	338.0	29.48	N/A
							1.0	19.38	8.07	9.17	99.6	338.0	29.78	
							2.0	19.37	8.08	9.15	99.5	338.0	29.89	
							3.0	19.37	8.08	9.15	99.4	338.0	29.88	
Nelson River Upstream # 2	US-2	25-Jul-17	14:55	13.1	N/A	N/A	0.3	19.49	8.21	9.17	99.9	337.4	30.12	N/A
Nelson River Upstream # 3	US-3	25-Jul-17	14:20	10.9	N/A	N/A	0.3	19.48	8.13	9.18	100.0	337.6	29.87	N/A
Nelson River Upstream # 4	US-4	25-Jul-17	13:50	12.3	N/A	N/A	0.3	19.43	7.92	9.15	99.6	337.5	29.51	N/A
Nelson River Upstream # 5	US-5	25-Jul-17	15:30	8.6	N/A	N/A	0.3	19.53	8.26	9.19	100.2	339.1	29.58	N/A

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Near-field # 1	NF-1	26-Jul-17	10:00	20.6	N/A	N/A	0.3	19.55	8.34	9.32	101.7	339.9	28.88	0.40
							1.0	19.55	8.33	9.31	101.5	339.8	28.67	
							2.0	19.53	8.32	9.29	101.3	340.0	28.97	
							3.0	19.52	8.32	9.28	101.1	340.0	31.78	
							4.0	19.52	8.32	9.29	101.0	340.1	29.55	
							5.0	19.51	8.32	9.25	100.8	340.4	29.51	
							6.0	19.51	8.32	9.24	100.7	340.3	29.16	
							7.0	19.51	8.32	9.23	100.7	340.3	29.34	
							8.0	19.51	8.31	9.22	100.5	340.4	29.31	
							9.0	19.51	8.31	9.21	100.4	340.7	29.44	
							10.0	19.51	8.27	9.21	100.4	340.4	28.78	
							11.0	19.51	8.30	9.20	100.6	340.7	29.55	
							12.0	19.51	8.31	9.19	100.2	340.7	28.30	
							13.0	19.51	8.31	9.18	100.1	340.6	29.95	
							14.0	19.51	8.31	9.18	100.0	340.7	28.92	
							15.0	19.52	8.31	9.17	100.0	340.6	29.80	
							16.0	19.51	8.31	9.16	99.9	340.7	29.62	
							17.0	19.51	8.31	9.16	99.8	340.7	29.07	
							18.0	19.51	8.31	9.14	99.7	340.8	29.86	
Stephens Lake - Near-field # 2	NF-2	26-Jul-17	11:45	11.6	N/A	N/A	0.3	19.59	8.36	9.34	102.0	341.8	27.16	0.43
							1.0	19.54	8.34	9.32	101.7	341.7	28.06	
							2.0	19.52	8.32	9.30	101.3	341.7	28.07	
							3.0	19.49	8.32	9.27	101.1	341.6	28.70	
							4.0	19.48	8.33	9.25	100.8	341.5	30.86	
							5.0	19.48	8.32	9.24	100.7	341.5	28.68	
							6.0	19.48	8.33	9.23	100.6	341.5	29.46	
							7.0	19.48	8.33	9.22	100.5	341.5	28.70	
							8.0	19.48	8.32	9.21	100.4	341.4	28.96	
							9.0	19.48	8.32	9.20	100.2	341.5	29.64	
							10.0	19.47	8.32	9.19	100.1	341.5	29.60	
							11.0	19.47	8.31	9.18	100.0	341.5	29.81	
Stephens Lake - Near-field # 3	NF-3	26-Jul-17	10:55	19.4	N/A	N/A	0.3	19.55	8.31	9.33	101.8	340.4	29.18	0.40
							1.0	19.55	8.31	9.33	101.8	340.2	18.58	
							2.0	19.53	8.31	9.30	101.5	340.3	18.86	
							3.0	19.52	8.31	9.29	101.6	340.5	19.19	
							4.0	19.53	8.31	9.28	101.2	340.5	18.96	
							5.0	19.52	8.31	9.27	101.1	340.6	30.42	
							6.0	19.52	8.31	9.26	100.9	340.7	31.97	
							7.0	19.51	8.32	9.25	100.8	340.8	31.20	
							8.0	19.51	8.31	9.24	100.7	340.7	30.36	
							9.0	19.51	8.31	9.23	100.6	340.8	28.70	
							10.0	19.51	8.31	9.22	100.5	340.8	27.18	
							11.0	19.51	8.32	9.21	100.4	340.8	29.05	
							12.0	19.51	8.31	9.20	100.3	340.9	28.67	
							13.0	19.51	8.31	9.20	100.2	340.9	29.54	
							14.0	19.51	8.31	9.19	100.2	340.9	29.32	
							15.0	19.51	8.31	9.19	100.1	340.9	28.75	
							16.0	19.51	8.30	9.18	100.0	340.9	28.67	
							17.0	19.51	8.30	9.17	100.0	341.0	28.95	
							18.0	19.51	8.30	9.16	99.9	340.9	29.58	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Near-field # 4	NF-4	26-Jul-17	12:10	6.6	N/A	N/A	0.3	19.61	8.34	9.37	102.3	342.0	27.28	0.40
							1.0	19.57	8.34	9.36	102.2	342.0	27.51	
							2.0	19.55	8.32	9.34	101.8	342.0	27.86	
							3.0	19.51	8.31	9.29	101.4	342.0	29.85	
							4.0	19.48	8.31	9.27	101.0	342.2	29.90	
							5.0	19.48	8.30	9.25	100.8	342.3	29.40	
							6.0	19.47	-	9.22	100.5	342.3	31.96	
Stephens Lake - Near-field # 5	NF-5	26-Jul-17	9:00	18.7	N/A	N/A	0.3	19.45	8.35	9.32	101.5	340.1	28.54	0.40
							1.0	19.45	8.36	9.31	101.4	340.1	27.54	
							2.0	19.44	8.35	9.30	101.2	340.1	27.96	
							3.0	19.45	8.34	9.28	101.0	340.1	27.88	
							4.0	19.44	8.33	9.26	100.8	340.1	28.49	
							5.0	19.44	8.33	9.24	100.6	340.1	28.45	
							6.0	19.43	8.33	9.24	100.6	340.1	28.42	
							7.0	19.46	8.32	9.23	100.5	340.1	30.41	
							8.0	19.46	8.31	9.22	100.4	340.2	30.76	
							9.0	19.42	8.31	9.19	100.1	340.1	31.65	
							10.0	19.42	8.30	9.18	99.9	340.2	28.48	
							11.0	19.50	8.30	9.21	100.6	340.2	31.08	
							12.0	19.46	8.31	9.18	100.0	340.2	29.96	
							13.0	19.44	8.31	9.17	99.8	340.2	30.34	
							14.0	19.44	8.31	9.16	99.7	340.1	30.14	
							15.0	19.44	8.31	9.15	99.6	340.2	29.84	
							16.0	19.44	8.31	9.14	99.6	340.1	30.42	
							17.0	19.44	8.31	9.14	99.5	340.2	30.00	
							18.0	19.42	8.31	9.12	99.2	340.2	29.80	
Stephens Lake - Far-field # 1	FF-1	26-Jul-17	13:50	23.2	N/A	N/A	0.3	19.11	8.29	9.13	98.7	342.4	22.19	0.38
							1.0	19.14	8.29	9.10	98.4	342.4	26.57	
							2.0	19.06	8.29	9.07	97.9	342.3	27.78	
							3.0	19.03	8.28	9.05	97.7	342.3	28.68	
							4.0	19.02	8.28	9.04	97.6	342.2	28.13	
							5.0	19.02	8.26	9.03	97.5	342.2	28.13	
							6.0	19.00	8.25	9.02	97.3	342.3	27.09	
							8.0	19.02	8.25	9.01	97.5	342.3	28.52	
							10.0	19.02	8.25	8.99	97.1	342.2	28.30	
							12.0	19.00	8.24	8.97	96.8	342.2	29.63	
							14.0	18.99	8.24	8.94	96.5	342.1	27.80	
							16.0	18.94	8.23	8.90	95.9	342.2	28.63	
							18.0	18.90	8.21	8.85	95.3	342.5	29.03	
							20.0	18.24	8.14	8.54	90.6	344.7	35.53	
							22.0	17.88	8.06	8.27	87.3	346.0	43.48	
Stephens Lake - Far-field # 2	FF-2	26-Jul-17	14:45	15.7	N/A	N/A	0.3	19.56	8.35	9.24	100.8	324.4	28.33	0.38
							1.0	19.48	8.34	9.21	100.4	324.4	28.19	
							2.0	19.42	8.32	9.18	99.9	324.3	28.05	
							3.0	19.40	8.32	9.15	99.7	324.4	29.60	
							4.0	19.35	8.31	9.14	99.2	342.4	28.81	
							6.0	19.30	8.29	9.09	98.6	342.5	29.91	
							8.0	19.29	8.26	9.06	98.4	342.6	30.75	
							10.0	19.28	8.25	9.05	98.2	342.6	30.48	
							12.0	19.28	8.23	9.03	98.0	342.7	29.64	
							14.0	19.28	8.21	9.01	97.8	342.7	30.29	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Far-field # 3	FF-3	26-Jul-17	15:35	26.6	N/A	N/A	0.3	19.72	8.34	9.30	101.9	343.0	26.74	0.40
							2.0	19.59	8.33	9.24	100.9	342.9	25.64	
							4.0	19.46	8.31	9.17	99.9	342.9	26.60	
							6.0	19.44	8.30	9.13	99.4	342.9	26.81	
							8.0	19.42	8.29	9.09	98.9	343.1	27.33	
							10.0	19.36	8.28	9.06	98.5	343.0	27.24	
							12.0	19.28	8.27	9.03	97.9	343.1	27.62	
							14.0	19.27	8.27	9.01	97.7	343.0	28.50	
							16.0	19.27	8.26	8.99	97.5	343.0	26.53	
							18.0	19.27	8.26	8.98	97.4	343.0	28.31	
							20.0	19.27	8.25	8.96	97.2	343.0	28.08	
							22.0	19.27	8.25	8.95	97.1	343.1	27.58	
							24.0	19.27	8.25	8.93	96.9	343.1	28.42	
Stephens Lake - Far-field # 4	FF-4	26-Jul-17	15:10	15.2	N/A	N/A	0.3	19.73	8.32	9.31	101.7	342.4	27.51	0.30
							1.0	19.60	8.31	9.27	101.1	342.3	27.54	
							2.0	19.51	8.30	9.23	100.7	342.4	27.37	
							3.0	19.48	8.29	9.21	100.3	342.5	27.44	
							4.0	19.44	8.28	9.18	99.9	342.6	28.74	
							5.0	19.41	8.28	9.15	99.6	342.7	29.10	
							6.0	19.37	8.27	9.11	99.1	342.9	29.12	
							8.0	19.23	8.24	9.02	97.7	343.1	30.70	
							10.0	19.22	8.23	8.99	97.4	343.1	31.54	
							12.0	19.22	8.23	8.96	97.1	343.2	31.91	
							14.0	19.22	8.22	8.93	96.8	343.2	32.97	
Stephens Lake - Far-field # 5	FF-5	26-Jul-17	14:20	11.4	N/A	N/A	0.3	19.27	8.38	9.13	99.0	342.3	26.94	N/A
							1.0	19.24	8.36	9.12	98.9	342.3	27.81	
							2.0	19.19	8.34	9.11	98.7	342.3	28.79	
							3.0	19.10	8.31	9.07	98.2	342.3	28.09	
							4.0	19.13	8.31	9.02	98.0	342.3	29.65	
							5.0	19.12	8.30	9.01	97.5	342.3	29.79	
							6.0	19.11	8.31	9.00	97.3	342.3	29.47	
							7.0	19.11	8.31	8.98	97.2	342.3	30.35	
							8.0	19.11	8.31	8.97	97.0	342.3	21.71	
							9.0	19.11	8.31	8.96	96.9	342.3	32.21	
							10.0	19.10	8.31	8.94	96.7	342.3	31.93	
Clark Lake # 1	CL-1	27-Aug-17	9:30	12.0	N/A	N/A	0.3	19.108	8.22	8.87	96.0	340.4	28.24	0.45
							1.0	19.109	8.22	8.85	95.8	341.7	29.62	
							2.0	19.101	8.24	8.85	95.7	340.5	29.54	
							3.0	19.104	8.24	8.84	95.6	341.6	28.81	
							4.0	19.104	8.25	8.83	95.5	342.6	28.75	
							5.0	19.101	8.24	8.92	95.3	342.1	30.05	
							6.0	19.104	8.25	8.81	95.2	343.0	29.34	
							7.0	19.111	8.25	8.78	95.1	343.7	28.95	
							8.0	19.111	8.25	8.78	95.1	344.1	29.33	
							9.0	19.110	8.26	8.77	94.9	344.6	29.07	
							10.0	19.111	8.25	8.77	94.8	344.7	28.83	
							11.0	19.111	8.26	8.76	94.7	344.6	28.87	
							12.0	19.111	8.26	8.75	94.5	344.8	31.45	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Clark Lake # 2	CL-2	27-Aug-17	11:00	13.4	N/A	N/A	0.3	19.146	8.30	8.86	95.9	346.5	27.84	0.45
							1.0	19.151	8.26	8.85	95.8	346.2	28.55	
							2.0	19.148	8.26	8.83	95.6	346.7	28.56	
							3.0	19.147	8.26	8.83	95.5	343.8	28.54	
							4.0	19.134	8.26	8.81	95.3	343.6	28.39	
							5.0	19.131	8.26	8.81	95.3	343.3	29.26	
							6.0	19.136	8.27	8.80	95.2	343.5	28.27	
							7.0	19.140	8.26	8.79	95.1	345.0	28.66	
							8.0	19.142	8.26	8.79	95.0	345.1	28.83	
							9.0	19.140	8.27	8.77	94.9	345.9	28.97	
							10.0	19.148	8.27	8.76	94.8	347.3	28.19	
							11.0	19.154	8.27	8.75	94.7	347.8	28.14	
							12.0	19.159	8.27	8.74	94.6	348.3	28.89	
Clark Lake # 3	CL-3	27-Aug-17	11:30	10.2	N/A	N/A	0.3	19.176	8.35	8.85	95.9	349.3	27.87	0.45
							1.0	19.163	8.30	8.85	95.8	349.4	27.87	
							2.0	19.172	8.27	8.84	95.7	348.7	27.97	
							3.0	19.154	8.26	8.82	95.5	348.7	27.86	
							4.0	19.159	8.26	8.81	95.4	349.1	28.25	
							5.0	19.158	8.26	8.81	95.4	348.6	27.62	
							6.0	19.159	8.26	8.80	95.2	348.3	28.00	
							7.0	19.159	8.26	8.79	95.1	348.1	28.56	
							8.0	19.158	8.27	8.78	95.1	348.0	28.52	
							9.0	19.158	8.27	8.77	94.9	348.0	28.61	
Clark Lake # 4	CL-4	27-Aug-17	12:15	8.1	N/A	N/A	0.3	19.205	8.28	8.90	96.4	330.4	30.47	0.45
							1.0	19.175	8.26	8.89	96.3	331.9	30.14	
							2.0	19.158	8.25	8.88	96.1	331.5	29.90	
							3.0	19.155	8.24	8.86	95.9	332.0	29.60	
							4.0	19.145	8.24	8.85	95.8	330.1	29.86	
							5.0	19.143	8.25	8.85	95.6	330.4	30.47	
							6.0	19.140	8.25	8.83	95.6	331.7	30.43	
							7.0	19.146	8.25	8.83	95.5	331.4	29.81	
Clark Lake # 5	CL-5	27-Aug-17	12:45	9.1	N/A	N/A	0.3	19.196	8.34	8.89	96.3	333.6	29.88	0.45
							1.0	19.188	8.30	8.89	96.3	333.3	29.96	
							2.0	19.172	8.27	8.87	96.1	333.7	30.14	
							3.0	19.185	8.24	8.86	96.0	330.1	29.58	
							4.0	19.170	8.23	8.85	95.8	334.0	29.54	
							5.0	19.172	8.23	8.85	95.8	334.9	29.76	
							6.0	19.174	8.23	8.83	95.6	335.0	30.14	
							7.0	19.184	8.24	8.82	95.5	334.7	30.03	
							8.0	19.185	8.26	8.82	95.5	334.5	30.36	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Nelson River Upstream # 1	US-1	28-Aug-17	11:30	12.0	N/A	N/A	0.3	19.179	7.98	8.98	97.3	345.6	27.63	0.60
							1.0	19.181	8.00	8.97	97.2	345.6	27.70	
							2.0	19.181	8.02	8.97	97.1	345.5	27.65	
							3.0	19.184	8.03	8.95	97.0	345.6	27.49	
							4.0	19.181	8.05	8.94	96.8	345.5	27.89	
							5.0	19.800	8.09	8.93	96.7	345.6	27.59	
							6.0	19.179	8.09	8.92	96.5	345.6	28.03	
							7.0	19.181	8.10	8.90	96.4	345.6	27.86	
							8.0	19.178	8.11	8.90	96.4	345.6	27.51	
							9.0	19.184	8.13	8.88	96.2	345.6	27.36	
							10.0	19.181	8.13	8.88	96.1	345.6	27.52	
							11.0	19.178	8.15	8.87	96.1	345.6	27.91	
							12.0	19.178	8.16	8.86	95.9	345.6	27.81	
Nelson River Upstream # 2	US-2	28-Aug-17	12:15	12.1	N/A	N/A	0.3	19.165	8.07	9.01	97.5	345.4	27.39	0.60
							1.0	19.169	8.11	8.97	97.5	345.5	27.65	
							2.0	19.173	8.14	8.96	97.0	345.5	27.31	
							3.0	19.173	8.17	8.85	96.9	345.5	27.21	
							4.0	19.174	8.20	8.83	96.7	345.5	27.66	
							5.0	19.178	8.23	8.82	96.6	345.5	28.00	
							6.0	19.180	8.24	8.91	96.5	345.5	27.91	
							7.0	19.180	8.25	8.90	96.4	345.4	27.49	
							8.0	19.182	8.25	8.89	96.3	345.5	27.82	
							9.0	19.184	8.26	8.89	96.2	345.3	27.66	
							10.0	19.185	8.26	8.87	96.1	345.4	27.55	
							11.0	19.189	8.26	8.87	96.0	345.3	27.70	
							12.0	19.190	8.28	8.86	96.0	345.2	27.50	
Nelson River Upstream # 3	US-3	28-Aug-17	12:45	9.1	N/A	N/A	0.3	19.226	8.28	9.00	97.6	345.0	28.06	0.60
							1.0	19.223	8.29	8.99	97.5	345.2	27.86	
							2.0	19.212	8.29	8.97	97.2	345.1	27.78	
							3.0	19.207	8.29	8.96	97.1	345.0	27.99	
							4.0	19.210	8.30	8.95	97.0	345.0	27.31	
							5.0	19.221	8.30	8.94	96.9	345.0	27.69	
							6.0	19.222	8.30	8.93	96.8	345.1	27.59	
							7.0	19.223	8.30	8.93	96.8	345.1	28.17	
							8.0	19.226	8.30	8.92	96.6	345.1	27.95	
							9.0	19.224	8.30	8.91	96.6	345.1	27.90	
Nelson River Upstream # 4	US-4	28-Aug-17	13:30	12.2	N/A	N/A	0.3	19.252	8.31	8.98	97.4	345.0	27.85	0.50
							1.0	19.246	8.30	8.97	97.2	345.0	27.78	
							2.0	19.247	8.29	8.96	97.1	345.1	27.56	
							3.0	19.248	8.29	8.95	97.1	345.0	27.51	
							4.0	19.246	8.29	8.94	96.9	345.0	27.46	
							5.0	19.245	8.29	8.93	96.8	345.0	27.57	
							6.0	19.247	8.29	8.92	96.7	345.0	27.49	
							7.0	19.249	8.29	8.91	96.6	345.0	28.00	
							8.0	19.247	8.29	8.90	96.5	345.0	27.70	
							9.0	19.248	8.29	8.89	96.4	345.0	27.41	
							10.0	19.251	8.29	8.89	96.4	345.0	27.42	
							11.0	19.251	8.29	8.88	96.3	344.9	28.09	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Nelson River Upstream # 5	US-5	28-Aug-17	14:15	9.8	N/A	N/A	0.3	19.308	8.34	8.99	97.7	344.9	27.90	0.58
							1.0	19.100	8.29	8.99	97.6	345.0	27.85	
							2.0	19.305	8.26	8.97	97.3	344.8	27.70	
							3.0	19.304	8.25	8.96	97.2	344.7	27.72	
							4.0	19.305	8.23	8.94	97.1	344.7	27.75	
							5.0	19.304	8.22	8.92	96.9	344.5	27.63	
							6.0	19.302	8.22	8.91	96.7	344.5	27.68	
							7.0	19.308	8.26	8.94	97.0	344.8	27.63	
							8.0	19.305	8.25	8.92	96.9	344.7	26.19	
							9.0	19.310	8.27	8.91	96.7	344.8	28.21	
Stephens Lake - Near-field # 1	NF-1	30-Aug-17	12:15	21.0	N/A	N/A	0.3	18.685	8.28	9.42	101.0	342.5	26.23	0.50
							1.0	18.590	8.29	9.41	100.7	342.3	27.58	
							2.0	18.570	8.31	9.35	100.2	342.7	26.66	
							3.0	18.557	8.32	9.33	99.8	342.7	26.35	
							4.0	18.543	8.33	9.32	99.7	343.2	26.95	
							5.0	18.539	8.33	9.30	99.4	342.9	26.27	
							6.0	18.539	8.33	9.29	99.3	343.0	26.62	
							7.0	18.532	8.33	9.28	99.2	343.2	27.56	
							8.0	18.532	8.33	9.27	99.1	342.9	26.86	
							9.0	18.536	8.34	9.26	99.0	343.2	27.11	
							10.0	18.528	8.33	9.25	98.9	343.0	27.55	
							11.0	18.491	8.33	9.24	98.7	343.0	27.18	
							12.0	18.523	8.33	9.22	98.5	343.3	29.44	
							13.0	18.491	8.33	9.21	98.3	343.4	27.30	
							14.0	18.489	8.33	9.20	98.2	343.3	26.28	
							15.0	18.476	8.33	9.19	98.2	343.4	27.75	
							16.0	18.465	8.33	9.18	98.0	343.3	27.19	
							17.0	18.411	8.33	9.17	97.9	343.3	27.77	
							18.0	18.388	8.33	9.15	97.6	343.7	26.78	
							19.0	18.367	8.33	9.13	97.2	344.3	27.86	
							20.0	18.287	8.33	9.09	96.7	344.8	26.17	
Stephens Lake - Near-field # 2	NF-2	30-Aug-17	13:45	11.3	N/A	N/A	0.3	18.943	8.30	9.63	103.8	345.1	25.07	0.45
							1.0	18.829	8.34	9.57	102.9	344.7	28.04	
							2.0	18.765	8.35	9.51	102.1	344.4	25.98	
							3.0	18.541	8.34	9.30	99.5	346.8	25.13	
							4.0	18.535	8.34	9.27	99.0	346.9	25.44	
							5.0	18.528	8.34	9.25	98.9	346.8	25.76	
							6.0	18.517	8.34	9.24	98.8	346.6	24.56	
							7.0	18.518	8.34	9.24	98.7	346.7	29.29	
							8.0	18.516	8.34	9.22	98.6	346.6	26.25	
							9.0	18.516	8.34	9.22	98.5	346.6	26.45	
							10.0	18.515	8.34	9.21	98.4	346.6	24.30	
							11.0	18.516	8.34	9.20	98.3	346.6	24.80	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Near-field # 3	NF-3	30-Aug-17	13:15	19.2	N/A	N/A	0.3	18.769	8.32	9.45	101.5	343.5	25.60	0.50
							1.0	18.665	8.31	9.39	100.5	343.6	27.26	
							2.0	18.546	8.32	9.33	99.7	343.6	26.43	
							3.0	18.530	8.32	9.32	99.6	343.9	26.46	
							4.0	18.533	8.31	9.31	99.5	343.9	27.98	
							5.0	18.533	8.31	9.30	99.4	343.6	26.32	
							6.0	18.532	8.32	9.29	99.3	343.6	27.08	
							7.0	18.533	8.31	9.29	99.3	343.5	26.70	
							8.0	18.530	8.32	9.27	99.1	343.6	26.60	
							9.0	18.532	8.32	9.27	99.1	343.6	27.99	
							10.0	18.530	8.32	9.26	99.0	343.6	27.40	
							11.0	18.528	8.32	9.25	98.9	343.4	26.61	
							12.0	18.531	8.33	9.24	98.8	343.5	27.51	
							13.0	18.531	8.33	9.23	98.7	343.6	26.82	
							14.0	18.532	8.32	9.23	98.6	343.5	26.70	
							15.0	18.533	8.32	9.21	98.5	343.7	26.89	
							16.0	18.526	8.32	9.21	98.4	343.6	26.36	
							17.0	18.526	8.32	9.20	98.3	343.6	27.10	
							18.0	18.531	8.32	9.20	98.3	343.6	26.75	
							19.0	18.529	8.32	9.19	98.2	343.7	26.94	
Stephens Lake - Near-field # 4	NF-4	30-Aug-17	14:15	6.4	N/A	N/A	0.3	19.103	8.39	9.64	104.2	344.9	23.62	0.45
							1.0	18.920	8.39	9.59	103.3	345.3	25.35	
							2.0	18.640	8.38	9.44	101.1	345.8	25.51	
							3.0	18.568	8.37	9.33	99.8	345.9	26.20	
							4.0	18.560	8.34	9.31	99.5	346.0	26.36	
							5.0	18.557	8.34	9.29	99.3	345.9	27.37	
							6.0	18.556	8.34	9.27	99.1	345.8	26.68	
Stephens Lake - Near-field # 5	NF-5	30-Aug-17	11:30	18.6	N/A	N/A	0.3	18.632	8.39	9.43	101.0	343.0	26.12	0.40
							1.0	18.630	8.41	9.41	100.5	343.1	27.49	
							2.0	18.539	8.40	9.37	100.3	343.2	26.83	
							3.0	18.541	8.39	9.33	99.8	343.2	27.14	
							4.0	18.539	8.37	9.32	99.6	343.2	28.13	
							5.0	18.502	8.35	9.29	99.2	343.3	26.53	
							6.0	18.509	8.35	9.27	99.1	343.3	27.25	
							7.0	18.497	8.35	9.26	99.0	343.4	27.37	
							8.0	18.495	8.35	9.25	98.8	343.3	27.94	
							9.0	18.490	8.33	9.24	98.7	343.3	27.25	
							10.0	18.489	8.33	9.22	98.6	343.5	27.28	
							11.0	18.464	8.34	9.22	98.5	343.4	27.44	
							12.0	18.462	8.35	9.20	98.1	343.7	26.90	
							13.0	18.455	8.34	9.20	98.2	343.5	27.53	
							14.0	18.444	8.34	9.18	97.9	343.7	27.61	
							15.0	18.451	8.33	9.17	97.8	343.7	27.21	
							16.0	18.430	8.33	9.16	97.8	343.7	25.98	
							17.0	18.382	8.33	9.10	97.0	344.4	27.32	
							18.0	18.372	8.33	9.08	96.7	344.4	27.54	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Far-field # 1	FF-1	30-Aug-17	7:30	23.2	N/A	N/A	0.3	18.475	8.32	9.66	103.2	348.9	23.91	0.53
							1.0	18.509	8.33	9.63	102.9	349.0	24.72	
							2.0	18.510	8.35	9.62	102.8	349.0	23.09	
							3.0	18.509	8.35	9.61	102.7	349.0	23.22	
							4.0	18.489	8.34	9.60	102.5	349.0	23.51	
							5.0	18.497	8.34	9.59	102.4	349.0	24.56	
							6.0	18.506	8.35	9.58	102.3	349.0	22.39	
							7.0	18.506	8.35	9.56	102.2	349.0	22.92	
							8.0	18.503	8.35	9.56	102.1	349.0	23.91	
							9.0	18.502	8.35	9.55	102.0	349.0	24.21	
							10.0	18.486	8.36	9.54	101.9	349.0	25.41	
							11.0	18.494	8.35	9.53	101.8	349.0	25.32	
							12.0	18.501	8.36	9.52	101.7	349.0	22.67	
							13.0	18.505	8.34	9.51	101.6	349.0	23.60	
							14.0	18.505	8.34	9.49	101.4	349.1	24.21	
							15.0	18.502	8.35	9.48	101.2	349.2	25.31	
							16.0	18.488	8.36	9.46	101.0	349.1	29.53	
							17.0	18.500	8.35	9.45	100.9	349.1	25.40	
							18.0	18.498	8.35	9.44	100.8	349.2	23.87	
							19.0	18.491	8.36	9.44	100.8	349.1	23.98	
							20.0	18.468	8.35	9.42	100.5	349.2	24.68	
							21.0	18.452	8.35	9.41	100.4	349.3	23.54	
							22.0	18.448	8.35	9.39	100.2	349.3	25.02	
							23.0	18.422	8.35	9.38	100.1	349.3	24.64	
Stephens Lake - Far-field # 2	FF-2	30-Aug-17	9:00	16.0	N/A	N/A	0.3	18.540	8.20	9.70	103.6	349.3	24.20	0.60
							1.0	18.554	8.27	9.65	103.2	349.4	23.51	
							2.0	18.560	8.28	9.63	103.1	349.4	23.77	
							3.0	18.562	8.29	9.62	102.9	349.4	23.61	
							4.0	18.569	8.31	9.60	102.7	349.3	24.10	
							5.0	18.563	8.33	9.60	102.6	349.4	24.74	
							6.0	18.565	8.33	9.59	102.5	349.4	24.71	
							7.0	18.556	8.33	9.58	102.4	349.4	25.23	
							8.0	18.549	8.34	9.56	102.3	349.3	23.92	
							9.0	18.549	8.34	9.55	102.2	349.3	24.16	
							10.0	18.549	8.34	9.54	102.1	349.4	24.02	
							11.0	18.543	8.34	9.53	101.9	349.4	24.15	
							12.0	18.538	8.34	9.52	101.8	349.3	25.75	
							13.0	18.535	8.34	9.51	101.7	349.4	24.71	
							14.0	18.537	8.34	9.50	101.6	349.3	24.78	
							15.0	18.536	8.34	9.49	101.5	349.4	24.14	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Far-field # 3	FF-3	30-Aug-17	10:00	25.9	N/A	N/A	0.3	18.607	8.26	9.75	104.3	349.6	22.74	0.60
							1.0	18.601	8.27	9.71	103.9	349.7	25.23	
							2.0	18.602	8.30	9.70	103.8	349.6	22.46	
							3.0	18.599	8.31	9.67	103.5	349.7	22.71	
							4.0	18.599	8.32	9.65	103.3	349.6	24.65	
							5.0	18.598	8.32	9.64	103.2	349.6	23.87	
							6.0	18.596	8.33	9.65	103.3	349.7	22.92	
							7.0	18.597	8.33	9.62	102.9	349.7	23.07	
							8.0	18.596	8.33	9.61	102.9	349.7	23.81	
							9.0	18.596	8.33	9.60	102.7	349.7	22.96	
							10.0	18.596	8.33	9.60	102.7	349.7	23.28	
							11.0	18.594	8.34	9.59	102.6	349.7	23.26	
							12.0	18.593	8.34	9.57	102.4	349.7	23.34	
							13.0	18.593	8.35	9.56	102.3	349.7	23.04	
							14.0	18.587	8.35	9.55	102.2	349.7	23.96	
							15.0	18.587	8.35	9.54	102.1	349.7	23.77	
							16.0	18.583	8.34	9.53	102.0	349.7	23.01	
							17.0	18.579	8.34	9.53	101.9	349.7	23.47	
							18.0	18.573	8.34	9.52	101.8	349.7	22.52	
							19.0	18.569	8.34	9.52	101.8	349.7	24.18	
							20.0	18.544	8.34	9.51	101.6	349.8	22.95	
							21.0	18.527	8.34	9.50	101.5	349.8	23.87	
							22.0	18.517	8.34	9.49	101.4	349.8	23.04	
							23.0	18.514	8.34	9.49	101.4	349.8	26.00	
							24.0	18.512	8.34	9.48	101.3	349.8	24.74	
							25.0	18.511	8.34	9.47	101.2	349.9	25.35	
							26.0	18.512	8.34	9.46	101.1	349.8	24.77	
Stephens Lake - Far-field # 4	FF-4	30-Aug-17	9:30	13.8	N/A	N/A	0.3	18.576	8.29	9.70	102.8	349.4	24.23	0.55
							1.0	18.596	8.29	9.69	103.7	349.5	24.89	
							2.0	18.604	8.30	9.66	103.4	349.5	23.81	
							3.0	18.604	8.32	9.65	103.3	349.5	24.06	
							4.0	18.607	8.32	9.63	103.1	349.6	24.45	
							5.0	18.606	8.32	9.63	103.1	349.6	23.88	
							6.0	18.607	8.32	9.61	102.9	349.6	23.90	
							7.0	18.607	8.33	9.60	102.8	349.5	23.70	
							8.0	18.609	8.33	9.59	102.7	349.6	24.15	
							9.0	18.608	8.33	9.57	102.5	349.6	23.79	
							10.0	18.612	8.34	9.57	102.4	349.6	24.15	
							11.0	18.610	8.33	9.56	102.3	349.6	24.51	
							12.0	18.609	8.34	9.55	102.2	349.6	25.53	
							13.0	18.608	8.34	9.54	102.1	349.6	24.66	
							14.0	18.609	8.34	9.53	102.0	349.7	23.90	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Far-field # 5	FF-5	30-Aug-17	8:30	12.2	N/A	N/A	0.3	18.495	8.26	9.66	103.2	348.8	24.40	0.58
							1.0	18.534	8.29	9.64	103.0	349.0	26.03	
							2.0	18.533	8.31	9.62	102.8	348.9	24.99	
							3.0	18.526	8.32	9.60	102.6	348.9	25.17	
							4.0	18.524	8.33	9.60	102.6	348.9	24.53	
							5.0	18.535	8.33	9.59	102.4	349.0	24.74	
							6.0	18.517	8.33	9.57	102.1	348.9	24.86	
							7.0	18.501	8.34	9.55	102.0	349.0	25.39	
							8.0	18.509	8.35	9.54	101.9	349.0	25.53	
							9.0	18.485	8.35	9.53	101.8	349.1	25.94	
							10.0	18.477	8.35	9.51	101.5	349.0	27.14	
							11.0	18.462	8.34	9.49	101.3	349.1	27.96	
							12.0	18.438	8.35	9.48	101.1	349.2	28.89	
Clark Lake # 1	CL-1	17-Sep-17	10:30	11.1	N/A	N/A	0.3	14.450	8.10	10.04	98.4	310.6	36.11	0.53
							1.0	14.450	8.14	10.02	98.3	311.1	35.55	
							2.0	14.451	8.14	10.01	98.2	311.0	34.68	
							3.0	14.445	8.15	10.00	98.1	310.8	34.88	
							4.0	14.448	8.16	9.99	98.0	310.8	35.06	
							5.0	14.450	8.18	9.99	97.9	310.3	35.31	
							6.0	14.448	8.18	9.97	97.8	307.9	35.16	
							7.0	14.448	8.18	9.97	97.8	309.6	35.24	
							8.0	14.449	8.19	9.96	97.7	309.2	35.19	
							9.0	14.447	8.19	9.95	97.2	309.2	36.35	
							10.0	14.442	8.19	9.95	97.5	306.7	36.40	
							11.0	14.440	8.19	9.93	97.4	309.8	36.55	
Clark Lake # 2	CL-2	17-Sep-17	11:30	13.1	N/A	N/A	0.3	14.434	8.10	10.21	100.2	307.4	40.24	0.50
							1.0	14.443	8.11	10.10	99.0	307.3	36.10	
							2.0	14.444	8.13	10.07	98.7	307.4	36.00	
							3.0	14.447	8.16	10.05	98.6	307.8	35.60	
							4.0	14.446	8.20	10.03	98.4	307.7	35.31	
							5.0	14.452	8.23	10.01	98.2	307.9	35.42	
							6.0	14.450	8.25	10.00	98.1	308.0	36.48	
							7.0	14.452	8.26	9.99	98.0	308.3	35.43	
							8.0	14.453	8.27	9.97	97.9	308.1	35.66	
							9.0	14.454	8.28	9.97	97.7	308.2	34.91	
							10.0	14.455	8.28	9.96	97.7	308.4	35.37	
							11.0	14.453	8.26	9.95	97.6	310.4	35.91	
							12.0	14.452	8.27	9.94	97.5	310.3	35.39	
Clark Lake # 3	CL-3	17-Sep-17	12:15	9.1	N/A	N/A	0.3	14.422	8.24	10.10	99.0	309.5	35.62	0.50
							1.0	14.430	8.25	10.07	98.7	310.0	35.88	
							2.0	14.429	8.27	10.05	98.5	309.2	35.45	
							3.0	14.432	8.28	10.03	98.4	309.3	36.01	
							4.0	14.434	8.29	10.01	98.2	308.1	35.87	
							5.0	14.436	8.30	10.00	98.0	308.3	35.85	
							6.0	14.436	8.30	9.98	97.9	307.6	36.03	
							7.0	14.437	8.30	9.97	97.8	307.6	35.91	
							8.0	14.437	8.30	9.96	97.7	307.6	35.69	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Clark Lake # 4	CL-4	17-Sep-17	12:45	7.1	N/A	N/A	0.3	14.411	8.25	10.13	99.3	302.4	39.10	0.50
							1.0	14.420	8.25	10.09	98.9	302.0	38.71	
							2.0	14.411	8.27	10.06	98.6	301.3	36.76	
							3.0	14.424	8.27	10.05	98.4	302.3	36.56	
							4.0	14.420	8.28	10.03	98.3	301.5	37.53	
							5.0	14.414	8.29	10.02	98.2	300.4	36.99	
							6.0	14.414	8.29	10.01	98.1	300.2	38.28	
							7.0	14.414	8.30	9.98	97.8	299.7	38.87	
Clark Lake # 5	CL-5	17-Sep-17	13:15	7.4	N/A	N/A	0.3	14.368	8.22	10.12	99.1	296.1	43.27	0.48
							1.0	14.391	8.26	10.09	98.8	299.3	36.96	
							2.0	14.393	8.29	10.06	98.5	299.7	37.08	
							3.0	14.408	8.30	10.03	98.3	302.2	37.01	
							4.0	14.409	8.30	10.03	98.2	301.7	37.16	
							5.0	14.422	8.30	10.01	98.1	303.6	37.20	
							6.0	14.428	8.29	10.00	98.0	304.8	36.61	
							7.0	14.434	8.29	9.98	97.9	305.3	36.15	
Nelson River Upstream # 1	US-1	18-Sep-17	12:15	13.0	N/A	N/A	0.3	13.819	8.07	10.06	97.4	302.7	36.47	0.45
							1.0	13.827	8.05	10.05	97.2	302.8	36.55	
							2.0	13.828	8.05	10.04	97.2	302.7	36.46	
							3.0	13.836	8.05	10.04	97.1	302.7	36.27	
							4.0	13.837	8.06	10.03	97.0	302.7	36.30	
							5.0	13.834	8.06	10.02	96.9	302.8	36.56	
							6.0	13.837	8.06	10.01	96.8	302.8	36.81	
							7.0	13.841	8.07	10.01	96.7	302.8	37.37	
							8.0	13.836	8.07	9.99	96.7	302.8	36.11	
							9.0	13.848	8.09	9.99	96.6	302.8	36.26	
							10.0	13.844	8.10	9.98	96.6	302.8	37.15	
							11.0	13.838	8.10	9.97	96.5	302.8	37.14	
							12.0	13.837	8.11	9.96	96.4	302.8	36.50	
Nelson River Upstream # 2	US-2	18-Sep-17	13:00	12.2	N/A	N/A	0.3	13.788	*8.00*	10.16	98.3	302.9	35.77	0.38
							1.0	13.765	*8.15*	10.09	97.6	302.9	36.08	
							2.0	13.792	*8.25*	10.08	97.4	303.0	35.72	
							3.0	13.785	8.33	10.05	97.2	302.9	36.01	
							4.0	13.786	8.33	10.04	97.0	303.0	36.69	
							5.0	13.790	8.33	10.03	96.9	302.9	36.89	
							6.0	13.785	8.29	10.01	96.8	303.0	35.89	
							7.0	13.795	8.29	10.00	96.7	302.9	36.64	
							8.0	13.792	8.27	9.99	96.6	303.0	36.47	
							9.0	13.788	8.28	9.98	96.5	302.9	36.40	
							10.0	13.806	8.28	9.98	96.5	302.9	36.72	
							11.0	13.807	8.28	9.96	96.4	302.9	37.18	
							12.0	13.808	8.28	9.95	96.3	302.8	38.14	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Nelson River Upstream # 3	US-3	18-Sep-17	14:15	10.3	N/A	N/A	0.3	13.849	8.31	10.11	97.9	303.2	37.85	0.45
							1.0	13.840	8.33	10.09	97.6	303.3	36.48	
							2.0	13.822	8.32	10.06	97.4	303.3	36.63	
							3.0	13.801	8.28	10.05	97.2	303.3	36.32	
							4.0	13.805	8.29	10.04	97.0	303.3	36.16	
							5.0	13.806	8.28	10.03	97.0	303.3	36.13	
							6.0	13.801	8.29	10.02	96.9	303.3	36.00	
							7.0	13.808	8.28	10.00	96.7	303.3	35.50	
							8.0	13.797	8.29	10.01	96.8	303.3	36.12	
							9.0	13.811	8.28	9.98	96.6	303.3	37.17	
							10.0	13.811	8.27	9.98	96.6	303.4	35.90	
							11.0	13.821	8.27	9.97	96.4	303.3	36.37	
Nelson River Upstream # 4	US-4	18-Sep-17	15:00	10.4	N/A	N/A	0.3	13.788	8.29	10.11	97.7	303.4	36.14	0.43
							1.0	13.781	8.27	10.09	97.6	303.3	36.58	
							2.0	13.795	8.27	10.07	97.4	303.3	36.45	
							3.0	13.803	8.28	10.05	97.3	303.3	36.47	
							4.0	13.801	8.28	10.05	97.1	303.4	35.99	
							5.0	13.801	8.29	10.04	97.0	303.4	36.67	
							6.0	13.801	8.29	10.02	96.9	303.4	36.33	
							7.0	13.803	8.29	10.01	96.8	303.4	37.37	
							8.0	13.803	8.29	10.01	96.7	303.4	36.50	
							9.0	13.801	8.29	10.00	96.6	303.4	37.05	
							10.0	13.810	8.28	9.98	96.5	303.4	36.67	
Nelson River Upstream # 5	US-5	18-Sep-17	15:30	9.7	N/A	N/A	0.3	13.999	8.29	10.07	97.8	307.7	37.02	0.38
							1.0	13.995	8.32	10.04	97.5	308.0	35.94	
							2.0	14.005	8.33	10.02	97.3	308.3	35.68	
							3.0	14.006	8.31	10.00	97.2	308.5	35.78	
							4.0	14.007	8.30	10.00	97.1	308.5	35.81	
							5.0	14.010	8.27	9.98	96.9	308.5	35.68	
							6.0	14.011	8.28	9.97	96.9	308.5	35.41	
							7.0	13.990	8.29	9.97	96.8	307.6	36.55	
							8.0	13.973	8.29	9.97	96.8	307.0	36.12	
							9.0	13.968	8.28	9.97	96.7	306.5	35.69	
							10.0	13.969	8.28	9.96	96.6	306.8	36.76	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Near-field # 1	NF-1	19-Sep-17	13:15	20.2	N/A	N/A	0.3	14.530	8.33	10.20	100.2	307.6	35.46	0.33
							1.0	14.294	8.33	10.19	99.5	307.7	33.42	
							2.0	13.843	8.33	10.10	97.8	307.4	34.75	
							3.0	13.753	8.30	9.99	96.6	307.3	36.15	
							4.0	13.746	8.28	9.97	96.4	307.0	36.84	
							5.0	13.746	8.27	9.97	96.3	306.9	36.01	
							6.0	13.733	8.26	9.94	96.0	307.2	36.04	
							7.0	13.735	8.25	9.93	95.9	307.3	35.66	
							8.0	13.730	8.25	9.92	95.8	307.4	35.12	
							9.0	13.728	8.24	9.91	95.7	307.5	35.88	
							10.0	13.727	8.24	9.90	95.6	307.5	37.47	
							11.0	13.727	8.23	9.89	95.5	307.5	36.15	
							12.0	13.727	8.23	9.89	95.4	307.5	35.35	
							13.0	13.730	8.23	9.88	95.4	307.5	35.26	
							14.0	13.728	8.23	9.86	95.2	307.9	35.57	
							15.0	13.728	8.22	9.86	95.2	307.7	34.45	
							16.0	13.729	8.22	9.85	95.1	307.7	37.15	
							17.0	13.731	8.22	9.84	95.0	308.1	36.88	
							18.0	13.731	8.22	9.83	94.9	308.0	35.87	
							19.0	13.732	8.22	9.82	94.8	308.1	36.88	
							20.0	13.732	8.22	9.82	94.8	308.0	31.05	
Stephens Lake - Near-field # 2	NF-2	19-Sep-17	14:45	11.6	N/A	N/A	0.3	13.992	8.32	10.12	98.3	308.7	34.67	0.35
							1.0	13.832	8.32	10.05	97.3	308.8	34.95	
							2.0	13.683	8.31	9.97	96.3	308.7	34.73	
							3.0	13.674	8.30	9.95	96.0	308.8	36.21	
							4.0	13.676	8.29	9.94	95.9	308.7	34.56	
							5.0	13.668	8.29	9.94	95.8	308.8	35.50	
							6.0	13.673	8.29	9.93	95.7	308.8	35.10	
							7.0	13.667	8.28	9.92	95.6	308.8	35.35	
							8.0	13.668	8.28	9.91	95.6	308.8	36.13	
							9.0	13.668	8.28	9.90	95.5	308.8	38.62	
							10.0	13.670	8.28	9.89	95.4	308.8	34.56	
Stephens Lake - Near-field # 3	NF-3	19-Sep-17	13:45	20.5	N/A	N/A	0.3	14.244	8.34	10.20	99.6	307.3	34.44	0.33
							1.0	14.117	8.33	10.15	98.9	307.0	34.19	
							2.0	13.793	8.31	10.02	97.0	307.2	35.45	
							3.0	13.727	8.30	9.97	96.3	307.5	35.43	
							4.0	13.727	8.29	9.96	96.1	307.4	34.64	
							5.0	13.724	8.29	9.95	96.0	307.5	33.65	
							6.0	13.722	8.28	9.94	95.9	307.4	36.33	
							7.0	13.724	8.27	9.93	95.8	307.6	35.80	
							8.0	13.723	8.27	9.92	95.7	307.6	35.15	
							9.0	13.723	8.26	9.91	95.6	307.4	35.14	
							10.0	13.722	8.25	9.91	95.6	307.6	34.45	
							11.0	13.724	8.25	9.90	95.4	307.7	35.35	
							12.0	13.725	8.24	9.89	95.4	307.7	34.33	
							13.0	13.725	8.24	9.88	95.2	307.8	35.64	
							14.0	13.727	8.24	9.87	95.2	307.8	35.71	
							15.0	13.725	8.24	9.86	95.2	307.7	34.88	
							16.0	13.726	8.24	9.86	95.0	307.7	34.23	
							17.0	13.727	8.23	9.84	95.0	307.7	35.11	
							18.0	13.727	8.23	8.84	94.9	307.7	35.01	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Near-field # 4	NF-4	19-Sep-17	14:30	6.5	N/A	N/A	0.3	13.872	8.32	10.14	98.2	308.5	34.79	0.40
							1.0	13.880	8.31	10.12	98.0	308.6	39.52	
							2.0	13.841	8.31	10.09	97.6	308.7	36.31	
							3.0	13.676	8.30	9.98	96.3	308.7	34.20	
							4.0	13.673	8.29	9.97	96.1	308.7	35.89	
							5.0	13.652	8.29	9.94	96.9	308.7	34.42	
Stephens Lake - Near-field # 5	NF-5	19-Sep-17	12:30	18.7	N/A	N/A	0.3	14.249	8.32	10.09	98.3	307.4	32.62	0.38
							1.0	13.733	8.29	10.03	96.9	307.5	34.23	
							2.0	13.720	8.25	10.02	96.7	307.3	35.75	
							3.0	13.696	8.25	9.99	96.4	307.4	31.43	
							4.0	13.691	8.25	9.97	96.3	307.4	38.84	
							5.0	13.688	8.25	9.97	96.2	307.4	42.19	
							6.0	13.679	8.26	9.95	95.9	307.4	38.33	
							7.0	13.668	8.26	9.94	95.9	307.4	37.12	
							8.0	13.646	8.26	9.93	95.8	307.6	35.57	
							9.0	13.624	8.26	9.93	95.7	307.6	37.30	
							10.0	13.635	8.26	9.92	95.6	307.5	37.89	
							11.0	13.620	8.26	9.90	95.4	307.6	35.51	
							12.0	13.631	8.26	9.90	95.3	307.6	35.95	
							13.0	13.619	8.26	9.89	95.3	307.6	37.04	
							14.0	13.612	8.26	9.88	95.1	307.6	36.58	
							15.0	13.591	8.25	9.87	95.0	307.4	37.76	
							16.0	13.589	8.25	9.86	94.9	307.5	35.59	
							17.0	13.584	8.24	9.85	94.8	307.4	34.42	
							18.0	13.584	8.23	9.84	94.7	307.4	35.70	
Stephens Lake - Far-field # 1	FF-1	19-Sep-17	9:15	22.5	N/A	N/A	0.3	13.527	7.96	10.17	97.8	314.6	31.85	0.40
							1.0	13.541	7.99	10.17	97.7	314.6	32.50	
							2.0	13.539	7.99	10.16	97.7	314.6	32.78	
							3.0	13.541	8.01	10.13	97.4	314.6	34.46	
							4.0	13.542	8.02	10.13	97.4	314.7	33.98	
							5.0	13.541	8.02	10.12	97.3	314.6	32.87	
							6.0	13.541	8.02	10.11	97.3	314.7	34.00	
							7.0	13.541	8.03	10.00	97.2	314.6	33.46	
							8.0	13.543	8.04	10.10	97.1	314.7	32.40	
							9.0	13.548	8.04	10.08	96.9	314.6	31.75	
							10.0	13.546	8.05	10.07	96.9	314.7	33.24	
							11.0	13.546	8.05	10.07	96.8	314.7	34.48	
							12.0	13.546	8.06	10.06	96.7	314.6	32.17	
							13.0	13.547	8.06	10.05	96.7	314.7	33.50	
							14.0	13.547	8.06	10.04	96.5	314.6	33.29	
							15.0	13.549	8.07	10.03	96.5	314.7	32.07	
							16.0	13.549	8.07	10.03	96.4	314.7	33.20	
							17.0	13.550	8.07	10.02	96.4	314.7	35.30	
							18.0	13.550	8.07	10.01	96.2	314.7	33.44	
							19.0	13.547	8.08	10.00	96.1	314.7	33.21	
							20.0	13.493	8.09	9.98	95.8	315.0	32.27	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Far-field # 2	FF-2	19-Sep-17	10:30	16.1	N/A	N/A	0.3	13.855	8.31	10.26	99.4	312.0	30.76	0.38
							1.0	13.756	8.31	10.21	98.8	312.0	32.41	
							2.0	13.746	8.30	10.18	98.3	312.0	33.47	
							3.0	13.742	8.30	10.16	98.1	312.0	33.19	
							4.0	13.737	8.30	10.14	97.9	311.9	34.43	
							5.0	13.736	8.29	10.12	97.7	312.0	35.39	
							6.0	13.736	8.29	10.12	97.7	312.0	33.15	
							7.0	13.736	8.29	10.10	97.6	312.0	33.69	
							8.0	13.736	8.29	10.10	97.5	312.0	33.58	
							9.0	13.733	8.29	10.09	97.4	312.0	34.18	
							10.0	13.733	8.28	10.08	97.4	312.0	33.67	
							11.0	13.733	8.28	10.07	97.2	312.0	34.37	
							12.0	13.734	8.28	10.06	97.1	312.1	33.37	
							13.0	13.733	8.28	10.05	97.1	312.0	33.29	
							14.0	13.733	8.28	10.05	97.0	312.0	32.80	
							15.0	13.732	8.28	10.03	96.8	312.1	33.32	
Stephens Lake - Far-field # 3	FF-3	19-Sep-17	11:30	26.4	N/A	N/A	0.3	14.250	8.36	10.33	101.0	312.0	31.20	0.35
							1.0	14.000	8.34	10.27	99.6	312.1	30.90	
							2.0	13.873	8.32	10.18	98.6	312.1	32.85	
							3.0	13.868	8.30	10.15	98.3	312.1	34.48	
							4.0	13.862	8.29	10.13	98.1	312.1	32.56	
							5.0	13.855	8.28	10.13	98.0	312.2	31.98	
							6.0	13.841	8.27	10.11	97.9	312.2	32.99	
							7.0	13.807	8.27	10.11	97.8	312.0	33.30	
							8.0	13.812	8.26	10.11	97.7	312.1	32.94	
							9.0	13.793	8.25	10.10	97.7	312.0	32.90	
							10.0	13.795	8.25	10.09	97.6	312.1	33.18	
							11.0	13.790	8.24	10.08	97.5	312.1	32.37	
							12.0	13.792	8.23	10.07	97.4	312.1	35.81	
							13.0	13.787	8.23	10.07	97.3	312.1	35.44	
							14.0	13.767	8.23	10.07	97.3	312.1	33.50	
							15.0	13.758	8.22	10.05	97.1	312.2	34.50	
							16.0	13.744	8.22	10.04	97.0	312.2	32.71	
							17.0	13.760	8.21	10.03	96.9	312.2	33.33	
							18.0	13.755	8.21	10.02	96.8	312.2	31.40	
							19.0	13.752	8.21	10.02	96.8	312.2	37.45	
							20.0	13.748	8.21	10.01	96.7	312.2	30.66	
							22.0	13.737	8.20	9.99	96.5	312.2	33.24	
							24.0	13.688	8.20	9.99	96.4	312.3	32.57	

Table A1-1: *In situ* parameters measured in the Keeyask local study area during the ice-cover and open-water seasons of 2017. Values in blue italics are considered suspect (continued).

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Snow Thickness (m)	Ice Thickness (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	Secchi Disk Depth (m)
Stephens Lake - Far-field # 4	FF-4	19-Sep-17	11:00	14.2	N/A	N/A	0.3	14.105	8.34	10.29	100.0	312.2	30.97	0.40
							1.0	13.871	8.32	10.27	99.4	312.2	32.52	
							2.0	13.818	8.31	10.24	99.0	312.1	32.37	
							3.0	13.800	8.30	10.20	98.6	312.2	31.01	
							4.0	13.793	8.29	10.18	98.4	312.1	33.04	
							5.0	13.791	8.29	10.17	98.3	312.2	34.87	
							6.0	13.792	8.28	10.16	98.2	312.2	33.33	
							7.0	13.790	8.28	10.14	98.0	312.1	32.35	
							8.0	13.791	8.27	10.13	97.9	312.1	34.49	
							9.0	13.791	8.26	10.12	97.8	312.2	32.65	
							10.0	13.780	8.26	10.11	97.8	312.1	32.93	
							11.0	13.786	8.25	10.10	97.6	312.2	32.51	
							12.0	13.784	8.25	10.09	97.6	312.2	32.98	
							13.0	13.783	8.24	10.08	97.5	312.3	35.00	
Stephens Lake - Far-field # 5	FF-5	19-Sep-17	10:00	12.9	N/A	N/A	0.3	13.616	8.17	10.25	98.7	312.6	31.04	0.33
							1.0	13.601	8.18	10.22	98.4	312.6	33.40	
							2.0	13.587	8.21	10.18	98.0	312.6	32.80	
							3.0	13.579	8.22	10.16	97.8	312.7	36.41	
							4.0	13.574	8.24	10.14	97.6	312.9	32.56	
							5.0	13.570	8.25	10.13	97.5	312.8	33.74	
							6.0	13.570	8.25	10.12	97.3	312.9	35.41	
							7.0	13.571	8.26	10.11	97.2	312.9	33.42	
							8.0	13.571	8.26	10.09	97.1	313.0	33.89	
							9.0	13.570	8.27	10.09	97.0	313.0	33.66	
							10.0	13.570	8.27	10.08	96.9	312.9	34.73	
							11.0	13.572	8.27	10.06	96.8	313.0	35.72	
							12.0	13.574	8.27	10.05	96.7	313.0	35.71	

Table A1-2: Routine water chemistry parameters measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017.

					Alkalinity				Nitrogen						Phosphorus	
Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Total ($CaCO_3$) (mg/L)	Bicarbonate (HCO_3) (mg/L)	Carbonate (CO_3) (mg/L)	Hydroxide (OH) (mg/L)	Ammonia (mg/L N)	Nitrate/ nitrite (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Total Kjeldahl N (mg/L)	Total N[1] (mg/L)	Dissolved P (mg/L)	Total P (mg/L)
Detection Limit					1.0	1.2	0.60	0.34	0.010	0.0051	0.0050	0.0010	0.20	-	0.0010/0.010	0.0010/0.010
Split Lake # 10	SPL-10	L1909314-1	3-Apr-17	11:30	99.4	121	<0.60	<0.34	0.032	0.0601	0.0601	<0.0010	0.44	0.50	0.0152	0.027
Split Lake # 11	SPL-11	L1909314-2	3-Apr-17	12:24	105	128	<0.60	<0.34	<0.010	0.0580	0.0580	<0.0010	0.40	0.46	0.0164	0.028
Split Lake # 12	SPL-12	L1909314-5	3-Apr-17	14:45	105	128	<0.60	<0.34	<0.010	0.0573	0.0573	<0.0010	0.43	0.49	0.0169	0.028
Split Lake # 13	SPL-13	L1909314-4	3-Apr-17	14:00	98.4	120	<0.60	<0.34	<0.010	0.0596	0.0596	<0.0010	0.44	0.50	0.0160	0.027
Split Lake # 14	SPL-14	L1909314-3	3-Apr-17	13:13	114	139	<0.60	<0.34	<0.010	0.0542	0.0528	0.0015	0.43	0.48	0.0177	0.028
Nelson River Upstream # 6	US-6	L1909812-4	5-Apr-17	11:10	116	141	<0.60	<0.34	<0.010	0.0570	0.0559	0.0011	0.48	0.54	0.0166	0.028
Nelson River Upstream # 8	US-8	L1909812-3	5-Apr-17	10:40	114	139	<0.60	<0.34	<0.010	0.0551	0.0551	<0.0010	0.48	0.54	0.0162	0.028
Nelson River Upstream # 9	US-9	L1909812-5	5-Apr-17	11:45	115	140	<0.60	<0.34	<0.010	0.0549	0.0538	0.0011	0.49	0.54	0.0169	0.028
Nelson River Upstream # 10	US-10	L1909812-1	5-Apr-17	8:45	116	142	<0.60	<0.34	<0.010	0.0557	0.0557	<0.0010	0.49	0.55	0.0156	0.027
Nelson River Upstream # 11	US-11	L1909812-2, 7, 8	5-Apr-17	9:39	114	139	<0.60	<0.34	<0.010	0.0558	0.0553	<0.0010	0.53	0.59	0.0163	0.030
Stephens Lake - Nearfield # 1	NF-1	L1909812-9	5-Apr-17	13:35	112	137	<0.60	<0.34	<0.010	0.0561	0.0561	<0.0010	0.51	0.57	0.0149	0.028
Stephens Lake - Nearfield # 2	NF-2	L1909812-10	5-Apr-17	15:00	115	140	<0.60	<0.34	0.011	0.0571	0.0571	<0.0010	0.53	0.59	0.0158	0.028
Stephens Lake - Nearfield # 3	NF-3	L1909812-11	5-Apr-17	14:20	114	139	<0.60	<0.34	<0.010	0.0546	0.0546	<0.0010	0.53	0.58	0.0169	0.028
Stephens Lake - Nearfield # 4	NF-4	L1909812-12	5-Apr-17	15:35	113	138	<0.60	<0.34	<0.010	0.0570	0.0570	<0.0010	0.50	0.56	0.0165	0.028
Stephens Lake - Nearfield # 5	NF-5	L1909812-13	5-Apr-17	13:10	115	140	<0.60	<0.34	<0.010	0.0552	0.0552	<0.0010	0.47	0.53	0.0161	0.028
Stephens Lake - Farfield # 1	FF-1	L1910427-3	6-Apr-17	8:35	112	137	<0.60	<0.34	<0.010	0.0564	0.0553	0.0012	0.35	0.41	0.0161	0.026
Stephens Lake - Farfield # 2	FF-2	L1910427-4	6-Apr-17	10:00	114	139	<0.60	<0.34	<0.010	0.0591	0.0580	0.0011	0.29	0.35	0.0171	0.061
Stephens Lake - Farfield # 3	FF-3	L1910427-5, 8	6-Apr-17	11:15	112	137	<0.60	<0.34	0.034	0.0558	0.0558	<0.0010	0.32	0.38	0.0185	0.027
Stephens Lake - Farfield # 4	FF-4	L1910427-6	6-Apr-17	10:34	112	137	<0.60	<0.34	<0.010	0.0561	0.0561	<0.0010	0.35	0.41	0.0161	0.028
Stephens Lake - Farfield # 5	FF-5	L1910427-7	6-Apr-17	9:30	114	138	<0.60	<0.34	<0.010	0.0583	0.0573	0.0010	0.39	0.45	0.0174	0.027
Clark Lake # 1	CL-1	L1949034-1	26-Jun-17	11:25	109	133	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.44	0.44	0.0108	0.050
Clark Lake # 2	CL-2	L1949034-2	26-Jun-17	11:54	110	134	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.54	0.54	0.0140	0.048
Clark Lake # 3	CL-3	L1949034-3	26-Jun-17	12:55	111	135	<0.60	<0.34	0.027	<0.0051	<0.0050	<0.0010	0.51	0.51	0.0127	0.050
Clark Lake # 4	CL-4	L1949034-4	26-Jun-17	12:20	106	129	<0.60	<0.34	0.080	<0.0051	<0.0050	<0.0010	0.56	0.56	0.0103	0.048
Clark Lake # 5	CL-5	L1949034-5	26-Jun-17	12:35	107	131	<0.60	<0.34	0.051	<0.0051	<0.0050	<0.0010	0.44	0.44	0.0097	0.047
Nelson River Upstream # 1	US-1	L1950846-1	27-Jun-17	12:40	112	137	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.61	0.61	0.0103	0.048
Nelson River Upstream # 2	US-2	L1950846-2	27-Jun-17	13:07	112	136	<0.60	<0.34	0.015	<0.0051	<0.0050	<0.0010	0.39	0.39	0.0136	0.050
Nelson River Upstream # 3	US-3	L1950846-3	27-Jun-17	14:01	111	136	<0.60	<0.34	<0.010	<0.0051	<0.0050	0.0011	0.36	0.36	0.0125	0.048
Nelson River Upstream # 4	US-4	L1950846-4	27-Jun-17	14:21	111	136	<0.60	<0.34	0.019	<0.0051	<0.0050	<0.0010	0.33	0.33	0.0130	0.049
Nelson River Upstream # 5	US-5	L1950846-5	27-Jun-17	13:30	112	136	<0.60	<0.34	0.017	<0.0051	<0.0050	<0.0010	0.39	0.39	0.0108	0.048
Stephens Lake - Nearfield # 1	NF-1	L1951672-1	29-Jun-17	10:45	111	136	<0.60	<0.34	0.022	<0.0051	<0.0050	<0.0010	0.49	0.49	0.021	0.047
Stephens Lake - Nearfield # 2	NF-2	L1951672-2	29-Jun-17	9:15	111	136	<0.60	<0.34	0.032	<0.0051	<0.0050	<0.0010	0.57	0.57	0.020	0.049
Stephens Lake - Nearfield # 3	NF-3	L1951672-3	29-Jun-17	10:25	113	137	<0.60	<0.34	0.024	<0.0051	<0.0050	<0.0010	0.50	0.50	0.0137	0.056
Stephens Lake - Nearfield # 4	NF-4	L1951672-4,-6,-7	29-Jun-17	9:45	114	139	<0.60	<0.34	0.029	<0.0051	<0.0050	<0.0010	0.57	0.57	0.0139	0.047
Stephens Lake - Nearfield # 5	NF-5	L1951672-5	29-Jun-17	11:15	114	139	<0.60	<0.34	0.013	0.0054	0.0054	<0.0010	0.50	0.51	0.027	0.050
Stephens Lake - Farfield # 1	FF-1	L1952246-1	2-Jul-17	9:30	112	136	<0.60	<0.34	0.031	<0.0051	<0.0050	<0.0010	0.62	0.62	0.0103	0.042
Stephens Lake - Farfield # 2	FF-2	L1952246-2	2-Jul-17	10:15	112	136	<0.60	<0.34	0.032	<0.0051	<0.0050	<0.0010	0.35	0.35	0.0158	0.049
Stephens Lake - Farfield # 3	FF-3	L1952246-3	2-Jul-17	10:55	112	136	<0.60	<0.34	0.019	0.0081	0.0081	<0.0010	0.53	0.54	0.0105	0.046
Stephens Lake - Farfield # 4	FF-4	L1952246-4	2-Jul-17	10:32	112	137	<0.60	<0.34	0.024	0.0062	0.0062	<0.0010	0.76	0.77	0.0091	0.046
Stephens Lake - Farfield # 5	FF-5	L1952246-5	2-Jul-17	9:55	112	136	<0.60	<0.34	0.034	<0.0051	<0.0050	<0.0010	0.45	0.45	0.0173	0.042

Table A1-2: Routine water chemistry parameters measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

					Alkalinity				Nitrogen						Phosphorus	
Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Total ($CaCO_3$) (mg/L)	Bicarbonate (HCO_3) (mg/L)	Carbonate (CO_3) (mg/L)	Hydroxide (OH) (mg/L)	Ammonia (mg/L N)	Nitrate/ nitrite (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Total Kjeldahl N (mg/L)	Total N[1] (mg/L)	Dissolved P (mg/L)	Total P (mg/L)
Detection Limit					1.0	1.2	0.60	0.34	0.010	0.0051	0.0050	0.0010	0.20	-	0.0010/0.010	0.0010/0.010
Clark Lake # 1	CL-1	L1963907-1	24-Jul-17	10:45	107	131	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.38	0.38	0.0164	0.041
Clark Lake # 2	CL-2	L1963907-2	24-Jul-17	11:20	109	132	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.38	0.38	0.030	0.041
Clark Lake # 3	CL-3	L1963907-3	24-Jul-17	11:55	109	133	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.45	0.45	0.0136	0.041
Clark Lake # 4	CL-4	L1963907-4	24-Jul-17	9:20	105	128	<0.60	<0.34	0.012	<0.0051	<0.0050	<0.0010	0.41	0.41	0.0158	0.044
Clark Lake # 5	CL-5	L1963907-5	24-Jul-17	10:00	106	129	<0.60	<0.34	0.012	<0.0051	<0.0050	<0.0010	0.37	0.37	0.0140	0.041
Nelson River Upstream # 1	US-1	L1965745-1	25-Jul-17	13:20	110	135	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.45	0.45	0.0119	0.040
Nelson River Upstream # 2	US-2	L1965745-2	25-Jul-17	14:55	110	134	<0.60	<0.34	0.010	<0.0051	<0.0050	<0.0010	0.42	0.42	0.0120	0.041
Nelson River Upstream # 3	US-3	L1965745-3	25-Jul-17	14:20	110	134	<0.60	<0.34	0.012	<0.0051	<0.0050	<0.0010	0.46	0.46	0.0121	0.041
Nelson River Upstream # 4	US-4	L1965745-4	25-Jul-17	13:50	108	132	<0.60	<0.34	0.013	<0.0051	<0.0050	<0.0010	0.44	0.44	0.0100	0.042
Nelson River Upstream # 5	US-5	L1965745-5	25-Jul-17	15:30	110	134	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.61	0.61	0.0150	0.041
Stephens Lake - Nearfield # 1	NF-1	L1966177-1	26-Jul-17	10:00	111	135	<0.60	<0.34	0.023	<0.0051	<0.0050	<0.0010	0.52	0.52	0.0136	0.041
Stephens Lake - Nearfield # 2	NF-2	L1966177-2	26-Jul-17	11:45	111	135	<0.60	<0.34	0.022	<0.0051	<0.0050	<0.0010	0.62	0.62	0.0130	0.041
Stephens Lake - Nearfield # 3	NF-3	L1966177-3,-6,-7	26-Jul-17	10:55	108	132	<0.60	<0.34	0.029	0.0067	0.0066	<0.0010	0.52	0.52	0.0136	0.042
Stephens Lake - Nearfield # 4	NF-4	L1966177-4	26-Jul-17	12:10	108	132	<0.60	<0.34	0.033	<0.0051	<0.0050	<0.0010	0.63	0.63	0.0125	0.041
Stephens Lake - Nearfield # 5	NF-5	L1966177-5	26-Jul-17	9:00	109	133	<0.60	<0.34	0.022	<0.0051	<0.0050	0.0012	0.34	0.34	0.0160	0.043
Stephens Lake - Farfield # 1	FF-1	L1966177-8	26-Jul-17	13:50	110	134	<0.60	<0.34	0.030	<0.0051	<0.0050	<0.0010	0.68	0.68	0.0113	0.041
Stephens Lake - Farfield # 2	FF-2	L1966177-9	26-Jul-17	14:45	110	134	<0.60	<0.34	0.024	<0.0051	<0.0050	<0.0010	0.67	0.67	0.020	0.043
Stephens Lake - Farfield # 3	FF-3	L1966177-10	26-Jul-17	15:35	112	136	<0.60	<0.34	0.018	<0.0051	<0.0050	<0.0010	0.60	0.60	0.0115	0.041
Stephens Lake - Farfield # 4	FF-4	L1966177-11	26-Jul-17	15:10	111	136	<0.60	<0.34	0.025	<0.0051	<0.0050	<0.0010	0.61	0.61	0.0140	0.042
Stephens Lake - Farfield # 5	FF-5	L1966177-12	26-Jul-17	14:20	110	134	<0.60	<0.34	0.022	<0.0051	<0.0050	<0.0010	0.52	0.52	0.0167	0.042
Clark Lake # 1	CL-1	L1982058-1	27-Aug-17	9:30	112	136	<0.60	<0.34	0.017	0.0228	0.0218	0.0010	0.43	0.45	0.0167	0.049
Clark Lake # 2	CL-2	L1982058-2	27-Aug-17	11:00	112	136	<0.60	<0.34	0.017	0.0238	0.0226	0.0012	0.40	0.42	0.024	0.045
Clark Lake # 3	CL-3	L1982058-3	27-Aug-17	11:30	111	136	<0.60	<0.34	0.014	0.0223	0.0223	<0.0010	0.47	0.49	0.0180	0.046
Clark Lake # 4	CL-4	L1982058-4	27-Aug-17	12:15	110	134	<0.60	<0.34	0.016	0.0215	0.0215	<0.0010	0.42	0.44	0.0171	0.046
Clark Lake # 5	CL-5	L1982058-5	27-Aug-17	12:45	108	131	<0.60	<0.34	0.019	0.0208	0.0208	<0.0010	0.41	0.43	0.0169	0.046
Nelson River Upstream # 1	US-1	L1983803-1	28-Aug-17	11:30	111	136	<0.60	<0.34	0.017	0.0223	0.0223	<0.0010	0.37	0.39	0.0161	0.047
Nelson River Upstream # 2	US-2	L1983803-2	28-Aug-17	12:15	109	133	<0.60	<0.34	0.015	0.0259	0.0246	0.0013	0.43	0.46	0.0157	0.049
Nelson River Upstream # 3	US-3	L1983803-3	28-Aug-17	12:45	110	134	<0.60	<0.34	0.022	0.0245	0.0245	<0.0010	0.48	0.50	0.0169	0.048
Nelson River Upstream # 4	US-4	L1983803-4	28-Aug-17	1:30	110	134	<0.60	<0.34	0.014	0.0238	0.0238	<0.0010	0.53	0.55	0.0171	0.048
Nelson River Upstream # 5	US-5	L1983803-5	28-Aug-17	2:15	112	136	<0.60	<0.34	0.018	0.0250	0.0240	0.0010	0.52	0.55	0.020	0.048
Stephens Lake - Nearfield # 1	NF-1	L1984553-8	30-Aug-17	12:15	112	137	<0.60	<0.34	0.027	0.0275	0.0275	<0.0010	0.32	0.35	0.0174	0.042
Stephens Lake - Nearfield # 2	NF-2	L1984553-9	30-Aug-17	13:45	112	136	<0.60	<0.34	0.025	0.0194	0.0194	<0.0010	0.35	0.37	0.0160	0.041
Stephens Lake - Nearfield # 3	NF-3	L1984553-10	30-Aug-17	13:15	112	137	<0.60	<0.34	0.029	0.0246	0.0246	<0.0010	0.30	0.32	0.0169	0.042
Stephens Lake - Nearfield # 4	NF-4	L1984553-11	30-Aug-17	14:15	112	137	<0.60	<0.34	0.038	0.0208	0.0196	0.0012	0.35	0.37	0.0154	0.042
Stephens Lake - Nearfield # 5	NF-5	L1984553-12,-13,-14	30-Aug-17	11:30	112	137	<0.60	<0.34	0.023	0.0265	0.0259	<0.0010	0.32	0.34	0.0181	0.042
Stephens Lake - Farfield # 1	FF-1	L1984553-1	30-Aug-17	7:30	112	137	<0.60	<0.34	0.027	0.0217	0.0217	<0.0010	0.35	0.37	0.0161	0.031
Stephens Lake - Farfield # 2	FF-2	L1984553-2	30-Aug-17	9:00	113	137	<0.60	<0.34	0.026	0.0224	0.0213	0.0011	0.31	0.33	0.0176	0.040
Stephens Lake - Farfield # 3	FF-3	L1984553-3	30-Aug-17	10:00	113	137	<0.60	<0.34	0.024	0.0254	0.0239	0.0015	0.33	0.36	0.0164	0.039
Stephens Lake - Farfield # 4	FF-4	L1984553-4	30-Aug-17	9:30	112	137	<0.60	<0.34	0.025	0.0218	0.0207	0.0011	0.32	0.34	0.0168	0.039
Stephens Lake - Farfield # 5	FF-5	L1984553-5	30-Aug-17	8:30	111	136	<0.60	<0.34	0.023	0.0215	0.0199	0.0017	0.35	0.37	0.0169	0.040

Table A1-2: Routine water chemistry parameters measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

					Alkalinity				Nitrogen						Phosphorus	
Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Total ($CaCO_3$) (mg/L)	Bicarbonate (HCO_3) (mg/L)	Carbonate (CO_3) (mg/L)	Hydroxide (OH) (mg/L)	Ammonia (mg/L N)	Nitrate/ nitrite (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Total Kjeldahl N (mg/L)	Total N[1] (mg/L)	Dissolved P (mg/L)	Total P (mg/L)
Detection Limit					1.0	1.2	0.60	0.34	0.010	0.0051	0.0050	0.0010	0.20	-	0.0010/0.010	0.0010/0.010
Clark Lake # 1	CL-1	L1992820-1	17-Sep-17	10:30	105	128	<0.60	<0.34	<0.010	0.0569	0.0532	0.0037	0.45	0.51	0.020	0.054
Clark Lake # 2	CL-2	L1992820-2	17-Sep-17	11:30	107	130	<0.60	<0.34	<0.010	0.0557	0.0525	0.0032	0.50	0.56	0.022	0.056
Clark Lake # 3	CL-3	L1992820-3	17-Sep-17	12:15	105	127	<0.60	<0.34	<0.010	0.0589	0.0551	0.0037	0.47	0.53	0.021	0.057
Clark Lake # 4	CL-4	L1992820-4	17-Sep-17	12:45	99.4	121	<0.60	<0.34	<0.010	0.0533	0.0507	0.0026	0.51	0.56	0.022	0.055
Clark Lake # 5	CL-5	L1992820-5	17-Sep-17	13:15	103	126	<0.60	<0.34	<0.010	0.0560	0.0529	0.0031	0.50	0.56	0.022	0.055
Nelson River Upstream # 1	US-1	L1994509-1	18-Sep-17	12:15	105	128	<0.60	<0.34	<0.010	0.0592	0.0575	0.0017	0.45	0.51	0.020	0.054
Nelson River Upstream # 2	US-2	L1994509-2,-6,-7	18-Sep-17	13:00	105	128	<0.60	<0.34	<0.010	0.0609	0.0572	0.0037	0.53	0.59	0.0223	0.056
Nelson River Upstream # 3	US-3	L1994509-3	18-Sep-17	14:15	105	128	<0.60	<0.34	<0.010	0.0541	0.0506	0.0034	0.43	0.48	0.022	0.054
Nelson River Upstream # 4	US-4	L1994509-4	18-Sep-17	15:00	106	129	<0.60	<0.34	<0.010	0.0606	0.0574	0.0032	0.42	0.48	0.022	0.054
Nelson River Upstream # 5	US-5	L1994509-5	18-Sep-17	15:30	107	131	<0.60	<0.34	0.052	0.0608	0.0585	0.0022	0.45	0.51	0.023	0.054
Stephens Lake - Nearfield # 1	NF-1	L1994519-1	19-Sep-17	13:15	103	126	<0.60	<0.34	<0.010	0.0579	0.0559	0.0020	<0.20	<0.20	0.023	0.056
Stephens Lake - Nearfield # 2	NF-2	L1994519-2	19-Sep-17	14:45	105	128	<0.60	<0.34	<0.010	0.0579	0.0560	0.0019	0.52	0.58	0.022	0.054
Stephens Lake - Nearfield # 3	NF-3	L1994519-3	19-Sep-17	13:45	104	126	<0.60	<0.34	<0.010	0.0580	0.0552	0.0028	0.50	0.56	0.023	0.056
Stephens Lake - Nearfield # 4	NF-4	L1994519-4	19-Sep-17	14:30	104	127	<0.60	<0.34	<0.010	0.0609	0.0575	0.0034	0.53	0.59	0.022	0.054
Stephens Lake - Nearfield # 5	NF-5	L1994519-5	19-Sep-17	12:30	103	126	<0.60	<0.34	<0.010	0.0607	0.0588	0.0019	0.48	0.54	0.023	0.055
Stephens Lake - Farfield # 1	FF-1	L1994519-6	19-Sep-17	9:15	107	130	<0.60	<0.34	<0.010	0.0593	0.0566	0.0028	0.50	0.56	0.022	0.051
Stephens Lake - Farfield # 2	FF-2	L1994519-7	19-Sep-17	10:30	105	128	<0.60	<0.34	0.010	0.0590	0.0563	0.0027	0.53	0.59	0.023	0.050
Stephens Lake - Farfield # 3	FF-3	L1994519-8	19-Sep-17	11:30	105	128	<0.60	<0.34	<0.010	0.0626	0.0591	0.0035	0.52	0.58	0.023	0.051
Stephens Lake - Farfield # 4	FF-4	L1994519-9	19-Sep-17	11:00	105	128	<0.60	<0.34	0.012	0.0628	0.0583	0.0044	0.56	0.62	0.023	0.050
Stephens Lake - Farfield # 5	FF-5	L1994519-10	19-Sep-17	10:00	105	128	<0.60	<0.34	<0.010	0.0624	0.0575	0.0049	<0.20	<0.20	0.021	0.052

Table A1-2: Routine water chemistry parameters measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

			Carbon		Water Clarity						Productivity	
Sample Location	Site ID	Sample Date	Total Organic C (mg/L)	Dissolved Organic C (mg/L)	Total Suspended Solids (mg/L)	Turbidity (NTU)	True Colour (CU)	Lab pH	Specific Conductance (µmhos/cm)	Total Dissolved Solids (mg/L)	Chlorophyll *a* (µg/L)	Phaeophytin *a* (µg/L)
Detection Limit			0.50	0.50	2.0	0.10	5.0	0.10	1.0	4.0/13/20	0.10	0.10
Split Lake # 10	SPL-10	3-Apr-17	9.28	9.26	3.8	12.3	17.9	7.91	292	167	2.14	0.89
Split Lake # 11	SPL-11	3-Apr-17	9.28	9.53	4.0	12.0	20.1	7.95	301	192	2.52	1.04
Split Lake # 12	SPL-12	3-Apr-17	9.24	9.50	4.8	11.9	20.1	7.97	309	192	2.03	0.82
Split Lake # 13	SPL-13	3-Apr-17	9.37	9.44	4.4	12.8	18.6	7.95	285	185	2.35	0.91
Split Lake # 14	SPL-14	3-Apr-17	9.42	9.53	3.6	10.0	17.6	7.98	350	218	3.03	1.09
Nelson River Upstream # 6	US-6	5-Apr-17	9.13	9.51	7.8	10.6	16.3	8.00	342	214	3.01	0.97
Nelson River Upstream # 8	US-8	5-Apr-17	9.29	9.71	6.0	10.9	15.9	7.99	339	217	3.09	1.02
Nelson River Upstream # 9	US-9	5-Apr-17	9.14	9.46	5.6	10.8	16.6	8.00	341	209	2.95	0.97
Nelson River Upstream # 10	US-10	5-Apr-17	9.49	9.51	6.0	11.1	15.5	8.02	338	228	2.99	1.06
Nelson River Upstream # 11	US-11	5-Apr-17	9.28	9.46	7.7	11.0	17.0	8.01	342	216	2.80	1.01
Stephens Lake - Nearfield # 1	NF-1	5-Apr-17	9.24	9.39	6.8	11.3	17.1	8.02	335	214	2.91	1.02
Stephens Lake - Nearfield # 2	NF-2	5-Apr-17	9.10	9.38	5.8	11.2	18.8	8.02	335	214	2.84	1.02
Stephens Lake - Nearfield # 3	NF-3	5-Apr-17	9.11	9.34	6.6	11.0	16.5	8.02	334	218	2.89	0.70
Stephens Lake - Nearfield # 4	NF-4	5-Apr-17	9.09	9.43	6.8	11.0	17.0	8.03	336	214	2.72	0.96
Stephens Lake - Nearfield # 5	NF-5	5-Apr-17	9.14	9.70	5.6	11.3	16.6	8.04	336	213	2.89	1.06
Stephens Lake - Farfield # 1	FF-1	6-Apr-17	8.84	8.69	5.2	10.5	16.4	7.95	335	206	2.32	0.91
Stephens Lake - Farfield # 2	FF-2	6-Apr-17	9.05	8.63	4.4	11.1	16.4	7.96	336	214	2.36	0.92
Stephens Lake - Farfield # 3	FF-3	6-Apr-17	9.00	8.70	5.2	10.9	16.6	7.97	335	209	2.44	0.96
Stephens Lake - Farfield # 4	FF-4	6-Apr-17	8.92	8.64	6.8	10.8	18.8	7.97	336	216	2.41	0.90
Stephens Lake - Farfield # 5	FF-5	6-Apr-17	9.06	8.77	4.4	11.3	14.5	7.97	335	211	2.39	1.04
Clark Lake # 1	CL-1	26-Jun-17	9.29	9.33	22.0	28.5	23.6	8.23	292	206	7.37	2.63
Clark Lake # 2	CL-2	26-Jun-17	9.29	9.27	20.6	29.3	24.0	8.19	304	202	7.31	2.58
Clark Lake # 3	CL-3	26-Jun-17	9.13	9.11	20.8	30.0	24.1	8.20	306	207	7.32	2.33
Clark Lake # 4	CL-4	26-Jun-17	9.59	9.58	20.0	24.2	35.1	8.11	268	193	6.12	2.03
Clark Lake # 5	CL-5	26-Jun-17	9.48	10.2	23.6	27.5	28.1	8.16	282	192	6.90	2.38
Nelson River Upstream # 1	US-1	27-Jun-17	9.24	9.17	16.8	28.4	21.7	8.17	311	213	5.61	2.27
Nelson River Upstream # 2	US-2	27-Jun-17	9.23	9.28	19.8	29.0	22.1	8.15	310	217	6.34	2.77
Nelson River Upstream # 3	US-3	27-Jun-17	9.09	9.57	19.4	29.1	24.1	8.16	308	216	6.25	2.53
Nelson River Upstream # 4	US-4	27-Jun-17	9.10	9.37	15.6	28.4	25.8	8.15	305	215	5.81	2.36
Nelson River Upstream # 5	US-5	27-Jun-17	9.02	9.43	19.4	28.9	24.5	8.16	307	215	5.58	2.40
Stephens Lake - Nearfield # 1	NF-1	29-Jun-17	8.91	9.65	26.8	32.1	23.1	8.20	287	216	6.89	2.71
Stephens Lake - Nearfield # 2	NF-2	29-Jun-17	8.94	9.26	18.8	30.8	24.6	8.23	284	220	6.53	2.37
Stephens Lake - Nearfield # 3	NF-3	29-Jun-17	9.21	9.29	29.0	31.8	25.1	8.23	281	209	7.71	2.89
Stephens Lake - Nearfield # 4	NF-4	29-Jun-17	8.93	9.57	18.1	28.1	23.2	8.25	289	219	6.97	2.55
Stephens Lake - Nearfield # 5	NF-5	29-Jun-17	8.97	9.17	25.2	32.0	23.1	8.25	317	213	7.09	3.21
Stephens Lake - Farfield # 1	FF-1	2-Jul-17	8.46	9.26	15.0	27.0	22.2	8.19	322	217	7.31	1.96
Stephens Lake - Farfield # 2	FF-2	2-Jul-17	8.44	9.17	19.6	26.6	19.5	8.23	321	228	8.38	1.74
Stephens Lake - Farfield # 3	FF-3	2-Jul-17	9.32	9.38	14.4	24.8	22.8	8.18	321	209	7.35	2.09
Stephens Lake - Farfield # 4	FF-4	2-Jul-17	8.94	9.12	15.0	25.6	21.3	8.19	315	221	7.99	2.34
Stephens Lake - Farfield # 5	FF-5	2-Jul-17	9.25	9.25	14.4	26.1	21.7	8.18	312	223	7.31	2.18

Table A1-2: Routine water chemistry parameters measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

			Carbon		Water Clarity						Productivity	
Sample Location	Site ID	Sample Date	Total Organic C (mg/L)	Dissolved Organic C (mg/L)	Total Suspended Solids (mg/L)	Turbidity (NTU)	True Colour (CU)	Lab pH	Conductivity (µmhos/cm)	Total Dissolved Solids (mg/L)	Chlorophyll *a* (µg/L)	Phaeophytin *a* (µg/L)
Detection Limit			0.50	0.50	2.0	0.10	5.0	0.10	1.0	4.0/13/20	0.10	0.10
Clark Lake # 1	CL-1	24-Jul-17	8.72	9.19	17.0	22.4	20.0	8.21	297	201	11.00	3.99
Clark Lake # 2	CL-2	24-Jul-17	8.76	9.86	15.8	22.2	19.4	8.24	265	200	9.48	2.88
Clark Lake # 3	CL-3	24-Jul-17	8.65	9.30	16.4	21.5	23.8	8.25	265	202	9.39	2.77
Clark Lake # 4	CL-4	24-Jul-17	8.93	9.33	15.0	23.7	22.8	8.17	285	197	8.71	2.84
Clark Lake # 5	CL-5	24-Jul-17	9.18	9.52	15.8	21.3	21.9	8.19	268	180	8.02	2.62
Nelson River Upstream # 1	US-1	25-Jul-17	8.82	9.03	18.0	23.7	23.3	8.23	278	191	7.45	2.34
Nelson River Upstream # 2	US-2	25-Jul-17	8.63	8.95	15.2	23.4	22.8	8.25	277	188	7.83	2.54
Nelson River Upstream # 3	US-3	25-Jul-17	8.69	9.34	17.0	23.3	22.9	8.25	278	190	8.24	2.70
Nelson River Upstream # 4	US-4	25-Jul-17	8.75	9.29	17.4	23.3	20.4	8.25	277	195	8.12	2.53
Nelson River Upstream # 5	US-5	25-Jul-17	8.65	9.18	15.2	23.8	20.3	8.26	308	194	8.24	2.79
Stephens Lake - Nearfield # 1	NF-1	26-Jul-17	9.04	9.41	16.0	22.0	21.2	8.27	266	204	6.10	2.49
Stephens Lake - Nearfield # 2	NF-2	26-Jul-17	8.99	9.54	14.0	21.1	22.5	8.27	268	200	4.58	1.80
Stephens Lake - Nearfield # 3	NF-3	26-Jul-17	8.91	9.34	14.6	22.3	20.3	8.21	289	200	6.54	2.71
Stephens Lake - Nearfield # 4	NF-4	26-Jul-17	8.67	9.60	11.6	21.0	19.3	8.21	297	203	7.23	2.66
Stephens Lake - Nearfield # 5	NF-5	26-Jul-17	8.71	9.44	12.4	21.4	22.5	8.26	279	198	6.97	2.85
Stephens Lake - Farfield # 1	FF-1	26-Jul-17	8.72	9.18	10.8	20.5	21.0	8.20	297	205	5.93	2.43
Stephens Lake - Farfield # 2	FF-2	26-Jul-17	8.79	9.51	13.0	21.2	21.2	8.22	294	195	6.31	3.02
Stephens Lake - Farfield # 3	FF-3	26-Jul-17	8.77	9.33	9.2	19.8	23.0	8.21	293	196	6.55	2.55
Stephens Lake - Farfield # 4	FF-4	26-Jul-17	8.70	9.43	10.2	20.5	21.8	8.21	292	195	6.72	2.92
Stephens Lake - Farfield # 5	FF-5	26-Jul-17	8.74	9.77	15.0	21.0	20.8	8.21	291	203	6.44	2.48
Clark Lake # 1	CL-1	27-Aug-17	8.31	8.46	15.4	22.5	17.9	8.24	302	194	4.71	1.79
Clark Lake # 2	CL-2	27-Aug-17	8.11	8.45	11.8	22.1	18.2	8.26	298	196	4.35	1.61
Clark Lake # 3	CL-3	27-Aug-17	8.13	8.58	15.2	21.5	17.9	8.24	301	197	4.36	1.86
Clark Lake # 4	CL-4	27-Aug-17	8.25	8.43	15.4	23.4	21.4	8.25	282	182	4.44	1.78
Clark Lake # 5	CL-5	27-Aug-17	8.31	8.69	15.2	23.1	20.5	8.24	284	186	4.56	5.55
Nelson River Upstream # 1	US-1	28-Aug-17	8.30	8.33	16.4	21.0	18.8	8.20	286	192	3.05	2.30
Nelson River Upstream # 2	US-2	28-Aug-17	8.16	8.57	14.2	21.6	20.7	8.22	285	195	2.96	1.70
Nelson River Upstream # 3	US-3	28-Aug-17	8.10	8.65	12.0	21.3	21.9	8.23	282	192	3.72	1.88
Nelson River Upstream # 4	US-4	28-Aug-17	8.16	8.40	14.0	21.2	18.9	8.21	284	197	3.28	1.45
Nelson River Upstream # 5	US-5	28-Aug-17	8.19	8.44	13.0	21.8	19.0	8.23	283	195	3.18	1.47
Stephens Lake - Nearfield # 1	NF-1	30-Aug-17	9.50	9.63	15.0	19.3	17.8	8.23	276	205	4.75	2.04
Stephens Lake - Nearfield # 2	NF-2	30-Aug-17	9.40	9.66	9.0	18.4	17.3	8.27	278	204	6.91	3.43
Stephens Lake - Nearfield # 3	NF-3	30-Aug-17	9.68	9.62	12.6	20.2	19.4	8.27	277	201	5.72	3.82
Stephens Lake - Nearfield # 4	NF-4	30-Aug-17	9.77	9.74	11.2	18.4	18.6	8.28	276	207	6.64	2.57
Stephens Lake - Nearfield # 5	NF-5	30-Aug-17	9.81	9.90	10.3	19.8	17.1	8.26	276	200	5.57	2.33
Stephens Lake - Farfield # 1	FF-1	30-Aug-17	9.50	9.59	8.6	18.6	12.5	8.25	282	211	4.45	2.27
Stephens Lake - Farfield # 2	FF-2	30-Aug-17	9.38	9.60	10.4	17.9	16.1	8.24	281	206	4.40	2.24
Stephens Lake - Farfield # 3	FF-3	30-Aug-17	9.45	9.79	9.0	17.3	17.5	8.25	283	200	4.48	2.38
Stephens Lake - Farfield # 4	FF-4	30-Aug-17	9.59	9.67	10.2	18.6	16.8	8.26	311	202	4.76	2.37
Stephens Lake - Farfield # 5	FF-5	30-Aug-17	9.47	9.60	10.2	18.2	16.9	8.27	283	200	4.83	1.93

Table A1-2: Routine water chemistry parameters measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

			Carbon		Water Clarity						Productivity	
Sample Location	Site ID	Sample Date	Total Organic C (mg/L)	Dissolved Organic C (mg/L)	Total Suspended Solids (mg/L)	Turbidity (NTU)	True Colour (CU)	Lab pH	Conductivity (µmhos/cm)	Total Dissolved Solids (mg/L)	Chlorophyll *a* (µg/L)	Phaeophytin *a* (µg/L)
Detection Limit			0.50	0.50	2.0	0.10	5.0	0.10	1.0	4.0/13/20	0.10	0.10
Clark Lake # 1	CL-1	17-Sep-17	8.46	9.31	11.8	27.0	17.6	8.14	264	205	4.71	2.39
Clark Lake # 2	CL-2	17-Sep-17	8.47	9.03	12.2	27.1	17.8	8.14	263	206	4.87	2.45
Clark Lake # 3	CL-3	17-Sep-17	8.54	9.17	11.2	26.6	15.5	8.15	263	207	5.02	2.48
Clark Lake # 4	CL-4	17-Sep-17	8.48	9.13	10.8	28.6	15.7	8.16	253	201	5.20	2.43
Clark Lake # 5	CL-5	17-Sep-17	8.42	8.98	11.0	27.4	16.4	8.15	272	193	4.73	2.35
Nelson River Upstream # 1	US-1	18-Sep-17	8.62	8.75	10.2	26.8	18.9	8.14	264	201	4.08	2.61
Nelson River Upstream # 2	US-2	18-Sep-17	8.40	9.00	14.3	27.1	17.0	8.14	261	193	4.13	2.49
Nelson River Upstream # 3	US-3	18-Sep-17	8.35	9.57	13.6	26.5	14.6	8.14	262	188	4.30	2.59
Nelson River Upstream # 4	US-4	18-Sep-17	8.43	9.01	16.8	26.9	15.1	8.14	263	190	4.17	2.41
Nelson River Upstream # 5	US-5	18-Sep-17	8.43	9.03	16.6	26.7	14.8	8.24	262	188	4.16	2.69
Stephens Lake - Nearfield # 1	NF-1	19-Sep-17	8.10	8.48	14.2	24.7	18.1	8.16	265	184	7.56	2.60
Stephens Lake - Nearfield # 2	NF-2	19-Sep-17	8.06	8.77	11.0	24.3	17.4	8.16	265	191	4.75	2.21
Stephens Lake - Nearfield # 3	NF-3	19-Sep-17	8.12	8.65	12.4	23.9	17.9	8.14	263	184	6.55	2.65
Stephens Lake - Nearfield # 4	NF-4	19-Sep-17	8.15	9.01	11.6	24.5	16.5	8.17	266	189	5.63	2.43
Stephens Lake - Nearfield # 5	NF-5	19-Sep-17	8.13	8.89	12.0	25.0	15.7	8.16	262	184	5.41	2.27
Stephens Lake - Farfield # 1	FF-1	19-Sep-17	7.96	8.62	9.2	23.8	16.1	8.17	269	189	3.87	1.79
Stephens Lake - Farfield # 2	FF-2	19-Sep-17	8.14	8.57	10.2	23.1	18.1	8.15	269	190	4.39	1.82
Stephens Lake - Farfield # 3	FF-3	19-Sep-17	8.02	8.53	9.2	22.4	17.4	8.17	270	189	4.98	1.97
Stephens Lake - Farfield # 4	FF-4	19-Sep-17	8.21	9.01	9.2	22.3	19.0	8.17	267	193	3.52	1.74
Stephens Lake - Farfield # 5	FF-5	19-Sep-17	8.03	9.06	13.2	22.8	17.2	8.16	267	191	3.65	1.95

1. Total nitrogen calculated as the sum of total Kjeldahl nitrogen and nitrate/nitrite.

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017.

Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Hardness (as $CaCO_3$) (mg/L)	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bismuth (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Calcium (mg/L)
Detection Limit					0.20/0.25	0.0030/0.0050	0.00010/0.00020	0.00010/0.00020	0.00020/0.00050	0.00020/0.00050	0.000050/0.00020	0.010	0.0000050/0.000010	0.050/0.10
Split Lake # 10	SPL-10	L1909314-1	3-Apr-17	11:30	116	0.487	<0.00020	0.00105	0.0329	<0.00020	<0.00020	0.028	<0.000010	26.7
Split Lake # 11	SPL-11	L1909314-2	3-Apr-17	12:24	118	0.524	<0.00020	0.00111	0.0336	<0.00020	<0.00020	0.025	<0.000010	27.4
Split Lake # 12	SPL-12	L1909314-5	3-Apr-17	14:45	120	0.608	<0.00020	0.00111	0.0347	<0.00020	<0.00020	0.024	<0.000010	27.7
Split Lake # 13	SPL-13	L1909314-4	3-Apr-17	14:00	113	0.624	<0.00020	0.00101	0.0329	<0.00020	<0.00020	0.023	<0.000010	26.4
Split Lake # 14	SPL-14	L1909314-3	3-Apr-17	13:13	135	0.478	<0.00020	0.00130	0.0387	<0.00020	<0.00020	0.027	<0.000010	30.7
Nelson River Upstream # 6	US-6	L1909812-4	5-Apr-17	11:10	139	0.520	<0.00020	0.00123	0.0404	<0.00020	<0.00020	0.027	<0.000010	32.4
Nelson River Upstream # 8	US-8	L1909812-3	5-Apr-17	10:40	141	0.518	<0.00020	0.00128	0.0398	<0.00020	<0.00020	0.027	<0.000010	32.0
Nelson River Upstream # 9	US-9	L1909812-5	5-Apr-17	11:45	137	0.490	<0.00020	0.00126	0.0397	<0.00020	<0.00020	0.027	<0.000010	31.2
Nelson River Upstream # 10	US-10	L1909812-1	5-Apr-17	8:45	141	0.555	<0.00020	0.00134	0.0406	<0.00020	<0.00020	0.029	<0.000010	32.8
Nelson River Upstream # 11	US-11	L1909812-2, 7, 8	5-Apr-17	9:39	141	0.531	<0.00020	0.00129	0.0406	<0.00020	<0.00020	0.027	<0.000010	32.3
Stephens Lake - Nearfield # 1	NF-1	L1909812-9	5-Apr-17	13:35	138	0.574	<0.00020	0.00128	0.0391	<0.00020	<0.00020	0.027	<0.000010	31.7
Stephens Lake - Nearfield # 2	NF-2	L1909812-10	5-Apr-17	15:00	138	0.553	<0.00020	0.00127	0.0396	<0.00020	<0.00020	0.027	<0.000010	31.3
Stephens Lake - Nearfield # 3	NF-3	L1909812-11	5-Apr-17	14:20	138	0.537	<0.00020	0.00125	0.0401	<0.00020	<0.00020	0.027	<0.000010	31.3
Stephens Lake - Nearfield # 4	NF-4	L1909812-12	5-Apr-17	15:35	140	0.538	<0.00020	0.00134	0.0399	<0.00020	<0.00020	0.027	<0.000010	31.9
Stephens Lake - Nearfield # 5	NF-5	L1909812-13	5-Apr-17	13:10	138	0.531	<0.00020	0.00133	0.0402	<0.00020	<0.00020	0.026	<0.000010	31.2
Stephens Lake - Farfield # 1	FF-1	L1910427-3	6-Apr-17	8:35	126	0.406	<0.00020	0.00114	0.0375	<0.00020	<0.00020	0.024	<0.000010	29.0
Stephens Lake - Farfield # 2	FF-2	L1910427-4	6-Apr-17	10:00	131	0.436	<0.00020	0.00126	0.0384	<0.00020	<0.00020	0.025	<0.000010	29.9
Stephens Lake - Farfield # 3	FF-3	L1910427-5, 8	6-Apr-17	11:15	129	0.443	<0.00020	0.00124	0.0380	<0.00020	<0.00020	0.025	<0.000010	29.4
Stephens Lake - Farfield # 4	FF-4	L1910427-6	6-Apr-17	10:34	131	0.413	<0.00020	0.00121	0.0387	<0.00020	<0.00020	0.025	<0.000010	30.2
Stephens Lake - Farfield # 5	FF-5	L1910427-7	6-Apr-17	9:30	128	0.450	<0.00020	0.00120	0.0379	<0.00020	<0.00020	0.025	<0.000010	29.4
Clark Lake # 1	CL-1	L1949034-1	26-Jun-17	11:25	131	0.767	<0.00020	0.00117	0.0380	<0.00020	<0.00020	0.026	<0.000010	30.2
Clark Lake # 2	CL-2	L1949034-2	26-Jun-17	11:54	125	0.693	0.00061	0.00114	0.0366	<0.00020	<0.00020	0.025	<0.000010	29.3
Clark Lake # 3	CL-3	L1949034-3	26-Jun-17	12:55	133	0.836	0.00020	0.00115	0.0400	<0.00020	<0.00020	0.027	<0.000010	31.0
Clark Lake # 4	CL-4	L1949034-4	26-Jun-17	12:20	130	1.03	<0.00020	0.00114	0.0380	<0.00020	<0.00020	0.025	<0.000010	30.9
Clark Lake # 5	CL-5	L1949034-5	26-Jun-17	12:35	124	1.02	<0.00020	0.00108	0.0362	<0.00020	<0.00020	0.023	<0.000010	29.6
Nelson River Upstream # 1	US-1	L1950846-1	27-Jun-17	12:40	122	0.737	<0.00020	0.00114	0.0372	<0.00020	<0.00020	0.025	<0.000010	29.1
Nelson River Upstream # 2	US-2	L1950846-2	27-Jun-17	13:07	128	0.914	<0.00020	0.00116	0.0379	<0.00020	<0.00020	0.025	<0.000010	30.3
Nelson River Upstream # 3	US-3	L1950846-3	27-Jun-17	14:01	130	0.730	<0.00020	0.00116	0.0384	<0.00020	<0.00020	0.025	<0.000010	30.6
Nelson River Upstream # 4	US-4	L1950846-4	27-Jun-17	14:21	130	0.700	<0.00020	0.00116	0.0375	<0.00020	<0.00020	0.025	<0.000010	30.8
Nelson River Upstream # 5	US-5	L1950846-5	27-Jun-17	13:30	126	0.894	<0.00020	0.00117	0.0381	<0.00020	<0.00020	0.024	<0.000010	29.9
Stephens Lake - Nearfield # 1	NF-1	L1951672-1	29-Jun-17	10:45	134	1.19	<0.00020	0.00128	0.0424	<0.00020	<0.00020	0.025	<0.000010	31.5
Stephens Lake - Nearfield # 2	NF-2	L1951672-2	29-Jun-17	9:15	129	0.879	<0.00020	0.00116	0.0381	<0.00020	<0.00020	0.023	<0.000010	30.9
Stephens Lake - Nearfield # 3	NF-3	L1951672-3	29-Jun-17	10:25	131	0.981	<0.00020	0.00122	0.0407	<0.00020	<0.00020	0.024	<0.000010	31.5
Stephens Lake - Nearfield # 4	NF-4	L1951672-4,-6,-7	29-Jun-17	9:45	130	1.06	<0.00020	0.00123	0.0399	<0.00020	<0.00020	0.024	<0.000010	30.8
Stephens Lake - Nearfield # 5	NF-5	L1951672-5	29-Jun-17	11:15	127	0.975	<0.00020	0.00132	0.0395	<0.00020	<0.00020	0.024	<0.000010	30.3
Stephens Lake - Farfield # 1	FF-1	L1952246-1	2-Jul-17	9:30	136	0.658	<0.00020	0.00111	0.0377	<0.00020	<0.00020	0.026	<0.000010	32.3
Stephens Lake - Farfield # 2	FF-2	L1952246-2	2-Jul-17	10:15	138	0.831	<0.00020	0.00118	0.0389	<0.00020	<0.00020	0.027	<0.000010	31.9
Stephens Lake - Farfield # 3	FF-3	L1952246-3	2-Jul-17	10:55	138	0.957	0.00021	0.00121	0.0411	<0.00020	<0.00020	0.027	<0.000010	31.7
Stephens Lake - Farfield # 4	FF-4	L1952246-4	2-Jul-17	10:32	138	1.01	0.00022	0.00120	0.0420	<0.00020	<0.00020	0.027	<0.000010	31.9
Stephens Lake - Farfield # 5	FF-5	L1952246-5	2-Jul-17	9:55	138	1.09	<0.00020	0.00117	0.0411	<0.00020	<0.00020	0.027	<0.000010	32.2

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Hardness (as $CaCO_3$) (mg/L)	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bismuth (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Calcium (mg/L)
Detection Limit					0.20/0.25	0.0030/0.0050	0.00010/0.00020	0.00010/0.00020	0.00020/0.00050	0.00020/0.00050	0.000050/0.00020	0.010	0.0000050/0.000010	0.050/0.10
Clark Lake # 1	CL-1	L1963907-1	24-Jul-17	10:45	149	0.717	<0.00010	0.00140	0.0370	<0.00010	<0.000050	0.029	0.0000070	35.9
Clark Lake # 2	CL-2	L1963907-2	24-Jul-17	11:20	139	0.689	<0.00010	0.00117	0.0361	<0.00010	<0.000050	0.025	0.0000082	32.2
Clark Lake # 3	CL-3	L1963907-3	24-Jul-17	11:55	148	0.795	<0.00010	0.00132	0.0367	<0.00010	<0.000050	0.028	0.0000075	35.0
Clark Lake # 4	CL-4	L1963907-4	24-Jul-17	9:20	145	0.770	<0.00010	0.00130	0.0359	<0.00010	<0.000050	0.029	0.0000076	34.9
Clark Lake # 5	CL-5	L1963907-5	24-Jul-17	10:00	144	0.807	<0.00010	0.00137	0.0356	<0.00010	<0.000050	0.028	0.0000088	35.2
Nelson River Upstream # 1	US-1	L1965745-1	25-Jul-17	13:20	132	0.582	0.00011	0.00128	0.0355	<0.00010	<0.000050	0.029	0.0000080	30.6
Nelson River Upstream # 2	US-2	L1965745-2	25-Jul-17	14:55	130	0.322	<0.00010	0.00123	0.0339	<0.00010	<0.000050	0.027	0.0000095	30.5
Nelson River Upstream # 3	US-3	L1965745-3	25-Jul-17	14:20	131	0.559	<0.00010	0.00123	0.0339	<0.00010	<0.000050	0.028	0.0000075	31.1
Nelson River Upstream # 4	US-4	L1965745-4	25-Jul-17	13:50	131	0.277	<0.00010	0.00116	0.0331	<0.00010	<0.000050	0.028	0.0000080	31.1
Nelson River Upstream # 5	US-5	L1965745-5	25-Jul-17	15:30	126	0.371	<0.00010	0.00119	0.0328	<0.00010	<0.000050	0.027	0.0000084	30.1
Stephens Lake - Nearfield # 1	NF-1	L1966177-1	26-Jul-17	10:00	127	0.489	0.00010	0.00126	0.0334	<0.00010	<0.000050	0.030	0.0000071	30.1
Stephens Lake - Nearfield # 2	NF-2	L1966177-2	26-Jul-17	11:45	130	0.636	0.00011	0.00122	0.0350	<0.00010	<0.000050	0.030	0.0000076	31.3
Stephens Lake - Nearfield # 3	NF-3	L1966177-3,-6,-7	26-Jul-17	10:55	127	0.741	0.00011	0.00126	0.0353	<0.00010	<0.000050	0.028	0.0000076	30.4
Stephens Lake - Nearfield # 4	NF-4	L1966177-4	26-Jul-17	12:10	128	0.760	0.00011	0.00128	0.0365	<0.00010	<0.000050	0.029	0.0000069	30.8
Stephens Lake - Nearfield # 5	NF-5	L1966177-5	26-Jul-17	9:00	126	0.513	0.00011	0.00115	0.0334	<0.00010	<0.000050	0.028	0.0000071	30.5
Stephens Lake - Farfield # 1	FF-1	L1966177-8	26-Jul-17	13:50	129	0.623	0.00012	0.00128	0.0350	<0.00010	<0.000050	0.029	0.0000061	30.9
Stephens Lake - Farfield # 2	FF-2	L1966177-9	26-Jul-17	14:45	127	0.471	0.00011	0.00122	0.0338	<0.00010	<0.000050	0.029	0.0000069	30.2
Stephens Lake - Farfield # 3	FF-3	L1966177-10	26-Jul-17	15:35	129	0.397	0.00011	0.00119	0.0342	<0.00010	<0.000050	0.029	0.0000065	30.9
Stephens Lake - Farfield # 4	FF-4	L1966177-11	26-Jul-17	15:10	127	0.619	0.00010	0.00122	0.0348	<0.00010	<0.000050	0.028	0.0000073	30.3
Stephens Lake - Farfield # 5	FF-5	L1966177-12	26-Jul-17	14:20	125	0.614	0.00010	0.00121	0.0350	<0.00010	<0.000050	0.028	0.0000072	30.0
Clark Lake # 1	CL-1	L1982058-1	27-Aug-17	9:30	134	0.683	0.00011	0.00152	0.0362	<0.00010	<0.000050	0.023	0.0000084	33.6
Clark Lake # 2	CL-2	L1982058-2	27-Aug-17	11:00	133	0.747	0.00011	0.00152	0.0359	<0.00010	<0.000050	0.023	0.0000076	33.5
Clark Lake # 3	CL-3	L1982058-3	27-Aug-17	11:30	132	0.785	0.00011	0.00147	0.0359	<0.00010	<0.000050	0.023	0.0000082	33.2
Clark Lake # 4	CL-4	L1982058-4	27-Aug-17	12:15	130	0.777	0.00010	0.00148	0.0351	<0.00010	<0.000050	0.023	0.0000064	33.2
Clark Lake # 5	CL-5	L1982058-5	27-Aug-17	12:45	127	0.781	0.00011	0.00145	0.0348	<0.00010	<0.000050	0.023	<0.0000050	31.9
Nelson River Upstream # 1	US-1	L1983803-1	28-Aug-17	11:30	133	0.831	0.00027	0.00154	0.0379	<0.00010	<0.000050	0.026	0.0000060	32.5
Nelson River Upstream # 2	US-2	L1983803-2	28-Aug-17	12:15	130	0.688	0.00024	0.00159	0.0361	<0.00010	<0.000050	0.026	0.0000064	31.3
Nelson River Upstream # 3	US-3	L1983803-3	28-Aug-17	12:45	131	0.657	0.00028	0.00154	0.0363	<0.00010	<0.000050	0.026	0.0000078	31.6
Nelson River Upstream # 4	US-4	L1983803-4	28-Aug-17	1:30	131	0.801	0.00027	0.00146	0.0363	<0.00010	<0.000050	0.027	0.0000074	31.8
Nelson River Upstream # 5	US-5	L1983803-5	28-Aug-17	2:15	128	0.838	0.00023	0.00156	0.0375	<0.00010	<0.000050	0.026	0.0000073	30.5
Stephens Lake - Nearfield # 1	NF-1	L1984553-8	30-Aug-17	12:15	130	0.741	0.00036	0.00157	0.0365	<0.00010	<0.000050	0.026	0.0000069	30.5
Stephens Lake - Nearfield # 2	NF-2	L1984553-9	30-Aug-17	13:45	133	0.757	0.00035	0.00155	0.0365	<0.00010	<0.000050	0.027	0.0000071	31.8
Stephens Lake - Nearfield # 3	NF-3	L1984553-10	30-Aug-17	13:15	133	0.810	0.00033	0.00155	0.0368	<0.00010	<0.000050	0.027	<0.0000050	31.7
Stephens Lake - Nearfield # 4	NF-4	L1984553-11	30-Aug-17	14:15	135	0.735	0.00036	0.00160	0.0371	<0.00010	<0.000050	0.027	<0.0000050	32.3
Stephens Lake - Nearfield # 5	NF-5	L1984553-12,-13,-14	30-Aug-17	11:30	132	0.502	0.00028	0.00154	0.0352	<0.00010	<0.000050	0.026	0.0000060	31.7
Stephens Lake - Farfield # 1	FF-1	L1984553-1	30-Aug-17	7:30	133	0.715	0.00030	0.00165	0.0366	<0.00010	<0.000050	0.028	0.0000054	31.2
Stephens Lake - Farfield # 2	FF-2	L1984553-2	30-Aug-17	9:00	133	0.659	0.00030	0.00163	0.0357	<0.00010	<0.000050	0.028	0.0000081	30.8
Stephens Lake - Farfield # 3	FF-3	L1984553-3	30-Aug-17	10:00	134	0.648	0.00031	0.00155	0.0357	<0.00010	<0.000050	0.027	0.0000069	32.0
Stephens Lake - Farfield # 4	FF-4	L1984553-4	30-Aug-17	9:30	135	0.745	0.00033	0.00157	0.0380	<0.00010	<0.000050	0.027	0.0000074	32.2
Stephens Lake - Farfield # 5	FF-5	L1984553-5	30-Aug-17	8:30	134	0.711	0.00033	0.00162	0.0367	<0.00010	<0.000050	0.027	0.0000057	31.8

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

Sample Location	Site ID	ALS Sample ID	Sample Date	Sample Time	Hardness (as $CaCO_3$) (mg/L)	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bismuth (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Calcium (mg/L)
Detection Limit					0.20/0.25	0.0030/0.0050	0.00010/0.00020	0.00010/0.00020	0.00020/0.00050	0.00020/0.00050	0.000050/0.00020	0.010	0.0000050/0.000010	0.050/0.10
Clark Lake # 1	CL-1	L1992820-1	17-Sep-17	10:30	119	0.926	0.00013	0.00143	0.0359	<0.00010	<0.000050	0.023	0.0000104	29.0
Clark Lake # 2	CL-2	L1992820-2	17-Sep-17	11:30	118	0.924	0.00013	0.00146	0.0344	<0.00010	<0.000050	0.022	0.0000065	28.5
Clark Lake # 3	CL-3	L1992820-3	17-Sep-17	12:15	119	0.953	0.00013	0.00144	0.0355	<0.00010	<0.000050	0.022	0.0000082	28.9
Clark Lake # 4	CL-4	L1992820-4	17-Sep-17	12:45	114	0.955	0.00014	0.00135	0.0346	<0.00010	<0.000050	0.022	0.0000076	27.7
Clark Lake # 5	CL-5	L1992820-5	17-Sep-17	13:15	117	0.953	0.00014	0.00140	0.0348	<0.00010	<0.000050	0.022	0.0000062	28.2
Nelson River Upstream # 1	US-1	L1994509-1	18-Sep-17	12:15	115	0.972	0.00012	0.00140	0.0364	<0.00010	<0.000050	0.021	0.0000078	25.8
Nelson River Upstream # 2	US-2	L1994509-2,-6,-7	18-Sep-17	13:00	116	0.933	<0.00010	0.00138	0.0361	<0.00010	<0.000050	0.021	0.0000088	26.5
Nelson River Upstream # 3	US-3	L1994509-3	18-Sep-17	14:15	118	1.00	<0.00010	0.00139	0.0367	<0.00010	<0.000050	0.021	0.0000054	27.2
Nelson River Upstream # 4	US-4	L1994509-4	18-Sep-17	15:00	119	0.996	<0.00010	0.00141	0.0366	<0.00010	<0.000050	0.022	0.0000080	27.2
Nelson River Upstream # 5	US-5	L1994509-5	18-Sep-17	15:30	118	0.964	0.00019	0.00144	0.0367	<0.00010	<0.000050	0.021	0.0000079	26.7
Stephens Lake - Nearfield # 1	NF-1	L1994519-1	19-Sep-17	13:15	125	0.750	0.00014	0.00143	0.0339	<0.00010	<0.000050	0.022	0.0000084	29.9
Stephens Lake - Nearfield # 2	NF-2	L1994519-2	19-Sep-17	14:45	124	0.876	0.00015	0.00148	0.0348	<0.00010	<0.000050	0.022	0.0000070	29.3
Stephens Lake - Nearfield # 3	NF-3	L1994519-3	19-Sep-17	13:45	124	0.872	0.00011	0.00144	0.0350	<0.00010	<0.000050	0.022	0.0000073	29.4
Stephens Lake - Nearfield # 4	NF-4	L1994519-4	19-Sep-17	14:30	123	0.871	0.00018	0.00144	0.0352	<0.00010	<0.000050	0.023	0.0000053	29.1
Stephens Lake - Nearfield # 5	NF-5	L1994519-5	19-Sep-17	12:30	125	1.03	0.00014	0.00147	0.0364	<0.00010	<0.000050	0.022	0.0000069	29.4
Stephens Lake - Farfield # 1	FF-1	L1994519-6	19-Sep-17	9:15	124	0.818	0.00018	0.00143	0.0345	<0.00010	<0.000050	0.023	0.0000063	29.0
Stephens Lake - Farfield # 2	FF-2	L1994519-7	19-Sep-17	10:30	124	0.922	0.00011	0.00149	0.0358	<0.00010	<0.000050	0.023	0.0000059	29.1
Stephens Lake - Farfield # 3	FF-3	L1994519-8	19-Sep-17	11:30	126	0.829	0.00019	0.00145	0.0345	<0.00010	<0.000050	0.023	0.0000072	29.7
Stephens Lake - Farfield # 4	FF-4	L1994519-9	19-Sep-17	11:00	122	0.722	0.00013	0.00141	0.0340	<0.00010	<0.000050	0.022	0.0000072	28.6
Stephens Lake - Farfield # 5	FF-5	L1994519-10	19-Sep-17	10:00	124	0.806	0.00011	0.00148	0.0345	<0.00010	<0.000050	0.023	0.0000069	29.6

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

Sample Location	Site ID	Sample Date	Cesium (mg/L)	Chloride (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)
Detection Limit			0.000010/0.00010	0.10	0.00010/0.0010	0.00010/0.00020	0.00020/0.00050	0.010	0.000050/0.000090	0.0010/0.0020	0.0050/0.010	0.00010/0.00030	0.0000005/0.0000010	0.000050/0.00020
Split Lake # 10	SPL-10	3-Apr-17	<0.00010	12.9	<0.0010	<0.00020	0.00217	0.437	0.000265	0.0086	11.9	0.0126	0.00000170	0.00055
Split Lake # 11	SPL-11	3-Apr-17	<0.00010	13.9	<0.0010	0.00021	0.00270	0.488	0.000304	0.0089	12.2	0.0126	0.00000310	0.00061
Split Lake # 12	SPL-12	3-Apr-17	<0.00010	14.2	<0.0010	0.00023	0.00170	0.510	0.000213	0.0090	12.4	0.0131	0.00000080	0.00063
Split Lake # 13	SPL-13	3-Apr-17	<0.00010	12.6	<0.0010	0.00024	0.00195	0.543	0.000272	0.0084	11.3	0.0133	0.00000170	0.00058
Split Lake # 14	SPL-14	3-Apr-17	<0.00010	17.7	<0.0010	<0.00020	0.00183	0.411	0.000198	0.0105	14.2	0.0119	0.00000110	0.00076
Nelson River Upstream # 6	US-6	5-Apr-17	<0.00010	17.7	<0.0010	<0.00020	0.00163	0.411	0.000223	0.0111	14.2	0.0125	0.00000190	0.00077
Nelson River Upstream # 8	US-8	5-Apr-17	<0.00010	17.7	<0.0010	0.00021	0.00168	0.441	0.000236	0.0112	14.7	0.0126	0.00000120	0.00075
Nelson River Upstream # 9	US-9	5-Apr-17	<0.00010	17.6	<0.0010	<0.00020	0.00159	0.416	0.000186	0.0109	14.3	0.0120	0.00000280	0.00078
Nelson River Upstream # 10	US-10	5-Apr-17	<0.00010	17.7	<0.0010	0.00021	0.00204	0.449	0.000227	0.0116	14.5	0.0125	0.00000180	0.00077
Nelson River Upstream # 11	US-11	5-Apr-17	<0.00010	17.7	<0.0010	<0.00020	0.00217	0.445	0.000280	0.0113	14.7	0.0126	0.00000163	0.00078
Stephens Lake - Nearfield # 1	NF-1	5-Apr-17	<0.00010	17.3	<0.0010	0.00022	0.00179	0.478	0.000221	0.0109	14.3	0.0130	0.00000140	0.00073
Stephens Lake - Nearfield # 2	NF-2	5-Apr-17	<0.00010	17.4	<0.0010	0.00021	0.00177	0.446	0.000217	0.0108	14.4	0.0126	0.00000140	0.00075
Stephens Lake - Nearfield # 3	NF-3	5-Apr-17	<0.00010	17.3	<0.0010	0.00021	0.00178	0.456	0.000215	0.0110	14.5	0.0128	0.00000120	0.00077
Stephens Lake - Nearfield # 4	NF-4	5-Apr-17	<0.00010	17.5	<0.0010	0.00020	0.00165	0.447	0.000198	0.0110	14.5	0.0130	0.00000150	0.00074
Stephens Lake - Nearfield # 5	NF-5	5-Apr-17	<0.00010	17.2	<0.0010	0.00021	0.00168	0.447	0.000203	0.0108	14.7	0.0130	0.00000170	0.00075
Stephens Lake - Farfield # 1	FF-1	6-Apr-17	<0.00010	17.4	<0.0010	<0.00020	0.00146	0.381	0.000184	0.0104	13.0	0.0104	0.00000170	0.00070
Stephens Lake - Farfield # 2	FF-2	6-Apr-17	<0.00010	17.5	<0.0010	<0.00020	0.00158	0.422	0.000198	0.0107	13.7	0.0113	0.00000130	0.00073
Stephens Lake - Farfield # 3	FF-3	6-Apr-17	<0.00010	17.6	<0.0010	<0.00020	0.00165	0.400	0.000218	0.0107	13.4	0.0109	0.00000140	0.00074
Stephens Lake - Farfield # 4	FF-4	6-Apr-17	<0.00010	17.6	<0.0010	<0.00020	0.00151	0.385	0.000194	0.0106	13.4	0.0113	0.00000110	0.00073
Stephens Lake - Farfield # 5	FF-5	6-Apr-17	<0.00010	17.5	<0.0010	<0.00020	0.00159	0.420	0.000191	0.0103	13.3	0.0110	0.00000130	0.00074
Clark Lake # 1	CL-1	26-Jun-17	<0.00010	16.2	0.0012	0.00036	0.00185	0.672	0.000393	0.0109	13.4	0.0223	0.0000015	0.00072
Clark Lake # 2	CL-2	26-Jun-17	<0.00010	16.3	0.0011	0.00032	0.00178	0.620	0.000385	0.0104	12.6	0.0213	0.0000015	0.00070
Clark Lake # 3	CL-3	26-Jun-17	<0.00010	16.9	0.0018	0.00034	0.00190	0.726	0.000423	0.0112	13.5	0.0221	0.0000018	0.00079
Clark Lake # 4	CL-4	26-Jun-17	0.00011	12.6	0.0016	0.00041	0.00200	0.894	0.000435	0.0102	12.9	0.0245	0.0000017	0.00071
Clark Lake # 5	CL-5	26-Jun-17	0.00012	14.4	0.0016	0.00039	0.00186	0.876	0.000416	0.0095	12.1	0.0238	0.0000021	0.00065
Nelson River Upstream # 1	US-1	27-Jun-17	<0.00010	16.3	0.0012	0.00034	0.00173	0.677	0.000340	0.0101	12.0	0.0200	0.00000170	0.00061
Nelson River Upstream # 2	US-2	27-Jun-17	0.00010	16.4	0.0015	0.00040	0.00184	0.852	0.000385	0.0109	12.6	0.0224	0.00000240	0.00067
Nelson River Upstream # 3	US-3	27-Jun-17	<0.00010	16.5	0.0011	0.00034	0.00182	0.685	0.000371	0.0107	13.0	0.0219	0.00000220	0.00067
Nelson River Upstream # 4	US-4	27-Jun-17	<0.00010	16.3	0.0011	0.00031	0.00175	0.647	0.000375	0.0107	12.9	0.0209	0.00000210	0.00064
Nelson River Upstream # 5	US-5	27-Jun-17	0.00010	16.6	0.0015	0.00039	0.00184	0.830	0.000382	0.0108	12.5	0.0228	0.00000160	0.00064
Stephens Lake - Nearfield # 1	NF-1	29-Jun-17	0.00013	16.9	0.0019	0.00049	0.00204	1.06	0.000477	0.0112	13.3	0.0270	0.00000140	0.00072
Stephens Lake - Nearfield # 2	NF-2	29-Jun-17	<0.00010	17.0	0.0013	0.00037	0.00180	0.780	0.000391	0.0105	12.5	0.0203	0.00000150	0.00066
Stephens Lake - Nearfield # 3	NF-3	29-Jun-17	0.00011	16.9	0.0015	0.00042	0.00192	0.893	0.000424	0.0108	12.6	0.0242	0.00000140	0.00071
Stephens Lake - Nearfield # 4	NF-4	29-Jun-17	0.00012	17.0	0.0016	0.00041	0.00190	0.906	0.000399	0.0109	12.8	0.0209	0.00000137	0.00070
Stephens Lake - Nearfield # 5	NF-5	29-Jun-17	0.00010	16.8	0.0015	0.00039	0.00184	0.833	0.000416	0.0104	12.5	0.0238	0.00000140	0.00065
Stephens Lake - Farfield # 1	FF-1	2-Jul-17	<0.00010	16.4	<0.0010	0.00028	0.00197	0.577	0.000309	0.0108	13.4	0.0167	0.00000120	0.00063
Stephens Lake - Farfield # 2	FF-2	2-Jul-17	<0.00010	17.0	0.0013	0.00034	0.00192	0.722	0.000335	0.0111	14.1	0.0183	0.00000150	0.00065
Stephens Lake - Farfield # 3	FF-3	2-Jul-17	<0.00010	17.1	0.0014	0.00039	0.00189	0.823	0.000358	0.0113	14.2	0.0186	0.00000110	0.00067
Stephens Lake - Farfield # 4	FF-4	2-Jul-17	0.00010	17.1	0.0016	0.00039	0.00195	0.854	0.000374	0.0116	14.3	0.0194	0.00000130	0.00067
Stephens Lake - Farfield # 5	FF-5	2-Jul-17	0.00018	16.5	0.0017	0.00041	0.00198	0.918	0.000388	0.0113	14.0	0.0191	0.00000130	0.00067

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

Sample Location	Site ID	Sample Date	Cesium (mg/L)	Chloride (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)
Detection Limit			0.000010/0.00010	0.10	0.00010/0.0010	0.00010/0.00020	0.00020/0.00050	0.010	0.000050/0.000090	0.0010/0.0020	0.0050/0.010	0.00010/0.00030	0.0000005/0.0000010	0.000050/0.00020
Clark Lake # 1	CL-1	24-Jul-17	0.000076	15.6	0.00113	0.00032	0.00192	0.638	0.000337	0.0108	14.3	0.0188	0.00000130	0.000660
Clark Lake # 2	CL-2	24-Jul-17	0.000067	15.9	0.00107	0.00032	0.00191	0.619	0.000320	0.0096	14.1	0.0189	0.00000100	0.000570
Clark Lake # 3	CL-3	24-Jul-17	0.000081	16.3	0.00122	0.00034	0.00202	0.679	0.000350	0.0107	14.8	0.0191	0.00000100	0.000663
Clark Lake # 4	CL-4	24-Jul-17	0.000076	14.6	0.00118	0.00034	0.00193	0.679	0.000337	0.0106	14.1	0.0190	0.00000110	0.000633
Clark Lake # 5	CL-5	24-Jul-17	0.000084	13.3	0.00128	0.00037	0.00195	0.717	0.000367	0.0104	13.7	0.0202	0.00000120	0.000630
Nelson River Upstream # 1	US-1	25-Jul-17	0.000065	15.8	0.00098	0.00029	0.00184	0.550	0.000317	0.0107	13.4	0.0180	0.00000130	0.000599
Nelson River Upstream # 2	US-2	25-Jul-17	0.000033	15.8	0.00066	0.00022	0.00165	0.333	0.000266	0.0103	13.1	0.0161	0.00000110	0.000527
Nelson River Upstream # 3	US-3	25-Jul-17	0.000056	15.7	0.00088	0.00028	0.00176	0.520	0.000306	0.0107	12.8	0.0175	0.00000100	0.000561
Nelson River Upstream # 4	US-4	25-Jul-17	0.000028	15.8	0.00051	0.00021	0.00162	0.301	0.000250	0.0104	12.9	0.0153	0.00000120	0.000531
Nelson River Upstream # 5	US-5	25-Jul-17	0.000037	15.9	0.00063	0.00022	0.00162	0.368	0.000268	0.0103	12.4	0.0162	0.00000100	0.000557
Stephens Lake - Nearfield # 1	NF-1	26-Jul-17	0.000057	15.9	0.00085	0.00028	0.00177	0.492	0.000279	0.0113	12.6	0.0169	0.00000110	0.000574
Stephens Lake - Nearfield # 2	NF-2	26-Jul-17	0.000069	16.1	0.00106	0.00030	0.00182	0.576	0.000287	0.0118	12.6	0.0163	0.00000140	0.000622
Stephens Lake - Nearfield # 3	NF-3	26-Jul-17	0.00008	16.0	0.00118	0.00033	0.00186	0.651	0.000305	0.0115	12.4	0.0181	0.00000117	0.00061
Stephens Lake - Nearfield # 4	NF-4	26-Jul-17	0.000081	16.1	0.00120	0.00034	0.00184	0.675	0.000296	0.0116	12.5	0.0168	0.00000140	0.000646
Stephens Lake - Nearfield # 5	NF-5	26-Jul-17	0.000058	16.0	0.00090	0.00028	0.00193	0.509	0.000266	0.0113	12.2	0.0158	0.00000110	0.000569
Stephens Lake - Farfield # 1	FF-1	26-Jul-17	0.000065	15.9	0.00095	0.00028	0.00182	0.505	0.000259	0.0113	12.7	0.0149	0.00000100	0.000610
Stephens Lake - Farfield # 2	FF-2	26-Jul-17	0.000051	16.0	0.00078	0.00026	0.00170	0.449	0.000248	0.0113	12.5	0.0147	0.00000100	0.000572
Stephens Lake - Farfield # 3	FF-3	26-Jul-17	0.000044	16.1	0.00072	0.00024	0.00164	0.402	0.000226	0.0112	12.7	0.0142	0.00000090	0.000576
Stephens Lake - Farfield # 4	FF-4	26-Jul-17	0.000064	16.0	0.00100	0.00030	0.00180	0.561	0.000268	0.0112	12.4	0.0155	0.00000100	0.000607
Stephens Lake - Farfield # 5	FF-5	26-Jul-17	0.000064	16.0	0.00100	0.00028	0.00180	0.553	0.000261	0.0112	12.1	0.0152	0.00000130	0.000591
Clark Lake # 1	CL-1	27-Aug-17	0.000078	15.9	0.00114	0.00033	0.00186	0.645	0.000431	0.0090	12.1	0.0202	0.00000180	0.000649
Clark Lake # 2	CL-2	27-Aug-17	0.000081	16.2	0.00116	0.00034	0.00175	0.681	0.000314	0.0091	12.0	0.0192	0.00000150	0.000664
Clark Lake # 3	CL-3	27-Aug-17	0.000086	16.4	0.00127	0.00036	0.00181	0.715	0.000306	0.0091	11.9	0.0194	0.00000160	0.000668
Clark Lake # 4	CL-4	27-Aug-17	0.000088	14.9	0.00127	0.00036	0.00184	0.743	0.000333	0.0091	11.5	0.0199	0.00000120	0.000653
Clark Lake # 5	CL-5	27-Aug-17	0.000087	15.1	0.00125	0.00036	0.00181	0.711	0.000334	0.0089	11.4	0.0197	0.00000210	0.000611
Nelson River Upstream # 1	US-1	28-Aug-17	0.000086	16.2	0.00127	0.00035	0.00195	0.734	0.000336	0.0108	12.6	0.0195	0.00000140	0.000658
Nelson River Upstream # 2	US-2	28-Aug-17	0.000073	16.2	0.00111	0.00031	0.00173	0.623	0.000314	0.0107	12.7	0.0190	0.00000150	0.000647
Nelson River Upstream # 3	US-3	28-Aug-17	0.000069	16.2	0.00105	0.00031	0.00176	0.603	0.000299	0.0107	12.7	0.0183	0.00000160	0.000626
Nelson River Upstream # 4	US-4	28-Aug-17	0.000088	16.1	0.00129	0.00034	0.00207	0.708	0.000346	0.0110	12.6	0.0197	0.00000140	0.000675
Nelson River Upstream # 5	US-5	28-Aug-17	0.000092	16.1	0.00132	0.00036	0.00184	0.750	0.000373	0.0108	12.6	0.0203	0.00000150	0.000666
Stephens Lake - Nearfield # 1	NF-1	30-Aug-17	0.000077	15.8	0.00115	0.00032	0.00183	0.664	0.000324	0.0109	13.0	0.0178	0.00000150	0.000681
Stephens Lake - Nearfield # 2	NF-2	30-Aug-17	0.000083	16.0	0.00116	0.00033	0.00187	0.658	0.000306	0.0110	13.1	0.0170	0.00000130	0.000695
Stephens Lake - Nearfield # 3	NF-3	30-Aug-17	0.000079	15.9	0.00122	0.00034	0.00252	0.690	0.000307	0.0110	13.1	0.0184	0.00000120	0.000676
Stephens Lake - Nearfield # 4	NF-4	30-Aug-17	0.000075	16.0	0.00116	0.00032	0.00191	0.651	0.000308	0.0110	13.1	0.0173	0.00000140	0.000730
Stephens Lake - Nearfield # 5	NF-5	30-Aug-17	0.00005	15.9	0.00082	0.00025	0.00173	0.463	0.000282	0.0106	12.9	0.0171	0.00000137	0.00064
Stephens Lake - Farfield # 1	FF-1	30-Aug-17	0.000075	16.3	0.00115	0.00031	0.00203	0.621	0.000294	0.0111	13.4	0.0174	0.00000210	0.000689
Stephens Lake - Farfield # 2	FF-2	30-Aug-17	0.000072	16.4	0.00107	0.00028	0.00185	0.606	0.000282	0.0112	13.5	0.0174	0.00000150	0.000686
Stephens Lake - Farfield # 3	FF-3	30-Aug-17	0.000067	16.4	0.00103	0.00028	0.00182	0.567	0.000280	0.0110	13.0	0.0159	0.00000140	0.000691
Stephens Lake - Farfield # 4	FF-4	30-Aug-17	0.000086	16.3	0.00114	0.00032	0.00182	0.642	0.000314	0.0112	13.4	0.0180	0.00000120	0.000731
Stephens Lake - Farfield # 5	FF-5	30-Aug-17	0.000073	16.3	0.00109	0.00030	0.00181	0.604	0.000284	0.0111	13.3	0.0171	0.00000150	0.000688

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

Sample Location	Site ID	Sample Date	Cesium (mg/L)	Chloride (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (mg/L)	Molybdenum (mg/L)
Detection Limit			0.000010/0.00010	0.10	0.00010/0.0010	0.00010/0.00020	0.00020/0.00050	0.010	0.000050/0.000090	0.0010/0.0020	0.0050/0.010	0.00010/0.00030	0.0000005/0.0000010	0.000050/0.00020
Clark Lake # 1	CL-1	17-Sep-17	0.000118	13.3	0.00167	0.00044	0.00211	0.947	0.000454	0.0095	11.4	0.0214	0.00000070	0.000568
Clark Lake # 2	CL-2	17-Sep-17	0.000119	13.1	0.00329	0.00046	0.00208	0.982	0.000441	0.0094	11.3	0.0215	0.00000070	0.00109
Clark Lake # 3	CL-3	17-Sep-17	0.000122	13.1	0.00173	0.00046	0.00207	0.967	0.000454	0.0095	11.3	0.0221	0.00000110	0.000535
Clark Lake # 4	CL-4	17-Sep-17	0.000126	12.3	0.00168	0.00046	0.00204	0.965	0.000462	0.0092	10.9	0.0219	0.00000100	0.000536
Clark Lake # 5	CL-5	17-Sep-17	0.000121	12.6	0.00175	0.00046	0.00206	0.975	0.000446	0.0093	11.4	0.0223	0.00000100	0.000552
Nelson River Upstream # 1	US-1	18-Sep-17	0.000120	12.6	0.00162	0.00048	0.00209	0.958	0.000417	0.0090	12.3	0.0218	0.00000100	0.000541
Nelson River Upstream # 2	US-2	18-Sep-17	0.00011	12.7	0.00167	0.00044	0.00220	0.915	0.000480	0.0093	12.1	0.0219	0.00000103	0.00055
Nelson River Upstream # 3	US-3	18-Sep-17	0.000124	12.7	0.00197	0.00048	0.00213	0.996	0.000441	0.0094	12.2	0.0223	0.00000110	0.000613
Nelson River Upstream # 4	US-4	18-Sep-17	0.000126	12.7	0.00163	0.00046	0.00212	0.964	0.000424	0.0093	12.3	0.0223	0.00000100	0.000538
Nelson River Upstream # 5	US-5	18-Sep-17	0.000120	13.0	0.00167	0.00046	0.00209	0.918	0.000434	0.0093	12.3	0.0224	0.00000090	0.000553
Stephens Lake - Nearfield # 1	NF-1	19-Sep-17	0.000089	13.0	0.00144	0.00039	0.00197	0.791	0.000370	0.0090	12.1	0.0192	0.00000100	0.000513
Stephens Lake - Nearfield # 2	NF-2	19-Sep-17	0.000103	13.1	0.00154	0.00042	0.00203	0.873	0.000375	0.0091	12.4	0.0196	0.00000090	0.000549
Stephens Lake - Nearfield # 3	NF-3	19-Sep-17	0.000106	13.0	0.00162	0.00042	0.00204	0.890	0.000387	0.0090	12.3	0.0203	0.00000090	0.000520
Stephens Lake - Nearfield # 4	NF-4	19-Sep-17	0.000100	13.1	0.00163	0.00040	0.00209	0.864	0.000379	0.0092	12.3	0.0190	0.00000090	0.000525
Stephens Lake - Nearfield # 5	NF-5	19-Sep-17	0.000124	12.9	0.00173	0.00046	0.00211	1.00	0.000422	0.0092	12.4	0.0214	0.00000090	0.000562
Stephens Lake - Farfield # 1	FF-1	19-Sep-17	0.000092	13.5	0.00143	0.00037	0.00198	0.773	0.000345	0.0093	12.7	0.0172	0.00000080	0.000540
Stephens Lake - Farfield # 2	FF-2	19-Sep-17	0.000102	13.4	0.00154	0.00040	0.00201	0.863	0.000374	0.0093	12.6	0.0181	0.00000080	0.000551
Stephens Lake - Farfield # 3	FF-3	19-Sep-17	0.000092	13.4	0.00141	0.00038	0.00199	0.798	0.000361	0.0094	12.6	0.0174	0.00000080	0.000562
Stephens Lake - Farfield # 4	FF-4	19-Sep-17	0.000077	13.4	0.00134	0.00035	0.00191	0.708	0.000324	0.0090	12.3	0.0168	0.00000080	0.000494
Stephens Lake - Farfield # 5	FF-5	19-Sep-17	0.000097	13.4	0.00142	0.00039	0.00196	0.789	0.000350	0.0093	12.2	0.0179	0.00000090	0.000527

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

Sample Location	Site ID	Sample Date	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)	Strontium (mg/L)	Sulphate (mg/L)	Sulfur (mg/L)	Tellurium (mg/L)	Thallium (mg/L)
Detection Limit			0.00050/0.0020	0.050/0.10	0.020/0.050	0.00020	0.000050/0.0010	0.10	0.000010/0.00010	0.030/0.050	0.00010/0.00020	0.30	0.50	0.00020	0.000010/0.00010
Split Lake # 10	SPL-10	3-Apr-17	<0.0020	<0.10	2.67	0.00229	<0.0010	2.43	<0.00010	15.2	0.100	27.3	-	<0.00020	<0.00010
Split Lake # 11	SPL-11	3-Apr-17	<0.0020	<0.10	2.78	0.00250	<0.0010	2.46	<0.00010	16.2	0.107	29.5	-	<0.00020	<0.00010
Split Lake # 12	SPL-12	3-Apr-17	<0.0020	<0.10	2.79	0.00269	<0.0010	2.69	<0.00010	16.2	0.108	30.2	-	<0.00020	<0.00010
Split Lake # 13	SPL-13	3-Apr-17	<0.0020	<0.10	2.63	0.00281	<0.0010	2.67	<0.00010	15.0	0.103	26.8	-	<0.00020	<0.00010
Split Lake # 14	SPL-14	3-Apr-17	<0.0020	<0.10	3.12	0.00237	<0.0010	2.39	<0.00010	19.9	0.129	37.4	-	<0.00020	<0.00010
Nelson River Upstream # 6	US-6	5-Apr-17	<0.0020	<0.10	3.24	0.00223	<0.0010	2.53	<0.00010	19.8	0.129	36.9	-	<0.00020	<0.00010
Nelson River Upstream # 8	US-8	5-Apr-17	<0.0020	<0.10	3.29	0.00247	<0.0010	2.54	<0.00010	20.0	0.127	36.8	-	<0.00020	<0.00010
Nelson River Upstream # 9	US-9	5-Apr-17	<0.0020	<0.10	3.22	0.00236	<0.0010	2.44	<0.00010	19.9	0.126	36.8	-	<0.00020	<0.00010
Nelson River Upstream # 10	US-10	5-Apr-17	<0.0020	<0.10	3.35	0.00258	<0.0010	2.65	<0.00010	20.2	0.131	36.8	-	<0.00020	<0.00010
Nelson River Upstream # 11	US-11	5-Apr-17	<0.0020	<0.10	3.35	0.00256	<0.0010	2.62	<0.00010	20.3	0.129	36.9	-	<0.00020	<0.00010
Stephens Lake - Nearfield # 1	NF-1	5-Apr-17	<0.0020	<0.10	3.24	0.00235	<0.0010	2.76	<0.00010	19.3	0.123	36.1	-	<0.00020	<0.00010
Stephens Lake - Nearfield # 2	NF-2	5-Apr-17	<0.0020	<0.10	3.26	0.00247	<0.0010	2.67	<0.00010	19.2	0.125	36.3	-	<0.00020	<0.00010
Stephens Lake - Nearfield # 3	NF-3	5-Apr-17	<0.0020	<0.10	3.27	0.00261	<0.0010	2.69	<0.00010	19.6	0.126	36.1	-	<0.00020	<0.00010
Stephens Lake - Nearfield # 4	NF-4	5-Apr-17	<0.0020	<0.10	3.32	0.00248	<0.0010	2.61	<0.00010	20.2	0.125	36.4	-	<0.00020	<0.00010
Stephens Lake - Nearfield # 5	NF-5	5-Apr-17	<0.0020	<0.10	3.29	0.00260	<0.0010	2.58	<0.00010	19.8	0.125	35.9	-	<0.00020	<0.00010
Stephens Lake - Farfield # 1	FF-1	6-Apr-17	<0.0020	<0.10	2.96	0.00237	<0.0010	2.06	<0.00010	17.6	0.126	36.2	-	<0.00020	<0.00010
Stephens Lake - Farfield # 2	FF-2	6-Apr-17	<0.0020	<0.10	3.05	0.00244	<0.0010	2.15	<0.00010	18.3	0.130	36.5	-	<0.00020	<0.00010
Stephens Lake - Farfield # 3	FF-3	6-Apr-17	<0.0020	<0.10	3.06	0.00235	<0.0010	2.34	<0.00010	18.7	0.128	36.7	-	<0.00020	<0.00010
Stephens Lake - Farfield # 4	FF-4	6-Apr-17	<0.0020	<0.10	3.07	0.00226	<0.0010	2.18	<0.00010	18.5	0.129	36.6	-	<0.00020	<0.00010
Stephens Lake - Farfield # 5	FF-5	6-Apr-17	<0.0020	<0.10	2.99	0.00236	<0.0010	2.24	<0.00010	18.4	0.129	36.4	-	<0.00020	<0.00010
Clark Lake # 1	CL-1	26-Jun-17	<0.0020	<0.10	2.94	0.00287	<0.0010	2.80	<0.00010	17.8	0.123	34.0	-	<0.00020	<0.00010
Clark Lake # 2	CL-2	26-Jun-17	<0.0020	<0.10	2.79	0.00267	<0.0010	2.71	<0.00010	17.0	0.120	34.2	-	<0.00020	<0.00010
Clark Lake # 3	CL-3	26-Jun-17	<0.0020	<0.10	3.05	0.00285	<0.0010	3.24	<0.00010	18.8	0.127	35.4	-	<0.00020	<0.00010
Clark Lake # 4	CL-4	26-Jun-17	0.0021	<0.10	2.94	0.00333	<0.0010	3.44	<0.00010	16.9	0.119	26.2	-	<0.00020	<0.00010
Clark Lake # 5	CL-5	26-Jun-17	<0.0020	<0.10	2.69	0.00324	<0.0010	3.45	<0.00010	15.5	0.111	30.2	-	<0.00020	<0.00010
Nelson River Upstream # 1	US-1	27-Jun-17	<0.0020	<0.10	2.74	0.00270	<0.0010	2.61	<0.00010	16.3	0.111	34.4	-	<0.00020	<0.00010
Nelson River Upstream # 2	US-2	27-Jun-17	<0.0020	<0.10	2.90	0.00314	<0.0010	3.02	<0.00010	17.4	0.120	34.3	-	<0.00020	<0.00010
Nelson River Upstream # 3	US-3	27-Jun-17	<0.0020	<0.10	2.92	0.00263	<0.0010	2.59	<0.00010	17.8	0.119	34.5	-	<0.00020	<0.00010
Nelson River Upstream # 4	US-4	27-Jun-17	<0.0020	<0.10	2.90	0.00267	<0.0010	2.52	<0.00010	17.5	0.117	34.3	-	<0.00020	<0.00010
Nelson River Upstream # 5	US-5	27-Jun-17	<0.0020	<0.10	2.90	0.00305	<0.0010	2.90	<0.00010	17.0	0.115	34.8	-	<0.00020	<0.00010
Stephens Lake - Nearfield # 1	NF-1	29-Jun-17	0.0022	<0.10	3.11	0.00387	<0.0010	3.65	<0.00010	16.8	0.123	35.2	-	<0.00020	<0.00010
Stephens Lake - Nearfield # 2	NF-2	29-Jun-17	<0.0020	<0.10	2.88	0.00301	<0.0010	2.91	<0.00010	16.1	0.115	35.5	-	<0.00020	<0.00010
Stephens Lake - Nearfield # 3	NF-3	29-Jun-17	0.0020	<0.10	2.98	0.00341	<0.0010	3.17	<0.00010	16.5	0.118	35.2	-	<0.00020	<0.00010
Stephens Lake - Nearfield # 4	NF-4	29-Jun-17	<0.0020	<0.10	2.99	0.00349	<0.0010	3.45	<0.00010	16.5	0.118	35.4	-	<0.00020	<0.00010
Stephens Lake - Nearfield # 5	NF-5	29-Jun-17	<0.0020	<0.10	2.96	0.00327	<0.0010	3.14	<0.00010	16.2	0.114	35.2	-	<0.00020	<0.00010
Stephens Lake - Farfield # 1	FF-1	2-Jul-17	<0.0020	<0.10	3.01	0.00237	<0.0010	2.50	<0.00010	18.4	0.117	34.3	-	<0.00020	<0.00010
Stephens Lake - Farfield # 2	FF-2	2-Jul-17	0.0020	<0.10	3.24	0.00293	<0.0010	2.91	<0.00010	19.2	0.122	35.7	-	<0.00020	<0.00010
Stephens Lake - Farfield # 3	FF-3	2-Jul-17	<0.0020	<0.10	3.24	0.00304	<0.0010	3.29	<0.00010	19.3	0.118	35.9	-	<0.00020	<0.00010
Stephens Lake - Farfield # 4	FF-4	2-Jul-17	<0.0020	<0.10	3.23	0.00311	<0.0010	3.38	<0.00010	19.4	0.120	35.8	-	<0.00020	<0.00010
Stephens Lake - Farfield # 5	FF-5	2-Jul-17	0.0020	<0.10	3.19	0.00335	<0.0010	3.61	<0.00010	18.7	0.117	34.7	-	<0.00020	<0.00010

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

Sample Location	Site ID	Sample Date	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)	Strontium (mg/L)	Sulphate (mg/L)	Sulfur (mg/L)	Tellurium (mg/L)	Thallium (mg/L)
Detection Limit			0.00050/0.0020	0.050/0.10	0.020/0.050	0.00020	0.000050/0.0010	0.10	0.000010/0.00010	0.030/0.050	0.00010/0.00020	0.30	0.50	0.00020	0.000010/0.00010
Clark Lake # 1	CL-1	24-Jul-17	0.00174	<0.050	2.75	0.00267	0.000118	2.00	<0.000010	16.9	0.119	31.7	11.7	<0.00020	0.000011
Clark Lake # 2	CL-2	24-Jul-17	0.00170	<0.050	2.66	0.00254	0.000111	1.96	0.000015	16.7	0.105	32.6	11.4	<0.00020	<0.000010
Clark Lake # 3	CL-3	24-Jul-17	0.00178	<0.050	2.83	0.00281	0.000132	2.13	0.000012	17.9	0.115	33.2	12.1	<0.00020	0.000011
Clark Lake # 4	CL-4	24-Jul-17	0.00178	<0.050	2.70	0.00264	0.000108	2.14	0.000010	16.4	0.114	29.8	11.7	<0.00020	<0.000010
Clark Lake # 5	CL-5	24-Jul-17	0.00183	<0.050	2.67	0.00284	0.000129	2.21	<0.000010	16.1	0.113	27.1	11.1	<0.00020	0.000012
Nelson River Upstream # 1	US-1	25-Jul-17	0.00158	<0.050	2.92	0.00243	0.000115	1.72	<0.000010	16.8	0.107	32.3	12.0	<0.00020	<0.000010
Nelson River Upstream # 2	US-2	25-Jul-17	0.00130	<0.050	2.82	0.00193	0.000111	1.14	<0.000010	16.8	0.103	32.3	12.0	<0.00020	<0.000010
Nelson River Upstream # 3	US-3	25-Jul-17	0.00149	<0.050	2.89	0.00240	0.000115	1.68	<0.000010	17.1	0.106	32.3	12.2	<0.00020	<0.000010
Nelson River Upstream # 4	US-4	25-Jul-17	0.00127	<0.050	2.76	0.00182	0.000089	1.04	<0.000010	16.5	0.103	32.2	12.0	<0.00020	<0.000010
Nelson River Upstream # 5	US-5	25-Jul-17	0.00136	<0.050	2.78	0.00199	0.000104	1.27	<0.000010	16.6	0.102	32.5	11.7	<0.00020	<0.000010
Stephens Lake - Nearfield # 1	NF-1	26-Jul-17	0.00157	<0.050	2.93	0.00222	0.000102	1.50	<0.000010	16.5	0.102	32.6	12.4	<0.00020	<0.000010
Stephens Lake - Nearfield # 2	NF-2	26-Jul-17	0.00166	<0.050	2.99	0.00260	0.000135	1.78	<0.000010	17.0	0.107	33.0	12.6	<0.00020	0.000012
Stephens Lake - Nearfield # 3	NF-3	26-Jul-17	0.0017	<0.050	2.99	0.00275	0.000114	2.04	<0.000010	16.6	0.105	32.6	12.3	<0.00020	<0.000010
Stephens Lake - Nearfield # 4	NF-4	26-Jul-17	0.00169	<0.050	3.01	0.00283	0.000127	2.11	<0.000010	16.6	0.105	32.9	12.5	<0.00020	0.000011
Stephens Lake - Nearfield # 5	NF-5	26-Jul-17	0.00150	<0.050	2.89	0.00233	0.000088	1.54	<0.000010	16.8	0.104	32.6	12.1	<0.00020	<0.000010
Stephens Lake - Farfield # 1	FF-1	26-Jul-17	0.00156	<0.050	3.07	0.00248	0.000112	1.77	<0.000010	17.5	0.108	32.7	11.7	<0.00020	<0.000010
Stephens Lake - Farfield # 2	FF-2	26-Jul-17	0.00146	<0.050	2.89	0.00223	0.000085	1.53	<0.000010	16.5	0.106	32.9	12.8	<0.00020	<0.000010
Stephens Lake - Farfield # 3	FF-3	26-Jul-17	0.00150	<0.050	2.95	0.00212	0.000120	1.28	<0.000010	17.3	0.107	33.0	12.8	<0.00020	<0.000010
Stephens Lake - Farfield # 4	FF-4	26-Jul-17	0.00155	<0.050	2.90	0.00258	0.000102	1.83	<0.000010	16.5	0.106	32.9	12.6	<0.00020	<0.000010
Stephens Lake - Farfield # 5	FF-5	26-Jul-17	0.00156	<0.050	2.91	0.00253	0.000110	1.91	<0.000010	16.2	0.104	32.7	12.6	<0.00020	<0.000010
Clark Lake # 1	CL-1	27-Aug-17	0.00156	<0.050	2.67	0.00264	0.000141	2.38	<0.000010	15.6	0.113	32.3	11.2	<0.00020	<0.000010
Clark Lake # 2	CL-2	27-Aug-17	0.00157	<0.050	2.69	0.00270	0.000106	2.63	<0.000010	15.8	0.113	32.9	11.7	<0.00020	<0.000010
Clark Lake # 3	CL-3	27-Aug-17	0.00167	<0.050	2.67	0.00282	0.000118	2.67	<0.000010	15.6	0.114	33.3	11.2	<0.00020	0.000011
Clark Lake # 4	CL-4	27-Aug-17	0.00172	<0.050	2.58	0.00308	0.000118	2.76	<0.000010	14.7	0.112	30.3	11.1	<0.00020	0.000010
Clark Lake # 5	CL-5	27-Aug-17	0.00162	<0.050	2.54	0.00297	0.000110	2.64	<0.000010	14.5	0.108	30.7	10.3	<0.00020	<0.000010
Nelson River Upstream # 1	US-1	28-Aug-17	0.00171	<0.050	2.75	0.00287	0.000132	2.88	<0.000010	16.3	0.115	32.3	11.6	<0.00020	0.000012
Nelson River Upstream # 2	US-2	28-Aug-17	0.00164	<0.050	2.71	0.00277	0.000120	2.48	<0.000010	16.0	0.115	32.4	11.4	<0.00020	<0.000010
Nelson River Upstream # 3	US-3	28-Aug-17	0.00162	<0.050	2.71	0.00264	0.000125	2.47	<0.000010	16.2	0.116	32.3	11.5	<0.00020	0.000011
Nelson River Upstream # 4	US-4	28-Aug-17	0.00172	<0.050	2.73	0.00300	0.000114	2.85	<0.000010	16.1	0.118	32.3	11.7	<0.00020	0.000011
Nelson River Upstream # 5	US-5	28-Aug-17	0.00180	<0.050	2.73	0.00316	0.000125	2.89	<0.000010	16.3	0.115	32.2	11.4	<0.00020	0.000012
Stephens Lake - Nearfield # 1	NF-1	30-Aug-17	0.00165	<0.050	2.76	0.00276	0.000125	2.72	<0.000010	16.5	0.113	32.0	11.2	<0.00020	0.000011
Stephens Lake - Nearfield # 2	NF-2	30-Aug-17	0.00173	<0.050	2.83	0.00304	0.000131	2.76	<0.000010	16.9	0.115	32.3	11.4	<0.00020	0.000012
Stephens Lake - Nearfield # 3	NF-3	30-Aug-17	0.00168	<0.050	2.83	0.00295	0.000123	2.84	<0.000010	16.7	0.116	32.0	11.1	<0.00020	0.000011
Stephens Lake - Nearfield # 4	NF-4	30-Aug-17	0.00163	<0.050	2.80	0.00291	0.000135	2.74	<0.000010	17.1	0.120	32.3	11.8	<0.00020	0.000011
Stephens Lake - Nearfield # 5	NF-5	30-Aug-17	0.0014	<0.050	2.70	0.00237	0.000115	2.17	<0.000010	16.4	0.115	32.0	11.7	<0.00020	<0.000010
Stephens Lake - Farfield # 1	FF-1	30-Aug-17	0.00169	<0.050	2.87	0.00262	0.000137	2.66	<0.000010	17.2	0.116	32.9	12.2	<0.00020	0.000011
Stephens Lake - Farfield # 2	FF-2	30-Aug-17	0.00188	<0.050	2.84	0.00272	0.000141	2.51	<0.000010	17.3	0.118	33.0	12.2	<0.00020	<0.000010
Stephens Lake - Farfield # 3	FF-3	30-Aug-17	0.00156	<0.050	2.81	0.00283	0.000114	2.49	<0.000010	17.1	0.117	33.1	12.0	<0.00020	0.000011
Stephens Lake - Farfield # 4	FF-4	30-Aug-17	0.00158	<0.050	2.81	0.00270	0.000150	2.75	<0.000010	17.0	0.117	33.1	12.0	<0.00020	0.000014
Stephens Lake - Farfield # 5	FF-5	30-Aug-17	0.00160	<0.050	2.82	0.00276	0.000135	2.66	<0.000010	17.3	0.119	32.9	12.2	<0.00020	0.000011

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

Sample Location	Site ID	Sample Date	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)	Strontium (mg/L)	Sulphate (mg/L)	Sulfur (mg/L)	Tellurium (mg/L)	Thallium (mg/L)
Detection Limit			0.00050/0.0020	0.050/0.10	0.020/0.050	0.00020	0.000050/0.0010	0.10	0.000010/0.00010	0.030/0.050	0.00010/0.00020	0.30	0.50	0.00020	0.000010/0.00010
Clark Lake # 1	CL-1	17-Sep-17	0.00203	0.060	2.60	0.00326	0.000110	3.76	<0.000010	14.3	0.101	26.2	9.15	<0.00020	0.000014
Clark Lake # 2	CL-2	17-Sep-17	0.00211	0.060	2.58	0.00325	0.000103	3.80	<0.000010	14.1	0.101	25.9	9.28	<0.00020	0.000014
Clark Lake # 3	CL-3	17-Sep-17	0.00202	<0.050	2.61	0.00345	0.000119	3.82	<0.000010	14.2	0.101	25.9	9.05	<0.00020	0.000013
Clark Lake # 4	CL-4	17-Sep-17	0.00200	0.059	2.53	0.00329	0.000120	3.82	<0.000010	13.8	0.0979	24.3	8.64	<0.00020	0.000013
Clark Lake # 5	CL-5	17-Sep-17	0.00205	0.060	2.61	0.00327	0.000085	3.81	<0.000010	14.1	0.0986	24.9	8.82	<0.00020	0.000014
Nelson River Upstream # 1	US-1	18-Sep-17	0.00224	0.058	2.35	0.00324	0.000100	3.74	<0.000010	14.0	0.103	25.0	8.58	<0.00020	0.000014
Nelson River Upstream # 2	US-2	18-Sep-17	0.0021	<0.050	2.32	0.00317	0.000104	3.64	<0.000010	14.0	0.102	25.0	8.6	<0.00020	0.000013
Nelson River Upstream # 3	US-3	18-Sep-17	0.00246	0.051	2.36	0.00339	0.000102	3.80	<0.000010	14.0	0.101	25.0	8.66	<0.00020	0.000014
Nelson River Upstream # 4	US-4	18-Sep-17	0.00204	<0.050	2.35	0.00329	0.000091	3.80	<0.000010	14.2	0.104	25.1	8.74	<0.00020	0.000014
Nelson River Upstream # 5	US-5	18-Sep-17	0.00198	0.050	2.41	0.00321	0.000103	3.72	<0.000010	14.4	0.105	25.8	8.99	<0.00020	0.000013
Stephens Lake - Nearfield # 1	NF-1	19-Sep-17	0.00185	<0.050	2.48	0.00293	0.000108	3.27	<0.000010	14.3	0.0972	25.8	8.57	<0.00020	0.000012
Stephens Lake - Nearfield # 2	NF-2	19-Sep-17	0.00192	<0.050	2.52	0.00317	0.000128	3.60	<0.000010	14.4	0.0973	26.0	8.95	<0.00020	0.000012
Stephens Lake - Nearfield # 3	NF-3	19-Sep-17	0.00196	<0.050	2.51	0.00324	0.000123	3.55	<0.000010	14.5	0.0969	25.7	8.87	<0.00020	0.000012
Stephens Lake - Nearfield # 4	NF-4	19-Sep-17	0.00189	<0.050	2.52	0.00308	0.000110	3.54	<0.000010	14.7	0.0959	25.9	8.87	<0.00020	0.000012
Stephens Lake - Nearfield # 5	NF-5	19-Sep-17	0.00208	0.053	2.55	0.00345	0.000118	4.00	<0.000010	14.5	0.0998	25.7	9.24	<0.00020	0.000015
Stephens Lake - Farfield # 1	FF-1	19-Sep-17	0.00180	<0.050	2.53	0.00300	0.000099	3.45	<0.000010	15.2	0.0965	26.7	9.50	<0.00020	0.000011
Stephens Lake - Farfield # 2	FF-2	19-Sep-17	0.00186	0.058	2.57	0.00316	0.000116	3.79	<0.000010	15.0	0.100	26.4	9.37	<0.00020	0.000011
Stephens Lake - Farfield # 3	FF-3	19-Sep-17	0.00179	<0.050	2.52	0.00297	0.000100	3.42	<0.000010	15.1	0.0970	26.4	9.08	<0.00020	0.000011
Stephens Lake - Farfield # 4	FF-4	19-Sep-17	0.00178	0.059	2.47	0.00273	0.000096	3.22	<0.000010	14.9	0.0924	26.5	9.12	<0.00020	<0.000010
Stephens Lake - Farfield # 5	FF-5	19-Sep-17	0.00183	<0.050	2.51	0.00293	0.000106	3.38	<0.000010	14.9	0.0983	26.5	8.99	<0.00020	0.000012

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

Sample Location	Site ID	Sample Date	Thorium (mg/L)	Tin (mg/L)	Titanium (mg/L)	Tungsten (mg/L)	Uranium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)	Zirconium (mg/L)
Detection Limit			0.00010	0.00010/0.00020	0.00030/0.00050	0.00010	0.000010/0.00010	0.00020/0.00050	0.0020/0.0030	0.000060/0.00040
Split Lake # 10	SPL-10	3-Apr-17	0.00017	0.00060	0.0194	<0.00010	0.00056	0.00137	0.0021	0.00068
Split Lake # 11	SPL-11	3-Apr-17	0.00018	0.00039	0.0208	<0.00010	0.00060	0.00146	0.0025	0.00061
Split Lake # 12	SPL-12	3-Apr-17	0.00020	<0.00020	0.0240	<0.00010	0.00061	0.00151	<0.0020	0.00115
Split Lake # 13	SPL-13	3-Apr-17	0.00022	0.00021	0.0234	<0.00010	0.00057	0.00151	0.0022	0.00071
Split Lake # 14	SPL-14	3-Apr-17	0.00015	<0.00020	0.0186	<0.00010	0.00073	0.00141	<0.0020	0.00058
Nelson River Upstream # 6	US-6	5-Apr-17	0.00017	0.00046	0.0196	<0.00010	0.00074	0.00148	0.0021	0.00061
Nelson River Upstream # 8	US-8	5-Apr-17	0.00017	<0.00020	0.0210	<0.00010	0.00077	0.00166	<0.0020	0.00058
Nelson River Upstream # 9	US-9	5-Apr-17	0.00015	<0.00020	0.0193	<0.00010	0.00073	0.00145	<0.0020	0.00052
Nelson River Upstream # 10	US-10	5-Apr-17	0.00017	0.00160	0.0219	<0.00010	0.00075	0.00150	<0.0020	0.00061
Nelson River Upstream # 11	US-11	5-Apr-17	0.00017	0.00026	0.0203	<0.00010	0.00076	0.00153	<0.0020	0.00057
Stephens Lake - Nearfield # 1	NF-1	5-Apr-17	0.00018	0.00096	0.0227	<0.00010	0.00072	0.00156	<0.0020	0.00060
Stephens Lake - Nearfield # 2	NF-2	5-Apr-17	0.00017	0.00052	0.0217	<0.00010	0.00074	0.00151	<0.0020	0.00056
Stephens Lake - Nearfield # 3	NF-3	5-Apr-17	0.00017	0.00042	0.0211	<0.00010	0.00073	0.00155	<0.0020	0.00061
Stephens Lake - Nearfield # 4	NF-4	5-Apr-17	0.00017	<0.00020	0.0211	<0.00010	0.00074	0.00153	<0.0020	0.00057
Stephens Lake - Nearfield # 5	NF-5	5-Apr-17	0.00017	0.00025	0.0211	<0.00010	0.00072	0.00152	<0.0020	0.00055
Stephens Lake - Farfield # 1	FF-1	6-Apr-17	0.00014	0.00068	0.0163	<0.00010	0.00073	0.00135	<0.0020	0.00048
Stephens Lake - Farfield # 2	FF-2	6-Apr-17	0.00016	<0.00020	0.0182	<0.00010	0.00078	0.00139	<0.0020	0.00056
Stephens Lake - Farfield # 3	FF-3	6-Apr-17	0.00017	0.00081	0.0178	<0.00010	0.00075	0.00142	<0.0020	0.00057
Stephens Lake - Farfield # 4	FF-4	6-Apr-17	0.00016	0.00055	0.0170	<0.00010	0.00077	0.00139	<0.0020	0.00049
Stephens Lake - Farfield # 5	FF-5	6-Apr-17	0.00017	<0.00020	0.0183	<0.00010	0.00073	0.00138	<0.0020	0.00049
Clark Lake # 1	CL-1	26-Jun-17	0.00030	<0.00020	0.0305	<0.00010	0.00077	0.00197	<0.0020	0.00103
Clark Lake # 2	CL-2	26-Jun-17	0.00027	<0.00020	0.0286	<0.00010	0.00074	0.00186	<0.0020	0.00101
Clark Lake # 3	CL-3	26-Jun-17	0.00044	<0.00020	0.0333	<0.00010	0.00079	0.00216	0.0024	0.00113
Clark Lake # 4	CL-4	26-Jun-17	0.00045	<0.00020	0.0430	<0.00010	0.00074	0.00233	0.0021	0.00121
Clark Lake # 5	CL-5	26-Jun-17	0.00043	<0.00020	0.0431	<0.00010	0.00068	0.00229	0.0023	0.00120
Nelson River Upstream # 1	US-1	27-Jun-17	0.00027	<0.00020	0.0305	<0.00010	0.00062	0.00189	0.0020	0.00074
Nelson River Upstream # 2	US-2	27-Jun-17	0.00032	<0.00020	0.0373	<0.00010	0.00066	0.00220	0.0029	0.00080
Nelson River Upstream # 3	US-3	27-Jun-17	0.00027	<0.00020	0.0284	<0.00010	0.00067	0.00194	0.0058	0.00075
Nelson River Upstream # 4	US-4	27-Jun-17	0.00027	<0.00020	0.0275	<0.00010	0.00068	0.00188	0.0035	0.00076
Nelson River Upstream # 5	US-5	27-Jun-17	0.00031	<0.00020	0.0368	<0.00010	0.00064	0.00214	0.0031	0.00077
Stephens Lake - Nearfield # 1	NF-1	29-Jun-17	0.00041	<0.00020	0.0488	<0.00010	0.00072	0.00269	0.0027	0.00098
Stephens Lake - Nearfield # 2	NF-2	29-Jun-17	0.00031	<0.00020	0.0351	<0.00010	0.00068	0.00213	0.0021	0.00082
Stephens Lake - Nearfield # 3	NF-3	29-Jun-17	0.00036	<0.00020	0.0395	<0.00010	0.00070	0.00235	0.0023	0.00086
Stephens Lake - Nearfield # 4	NF-4	29-Jun-17	0.00036	<0.00020	0.0414	<0.00010	0.00069	0.00237	0.0024	0.00086
Stephens Lake - Nearfield # 5	NF-5	29-Jun-17	0.00034	<0.00020	0.0386	<0.00010	0.00068	0.00224	0.0022	0.00087
Stephens Lake - Farfield # 1	FF-1	2-Jul-17	0.00022	<0.00020	0.0243	<0.00010	0.00065	0.00183	<0.0020	0.00072
Stephens Lake - Farfield # 2	FF-2	2-Jul-17	0.00027	<0.00020	0.0317	<0.00010	0.00068	0.00213	0.0025	0.00076
Stephens Lake - Farfield # 3	FF-3	2-Jul-17	0.00032	<0.00020	0.0376	<0.00010	0.00071	0.00228	0.0024	0.00080
Stephens Lake - Farfield # 4	FF-4	2-Jul-17	0.00033	<0.00020	0.0383	<0.00010	0.00073	0.00230	0.0026	0.00081
Stephens Lake - Farfield # 5	FF-5	2-Jul-17	0.00035	<0.00020	0.0427	<0.00010	0.00070	0.00246	0.0025	0.00089

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

Sample Location	Site ID	Sample Date	Thorium (mg/L)	Tin (mg/L)	Titanium (mg/L)	Tungsten (mg/L)	Uranium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)	Zirconium (mg/L)
Detection Limit			0.00010	0.00010/0.00020	0.00030/0.00050	0.00010	0.000010/0.00010	0.00020/0.00050	0.0020/0.0030	0.000060/0.00040
Clark Lake # 1	CL-1	24-Jul-17	0.00017	<0.00010	0.0256	<0.00010	0.000632	0.00203	<0.0030	0.000635
Clark Lake # 2	CL-2	24-Jul-17	0.00018	<0.00010	0.0257	<0.00010	0.000581	0.00195	<0.0030	0.000609
Clark Lake # 3	CL-3	24-Jul-17	0.00019	<0.00010	0.0286	<0.00010	0.000635	0.00216	<0.0030	0.000615
Clark Lake # 4	CL-4	24-Jul-17	0.00020	<0.00010	0.0276	<0.00010	0.000613	0.00207	<0.0030	0.000674
Clark Lake # 5	CL-5	24-Jul-17	0.00021	<0.00010	0.0317	<0.00010	0.000617	0.00215	<0.0030	0.000669
Nelson River Upstream # 1	US-1	25-Jul-17	0.00016	<0.00010	0.0223	<0.00010	0.000628	0.00187	<0.0030	0.000573
Nelson River Upstream # 2	US-2	25-Jul-17	0.00011	<0.00010	0.0115	<0.00010	0.000606	0.00155	<0.0030	0.000497
Nelson River Upstream # 3	US-3	25-Jul-17	0.00016	<0.00010	0.0201	<0.00010	0.000614	0.00179	<0.0030	0.000578
Nelson River Upstream # 4	US-4	25-Jul-17	0.00010	<0.00010	0.00973	<0.00010	0.000595	0.00142	<0.0030	0.000518
Nelson River Upstream # 5	US-5	25-Jul-17	0.00011	<0.00010	0.0139	<0.00010	0.000589	0.00152	<0.0030	0.000508
Stephens Lake - Nearfield # 1	NF-1	26-Jul-17	0.00014	<0.00010	0.0203	<0.00010	0.000599	0.00177	0.0050	0.000546
Stephens Lake - Nearfield # 2	NF-2	26-Jul-17	0.00016	<0.00010	0.0243	<0.00010	0.000621	0.00194	<0.0030	0.000605
Stephens Lake - Nearfield # 3	NF-3	26-Jul-17	0.00019	<0.00010	0.0284	<0.00010	0.00061	0.00212	<0.0030	0.00062
Stephens Lake - Nearfield # 4	NF-4	26-Jul-17	0.00019	<0.00010	0.0291	<0.00010	0.000617	0.00209	<0.0030	0.000597
Stephens Lake - Nearfield # 5	NF-5	26-Jul-17	0.00015	<0.00010	0.0195	<0.00010	0.000599	0.00177	<0.0030	0.000584
Stephens Lake - Farfield # 1	FF-1	26-Jul-17	0.00016	<0.00010	0.0223	<0.00010	0.000610	0.00195	<0.0030	0.000572
Stephens Lake - Farfield # 2	FF-2	26-Jul-17	0.00013	<0.00010	0.0174	<0.00010	0.000600	0.00172	<0.0030	0.000549
Stephens Lake - Farfield # 3	FF-3	26-Jul-17	0.00011	<0.00010	0.0155	<0.00010	0.000597	0.00162	<0.0030	0.000493
Stephens Lake - Farfield # 4	FF-4	26-Jul-17	0.00016	<0.00010	0.0238	<0.00010	0.000601	0.00188	<0.0030	0.000555
Stephens Lake - Farfield # 5	FF-5	26-Jul-17	0.00016	<0.00010	0.0224	<0.00010	0.000589	0.00189	<0.0030	0.000561
Clark Lake # 1	CL-1	27-Aug-17	0.00017	<0.00010	0.0266	<0.00010	0.000551	0.00220	0.0035	0.000620
Clark Lake # 2	CL-2	27-Aug-17	0.00018	<0.00010	0.0293	<0.00010	0.000558	0.00228	0.0031	0.000635
Clark Lake # 3	CL-3	27-Aug-17	0.00019	<0.00010	0.0293	<0.00010	0.000562	0.00233	<0.0030	0.000617
Clark Lake # 4	CL-4	27-Aug-17	0.00020	<0.00010	0.0306	<0.00010	0.000537	0.00236	<0.0030	0.000638
Clark Lake # 5	CL-5	27-Aug-17	0.00020	<0.00010	0.0298	<0.00010	0.000528	0.00230	<0.0030	0.000669
Nelson River Upstream # 1	US-1	28-Aug-17	0.00022	<0.00010	0.0305	<0.00010	0.000609	0.00231	<0.0030	0.000645
Nelson River Upstream # 2	US-2	28-Aug-17	0.00018	<0.00010	0.0252	<0.00010	0.000597	0.00206	<0.0030	0.000595
Nelson River Upstream # 3	US-3	28-Aug-17	0.00017	<0.00010	0.0240	<0.00010	0.000603	0.00205	<0.0030	0.000615
Nelson River Upstream # 4	US-4	28-Aug-17	0.00020	<0.00010	0.0295	<0.00010	0.000620	0.00225	<0.0030	0.000642
Nelson River Upstream # 5	US-5	28-Aug-17	0.00021	<0.00010	0.0313	<0.00010	0.000604	0.00232	<0.0030	0.000668
Stephens Lake - Nearfield # 1	NF-1	30-Aug-17	0.00018	<0.00010	0.0277	<0.00010	0.000599	0.00220	<0.0030	0.000595
Stephens Lake - Nearfield # 2	NF-2	30-Aug-17	0.00019	<0.00010	0.0276	<0.00010	0.000622	0.00219	<0.0030	0.000605
Stephens Lake - Nearfield # 3	NF-3	30-Aug-17	0.00019	<0.00010	0.0290	<0.00010	0.000608	0.00224	<0.0030	0.000641
Stephens Lake - Nearfield # 4	NF-4	30-Aug-17	0.00018	<0.00010	0.0264	<0.00010	0.000621	0.00223	0.0035	0.000601
Stephens Lake - Nearfield # 5	NF-5	30-Aug-17	0.00013	<0.00010	0.0180	<0.00010	0.00060	0.00187	<0.0030	0.00055
Stephens Lake - Farfield # 1	FF-1	30-Aug-17	0.00018	<0.00010	0.0252	<0.00010	0.000638	0.00214	<0.0030	0.000577
Stephens Lake - Farfield # 2	FF-2	30-Aug-17	0.00016	<0.00010	0.0247	<0.00010	0.000628	0.00205	<0.0030	0.000565
Stephens Lake - Farfield # 3	FF-3	30-Aug-17	0.00015	<0.00010	0.0237	<0.00010	0.000619	0.00209	<0.0030	0.000577
Stephens Lake - Farfield # 4	FF-4	30-Aug-17	0.00019	<0.00010	0.0270	<0.00010	0.000642	0.00220	<0.0030	0.000610
Stephens Lake - Farfield # 5	FF-5	30-Aug-17	0.00018	<0.00010	0.0252	<0.00010	0.000630	0.00211	<0.0030	0.000575

Table A1-3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

Sample Location	Site ID	Sample Date	Thorium (mg/L)	Tin (mg/L)	Titanium (mg/L)	Tungsten (mg/L)	Uranium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)	Zirconium (mg/L)
Detection Limit			0.00010	0.00010/0.00020	0.00030/0.00050	0.00010	0.000010/0.00010	0.00020/0.00050	0.0020/0.0030	0.000060/0.00040
Clark Lake # 1	CL-1	17-Sep-17	0.00029	<0.00010	0.0383	<0.00010	0.000586	0.00263	0.0114	0.000754
Clark Lake # 2	CL-2	17-Sep-17	0.00029	<0.00010	0.0394	<0.00010	0.000588	0.00256	0.0042	0.000781
Clark Lake # 3	CL-3	17-Sep-17	0.00031	<0.00010	0.0411	<0.00010	0.000604	0.00266	0.0043	0.000795
Clark Lake # 4	CL-4	17-Sep-17	0.00031	<0.00010	0.0424	<0.00010	0.000559	0.00264	0.0050	0.000803
Clark Lake # 5	CL-5	17-Sep-17	0.00030	<0.00010	0.0411	<0.00010	0.000570	0.00266	0.0036	0.000808
Nelson River Upstream # 1	US-1	18-Sep-17	0.00028	<0.00010	0.0393	<0.00010	0.000520	0.00271	0.0044	0.000873
Nelson River Upstream # 2	US-2	18-Sep-17	0.00028	<0.00010	0.0361	<0.00010	0.00052	0.00266	0.0069	0.00085
Nelson River Upstream # 3	US-3	18-Sep-17	0.00030	<0.00010	0.0401	<0.00010	0.000525	0.00277	0.0112	0.000896
Nelson River Upstream # 4	US-4	18-Sep-17	0.00030	<0.00010	0.0385	<0.00010	0.000513	0.00273	0.0044	0.000870
Nelson River Upstream # 5	US-5	18-Sep-17	0.00029	<0.00010	0.0373	<0.00010	0.000542	0.00274	0.0048	0.000858
Stephens Lake - Nearfield # 1	NF-1	19-Sep-17	0.00023	<0.00010	0.0326	<0.00010	0.000527	0.00237	0.0075	0.000745
Stephens Lake - Nearfield # 2	NF-2	19-Sep-17	0.00026	<0.00010	0.0352	<0.00010	0.000528	0.00255	0.0054	0.000756
Stephens Lake - Nearfield # 3	NF-3	19-Sep-17	0.00026	<0.00010	0.0353	<0.00010	0.000523	0.00254	0.0057	0.000752
Stephens Lake - Nearfield # 4	NF-4	19-Sep-17	0.00026	<0.00010	0.0358	<0.00010	0.000544	0.00254	0.0045	0.000733
Stephens Lake - Nearfield # 5	NF-5	19-Sep-17	0.00030	0.00013	0.0425	<0.00010	0.000563	0.00276	0.0104	0.000809
Stephens Lake - Farfield # 1	FF-1	19-Sep-17	0.00025	<0.00010	0.0330	<0.00010	0.000533	0.00248	0.0063	0.000742
Stephens Lake - Farfield # 2	FF-2	19-Sep-17	0.00026	<0.00010	0.0366	<0.00010	0.000541	0.00251	0.0053	0.000737
Stephens Lake - Farfield # 3	FF-3	19-Sep-17	0.00024	<0.00010	0.0335	<0.00010	0.000536	0.00244	0.0092	0.000698
Stephens Lake - Farfield # 4	FF-4	19-Sep-17	0.00023	<0.00010	0.0283	<0.00010	0.000516	0.00233	0.0066	0.000724
Stephens Lake - Farfield # 5	FF-5	19-Sep-17	0.00023	<0.00010	0.0311	<0.00010	0.000534	0.00241	0.0068	0.000726

Table A1-4: Hydrocarbons measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017.

Sample Location	Site ID	ALS ID	Sample Date	Sample Time	Benzene (mg/L)	Ethyl benzene (mg/L)	Toluene (mg/L)	o-Xylene (mg/L)	m+p-Xylenes (mg/L)	Xylenes (Total) (mg/L)	F1 (C6-C10) (mg/L)	F1-BTEX (mg/L)	Total Hydrocarbons (C6-C50) (mg/L)	F2 (C10-C16) (mg/L)	F3 (C16-C34) (mg/L)	F4 (C34-C50) (mg/L)
Detection Limit					0.00050	0.00050	0.0010	0.00050	0.00040/0.00050	0.00064/0.00071/0.0015	0.10	0.10	0.38/0.74	0.10/0.020	0.25/0.050	0.25/0.050
PAL Guideline					0.370	0.090	0.0020									
Split Lake # 10	SPL-10	L1909314-1	3-Apr-17	11:30	-	-	-	-	-	-	-	-	-	-	-	-
Split Lake # 11	SPL-11	L1909314-2	3-Apr-17	12:24	-	-	-	-	-	-	-	-	-	-	-	-
Split Lake # 12	SPL-12	L1909314-5	3-Apr-17	14:45	-	-	-	-	-	-	-	-	-	-	-	-
Split Lake # 13	SPL-13	L1909314-4	3-Apr-17	14:00	-	-	-	-	-	-	-	-	-	-	-	-
Split Lake # 14	SPL-14	L1909314-3	3-Apr-17	13:13	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream # 6	US-6	L1909812-4	5-Apr-17	11:10	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 8	US-8	L1909812-3	5-Apr-17	10:40	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 9	US-9	L1909812-5	5-Apr-17	11:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 10	US-10	L1909812-1	5-Apr-17	8:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 11	US-11	L1909812-2, 7, 8	5-Apr-17	9:39	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 1	NF-1	L1909812-9	5-Apr-17	13:35	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 2	NF-2	L1909812-10	5-Apr-17	15:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 3	NF-3	L1909812-11	5-Apr-17	14:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 4	NF-4	L1909812-12	5-Apr-17	15:35	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 5	NF-5	L1909812-13	5-Apr-17	13:10	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Farfield # 1	FF-1	L1910427-3	6-Apr-17	8:35	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 2	FF-2	L1910427-4	6-Apr-17	10:00	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 3	FF-3	L1910427-5, 8	6-Apr-17	11:15	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 4	FF-4	L1910427-6	6-Apr-17	10:34	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 5	FF-5	L1910427-7	6-Apr-17	9:30	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 1	CL-1	L1949034-1	26-Jun-17	11:25	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 2	CL-2	L1949034-2	26-Jun-17	11:54	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 3	CL-3	L1949034-3	26-Jun-17	12:55	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 4	CL-4	L1949034-4	26-Jun-17	12:20	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 5	CL-5	L1949034-5	26-Jun-17	12:35	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream # 1	US-1	L1950846-1	27-Jun-17	12:40	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 2	US-2	L1950846-2	27-Jun-17	13:07	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 3	US-3	L1950846-3	27-Jun-17	14:01	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 4	US-4	L1950846-4	27-Jun-17	14:21	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 5	US-5	L1950846-5	27-Jun-17	13:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 1	NF-1	L1951672-1	29-Jun-17	10:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 2	NF-2	L1951672-2	29-Jun-17	9:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 3	NF-3	L1951672-3	29-Jun-17	10:25	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 4	NF-4	L1951672-4,-6,-7	29-Jun-17	9:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 5	NF-5	L1951672-5	29-Jun-17	11:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Farfield # 1	FF-1	L1952246-1	2-Jul-17	9:30	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 2	FF-2	L1952246-2	2-Jul-17	10:15	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 3	FF-3	L1952246-3	2-Jul-17	10:55	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 4	FF-4	L1952246-4	2-Jul-17	10:32	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 5	FF-5	L1952246-5	2-Jul-17	9:55	-	-	-	-	-	-	-	-	-	-	-	-

Table A1-4: Hydrocarbons measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

Sample Location	Site ID	ALS ID	Sample Date	Sample Time	Benzene (mg/L)	Ethyl benzene (mg/L)	Toluene (mg/L)	o-Xylene (mg/L)	m+p-Xylenes (mg/L)	Xylenes (Total) (mg/L)	F1 (C6-C10) (mg/L)	F1-BTEX (mg/L)	Total Hydrocarbons (C6-C50) (mg/L)	F2 (C10-C16) (mg/L)	F3 (C16-C34) (mg/L)	F4 (C34-C50) (mg/L)
Detection Limit					0.00050	0.00050	0.0010	0.00050	0.00040/0.00050	0.00064/0.00071/0.0015	0.10	0.10	0.38/0.74	0.10/0.020	0.25/0.050	0.25/0.050
PAL Guideline					0.370	0.090	0.0020									
Clark Lake # 1	CL-1	L1963907-1	24-Jul-17	10:45	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 2	CL-2	L1963907-2	24-Jul-17	11:20	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 3	CL-3	L1963907-3	24-Jul-17	11:55	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 4	CL-4	L1963907-4	24-Jul-17	9:20	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 5	CL-5	L1963907-5	24-Jul-17	10:00	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream # 1	US-1	L1965745-1	25-Jul-17	13:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 2	US-2	L1965745-2	25-Jul-17	14:55	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 3	US-3	L1965745-3	25-Jul-17	14:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 4	US-4	L1965745-4	25-Jul-17	13:50	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 5	US-5	L1965745-5	25-Jul-17	15:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 1	NF-1	L1966177-1	26-Jul-17	10:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 2	NF-2	L1966177-2	26-Jul-17	11:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 3	NF-3	L1966177-3,-6,-7	26-Jul-17	10:55	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 4	NF-4	L1966177-4	26-Jul-17	12:10	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 5	NF-5	L1966177-5	26-Jul-17	9:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Farfield # 1	FF-1	L1966177-8	26-Jul-17	13:50	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 2	FF-2	L1966177-9	26-Jul-17	14:45	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 3	FF-3	L1966177-10	26-Jul-17	15:35	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 4	FF-4	L1966177-11	26-Jul-17	15:10	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 5	FF-5	L1966177-12	26-Jul-17	14:20	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 1	CL-1	L1982058-1	27-Aug-17	9:30	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 2	CL-2	L1982058-2	27-Aug-17	11:00	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 3	CL-3	L1982058-3	27-Aug-17	11:30	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 4	CL-4	L1982058-4	27-Aug-17	12:15	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 5	CL-5	L1982058-5	27-Aug-17	12:45	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream # 1	US-1	L1983803-1	28-Aug-17	11:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 2	US-2	L1983803-2	28-Aug-17	12:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 3	US-3	L1983803-3	28-Aug-17	12:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 4	US-4	L1983803-4	28-Aug-17	1:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 5	US-5	L1983803-5	28-Aug-17	2:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 1	NF-1	L1984553-8	30-Aug-17	12:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 2	NF-2	L1984553-9	30-Aug-17	13:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 3	NF-3	L1984553-10	30-Aug-17	13:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 4	NF-4	L1984553-11	30-Aug-17	14:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 5	NF-5	L1984553-12,-13,-14	30-Aug-17	11:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Farfield # 1	FF-1	L1984553-1	30-Aug-17	7:30	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 2	FF-2	L1984553-2	30-Aug-17	9:00	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 3	FF-3	L1984553-3	30-Aug-17	10:00	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 4	FF-4	L1984553-4	30-Aug-17	9:30	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 5	FF-5	L1984553-5	30-Aug-17	8:30	-	-	-	-	-	-	-	-	-	-	-	-

Table A1-4: Hydrocarbons measured in the laboratory for sites monitored in the Keeyask local study area during the ice-cover and open-water seasons of 2017 (continued).

Sample Location	Site ID	ALS ID	Sample Date	Sample Time	Benzene (mg/L)	Ethyl benzene (mg/L)	Toluene (mg/L)	o-Xylene (mg/L)	m+p-Xylenes (mg/L)	Xylenes (Total) (mg/L)	F1 (C6-C10) (mg/L)	F1-BTEX (mg/L)	Total Hydrocarbons (C6-C50) (mg/L)	F2 (C10-C16) (mg/L)	F3 (C16-C34) (mg/L)	F4 (C34-C50) (mg/L)
Detection Limit					0.00050	0.00050	0.0010	0.00050	0.00040/0.00050	0.00064/0.00071/0.0015	0.10	0.10	0.38/0.74	0.10/0.020	0.25/0.050	0.25/0.050
PAL Guideline					0.370	0.090	0.0020									
Clark Lake # 1	CL-1	L1992820-1	17-Sep-17	10:30	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 2	CL-2	L1992820-2	17-Sep-17	11:30	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 3	CL-3	L1992820-3	17-Sep-17	12:15	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 4	CL-4	L1992820-4	17-Sep-17	12:45	-	-	-	-	-	-	-	-	-	-	-	-
Clark Lake # 5	CL-5	L1992820-5	17-Sep-17	13:15	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream # 1	US-1	L1994509-1	18-Sep-17	12:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 2	US-2	L1994509-2,-6,-7	18-Sep-17	13:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 3	US-3	L1994509-3	18-Sep-17	14:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 4	US-4	L1994509-4	18-Sep-17	15:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Nelson River Upstream # 5	US-5	L1994509-5	18-Sep-17	15:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 1	NF-1	L1994519-1	19-Sep-17	13:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 2	NF-2	L1994519-2	19-Sep-17	14:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 3	NF-3	L1994519-3	19-Sep-17	13:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 4	NF-4	L1994519-4	19-Sep-17	14:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Nearfield # 5	NF-5	L1994519-5	19-Sep-17	12:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Stephens Lake - Farfield # 1	FF-1	L1994519-6	19-Sep-17	9:15	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 2	FF-2	L1994519-7	19-Sep-17	10:30	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 3	FF-3	L1994519-8	19-Sep-17	11:30	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 4	FF-4	L1994519-9	19-Sep-17	11:00	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 5	FF-5	L1994519-10	19-Sep-17	10:00	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX 2: RESULTS OF QUALITY ASSURANCE/QUALITY CONTROL SAMPLES, 2017

Table A2-1: Quality assurance/quality control results for routine water chemistry variables measured in the laboratory during the ice-cover and open-water seasons, 2017. Percent relative standard deviations (PRSD) were calculated for triplicate samples where all results exceeded five times the detection limit (DL); values exceeding 18% are indicated in bold red. Blank values exceeding five times the DL are indicated in bold red.

					Alkalinity				Nitrogen					Phosphorus	
Sample Location	Sample ID	ALS Sample ID	Sample Date	Sample Time	Total ($CaCO_3$) (mg/L)	Bicarbonate (HCO_3) (mg/L)	Carbonate (CO_3) (mg/L)	Hydroxide (OH) (mg/L)	Ammonia (mg/L N)	Nitrate/ nitrite (mg/L)	Nitrate (mg/L)	Nitrite (mg/L)	Total Kjeldahl N (mg/L)	Dissolved P (mg/L)	Total P (mg/L)
Detection Limit					1.0	1.2	0.60	0.34	0.010	0.0051	0.0050	0.0010	0.20	0.0010/0.010	0.0010/0.010
Nelson River Upstream # 11	US-11A	L1909812-2	5-Apr-17	9:39	114	139	<0.60	<0.34	<0.010	0.0576	0.0563	0.0013	0.53	0.0175	0.029
	US-11B	L1909812-7	5-Apr-17	9:45	115	140	<0.60	<0.34	<0.010	0.0556	0.0556	<0.0010	0.55	0.0157	0.034
	US-11C	L1909812-8	5-Apr-17	9:50	114	139	<0.60	<0.34	<0.010	0.0541	0.0541	<0.0010	0.52	0.0156	0.028
	US-11			Mean	114	139	<0.60	<0.34	<0.010	0.0558	0.0553	<0.0010	0.53	0.0163	0.030
				SD	0.6	0.6	-	-	-	0.00176	0.00112	-	0.015	0.00107	0.0032
				PRSD	1	0	-	-	-	3	2	-	-	7	-
Stephens Lake - Nearfield # 4	NF-4	L1951672-4	29-Jun-17	9:45	113	137	<0.60	<0.34	0.048	<0.0051	<0.0050	<0.0010	0.49	0.0154	0.048
	NF-4B	L1951672-6	29-Jun-17	9:50	115	140	<0.60	<0.34	0.025	<0.0051	<0.0050	<0.0010	0.70	0.0147	0.046
	NF-4C	L1951672-7	29-Jun-17	9:55	115	141	<0.60	<0.34	0.014	<0.0051	<0.0050	<0.0010	0.52	0.0117	0.046
	NF-4			Mean	114	139	<0.60	<0.34	0.029	<0.0051	<0.0050	<0.0010	0.57	0.0139	0.047
				SD	1.2	2.1	-	-	-	0.00000	0.00000	-	0.114	0.00197	0.0012
				PRSD	1	1	-	-	-	-	-	-	-	14	-
Stephens Lake - Nearfield # 3	NF-3	L1966177-3	26-Jul-17	10:55	109	133	<0.60	<0.34	0.031	<0.0051	<0.0050	<0.0010	0.67	0.0130	0.043
	NF-3B	L1966177-6	26-Jul-17	11:15	109	132	<0.60	<0.34	0.024	<0.0051	<0.0050	<0.0010	0.41	0.0134	0.041
	NF-3C	L1966177-7	26-Jul-17	11:30	107	131	<0.60	<0.34	0.031	0.0149	0.0149	<0.0010	0.47	0.0144	0.041
	NF-3			Mean	108	132	<0.60	<0.34	0.029	0.0067	0.0066	<0.0010	0.52	0.0136	0.042
				SD	1.2	1.0	-	-	-	0.00713	0.00716	-	0.136	0.00072	0.0012
				PRSD	1	1	-	-	-	-	-	-	-	5	-
Stephens Lake - Nearfield # 5	NF-5A	L1984553-12	30-Aug-17	11:30	112	137	<0.60	<0.34	0.022	0.0269	0.0269	<0.0010	0.31	0.0172	0.041
	NF-5B	L1984553-13	30-Aug-17	11:45	112	137	<0.60	<0.34	0.025	0.0272	0.0255	0.0017	0.36	0.0162	0.043
	NF-5C	L1984553-14	30-Aug-17	12:00	112	136	<0.60	<0.34	0.022	0.0253	0.0253	<0.0010	0.28	0.0209	0.043
	NF-5			Mean	112	137	<0.60	<0.34	0.023	0.0265	0.0259	<0.0010	0.32	0.0181	0.042
				SD	0.0	0.6	-	-	-	0.00102	0.00087	-	0.040	0.00248	0.0012
				PRSD	0	0	-	-	-	4	3	-	-	14	-
Nelson River Upstream # 2	US-2A	L1994509-2	18-Sep-17	13:00	104	127	<0.60	<0.34	<0.010	0.0601	0.0556	0.0045	0.45	0.022	0.055
	US-2B	L1994509-6	18-Sep-17	13:15	105	128	<0.60	<0.34	0.011	0.0605	0.0568	0.0037	0.45	0.023	0.056
	US-2C	L1994509-7	18-Sep-17	13:30	105	128	<0.60	<0.34	<0.010	0.0621	0.0593	0.0029	0.69	0.022	0.056
	US-2			Mean	105	128	<0.60	<0.34	<0.010	0.0609	0.0572	0.0037	0.53	0.0223	0.056
				SD	0.6	0.6	-	-	-	0.00106	0.00189	-	0.139	0.00058	0.0006
				PRSD	1	0	-	-	-	2	3	-	-	-	-
Field Blanks															
Field Blank	TF-2	L1910427-2	6-Apr-17	8:45	<1.0	<1.2	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	<0.0010	<0.0010
Field Blank	TF-2	L1950846-7	27-Jun-17	13:40	<1.0	<1.2	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	0.0033	<0.0010
Field Blank	TF-2	L1965745-7	25-Jul-17	16:30	1.0	1.2	<0.60	<0.34	<0.010	**0.0500**	**0.0500**	<0.0010	<0.20	<0.0010	<0.0010
Field Blank	TF-2	L1984553-7	30-Aug-17	12:45	<1.0	<1.2	<0.60	<0.34	<0.010	**0.0338**	**0.0338**	<0.0010	<0.20	<0.0010	<0.0010
Field Blank	TF-2	L1994509-9	18-Sep-17	12:45	<1.0	<1.2	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	<0.0010	<0.0010
Trip Blanks															
Trip Blank	TF-1	L1910427-1, 9	6-Apr-17	8:40	<1.0	<1.2	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	<0.0010	0.0012
Trip Blank	TF-1	L1950846-6	27-Jun-17	13:35	<1.0	<1.2	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	<0.0010	<0.0010
Trip Blank	TF-1	L1965745-6	25-Jul-17	15:50	1.1	1.3	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	<0.0010	<0.0010
Trip Blank	TF-1	L1984553-6	30-Aug-17	12:30	<1.0	<1.2	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	<0.0010	<0.0010
Trip Blank	TF-1	L1994509-8	18-Sep-17	12:30	<1.0	<1.2	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	0.93	<0.0010	<0.0010

Table A2-1: Quality assurance/quality control results for routine water chemistry variables measured in the laboratory during the ice-cover and open-water seasons, 2017. Percent relative standard deviations (PRSD) were calculated for triplicate samples where all results exceeded five times the detection limit (DL); values exceeding 18% are indicated in bold red. Blank values exceeding five times the DL are indicated in bold red (continued).

					Carbon		Water Clarity						Productivity	
Sample Location	Sample ID	ALS Sample ID	Sample Date	Sample Time	Total Organic C (mg/L)	Dissolved Organic C (mg/L)	Total Suspended Solids (mg/L)	Turbidity (NTU)	True Colour (CU)	Lab pH	Laboratory Conductivity (µmhos/cm)	Total Dissolved Solids (mg/L)	Chlorophyll *a* (µg/L)	Phaeophytin *a* (µg/L)
Detection Limit					0.50	0.50	2.0	0.10	5.0	0.10	1.0	4.0/13/20	0.10	0.10
Nelson River Upstream # 11	US-11A	L1909812-2	5-Apr-17	9:39	9.41	9.44	6.8	11.0	15.0	7.99	339	221	2.95	1.07
	US-11B	L1909812-7	5-Apr-17	9:45	9.22	9.47	7.6	11.1	18.7	8.01	346	208	2.69	0.97
	US-11C	L1909812-8	5-Apr-17	9:50	9.20	9.47	8.8	11.0	17.2	8.02	340	219	2.75	0.99
	US-11			Mean	9.28	9.46	7.7	11.0	17.0	8.01	342	216	2.80	1.01
				SD	0.116	0.017	1.01	0.06	1.86	0.015	3.8	7.0	0.136	0.053
				PRSD	1	0	-	1	-	0	1	3	5	5
Stephens Lake - Nearfield # 4	NF-4	L1951672-4	29-Jun-17	9:45	9.09	9.18	14.4	27.7	22.4	8.24	283	223	7.23	2.58
	NF-4B	L1951672-6	29-Jun-17	9:50	8.80	9.34	21.0	28.5	23.6	8.26	294	213	7.04	2.71
	NF-4C	L1951672-7	29-Jun-17	9:55	8.90	10.2	18.8	28.0	23.5	8.26	290	220	6.63	2.35
	NF-4			Mean	8.93	9.57	18.1	28.1	23.2	8.25	289	219	6.97	2.55
				SD	0.147	0.549	3.36	0.40	0.67	0.012	5.6	5.1	0.307	0.182
				PRSD	2	6	**19**	1	-	0	2	2	4	7
Stephens Lake - Nearfield # 3	NF-3	L1966177-3	26-Jul-17	10:55	8.98	9.35	16.6	22.0	20.3	8.20	295	202	6.85	2.72
	NF-3B	L1966177-6	26-Jul-17	11:15	9.02	9.35	12.4	21.5	20.5	8.25	276	198	6.09	2.70
	NF-3C	L1966177-7	26-Jul-17	11:30	8.72	9.31	14.8	23.3	20.2	8.18	296	200	6.68	2.70
	NF-3			Mean	8.91	9.34	14.6	22.3	20.3	8.21	289	200	6.54	2.71
				SD	0.163	0.023	2.11	0.93	0.15	0.036	11.3	2.0	0.399	0.012
				PRSD	2	0	14	4	-	0	4	1	6	0
Stephens Lake - Nearfield # 5	NF-5A	L1984553-12	30-Aug-17	11:30	9.73	10.0	11.2	19.7	14.7	8.26	275	198	5.85	2.33
	NF-5B	L1984553-13	30-Aug-17	11:45	9.93	9.74	9.6	20.0	18.2	8.27	275	201	5.48	2.26
	NF-5C	L1984553-14	30-Aug-17	12:00	9.77	9.97	10.0	19.8	18.5	8.24	277	201	5.39	2.39
	NF-5			Mean	9.81	9.90	10.3	19.8	17.1	8.26	276	200	5.57	2.33
				SD	0.106	0.142	0.83	0.15	2.11	0.015	1.2	1.7	0.244	0.065
				PRSD	1	1	-	1	-	0	0	1	4	3
Nelson River Upstream # 2	US-2A	L1994509-2	18-Sep-17	13:00	8.51	9.02	12.6	27.4	19.7	8.13	263	196	4.20	2.64
	US-2B	L1994509-6	18-Sep-17	13:15	8.30	9.09	17.6	26.9	15.7	8.15	260	194	4.13	2.53
	US-2C	L1994509-7	18-Sep-17	13:30	8.40	8.90	12.8	27.0	15.6	8.14	261	188	4.05	2.30
	US-2			Mean	8.40	9.00	14.3	27.1	17.0	8.14	261	193	4.13	2.49
				SD	0.105	0.096	2.83	0.26	2.34	0.010	1.5	4.2	0.075	0.173
				PRSD	1	1	**20**	1	-	0	1	2	2	7
Field Blanks														
Field Blank	TF-2	L1910427-2	6-Apr-17	8:45	<0.50	<0.50	<2.0	0.24	<5.0	5.85	<1.0	<4.0	<0.10	<0.10
Field Blank	TF-2	L1950846-7	27-Jun-17	13:40	<0.50	<0.50	<2.0	<0.10	<5.0	6.13	<1.0	<4.0	<0.10	<0.10
Field Blank	TF-2	L1965745-7	25-Jul-17	16:30	<0.50	<0.50	<2.0	<0.10	<5.0	5.32	1.9	<4.0	<0.10	0.15
Field Blank	TF-2	L1984553-7	30-Aug-17	12:45	<0.50	<0.50	<2.0	0.25	<5.0	5.40	<1.0	<4.0	<0.10	<0.10
Field Blank	TF-2	L1994509-9	18-Sep-17	12:45	0.67	<0.50	<2.0	<0.10	<5.0	6.01	<1.0	<4.0	<0.10	<0.10
Trip Blanks														
Trip Blank	TF-1	L1910427-1, 9	6-Apr-17	8:40	<0.50	<0.50	<2.0	<0.10	<5.0	5.98	1.2	<4.0	<0.10	<0.10
Trip Blank	TF-1	L1950846-6	27-Jun-17	13:35	<0.50	<0.50	<2.0	<0.10	<5.0	6.17	<1.0	<4.0	<0.10	<0.10
Trip Blank	TF-1	L1965745-6	25-Jul-17	15:50	<0.50	<0.50	<2.0	<0.10	<5.0	5.87	<1.0	<4.0	<0.10	<0.10
Trip Blank	TF-1	L1984553-6	30-Aug-17	12:30	<0.50	<0.50	<2.0	<0.10	<5.0	6.11	<1.0	<4.0	<0.10	<0.10
Trip Blank	TF-1	L1994509-8	18-Sep-17	12:30	<0.50	0.56	<2.0	<0.10	<5.0	6.05	<1.0	<4.0	<0.10	<0.10

Table A2-2: Quality assurance/quality control results for metals and major ions measured in the laboratory during the ice-cover and open-water seasons, 2017. Percent relative standard deviations (PRSD) were calculated for triplicate samples where all results exceeded five times the detection limit (DL); values exceeding 18% are indicated in bold red. Blank values exceeding five times the DL are indicated in bold red.

Sample Location	Sample ID	ALS Sample ID	Sample Date	Sample Time	Hardness (as $CaCO_3$) (mg/L)	Aluminum (mg/L)	Antimony (mg/L)	Arsenic (mg/L)	Barium (mg/L)	Beryllium (mg/L)	Bismuth (mg/L)	Boron (mg/L)	Cadmium (mg/L)	Calcium (mg/L)
Detection Limit					0.20/0.25	0.0030/0.0050	0.00010/0.00020	0.00010/0.00020	0.00020/0.00050	0.00020/0.00050	0.000050/0.00020	0.010	0.0000050/0.000010	0.050/0.10
Nelson River Upstream # 11	US-11A	L1909812-2	5-Apr-17	9:39	140	0.559	<0.00020	0.00128	0.0402	<0.00020	<0.00020	0.028	<0.000010	32.1
	US-11B	L1909812-7	5-Apr-17	9:45	141	0.500	<0.00020	0.00133	0.0415	<0.00020	<0.00020	0.027	<0.000010	32.2
	US-11C	L1909812-8	5-Apr-17	9:50	142	0.535	<0.00020	0.00127	0.0401	<0.00020	<0.00020	0.027	<0.000010	32.6
	US-11			Mean	141	0.531	<0.00020	0.00129	0.0406	<0.00020	<0.00020	0.027	<0.000010	32.3
				SD	1.0	0.0297	-	0.000032	0.00078	-	-	0.0006	-	0.26
				PRSD	1	6	-	2	2	-	-	-	-	1
Stephens Lake - Nearfield # 4	NF-4	L1951672-4	29-Jun-17	9:45	129	1.10	0.00021	0.00123	0.0390	<0.00020	<0.00020	0.024	<0.000010	30.8
	NF-4B	L1951672-6	29-Jun-17	9:50	129	0.933	<0.00020	0.00121	0.0393	<0.00020	<0.00020	0.024	<0.000010	30.4
	NF-4C	L1951672-7	29-Jun-17	9:55	132	1.14	<0.00020	0.00126	0.0413	<0.00020	<0.00020	0.024	<0.000010	31.3
	NF-4			Mean	130	1.058	<0.00020	0.00123	0.0399	<0.00020	<0.00020	0.024	<0.000010	30.8
				SD	1.7	0.1098	0.000064	0.000025	0.00125	-	-	0.0000	0.0000000	0.45
				PRSD	1	10	-	2	3	-	-	-	-	1
Stephens Lake - Nearfield # 3	NF-3	L1966177-3	26-Jul-17	10:55	127	0.836	0.00012	0.00129	0.0364	<0.00010	<0.000050	0.029	0.0000085	30.3
	NF-3B	L1966177-6	26-Jul-17	11:15	127	0.693	0.00011	0.00123	0.0347	<0.00010	<0.000050	0.028	0.0000066	30.8
	NF-3C	L1966177-7	26-Jul-17	11:30	127	0.694	0.00011	0.00125	0.0347	<0.00010	<0.000050	0.028	0.0000076	30.0
	NF-3			Mean	127	0.741	0.00011	0.00126	0.0353	<0.00010	<0.000050	0.028	0.0000076	30.4
				SD	0.0	0.0823	0.000006	0.000031	0.00098	-	-	0.0006	0.0000010	0.40
				PRSD	0	11	-	2	3	-	-	2	-	1
Stephens Lake - Nearfield # 5	NF-5A	L1984553-12	30-Aug-17	11:30	130	0.725	0.00033	0.00153	0.0363	<0.00010	<0.000050	0.026	0.0000073	31.5
	NF-5B	L1984553-13	30-Aug-17	11:45	134	0.545	0.00030	0.00157	0.0361	<0.00010	<0.000050	0.026	0.0000053	32.1
	NF-5C	L1984553-14	30-Aug-17	12:00	133	0.236	0.00020	0.00152	0.0333	<0.00010	<0.000050	0.027	0.0000053	31.6
	NF-5			Mean	132	0.502	0.00028	0.00154	0.0352	<0.00010	<0.000050	0.026	0.0000060	31.7
				SD	2.1	0.2473	0.000068	0.000026	0.00168	-	-	0.0006	0.0000012	0.32
				PRSD	2	**49**	-	2	5	-	-	2	-	1
Nelson River Upstream # 2	US-2A	L1994509-2	18-Sep-17	13:00	114	0.809	0.00011	0.00136	0.0351	<0.00010	<0.000050	0.021	0.0000110	26.0
	US-2B	L1994509-6	18-Sep-17	13:15	117	0.992	<0.00010	0.00140	0.0365	<0.00010	<0.000050	0.021	0.0000063	26.7
	US-2C	L1994509-7	18-Sep-17	13:30	116	0.999	<0.00010	0.00138	0.0367	<0.00010	<0.000050	0.022	0.0000091	26.7
	US-2			Mean	116	0.933	<0.00010	0.00138	0.0361	<0.00010	<0.000050	0.021	0.0000088	26.5
				SD	1.5	0.1077	0.000035	0.000020	0.00087	-	-	0.0006	0.0000024	0.40
				PRSD	1	12	-	1	2	-	-	3	-	2
Field Blanks														
Field Blank	TF-2	L1910427-2	6-Apr-17	8:45	<0.25	<0.0050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.010	<0.000010	<0.10
Field Blank	TF-2	L1950846-7	27-Jun-17	13:40	0.28	<0.0050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.010	<0.000010	0.11
Field Blank	TF-2	L1965745-7	25-Jul-17	16:30	0.21	<0.0030	<0.00010	<0.00010	<0.000050	<0.00010	<0.000050	<0.010	<0.0000050	0.083
Field Blank	TF-2	L1984553-7	30-Aug-17	12:45	<0.20	<0.0030	0.00023	<0.00010	0.000067	<0.00010	<0.000050	<0.010	<0.0000050	<0.050
Field Blank	TF-2	L1994509-9	18-Sep-17	12:45	0.29	<0.0030	<0.00010	<0.00010	0.000074	<0.00010	<0.000050	<0.010	<0.0000050	0.115
Trip Blanks														
Trip Blank	TF-1	L1910427-1, 9	6-Apr-17	8:40	0.54	0.0125	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.010	<0.000010	<0.10
Trip Blank	TF-1	L1950846-6	27-Jun-17	13:35	<0.25	<0.0050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.010	<0.000010	<0.10
Trip Blank	TF-1	L1965745-6	25-Jul-17	15:50	<0.20	<0.0030	<0.00010	<0.00010	<0.000050	<0.00010	<0.000050	<0.010	<0.0000050	0.061
Trip Blank	TF-1	L1984553-6	30-Aug-17	12:30	<0.20	<0.0030	0.00024	<0.00010	0.000089	<0.00010	<0.000050	<0.010	<0.0000050	<0.050
Trip Blank	TF-1	L1994509-8	18-Sep-17	12:30	0.23	<0.0030	<0.00010	<0.00010	<0.000050	<0.00010	<0.000050	<0.010	<0.0000050	0.078

Table A2-2: Quality assurance/quality control results for metals and major ions measured in the laboratory during the ice-cover and open-water seasons, 2017. Percent relative standard deviations (PRSD) were calculated for triplicate samples where all results exceeded five times the detection limit (DL); values exceeding 18% are indicated in bold red. Blank values exceeding five times the DL are indicated in bold red (continued).

Sample Location	Sample ID	Sample Date	Sample Time	Cesium (mg/L)	Chloride (mg/L)	Chromium (mg/L)	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (mg/L)
Detection Limit				0.000010/0.00010	0.10	0.00010/0.0010	0.00010/0.00020	0.00020/0.00050	0.010	0.000050/0.000090	0.0010/0.0020	0.0050/0.010	0.00010/0.00030	0.0000005/0.0000010
Nelson River Upstream # 11	US-11A	5-Apr-17	9:39	<0.00010	17.7	<0.0010	0.00021	0.00213	0.456	0.000270	0.0114	14.5	0.0123	0.00000120
	US-11B	5-Apr-17	9:45	<0.00010	17.7	<0.0010	<0.00020	0.00236	0.436	0.000308	0.0112	14.7	0.0125	0.00000260
	US-11C	5-Apr-17	9:50	<0.00010	17.7	<0.0010	<0.00020	0.00202	0.444	0.000262	0.0112	14.8	0.0131	0.00000110
	US-11		Mean	<0.00010	17.7	<0.0010	<0.00020	0.00217	0.445	0.000280	0.0113	14.7	0.0126	0.00000163
			SD	-	0.00	-	-	0.000173	0.0101	0.0000246	0.00012	0.15	0.00042	0.000000839
			PRSD	-	0	-	-	8	2	-	1	1	3	-
Stephens Lake - Nearfield # 4	NF-4	29-Jun-17	9:45	0.00012	17.0	0.0017	0.00044	0.00189	0.956	0.000409	0.0109	12.7	0.0211	0.00000120
	NF-4B	29-Jun-17	9:50	0.00010	16.9	0.0013	0.00036	0.00182	0.772	0.000373	0.0107	12.8	0.0197	0.00000160
	NF-4C	29-Jun-17	9:55	0.00013	17.0	0.0018	0.00043	0.00199	0.989	0.000414	0.0110	13.0	0.0219	0.00000130
	NF-4		Mean	0.00012	17.0	0.0016	0.00041	0.00190	0.906	0.000399	0.0109	12.8	0.0209	0.00000137
			SD	0.000015	0.06	0.00026	0.000044	0.000085	0.1169	0.0000224	0.00015	0.15	0.00111	0.000000208
			PRSD	-	0	-	-	-	13	-	1	1	5	-
Stephens Lake - Nearfield # 3	NF-3	26-Jul-17	10:55	0.000093	16.0	0.00132	0.00034	0.00191	0.728	0.000323	0.0118	12.4	0.0191	0.00000120
	NF-3B	26-Jul-17	11:15	0.000074	16.0	0.00108	0.00031	0.00181	0.587	0.000292	0.0113	12.2	0.0172	0.00000110
	NF-3C	26-Jul-17	11:30	0.000074	16.1	0.00115	0.00033	0.00185	0.637	0.000299	0.0113	12.5	0.0181	0.00000120
	NF-3		Mean	0.00008	16.0	0.0012	0.00033	0.00186	0.651	0.000305	0.0115	12.4	0.0181	0.00000117
			SD	0.000011	0.06	0.00012	0.000015	0.000050	0.0715	0.0000163	0.00029	0.15	0.00095	0.000000058
			PRSD	14	0	10	-	3	11	5	3	1	5	-
Stephens Lake - Nearfield # 5	NF-5A	30-Aug-17	11:30	0.000079	15.9	0.00112	0.00031	0.00180	0.646	0.000312	0.0106	12.5	0.0182	0.00000170
	NF-5B	30-Aug-17	11:45	0.000058	15.9	0.00092	0.00026	0.00174	0.507	0.000285	0.0107	13.0	0.0174	0.00000110
	NF-5C	30-Aug-17	12:00	0.000021	15.9	0.00041	0.00017	0.00164	0.237	0.000249	0.0106	13.1	0.0156	0.00000130
	NF-5		Mean	0.00005	15.9	0.0008	0.00025	0.00173	0.463	0.000282	0.0106	12.9	0.0171	0.00000137
			SD	0.000029	0.00	0.00037	0.000071	0.000081	0.2080	0.0000316	0.00006	0.32	0.00133	0.000000306
			PRSD	-	0	-	-	5	**45**	11	1	2	8	-
Nelson River Upstream # 2	US-2A	18-Sep-17	13:00	0.000098	12.7	0.00161	0.00041	0.00240	0.805	0.000562	0.0090	12.0	0.0211	0.00000100
	US-2B	18-Sep-17	13:15	0.000120	12.6	0.00170	0.00047	0.00210	0.978	0.000435	0.0094	12.3	0.0223	0.00000100
	US-2C	18-Sep-17	13:30	0.000123	12.7	0.00171	0.00045	0.00211	0.961	0.000443	0.0094	11.9	0.0222	0.00000110
	US-2		Mean	0.00011	12.7	0.0017	0.00044	0.00220	0.915	0.000480	0.0093	12.1	0.0219	0.00000103
			SD	0.000014	0.06	0.00006	0.000031	0.000170	0.0954	0.0000711	0.00023	0.21	0.00067	0.000000058
			PRSD	12	0	3	-	8	10	15	2	2	3	-
Field Blanks														
Field Blank	TF-2	6-Apr-17	8:45	<0.00010	<0.10	<0.0010	<0.00020	<0.00020	<0.010	<0.000090	<0.0020	<0.010	0.00051	<0.0000005
Field Blank	TF-2	27-Jun-17	13:40	<0.00010	<0.10	<0.0010	<0.00020	<0.00020	<0.010	0.000123	<0.0020	<0.010	<0.00030	<0.00000050
Field Blank	TF-2	25-Jul-17	16:30	<0.000010	<0.10	<0.00010	<0.00010	<0.00050	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.00000050
Field Blank	TF-2	30-Aug-17	12:45	<0.000010	<0.10	<0.00010	<0.00010	<0.00050	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.00000050
Field Blank	TF-2	18-Sep-17	12:45	<0.000010	<0.10	<0.00010	<0.00010	<0.00050	<0.010	**0.000293**	<0.0010	<0.0050	<0.00010	<0.00000050
Trip Blanks														
Trip Blank	TF-1	6-Apr-17	8:40	<0.00010	<0.10	<0.0010	<0.00020	<0.00020	<0.010	<0.000090	<0.0020	0.010	<0.00030	<0.0000005
Trip Blank	TF-1	27-Jun-17	13:35	<0.00010	<0.10	<0.0010	<0.00020	0.00041	<0.010	<0.000090	<0.0020	<0.010	<0.00030	0.00000050
Trip Blank	TF-1	25-Jul-17	15:50	<0.000010	<0.10	<0.00010	<0.00010	<0.00050	<0.010	<0.000050	<0.0010	<0.0050	<0.00010	<0.00000050
Trip Blank	TF-1	30-Aug-17	12:30	<0.000010	<0.10	<0.00010	<0.00010	<0.00050	<0.010	<0.000050	<0.0010	0.0060	<0.00010	<0.00000050
Trip Blank	TF-1	18-Sep-17	12:30	<0.000010	<0.10	<0.00010	<0.00010	<0.00050	0.028	<0.000050	<0.0010	0.0077	0.00023	<0.00000050

Table A2-2: Quality assurance/quality control results for metals and major ions measured in the laboratory during the ice-cover and open-water seasons, 2017. Percent relative standard deviations (PRSD) were calculated for triplicate samples where all results exceeded five times the detection limit (DL); values exceeding 18% are indicated in bold red. Blank values exceeding five times the DL are indicated in bold red (continued).

Sample Location	Sample ID	Sample Date	Sample Time	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)	Strontium (mg/L)	Sulphate (mg/L)	Sulfur (mg/L)	Tellurium (mg/L)	Thallium (mg/L)
Detection Limit				0.000050/0.00020	0.00050/0.0020	0.050/0.10	0.020/0.050	0.00020	0.000050/0.0010	0.10	0.000010/0.00010	0.030/0.050	0.00010/0.00020	0.30	0.50	0.00020	0.000010/0.00010
Nelson River Upstream # 11	US-11A	5-Apr-17	9:39	0.00078	<0.0020	<0.10	3.28	0.00255	<0.0010	2.68	<0.00010	19.9	0.130	37.0	-	<0.00020	<0.00010
	US-11B	5-Apr-17	9:45	0.00078	<0.0020	<0.10	3.39	0.00241	<0.0010	2.54	<0.00010	20.4	0.129	36.9	-	<0.00020	<0.00010
	US-11C	5-Apr-17	9:50	0.00077	<0.0020	<0.10	3.39	0.00272	<0.0010	2.63	<0.00010	20.5	0.128	36.9	-	<0.00020	<0.00010
	US-11		Mean	0.00078	<0.0020	<0.10	3.35	0.00256	<0.0010	2.62	<0.00010	20.3	0.129	36.9	-	<0.00020	<0.00010
			SD	0.000006	-	-	0.064	0.000155	-	0.071	-	0.32	0.0010	0.06	-	-	-
			PRSD	-	-	-	2	6	-	3	-	2	1	0	-	-	-
Stephens Lake - Nearfield # 4	NF-4	29-Jun-17	9:45	0.00070	<0.0020	<0.10	2.95	0.00354	<0.0010	3.58	<0.00010	16.3	0.117	35.4	-	<0.00020	<0.00010
	NF-4B	29-Jun-17	9:50	0.00068	<0.0020	<0.10	2.97	0.00317	<0.0010	3.10	<0.00010	16.5	0.116	35.4	-	<0.00020	<0.00010
	NF-4C	29-Jun-17	9:55	0.00072	0.0020	<0.10	3.04	0.00377	<0.0010	3.66	<0.00010	16.8	0.120	35.5	-	<0.00020	<0.00010
	NF-4		Mean	0.00070	<0.0020	<0.10	2.99	0.00349	<0.0010	3.45	<0.00010	16.5	0.118	35.4	-	<0.00020	<0.00010
			SD	0.000020	0.00058	-	0.047	0.000303	-	0.303	-	0.25	0.0021	0.06	-	-	-
			PRSD	-	-	-	2	9	-	9	-	2	2	0	-	-	-
Stephens Lake - Nearfield # 3	NF-3	26-Jul-17	10:55	0.000648	0.00178	<0.050	3.03	0.00292	0.000116	2.27	<0.000010	16.9	0.106	32.6	12.3	<0.00020	0.000013
	NF-3B	26-Jul-17	11:15	0.000608	0.00166	<0.050	2.98	0.00264	0.000103	1.95	<0.000010	16.4	0.104	32.6	12.4	<0.00020	<0.000010
	NF-3C	26-Jul-17	11:30	0.000586	0.00171	<0.050	2.97	0.00268	0.000123	1.91	<0.000010	16.6	0.104	32.6	12.3	<0.00020	0.000011
	NF-3		Mean	0.00061	0.0017	<0.050	2.99	0.00275	0.000114	2.04	<0.000010	16.6	0.105	32.6	12.3	<0.00020	<0.000010
			SD	0.000031	0.00006	-	0.032	0.000151	0.0000101	0.197	-	0.25	0.0012	0.00	0.06	-	-
			PRSD	5	-	-	1	6	9	10	-	2	1	0	0	-	-
Stephens Lake - Nearfield # 5	NF-5A	30-Aug-17	11:30	0.000646	0.00155	<0.050	2.69	0.00274	0.000123	2.65	<0.000010	15.8	0.114	31.9	11.5	<0.00020	0.000011
	NF-5B	30-Aug-17	11:45	0.000661	0.00147	<0.050	2.74	0.00253	0.000102	2.26	<0.000010	16.5	0.114	32.1	11.7	<0.00020	<0.000010
	NF-5C	30-Aug-17	12:00	0.000606	0.00117	<0.050	2.66	0.00183	0.000120	1.59	<0.000010	16.8	0.116	32.1	11.9	<0.00020	<0.000010
	NF-5		Mean	0.00064	0.0014	<0.050	2.70	0.00237	0.000115	2.17	<0.000010	16.4	0.115	32.0	11.7	<0.00020	<0.000010
			SD	0.000028	0.00020	-	0.040	0.000476	0.0000114	0.536	-	0.51	0.0012	0.12	0.20	-	-
			PRSD	4	-	-	1	**20**	10	**25**	-	3	1	0	2	-	-
Nelson River Upstream # 2	US-2A	18-Sep-17	13:00	0.000584	0.00207	<0.050	2.31	0.00291	0.000089	3.35	<0.000010	14.0	0.102	25.0	8.47	<0.00020	0.000012
	US-2B	18-Sep-17	13:15	0.000521	0.00207	<0.050	2.34	0.00323	0.000111	3.80	<0.000010	14.1	0.101	25.0	8.69	<0.00020	0.000014
	US-2C	18-Sep-17	13:30	0.000540	0.00207	<0.050	2.32	0.00336	0.000113	3.77	<0.000010	13.9	0.102	25.1	8.55	<0.00020	0.000014
	US-2		Mean	0.00055	0.0021	<0.050	2.32	0.00317	0.000104	3.64	<0.000010	14.0	0.102	25.0	8.6	<0.00020	0.000013
			SD	0.000032	0.00000	-	0.015	0.000232	0.0000133	0.252	-	0.10	0.0006	0.06	0.11	-	-
			PRSD	6	-	-	1	7	13	7	-	1	1	0	1	-	9
Field Blanks																	
Field Blank	TF-2	6-Apr-17	8:45	<0.00020	<0.0020	<0.10	<0.020	<0.00020	<0.0010	<0.10	<0.00010	<0.030	<0.00010	<0.30	-	<0.00020	<0.00010
Field Blank	TF-2	27-Jun-17	13:40	<0.00020	<0.0020	<0.10	<0.020	<0.00020	<0.0010	<0.10	<0.00010	<0.030	<0.00010	<0.30	-	<0.00020	<0.00010
Field Blank	TF-2	25-Jul-17	16:30	<0.000050	<0.00050	<0.050	<0.050	<0.00020	<0.000050	<0.10	<0.000010	<0.050	<0.00020	<0.30	<0.50	<0.00020	<0.000010
Field Blank	TF-2	30-Aug-17	12:45	<0.000050	<0.00050	<0.050	<0.050	<0.00020	<0.000050	<0.10	<0.000010	<0.050	<0.00020	<0.30	<0.50	<0.00020	<0.000010
Field Blank	TF-2	18-Sep-17	12:45	<0.000050	<0.00050	<0.050	<0.050	<0.00020	<0.000050	<0.10	<0.000010	<0.050	<0.00020	<0.30	<0.50	<0.00020	<0.000010
Trip Blanks																	
Trip Blank	TF-1	6-Apr-17	8:40	<0.00020	<0.0020	<0.10	<0.020	<0.00020	<0.0010	<0.10	<0.00010	0.045	0.00015	<0.30	-	<0.00020	<0.00010
Trip Blank	TF-1	27-Jun-17	13:35	<0.00020	<0.0020	<0.10	<0.020	<0.00020	<0.0010	<0.10	<0.00010	<0.030	<0.00010	<0.30	-	<0.00020	<0.00010
Trip Blank	TF-1	25-Jul-17	15:50	<0.000050	<0.00050	<0.050	<0.050	<0.00020	<0.000050	<0.10	<0.000010	<0.050	<0.00020	<0.30	<0.50	<0.00020	<0.000010
Trip Blank	TF-1	30-Aug-17	12:30	<0.000050	<0.00050	<0.050	<0.050	<0.00020	<0.000050	<0.10	<0.000010	<0.050	<0.00020	<0.30	<0.50	<0.00020	<0.000010
Trip Blank	TF-1	18-Sep-17	12:30	<0.000050	<0.00050	<0.050	<0.050	<0.00020	<0.000050	<0.10	<0.000010	<0.050	<0.00020	<0.30	<0.50	<0.00020	<0.000010

Table A2-2: Quality assurance/quality control results for metals and major ions measured in the laboratory during the ice-cover and open-water seasons, 2017. Percent relative standard deviations (PRSD) were calculated for triplicate samples where all results exceeded five times the detection limit (DL); values exceeding 18% are indicated in bold red. Blank values exceeding five times the DL are indicated in bold red (continued).

Sample Location	Sample ID	Sample Date	Sample Time	Thorium (mg/L)	Tin (mg/L)	Titanium (mg/L)	Tungsten (mg/L)	Uranium (mg/L)	Vanadium (mg/L)	Zinc (mg/L)	Zirconium (mg/L)
Detection Limit				0.00010	0.00010/0.00020	0.00030/0.00050	0.00010	0.000010/0.00010	0.00020/0.00050	0.0020/0.0030	0.000060/0.00040
Nelson River Upstream # 11	US-11A	5-Apr-17	9:39	0.00017	<0.00020	0.0213	<0.00010	0.00076	0.00154	<0.0020	0.00063
	US-11B	5-Apr-17	9:45	0.00017	0.00031	0.0193	<0.00010	0.00076	0.00154	<0.0020	0.00053
	US-11C	5-Apr-17	9:50	0.00017	0.00036	0.0202	<0.00010	0.00076	0.00152	0.0022	0.00055
	US-11		Mean	0.00017	0.00026	0.0203	<0.00010	0.00076	0.00153	<0.0020	0.00057
			SD	0.000000	0.000138	0.00100	-	0.000000	0.000012	-	0.000053
			PRSD	-	-	5	-	0	1	-	-
Stephens Lake - Nearfield # 4	NF-4	29-Jun-17	9:45	0.00038	<0.00020	0.0440	<0.00010	0.00069	0.00247	0.0025	0.00087
	NF-4B	29-Jun-17	9:50	0.00032	<0.00020	0.0353	<0.00010	0.00068	0.00217	0.0023	0.00082
	NF-4C	29-Jun-17	9:55	0.00039	<0.00020	0.0450	<0.00010	0.00070	0.00248	0.0025	0.00089
	NF-4		Mean	0.00036	<0.00020	0.0414	<0.00010	0.00069	0.00237	0.0024	0.00086
			SD	0.000038	-	0.00534	-	0.000010	0.000176	0.00012	0.000036
			PRSD	10	-	13	-	1	7	-	-
Stephens Lake - Nearfield # 3	NF-3	26-Jul-17	10:55	0.00020	<0.00010	0.0322	<0.00010	0.000623	0.00224	<0.0030	0.000651
	NF-3B	26-Jul-17	11:15	0.00018	<0.00010	0.0257	<0.00010	0.000601	0.00207	<0.0030	0.000600
	NF-3C	26-Jul-17	11:30	0.00018	<0.00010	0.0272	<0.00010	0.000604	0.00206	<0.0030	0.000607
	NF-3		Mean	0.00019	<0.00010	0.0284	<0.00010	0.00061	0.00212	<0.0030	0.00062
			SD	0.000012	-	0.00340	-	0.000012	0.000101	-	0.000028
			PRSD	6	-	12	-	2	-	-	4
Stephens Lake - Nearfield # 5	NF-5A	30-Aug-17	11:30	0.00019	<0.00010	0.0266	<0.00010	0.000594	0.00216	<0.0030	0.000602
	NF-5B	30-Aug-17	11:45	0.00015	<0.00010	0.0197	<0.00010	0.000603	0.00194	<0.0030	0.000584
	NF-5C	30-Aug-17	12:00	<0.00010	<0.00010	0.00760	<0.00010	0.000589	0.00150	<0.0030	0.000456
	NF-5		Mean	0.00013	<0.00010	0.0180	<0.00010	0.00060	0.00187	<0.0030	0.00055
			SD	0.000072	-	0.00962	-	0.000007	0.000336	-	0.000080
			PRSD	-	-	-	-	1	-	-	15
Nelson River Upstream # 2	US-2A	18-Sep-17	13:00	0.00025	<0.00010	0.0317	<0.00010	0.000516	0.00252	0.0065	0.000829
	US-2B	18-Sep-17	13:15	0.00028	<0.00010	0.0382	<0.00010	0.000520	0.00272	0.0074	0.000843
	US-2C	18-Sep-17	13:30	0.00030	<0.00010	0.0384	<0.00010	0.000515	0.00274	0.0067	0.000874
	US-2		Mean	0.00028	<0.00010	0.0361	<0.00010	0.00052	0.00266	0.0069	0.00085
			SD	0.000025	-	0.00381	-	0.000003	0.000122	0.00047	0.000023
			PRSD	9	-	11	-	1	5	-	3
Field Blanks											
Field Blank	TF-2	6-Apr-17	8:45	<0.00010	<0.00020	<0.00050	<0.00010	<0.00010	<0.00020	<0.0020	<0.00040
Field Blank	TF-2	27-Jun-17	13:40	<0.00010	<0.00020	<0.00050	<0.00010	<0.00010	<0.00020	<0.0020	<0.00040
Field Blank	TF-2	25-Jul-17	16:30	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0030	<0.000060
Field Blank	TF-2	30-Aug-17	12:45	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0030	<0.000060
Field Blank	TF-2	18-Sep-17	12:45	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0030	<0.000060
Trip Blanks											
Trip Blank	TF-1	6-Apr-17	8:40	<0.00010	<0.00020	<0.00050	<0.00010	<0.00010	<0.00020	0.0080	<0.00040
Trip Blank	TF-1	27-Jun-17	13:35	<0.00010	<0.00020	<0.00050	<0.00010	<0.00010	<0.00020	<0.0020	<0.00040
Trip Blank	TF-1	25-Jul-17	15:50	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0030	<0.000060
Trip Blank	TF-1	30-Aug-17	12:30	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0030	<0.000060
Trip Blank	TF-1	18-Sep-17	12:30	<0.00010	<0.00010	<0.00030	<0.00010	<0.000010	<0.00050	<0.0030	<0.000060

Table A2-3: Quality assurance/quality control results for hydrocarbons during the ice-cover and open-water seasons, 2017. Percent relative standard deviations (PRSD) were calculated for triplicate samples where all results exceeded five times the detection limit.

Sample Location	Sample ID	ALS Sample ID	Sample Date	Sample Time	Benzene (mg/L)	Ethyl benzene (mg/L)	Toluene (mg/L)	o-Xylene (mg/L)	m+p-Xylenes (mg/L)	Xylenes (Total) (mg/L)	F1 (C6-C10) (mg/L)	F1-BTEX (mg/L)	Total Hydrocarbons (C6-C50) (mg/L)	F2 (C10-C16) (mg/L)	F3 (C16-C34) (mg/L)	F4 (C34-C50) (mg/L)
Detection Limit					0.00050	0.00050	0.0010	0.00050	0.00040/0.00050	0.00064/0.00071	0.10	0.10	0.38/0.74	0.10/0.020	0.25/0.050	0.25/0.050
Nelson River Upstream # 11	US-11A	L1909812-2	5-Apr-17	9:39	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	US-11B	L1909812-7	5-Apr-17	9:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	US-11C	L1909812-8	5-Apr-17	9:50	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	US-11			Mean	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
				SD	-	-	-	-	-	-	-	-	-	-	-	-
				PRSD	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Nearfield # 4	NF-4	L1951672-4	29-Jun-17	9:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	NF-4B	L1951672-6	29-Jun-17	9:50	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	NF-4C	L1951672-7	29-Jun-17	9:55	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	NF-4			Mean	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
				SD	-	-	-	-	-	-	-	-	-	-	-	-
				PRSD	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Nearfield # 3	NF-3	L1966177-3	26-Jul-17	10:55	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	NF-3B	L1966177-6	26-Jul-17	11:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.74	<0.20	<0.50	<0.50
	NF-3C	L1966177-7	26-Jul-17	11:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	NF-3			Mean	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
				SD	-	-	-	-	-	-	-	-	-	-	-	-
				PRSD	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Nearfield # 5	NF-5A	L1984553-12	30-Aug-17	11:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	NF-5B	L1984553-13	30-Aug-17	11:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	NF-5C	L1984553-14	30-Aug-17	12:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	NF-5			Mean	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
				SD	-	-	-	-	-	-	-	-	-	-	-	-
				PRSD	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream # 2	US-2A	L1994509-2	18-Sep-17	13:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	US-2B	L1994509-6	18-Sep-17	13:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	US-2C	L1994509-7	18-Sep-17	13:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
	US-2			Mean	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
				SD	-	-	-	-	-	-	-	-	-	-	-	-
				PRSD	-	-	-	-	-	-	-	-	-	-	-	-
Field Blanks																
Field Blank	TF-2	L1910427-2	6-Apr-17	8:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Field Blank	TF-2	L1950846-7	27-Jun-17	13:40	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Field Blank	TF-2	L1965745-7	25-Jul-17	16:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Field Blank	TF-2	L1984553-7	30-Aug-17	12:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Field Blank	TF-2	L1994509-9	18-Sep-17	12:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Trip Blanks																
Trip Blank	TF-1	L1910427-1, 9	6-Apr-17	8:40	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Trip Blank	TF-1	L1950846-6	27-Jun-17	13:35	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Trip Blank	TF-1	L1965745-6	25-Jul-17	15:50	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00071	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Trip Blank	TF-1	L1984553-6	30-Aug-17	12:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25
Trip Blank	TF-1	L1994509-8	18-Sep-17	12:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00040	<0.00064	<0.10	<0.10	<0.38	<0.10	<0.25	<0.25