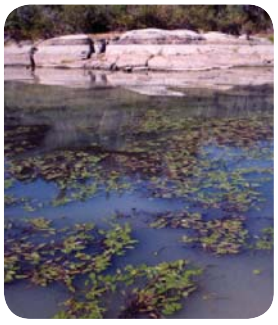
Keeyask Generation Project

Aquatic Effects Monitoring Plan

Water Quality Monitoring Report

AEMP-2015-05



Manitoba Hydro

KEEYASK

Manitoba Conservation and Water Stewardship Client File 5550.00
Manitoba Environment Act Licence No. 3107

2014 - 2015

KEEYASK GENERATION PROJECT

AQUATIC EFFECTS MONITORING PLAN

Report #AEMP–2015–05

Water Quality Monitoring in the Nelson River, 2014: Year 1 of Construction

Prepared for

Manitoba Hydro

By

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SUMMARY

BACKGROUND

Construction of the Keeyask Generating Station (GS) at Gull Rapids began in July 2014. Before the government issued a licence to construct the generating station, the Keeyask Hydropower Limited Partnership (KHLP) was required to prepare a plan to monitor the effects of construction and operation of the generating station on the aquatic environment. Monitoring results will help the KHLP, government regulators, members of local First Nation communities, and the general public understand how construction and operation of the generating station will affect the environment, and whether or not more needs to be done to reduce harmful effects.

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 generating station, can affect water quality.

This report describes the results of water quality monitoring conducted during the first three months of construction at Gull Rapids. Samples were collected at sites in the Nelson River upstream of construction and at sites in Stephens Lake downstream of construction. Monitoring included substances such as suspended solids and related variables, such as 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 in case unexpected effects occur.

WHY IS THE STUDY BEING DONE?

The study is being done to address one main question:

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

The primary effect of construction on water quality relates to increasing the amounts of suspended solids in the Nelson River (i.e., making the water "muddier"). This can be caused by building structures such as cofferdams in the river, changes in water levels or flows that increase shoreline erosion, and by various on-land activities such as clearing. Construction may also result in the release of other potentially harmful substances, such as hydrocarbons, to the river. 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.

As part of the management plan for constructing in the water, the increase in sediment concentrations downstream of construction is being continuously measured and results are being relayed to the work-site so that construction activities can be adjusted, if required, to avoid harmful releases of sediments. The results of this program are reported as part of the Environmental Protection Program in the annual report on monitoring activities for the implementation of the Sediment Management Plan (SMP). The water sampling program described in this report refers to the broader water quality monitoring program that is being done

to measure other aspects of water quality, such as nutrients (which are necessary for aquatic life), metals, and substances that are found in oil and gas (i.e., hydrocarbons).

WHAT WAS DONE?

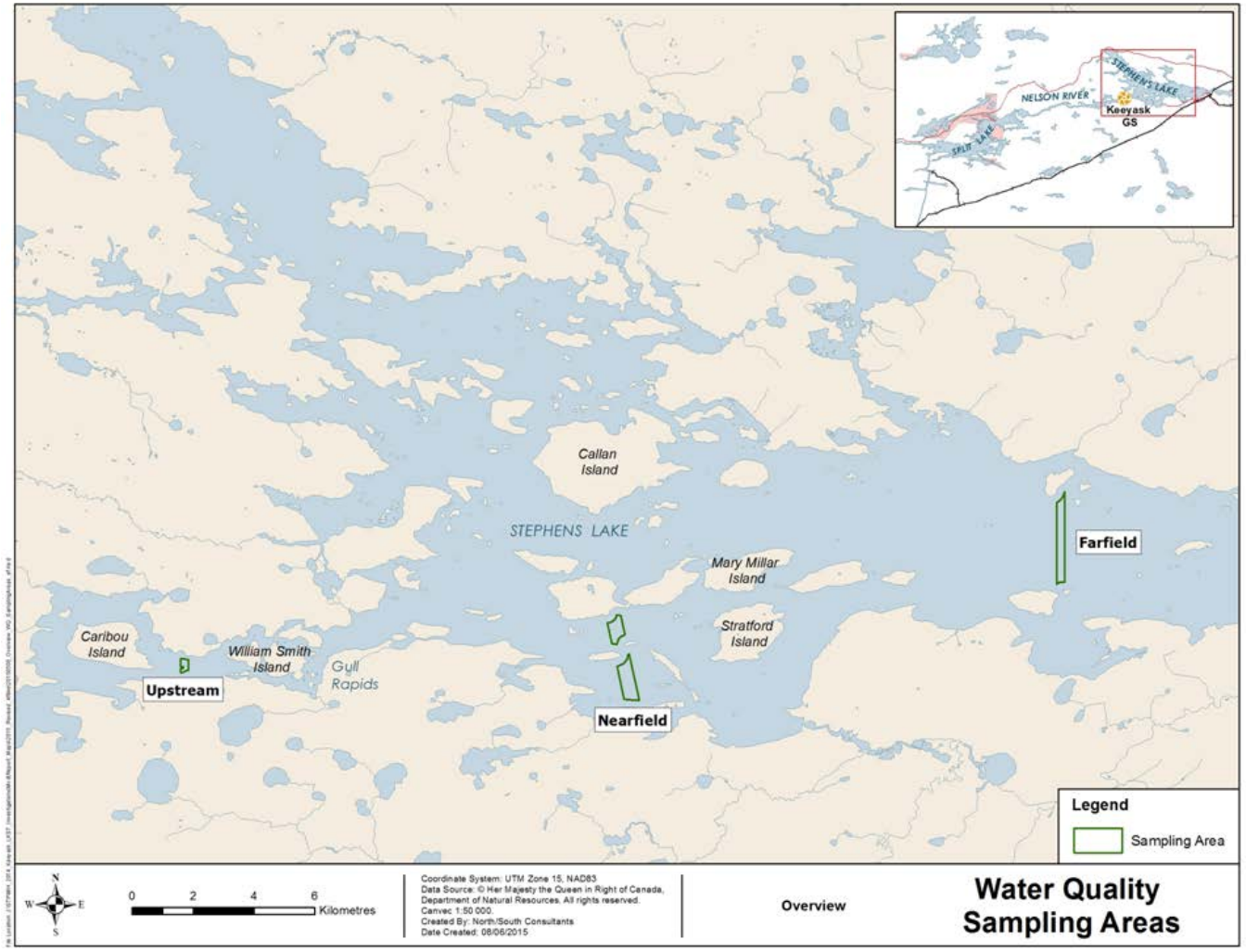
Water quality sampling was conducted in late July, August, and September and a number of parameters were measured, including:

- total suspended solids and turbidity;
- pH;
- oxygen;
- nutrients (compounds that 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

Samples were collected in three areas of the Nelson River and Stephens Lake. One area was upstream of construction at Gull Rapids ("upstream area") and serves as a reference for natural (unimpacted) conditions at the time of sampling. The second area is in Stephens Lake approximately 9 km downstream of the construction activities ("near-field area"); this represents an area where some effects on water quality are expected. The third area is also in Stephens Lake, approximately 25 km downstream of the construction ("far-field"). This area is used to determine whether effects observed at the near-field area extend further downstream or are confined to the area nearer the construction site.

Five sites were sampled in each of the upstream, near-field, and far-field areas to ensure that the results accurately represent the local conditions at that time.



Map of the study area. Green areas show the locations of the upstream, nearfield, and farfield sampling areas. Five sites are sampled in each area.

WHAT WAS FOUND?

Overall, water quality was similar upstream and downstream of the construction activities, indicating that there was minimal effect to water quality in terms of its suitability for aquatic life.

Water quality monitoring sites near data loggers in the upstream (left) and far-field (right) sampling areas in July, 2014.

WHAT DOES IT MEAN?

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

WHAT WILL BE DONE NEXT?

Water quality monitoring was conducted in winter (March/April) 2015 and monitoring will be conducted during the open-water season of 2015 (Year 2 of construction) over the period of June to late September/early October. Results of monitoring conducted in 2015 will be presented in the Year 2 construction report.

ACKNOWLEDGEMENTS

We would like to thank Manitoba Hydro for the opportunity and resources to conduct this study. Saul Mayham and Jonathan G. Kitchekeesik Jr. of Tataskweyak Cree Nation are thanked for their assistance in collection of the water quality data. We would also like to thank Clayton Flett and Douglas Kitchekeesik of Tataskweyak Cree Nation for arranging logistic support and personnel needed to conduct the fieldwork.

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1.0 INTRODUCTION

Construction of the Keeyask Generation Project (the Project), a 695-megawatt hydroelectric generating station and associated facilities, began in July 2014. The Project is located at Gull Rapids on the lower Nelson River in northern Manitoba where Gull Lake flows into Stephens Lake, 35 km upstream of the existing Kettle Generating Station (Figure 1).

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 licencing 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.

The primary effect of the Project during the construction phase 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 Sediment Management Plan (SMP) and the Physical Environment Monitoring Plan (PEMP), which include monitoring of TSS and turbidity in the Nelson River. The results of these programs are reported in the annual report on monitoring activities for the implementation of the Sediment Management Plan (SMP). Other pathways of effect (*i.e.*, discharge of point sources) are expected to result in highly localized and negligible to small effects (*e.g.*, discharge of concrete batch plant effluent). The water quality monitoring program implemented during construction is intended to monitor effects to 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 the reach of the Nelson River upstream of Gull Rapids and the southern area of Stephens Lake (Figure 2), and a Regional Study Area (RSA) which includes the lower Nelson River downstream of Stephens Lake to Gillam Island, as well as additional sites in Stephens Lake (Figure 3). The 2014 (Year 1) construction water quality monitoring program included monitoring in the LSA only. Monitoring in the RSA is to be conducted during periods when TSS is predicted to be increased by more than 5 mg/L (as a 24-hour rolling average in the fully mixed river) due to construction (Table 2-6 in the AEMP).

Key questions identified in the AEMP 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, Table 1). 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; and the Canadian Council of Ministers of the Environment (CCME) phosphorus guidance framework for freshwater systems (CCME 1999; updated to 2015).

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 a 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 (i.e., upstream of Gull Rapids).

An adaptive management framework (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), between backbay and reservoir mainstem areas (i.e., spatial differences), 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.

Construction of the Keeyask GS began in mid-July 2014, and through October 2014, cofferdams were constructed across the north and central channels of Gull Rapids, resulting in the diversion of all flow through the south channel. The following report presents the results of water quality monitoring completed in the open-water season of 2014 during Year 1 of construction. Results are assessed using the adaptive management framework as summarized above and detailed in the AEMP.

2.0 THE KEEYASK STUDY SETTING

The study area encompasses an approximately 220 km long reach of the Nelson River from Clark Lake to Gillam Island on the lower Nelson River. 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 (Figure 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 (Figure 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 (Figure 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 (Figure 3).

Gull Rapids is located approximately 3 km downstream of Caribou Island on the Nelson River (Figure 1). Two large islands and several small islands occur within the rapids, prior to the river narrowing. The rapids are approximately 2 km in length, and the river elevation drops approximately 11 m along its 2 km length.

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 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. 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 (Figure 1). Kettle GS is located approximately 40 km downstream of Gull Rapids.

Long Spruce Forebay 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). The forebay formation resulted in flooding of 14 km^2 of shoreline and tributaries. Kettle River and Boots Creek are the only major tributaries flowing into Long Spruce Forebay, with both tributaries entering the Forebay on the south shore.

The Limestone GS was completed in 1992, and the forebay encompasses the 23 km long reach of the Nelson River between the Long Spruce GS and the Limestone GS (Manitoba Hydro Public Affairs 1998). Unlike Long Spruce GS, the Limestone Forebay is contained within the existing riverbank and ranges from a riverine environment in the upstream portion, to more of a lake-like environment just upstream of Limestone GS. There are four main tributaries that flow into Limestone Forebay: Wilson Creek and Brooks Creek both enter from the south shoreline of the forebay, while Sky Pilot Creek and Leslie Creek enter from the north shore.

Similar to the section of the Nelson River between Split Lake and Stephens Lake, the Nelson River below the Limestone GS is also characterized by narrow sections with swiftly flowing water and wider more lacustrine sections created by the forebays of the Long Spruce and Limestone GSs. The Nelson River below the Limestone GS is extensively affected by discharge regulation, with diurnal fluctuations in discharge and stage changes varying on the order of 1 m (Manitoba Hydro 1994). There are three main tributaries (and numerous smaller ones) that flow into the mainstem of the Nelson River between the Limestone GS and Gillam Island: the Limestone and Weir rivers enter from the north shore, while the Angling River enters from the south shore. All three rivers are perennial in nature.

3.0 METHODS

The following provides a description of the study design, sampling sites, sampling methods, and data analysis methods.

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 a 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.

The AEMP also indicates that water quality will be periodically monitored at single stations downstream of Stephens Lake to the Nelson River estuary (i.e., in the RSA) during periods where TSS was predicted to be increased by more than 5 mg/L above background during the construction period. As TSS was not expected to be affected to this magnitude during Year 1 of construction, water quality monitoring in 2014 was restricted to the LSA.

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 incorporates monitoring at replicate sampling sites immediately upstream and downstream of construction activities within the LSA (Figures 5-7) in each year of construction as follows:

- **Upstream Area**: the Nelson River upstream of Gull Rapids. This area served as the reference area;
- **Near-Field Area**: this area is located approximately 9 km downstream of all construction activities in Stephens Lake; and
- **Far-Field Area**: 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); Universal Transverse Mercator (UTM) coordinates for the water quality sites are provided in Table 3.

The locations of the replicate stations were defined differently for the upstream area 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 area upstream of Gull Rapids, the polygon boundary was defined based on water depth (> 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).

Due to the lack of detailed bathymetry for the two downstream sampling areas, 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.

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).

Turbidity loggers were concurrently deployed in the upstream (1 site) and near-field (2 sites) areas as part of the SMP, and the water quality monitoring sites were established to include sampling in the vicinity of the logger locations, as indicated in Figures 5 and 6.

3.3 SAMPLING METHODS

Monitoring was conducted three times during the open-water season in 2014: July 27-28, August 26-27; and, September 24-25. Sites were accessed by boat and UTMs were recorded at each site using a hand-held Global Positioning System (GPS) unit. 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; and,
- Any deviations from field sampling protocols.

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 as the average of two readings at the near-field and far-field locations; velocities were too high for reliable measurement of Secchi disk depth in the upstream area. 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), pH, specific conductance, turbidity, and temperature were collected at each sampling site using a YSI EXO2 water quality multi-meter. *In situ* parameters were measured at 1.0 m intervals at each site in the near-field and far-field sampling areas, beginning with a near surface measurement (*i.e.*, 0.3 m). High velocities in the upstream sampling area precluded measurement of *in situ* parameters in profile and measurements were limited to surface depths.

3.3.2 SAMPLING FOR LABORATORY ANALYSES

At each site, grab samples of surface water (i.e., elbow depth, approximately 0.3 m depth) 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, grab samples were collected wearing gloves, by submerging each sample bottle (provided by the analytical laboratory) to elbow depth, uncapping, filling, recapping, and retrieving the bottle to the surface, and preservatives were added, as required. 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 and in the dark until submission to a Canadian Association for Laboratory Accreditation (CALA) accredited laboratory (ALS Laboratories, Winnipeg).

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;
- Sampling from upstream to downstream or from the least to the most contaminated site, wherever feasible;
- 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 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) 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 (i.e., bottles were labelled as TF-2), 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) 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 (i.e., as TF-1) so the laboratory was not aware that it was a QA/QC sample.

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 the values 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 through verification of reporting accuracy.

QA/QC samples were assessed according to standard criteria to evaluate precision and identify potential sample contamination issues (BCMELP 1998). Field and trip blank results were evaluated for evidence of sample contamination. Blank results that exceeded five times the analytical detection limit 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 QAQC 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 were less than five times the analytical detection limit (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. For calculations and graphical presentations, values that were reported below the analytical detection limit were assigned a value of one half the detection limit.

As summarized in Section 1.0, and detailed in the AEMP, results of the water quality monitoring program are to be subject to the steps identified within the AMF (Figure 8). 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 2014, means for key indicators were first compared to benchmarks (Table 1). For each key indicator that exceeded a benchmark, a statistical comparison between upstream and downstream sampling areas was undertaken during each sampling period. Data were evaluated and found to be normally distributed with equal variance and were therefore compared through an Analysis of Variance (ANOVA) and a Tukey's test ($\alpha = 0.05$).

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 Manitoba Water Quality Standards, Objectives, and Guidelines (MWQSOGs; Table 4) for PAL (MWS 2011) 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 2014 open-water season are presented below, in Tables 1 and 2, and Figures 9-41. 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, and TP concentrations measured in the upstream, near-field, and far-field areas during each of the sampling events in July, August, and September were within the benchmark values (Table 1; Figures 9-11).

4.1.2 CHLOROPHYLL *A*

Mean chlorophyll *a* concentrations measured in the upstream, near-field, and far-field areas in August and September were below the benchmark of 10.00 µg/L (Table 1; Figure 12). In July, the mean chlorophyll *a* concentration measured in the near-field area was marginally above the benchmark (10.04 µg/L) and concentrations in the near-field area were significantly higher than those measured in either the upstream or far-field areas.

4.1.3 TOTAL SUSPENDED SOLIDS

Mean Total Suspended Solids (TSS) concentrations measured in the near-field and far-field areas during each of the sampling events in July, August, and September were within the benchmark values, which are defined as an increase above the mean upstream concentration (i.e., background conditions) of 25 mg/L for a short-term duration and 5 mg/L for a long-term duration (Table 1; Figure 13).

4.1.4 PH

Mean laboratory and *in situ* pH measured in the upstream, near-field, and far-field areas during each of the sampling events in July, August, and September were within the benchmark values (Table 1; Figure 14).

4.1.5 DISSOLVED OXYGEN

Mean DO measured in the upstream, near-field, and far-field areas during each of the sampling events in July, August, and September were within the benchmark values (Table 1; Figure 15).

4.1.6 METALS

Mean concentrations of total metals measured in the upstream, near-field, and far-field areas during each of the sampling events in July, August, and September were within the benchmark values, including: aluminum, arsenic, boron, cadmium, chromium, copper, iron, lead, mercury, molybdenum, nickel, selenium, silver, thallium, uranium, and zinc (Table 1; Figures 16-31).

4.1.7 HYDROCARBONS AND BTEX

F1-F4 hydrocarbons and BTEX were below the analytical detection limits in all samples collected from the upstream, near-field, and far-field areas during each of the sampling events in July, August, and September. As the detection limits were lower than PAL guidelines, all measurements were within the PAL guidelines (Table 4). Monitoring results indicate that construction activities did not affect hydrocarbon concentrations in the local study area.

4.2 ADDITIONAL PARAMETERS

Results for parameters that are not key indicators are presented as follows: dissolved phosphorous (Figure 32), total nitrogen (Figure 33), dissolved organic carbon (Figure 34), turbidity (Figure 35), conductivity and total dissolved solids (Figure 36), true colour (Figure 37), hardness (Figure 38), and major ions (chloride, sulphate, calcium, magnesium, potassium, and sodium; Figures 39-41).

5.0 DISCUSSION

With one exception (chlorophyll *a* in July), the concentrations of all the key indicators were within the benchmark values during the July, August, and September sampling events. As per Step 1 of the AMF, no further analysis was conducted for parameters within the benchmarks.

Mean chlorophyll *a* concentrations measured in July in the near-field area were marginally above the benchmark of 10.00 µg/L, which triggered additional analyses of data under Step 2 of the AMF. Statistical comparisons indicated that chlorophyll *a* was significantly higher in the near-field area compared to the upstream and far-field areas, which therefore triggered additional actions under Step 3 of the AMF (i.e., determination if the observed difference was likely to be Project-related).

While the concentration of chlorophyll *a* was marginally above the benchmark in the near-field area and statistically higher than upstream or downstream areas, several lines of evidence suggest that this observed difference was not likely due to the Project, including consideration of other related water quality parameters and baseline data for the LSA.

Phytoplankton abundance is primarily affected by concentrations of key nutrients (nitrogen and phosphorus), water temperature, and light. Therefore, monitoring results for nutrients and measures of water clarity (i.e., turbidity levels) were evaluated to explore potential explanations for the higher chlorophyll *a* observed in July in the near-field area,

Concentrations of TP (i.e., a primary driver of phytoplankton abundance) were not higher in the near-field area relative to other monitoring areas. In fact, TP concentrations were lower downstream of the construction activities. While other nutrients (TDP and TN) were higher in the near-field area than the upstream area, concentrations were similar between the near-field and far-field areas, yet chlorophyll *a* concentrations differed significantly between the sites. Similarly, while turbidity was lower in the near-field area than upstream, levels were similar to the downstream sampling area. This collectively indicates that there was no substantive change in the key drivers affecting phytoplankton abundance that may suggest a Project-related effect had occurred.

The benchmark for chlorophyll *a* (10.00 µg/L) was derived from pre-Project (i.e., baseline) data for the LSA. Specifically, the benchmark represents the 95th percentile of concentrations measured during the open-water season in the LSA over the period of 2001-2012. The mean concentration (10.04 µg/L) was therefore within the range of baseline concentrations (maximum of 12.0 µg/L) measured prior to construction.

For the reasons outlined above, it is concluded that the observed difference in chlorophyll *a* in July was not likely due to the Project.

F1-F4 hydrocarbons and BTEX were below the analytical detection limits in all samples collected from the upstream, near-field, and far-field areas during each of the sampling events. As such, the concentrations were always within the MWQSOG PALs and there does not appear

to be any evidence that construction affected hydrocarbon concentrations in the local study area.

6.0 REFERENCES

British Columbia Ministry of Environment, Lands, and Parks (BCMELP). 1998. Guidelines for interpreting water quality data, version 1. May 1998. Prepared for the Land Use Task Force Resource Inventory Committee.

CCME (Canadian Council of Ministers of the Environment). 1999. Canadian environmental quality guidelines. Canadian Council of Ministers of the Environment, Winnipeg, MB. Updated to 2015.

Manitoba Hydro. 1994. Lower Nelson River – Generating Planning, Conawapa Generating Station: Biophysical Environmental Evaluation. A report prepared by North/South Consultants Inc.

Manitoba Hydro Public Affairs. November 1998. Limestone Generating Station. Brochure.

Manitoba Hydro Public Affairs. December 1999. Long Spruce Generating Station. Brochure.

Manitoba Water Stewardship (MWS). 2011. Manitoba water quality standards, objectives, and guidelines. Water Science and Management Branch, Manitoba Water Stewardship. July 4, 2011. Manitoba Water Stewardship Report 2011-01.

U.S. Environmental Protection Agency (EPA). 1996. Method 1669 Sampling ambient water for trace metals at EPA water quality criteria levels. U.S. EPA. Office of Water, Engineering and Analysis Division, Washington , D.C.

TABLES

Table 1: Benchmark values and means of key water quality parameters measured during the water quality monitoring program, 2014.

Indicator	Unit	Benchmark	July			August			September			Open-water Season		
			Upstream	Near-Field	Far-Field	Upstream	Near-Field	Far-Field	Upstream	Near-Field	Far-Field	Upstream	Near-Field	Far-Field
Dissolved Ammonia	(mg N/L)	0.896	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.0286	<0.010	<0.010	0.014	<0.010
Dissolved Nitrate/ nitrite	(mg N/L)	2.93	<0.0051	0.0061	<0.0051	0.0451	0.0586	0.0576	0.0088	<0.0051	0.0059	0.0192	0.0230	0.0222
Total Phosphorous	(mg/L)	0.058	0.045	0.042	0.036	0.054	0.049	0.050	0.029	0.024	0.029	0.043	0.039	0.038
Chlorophyll *a*	(ug/L)	10.00	8.54	10.04	8.77	4.97	5.32	6.00	6.46	7.18	5.98	6.66	7.48	6.92
Total Suspended Solids	(mg/L)	39.3	19.8	14.1	13.8	20.6	18.3	12.9	10.7	9.0	6.6	17.0	13.8	11.1
Lab pH		6.5/9.0	8.29	8.21	8.19	8.26	8.37	8.25	8.21	8.18	8.20	8.26	8.25	8.21
Dissolved Oxygen	(mg/L)	6.50	9.52	9.81	9.51	9.39	9.77	9.73	11.09	11.40	11.23	10.00	10.33	10.16
Aluminum	(mg/L)	1.98	1.12	0.93	0.91	1.19	1.18	1.05	0.66	0.69	0.67	0.985	0.934	0.877
Arsenic	(mg/L)	0.150	0.00137	0.00149	0.00131	0.00159	0.00159	0.00160	0.00136	0.00131	0.00132	0.00144	0.00146	0.00141
Cadmium	(mg/L)	0.00030	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Chromium	(mg/L)	0.097	0.0018	0.0015	0.0015	0.0019	0.0019	0.0020	<0.0010	0.0010	<0.0010	0.0015	0.0015	0.0014
Copper	(mg/L)	0.0106	0.00212	0.00223	0.00205	0.00215	0.00217	0.00210	0.00172	0.00186	0.00187	0.00200	0.00210	0.00200
Iron	(mg/L)	1.45	0.93	0.80	0.79	0.99	0.99	0.82	0.51	0.51	0.49	0.808	0.772	0.701
Lead	(mg/L)	0.00383	0.000422	0.000356	0.000359	0.000453	0.000462	0.000363	0.000251	0.000254	0.000230	0.000372	0.000357	0.000317
Mercury	(mg/L)	0.000026	0.0000013	0.0000010	0.0000012	0.0000018	0.0000014	0.0000013	0.0000010	0.0000006	0.0000006	0.0000014	<0.0000010	0.0000011
Molybdenum	(mg/L)	0.073	0.00070	0.00083	0.00079	0.00080	0.00143	0.00084	0.00073	0.00073	0.00072	0.00075	0.00101	0.00078
Nickel	(mg/L)	0.059	<0.0020	<0.0020	<0.0020	0.0023	0.0023	0.0024	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Selenium	(mg/L)	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Silver	(mg/L)	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Thallium	(mg/L)	0.0008	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Uranium	(mg/L)	0.0330	0.00077	0.00076	0.00076	0.00085	0.00087	0.00081	0.00085	0.00082	0.00079	0.00082	0.00081	0.00079
Zinc	(mg/L)	0.135	0.0038	0.0034	0.0035	0.0036	0.0036	0.0038	0.0022	<0.0020	0.0029	0.0032	0.0031	0.0034

Table 2: Mean values of additional parameters measured during the water quality monitoring program, 2014.

		July			August			September			Open-water Season		
Indicator	**Unit**	**Upstream**	**Near-Field**	**Far-Field**	**Upstream**	**Near-Field**	**Far-Field**	**Upstream**	**Near-Field**	**Far-Field**	**Upstream**	**Near-Field**	**Far-Field**
Total Nitrogen	(mg/L)	0.49	0.53	0.51	0.58	0.61	0.61	0.51	0.52	0.45	0.53	0.55	0.52
Dissolved Organic Carbon	(mg/L)	10.3	10.0	10.1	6.5	6.4	6.5	9.8	9.6	9.7	8.8	8.7	8.8
Turbidity	(NTU)	26	22	22	33	33	29	14	13	12	24.4	22.9	21.2
In situ Turbidity	(NTU)	17.66	15.44	15.22	24.30	24.56	23.59	10.16	10.72	9.62	17.37	16.91	16.14
Specific Conductance	(µS/cm)	339.3	344.3	337.9	370.2	370.0	371.5	340.5	337.7	339.8	350.0	350.7	349.7
Conductivity	(umhos/cm)	345	319	316	356	364	362	351	351	353	346	345	344
Total Dissolved Solids	(mg/L)	216	218	221	219	227	228	228	213	209	221	219	219
True Color	(TCU)	16.5	17.7	19.1	12.3	12.1	12.6	13.6	14.4	13.2	14.2	14.8	15.0
In situ pH		8.25	8.30	8.24	8.28	8.33	8.35	8.33	8.37	8.34	8.29	8.33	8.31
Hardness as $CaCO_3$	(mg/L)	131	125	125	147	144	142	130	145	129	136	136	132
Dissolved Chloride	(mg/L)	21.1	21.0	20.5	22.3	22.6	22.7	23.2	22.7	22.7	22.2	22.1	22.0
Dissolved Sulphate	(mg/L)	36.4	36.7	35.7	38.0	38.2	38.3	38.1	37.5	37.5	37.5	37.5	37.2
Calcium	(mg/L)	30.5	28.9	29.1	35.2	33.6	32.9	29.2	31.0	29.1	31.5	31.0	30.4
Magnesium	(mg/L)	13.3	12.9	12.6	14.3	14.7	14.4	13.9	16.4	13.8	13.9	14.2	13.6
Potassium	(mg/L)	3.18	3.04	2.97	3.42	3.51	3.41	3.21	3.09	3.11	3.27	3.21	3.16
Sodium	(mg/L)	20.2	20.3	19.5	21.2	21.4	21.4	21.9	22.1	21.9	21.2	21.3	20.9

Table 3: Coordinates of water quality monitoring sites sampled in 2014.

		UTM Coordinates		
Region	**Site ID**	**Zone**	**Northing**	**Easting**
Upstream	US-01	15 V	359563	6246182
Upstream	US-02	15 V	359505	6246054
Upstream	US-03	15 V	359362	6246133
Upstream	US-04	15 V	359386	6246181
Upstream	US-05	15 V	359437	6246065
Nearfield	NF-01	15 V	373752	6247202
Nearfield	NF-02	15 V	373915	6245451
Nearfield	NF-03	15 V	373832	6247136
Nearfield	NF-04	15 V	374307	6245232
Nearfield	NF-05	15 V	373817	6247475
Farfield	FF-01	15 V	388131	6250842
Farfield	FF-02	15 V	388235	6249838
Farfield	FF-03	15 V	388356	6249136
Farfield	FF-04	15 V	388166	6249639
Farfield	FF-05	15 V	388373	6250442

Table 4. Manitoba water quality guidelines for the protection of aquatic life for hydrocarbons.

Parameter	Guideline
Benzene	0.370 mg/L
Ethylbenzene	0.090 mg/L
Toluene	0.002 mg/L

FIGURES

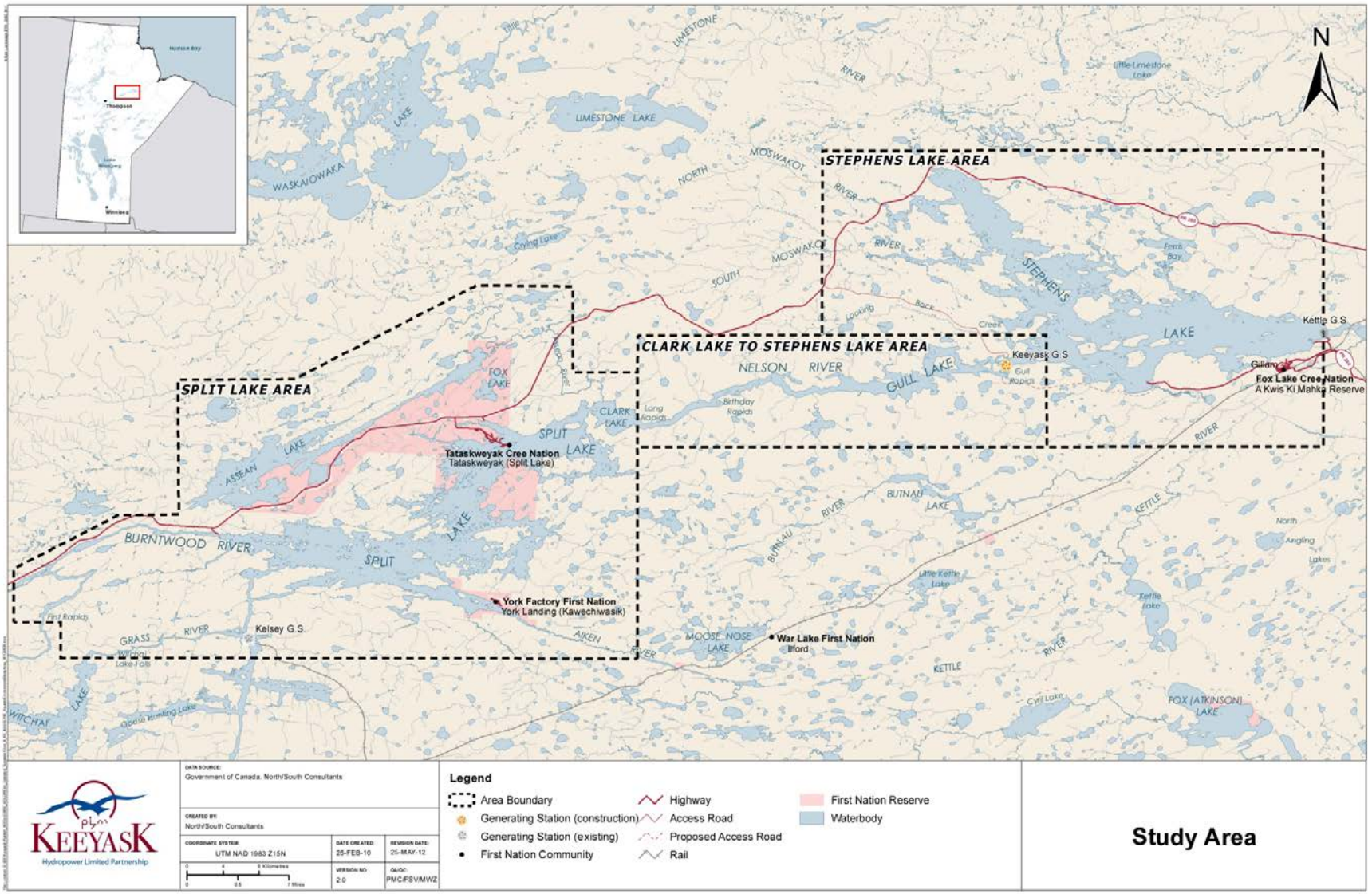

Figure 1: Map of the Keeyask Study Area showing hydroelectric development

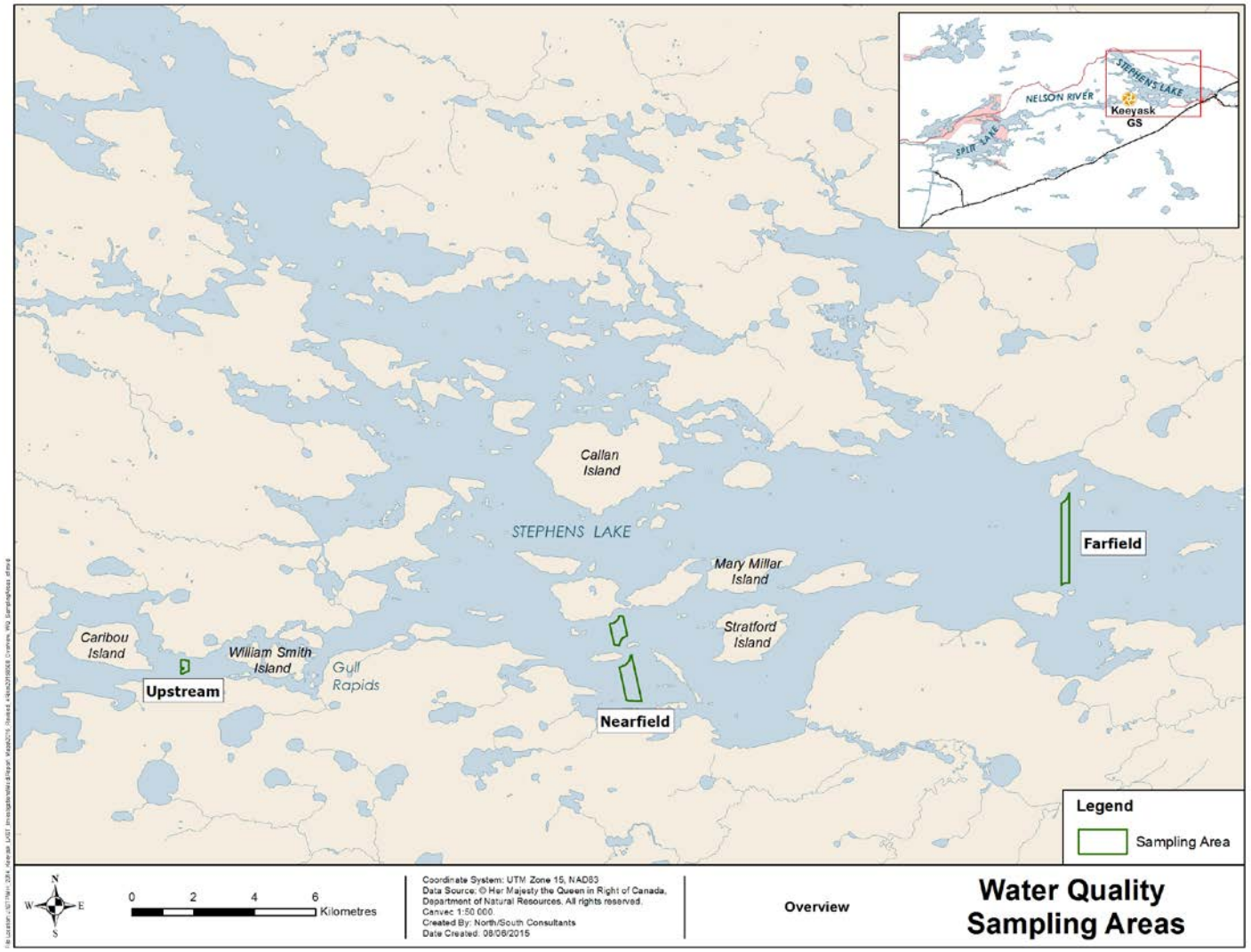

Figure 2: Overview of water quality monitoring areas in the local study area upstream of Gull Rapids to Stephens Lake

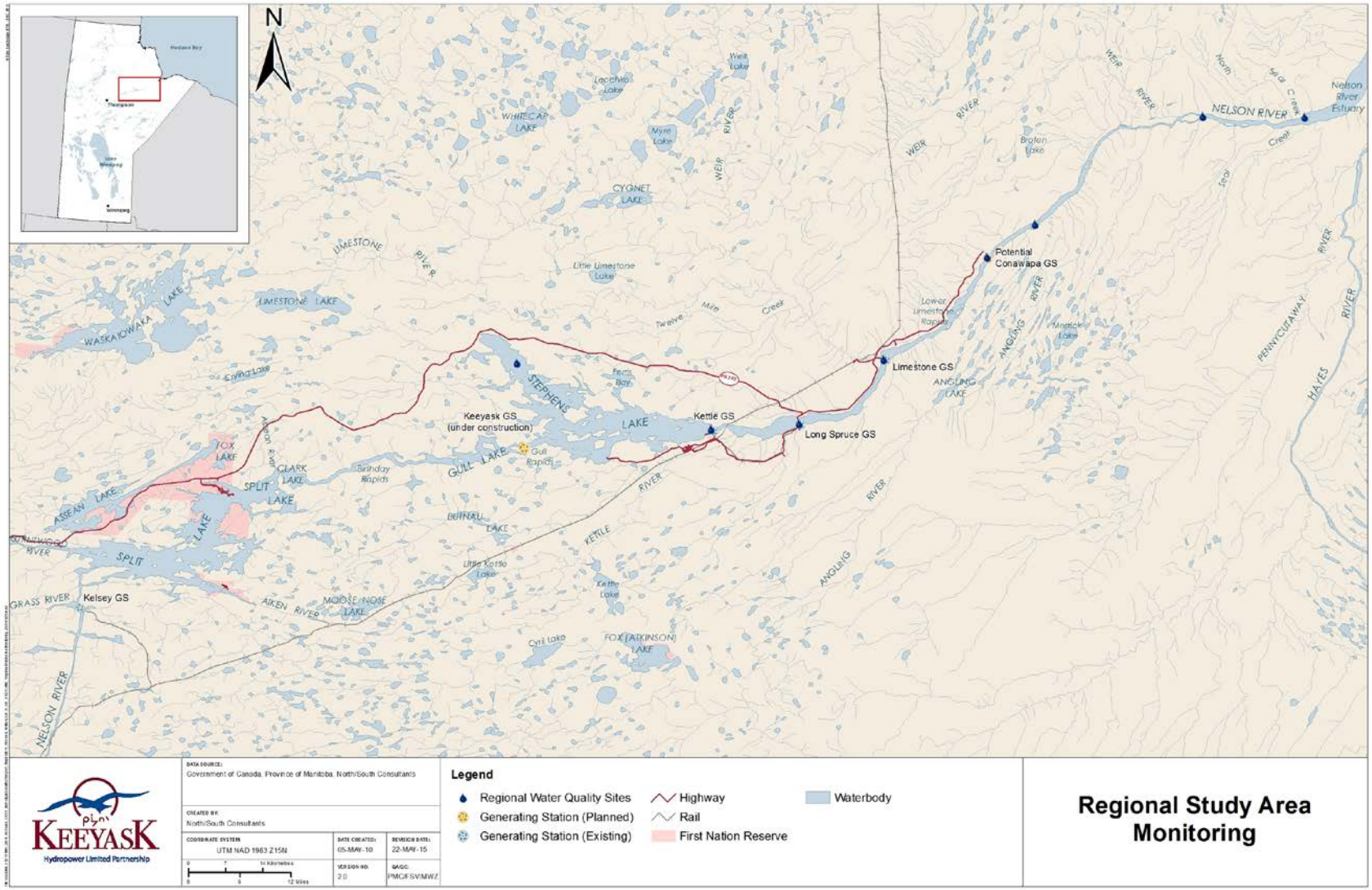

Figure 3: Water quality sampling locations in the regional study area

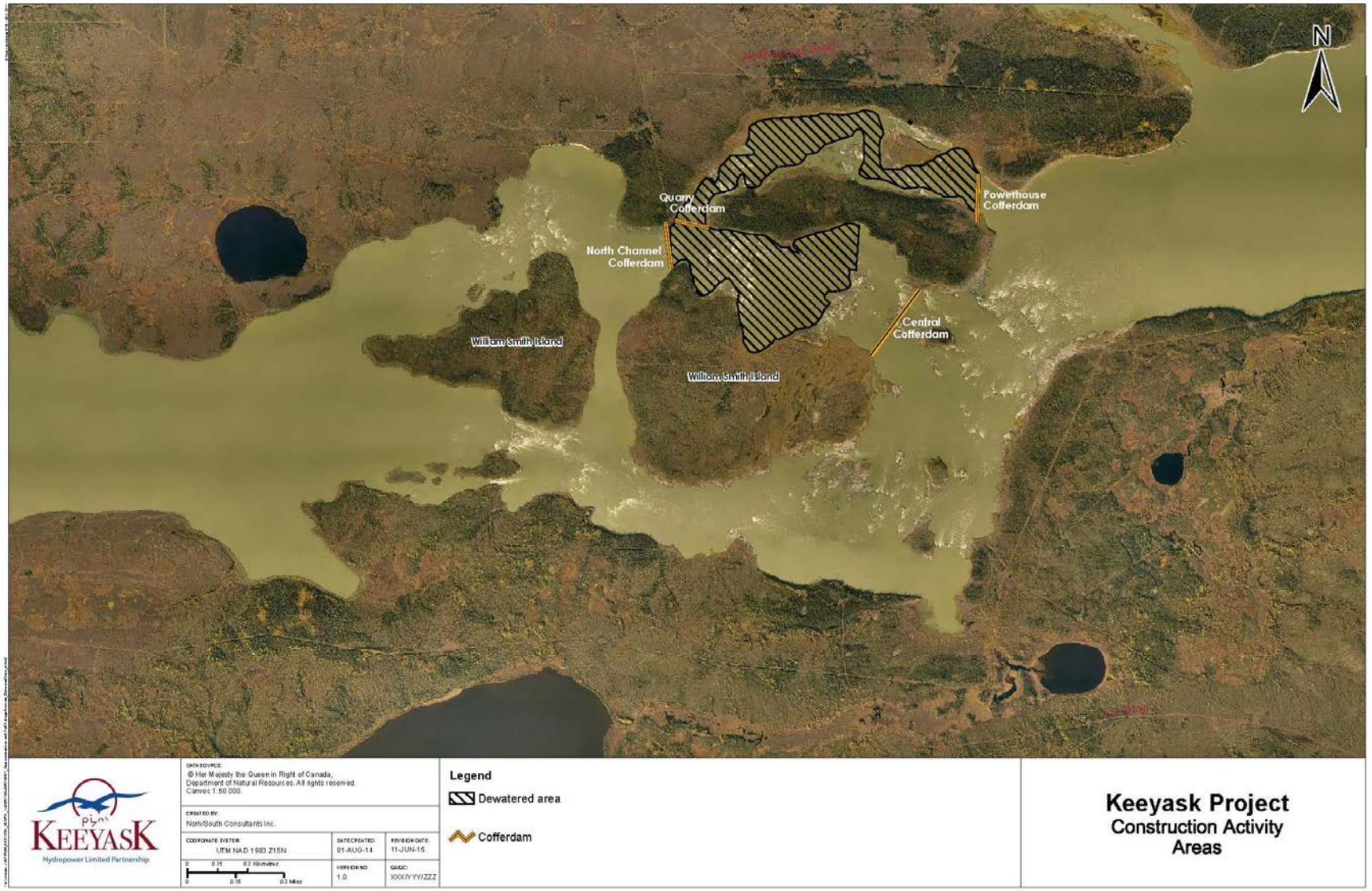

Figure 4: Locations of construction activities within the north and central channels of Gull Lake, July to October, 2014

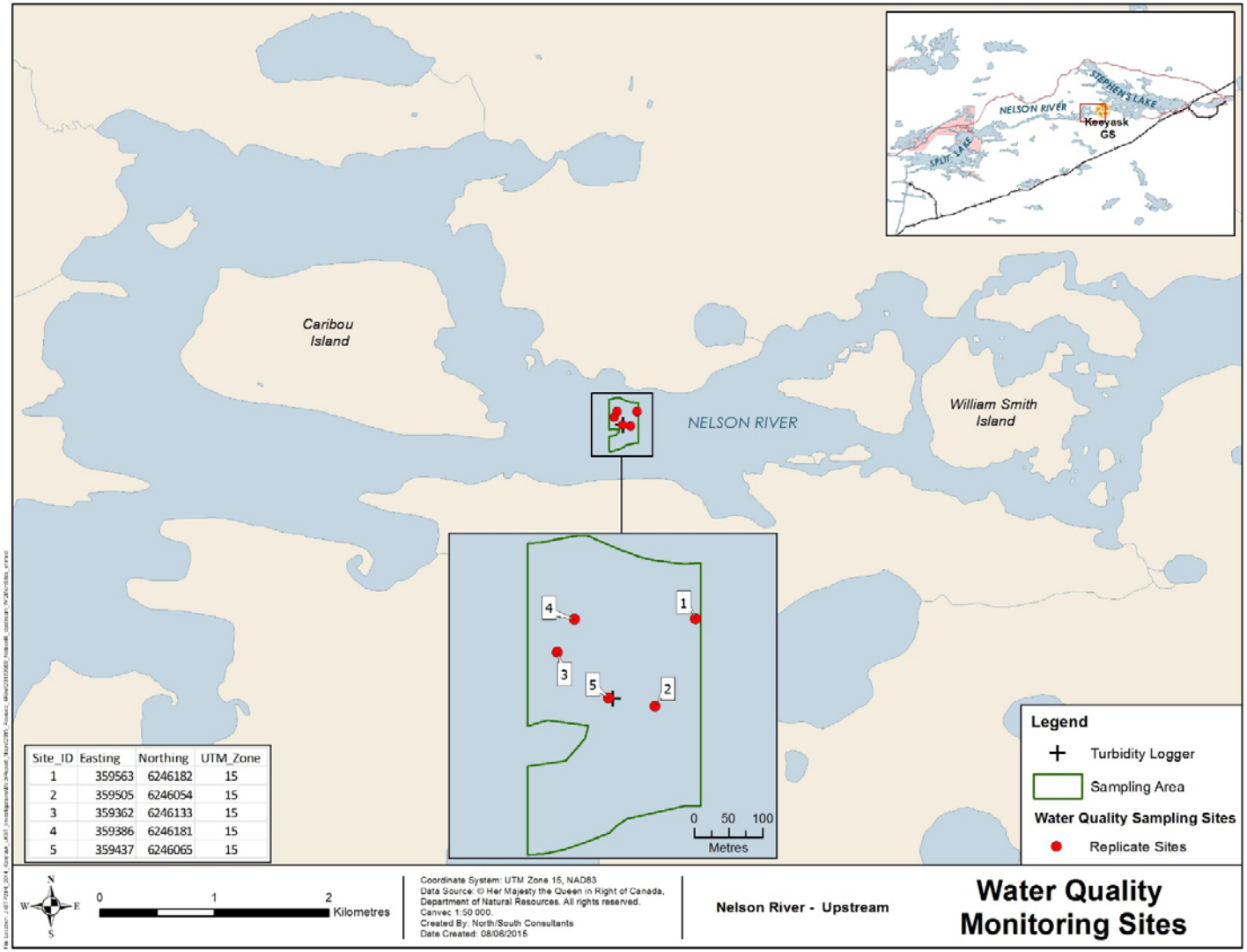

Figure 5: Water quality sampling locations in the upstream reference area, July – September 2014.

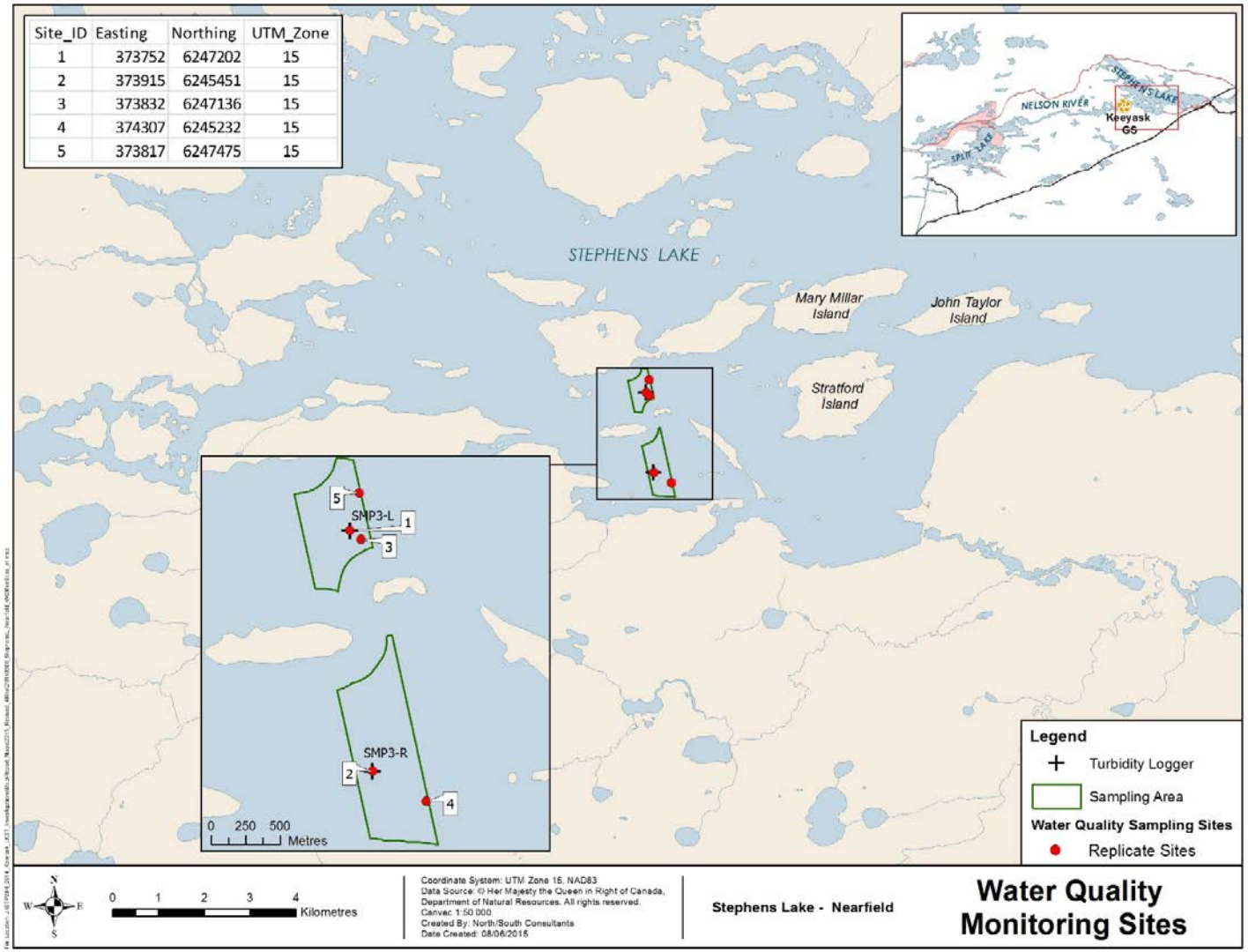

Figure 6: Water quality sampling locations in the near-field sampling area of Stephens Lake, July – September 2014.

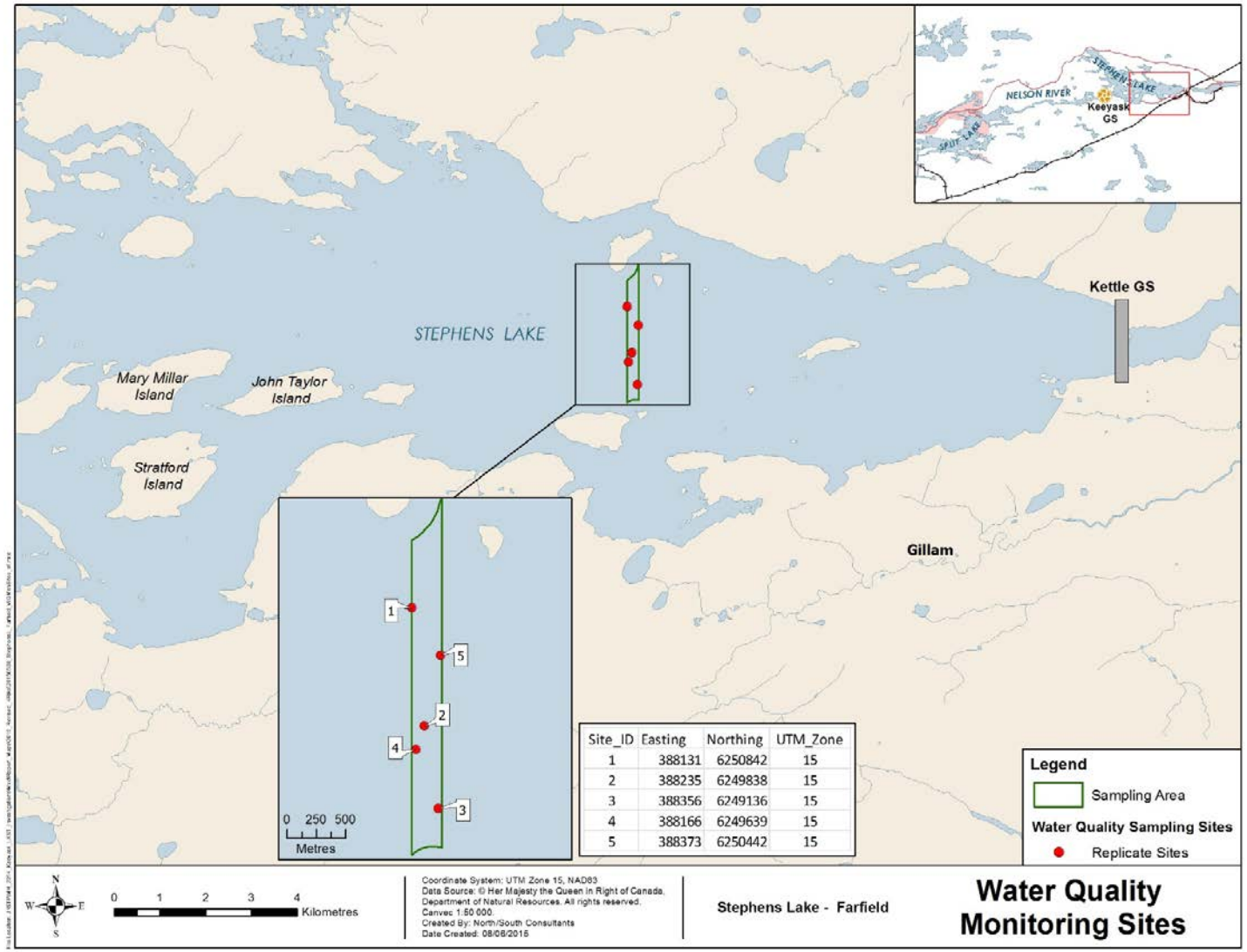

Figure 7: Water quality sampling locations in the far-field sampling area of Stephens Lake, July – September 2014.

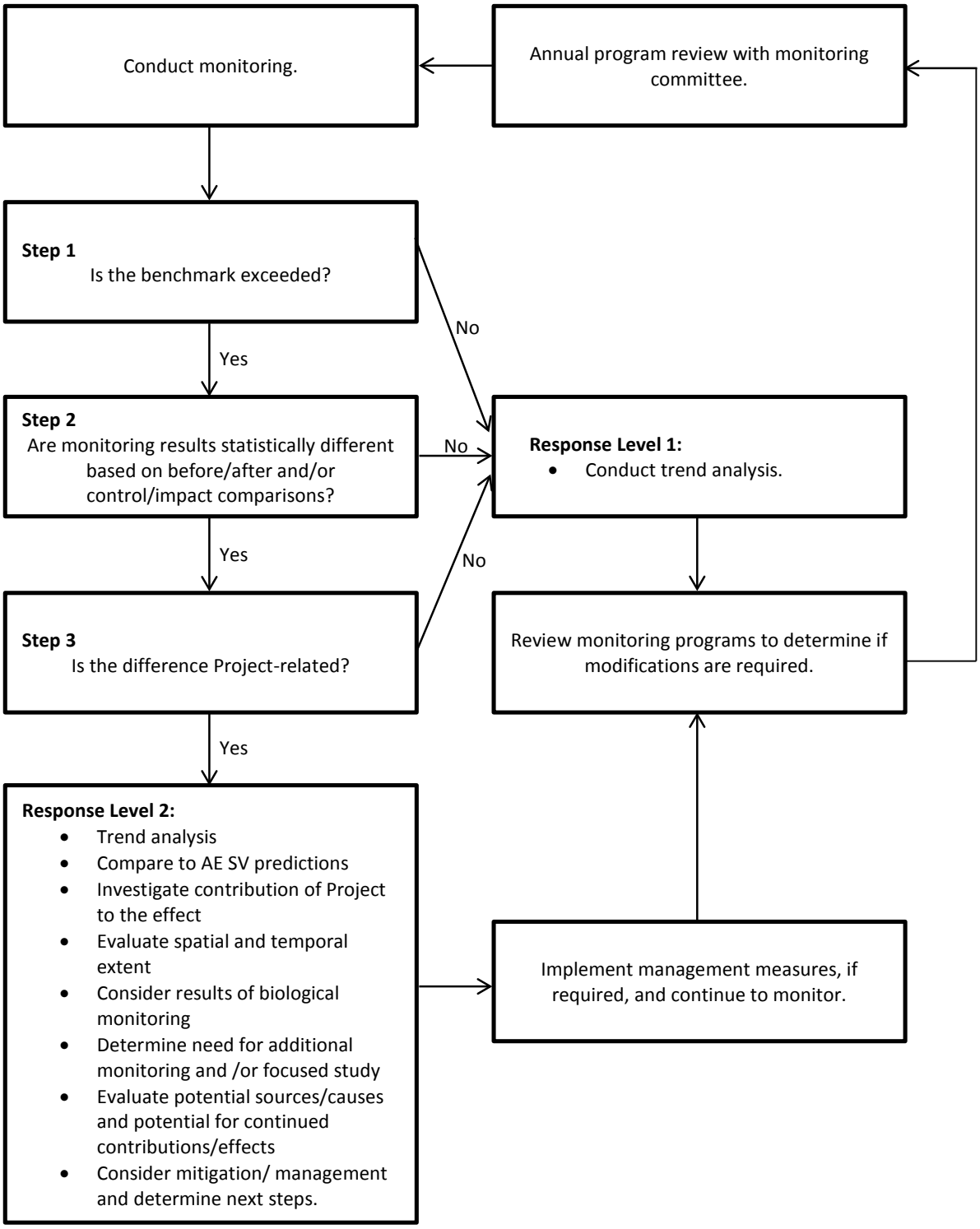

Figure 8: Water quality assessment management framework (AMF).

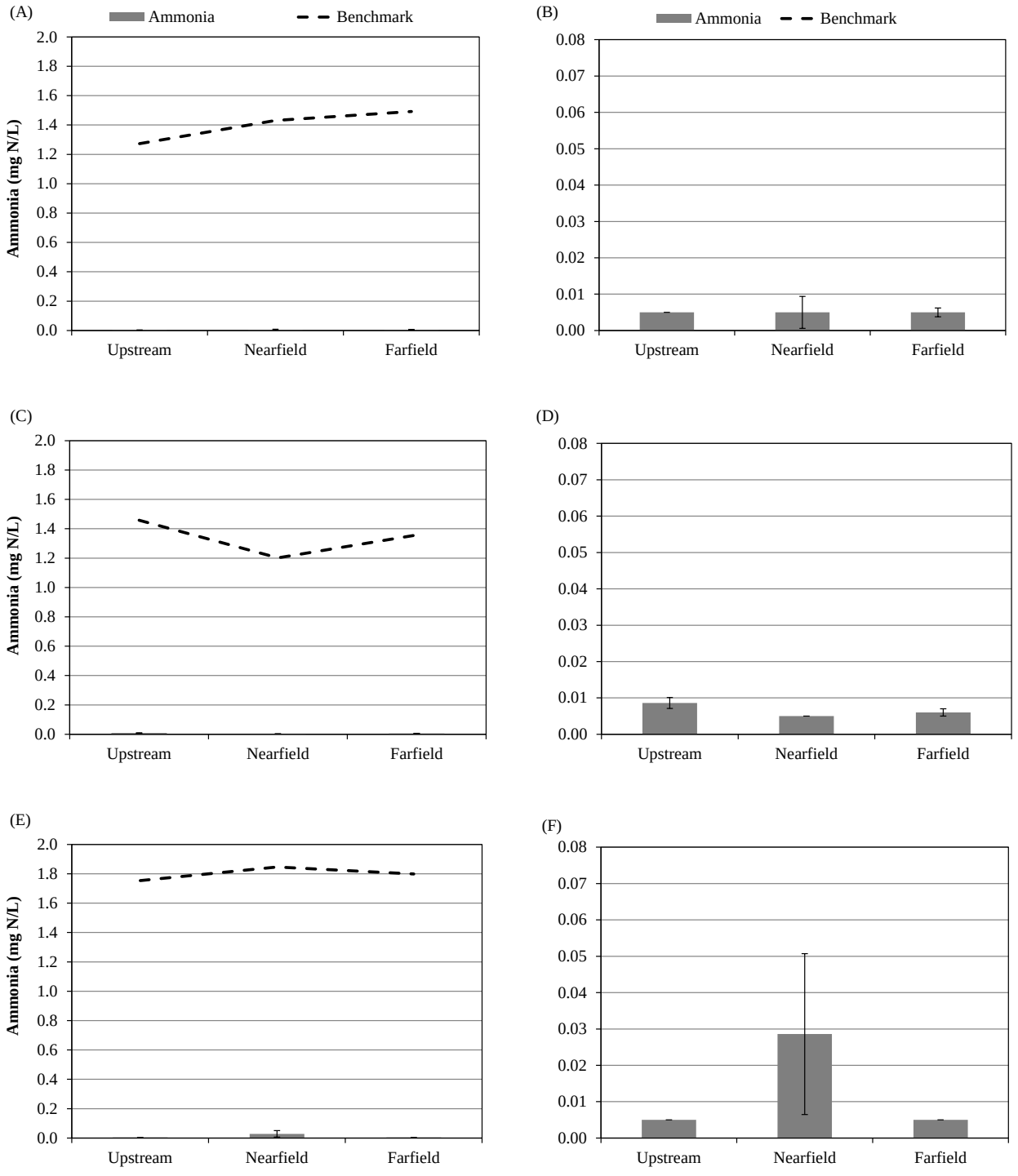

Figure 9: Mean (± SE) ammonia concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014. Scales are plotted to show the comparison of the data to benchmark values on the left, and the differences in mean values on the right.

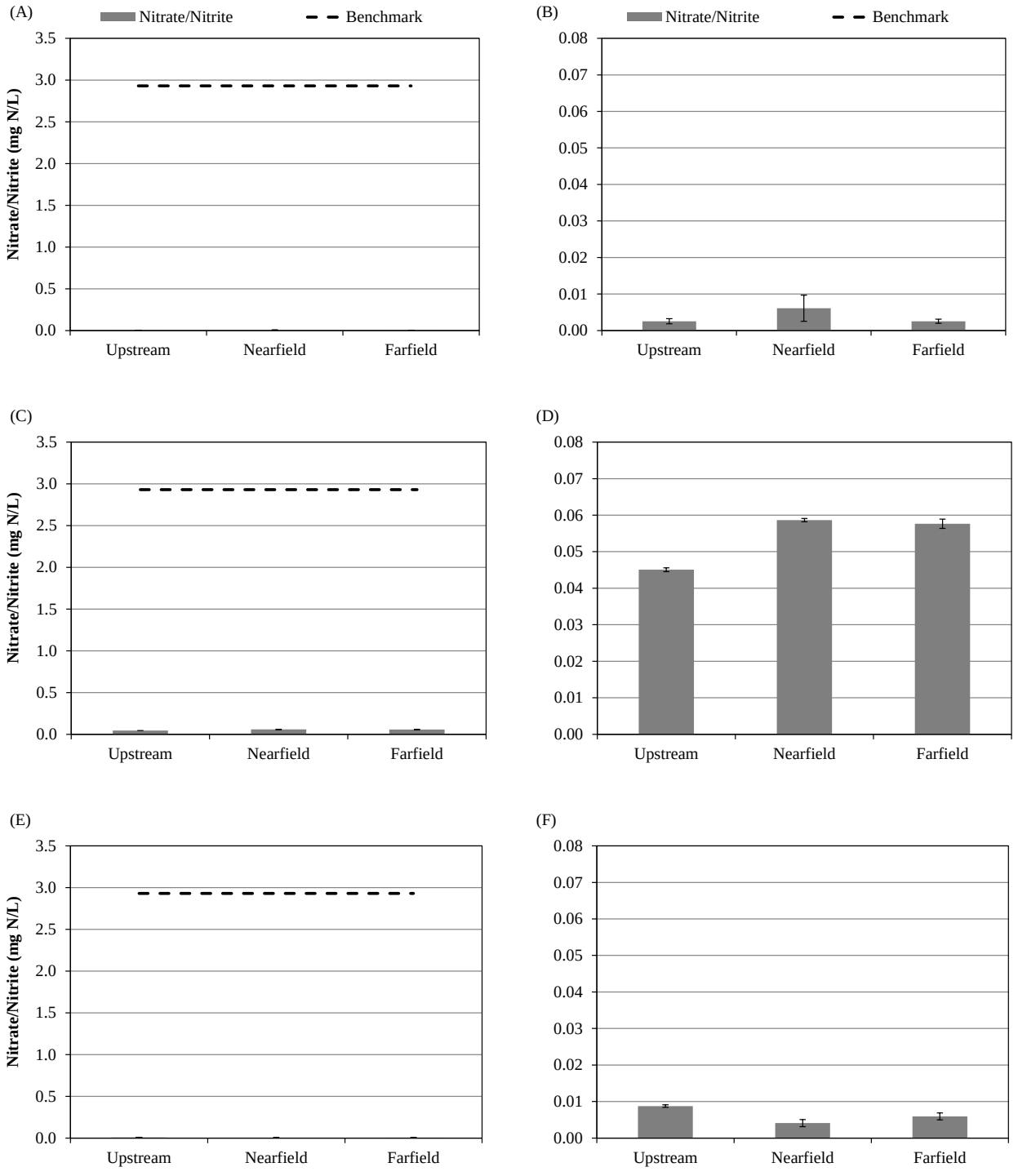

Figure 10: Mean (± SE) nitrate/nitrite concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014. Scales are plotted to show the comparison of the data to benchmark values on the left, and the differences in mean values on the right.

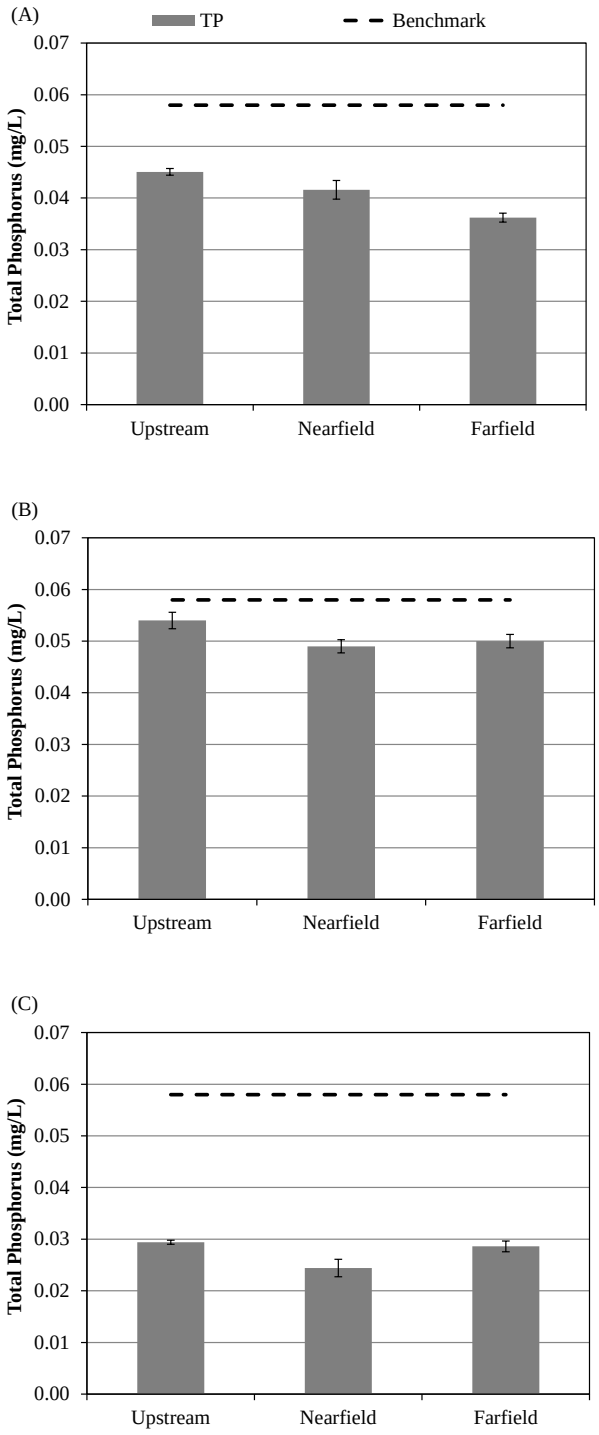

Figure 11: Mean (± SE) concentrations of total phosphorous measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

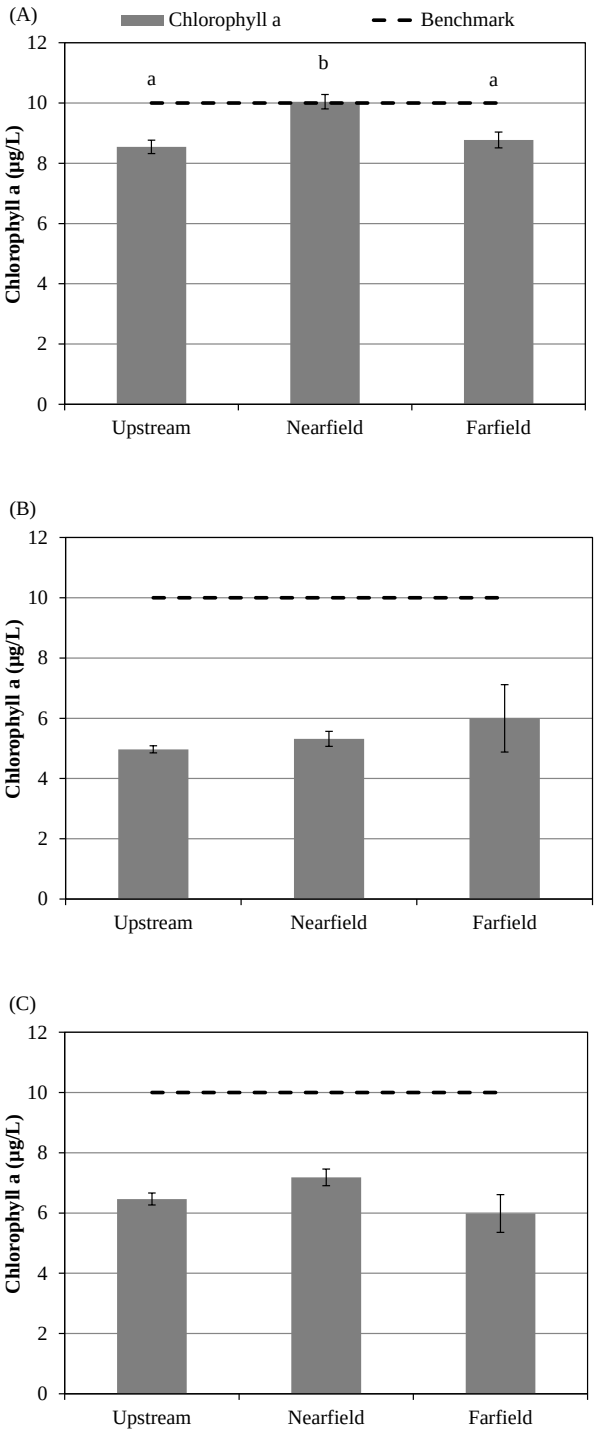

Figure 12: Mean (± SE) chlorophyll *a* concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014. Letters in (A) indicate significantly (α = 0.05) different results between sampling areas.

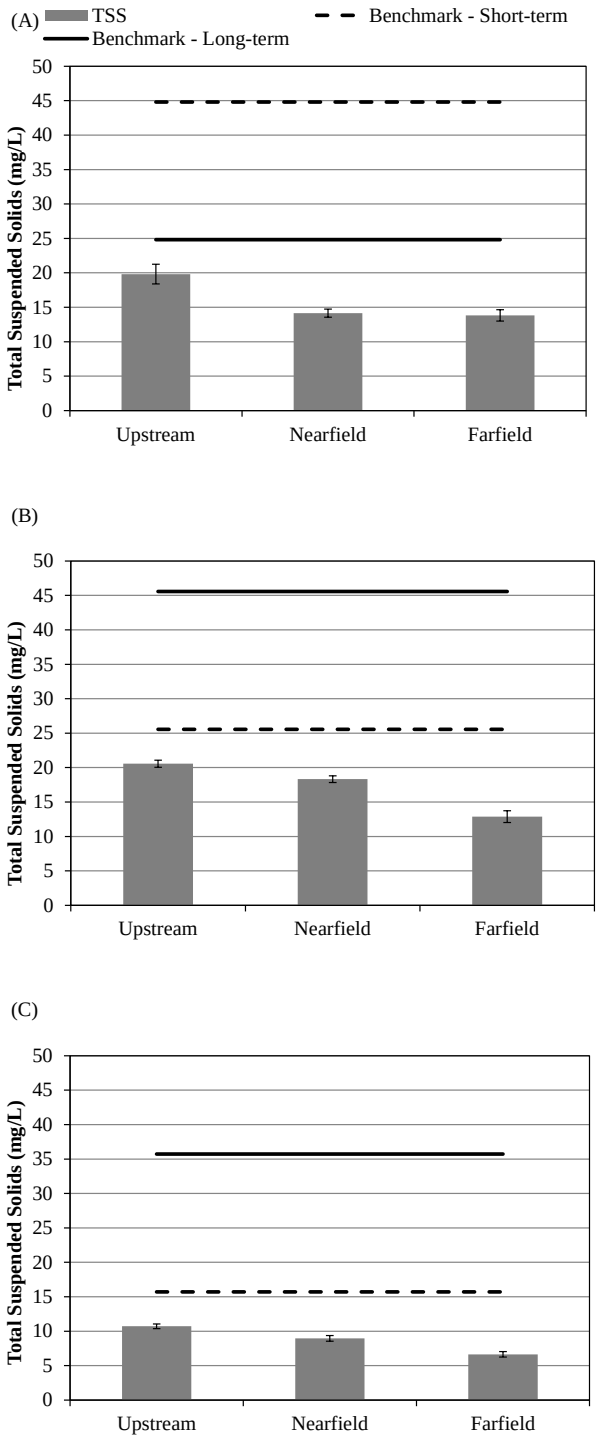

Figure 13: Mean (± SE) total suspended solids concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

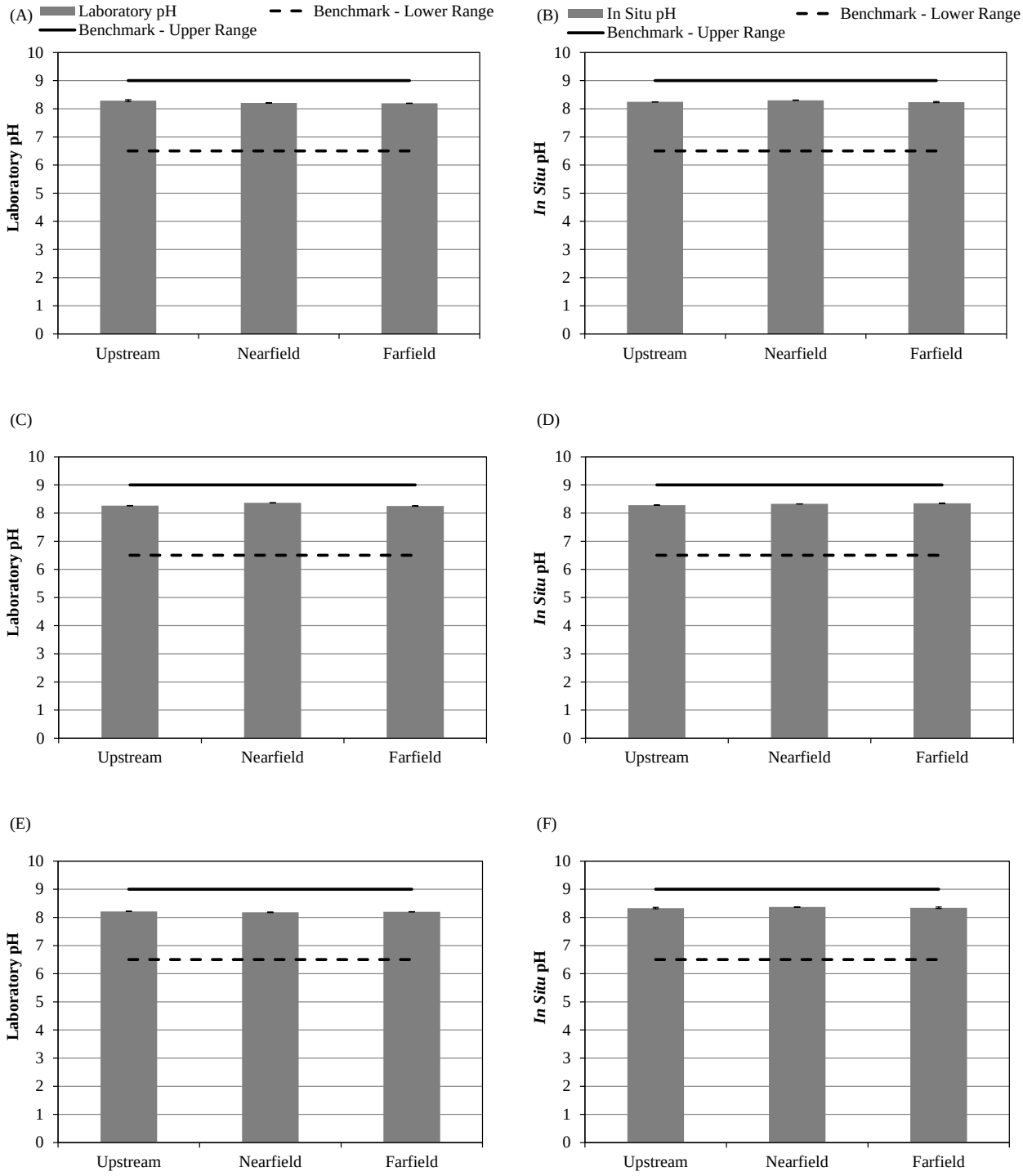

Figure 14: Mean (± SE) laboratory (left side) and *in situ* (right side) pH measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014.

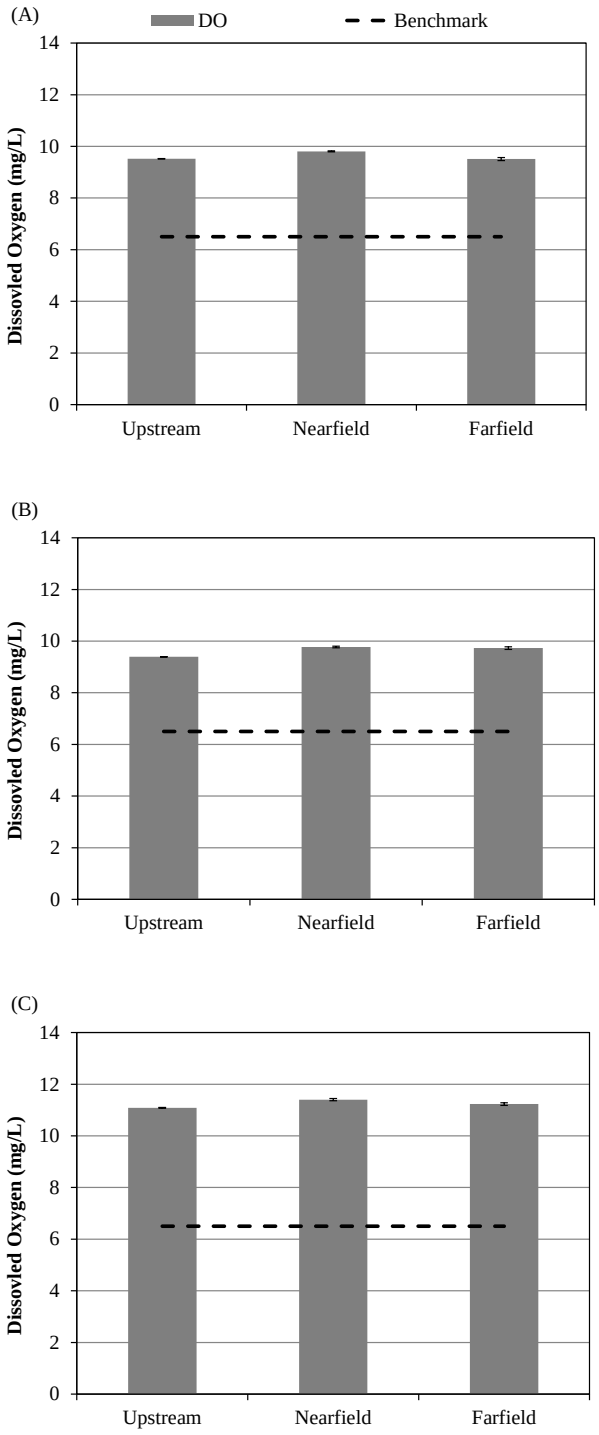

Figure 15: Mean (± SE) dissolved oxygen measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

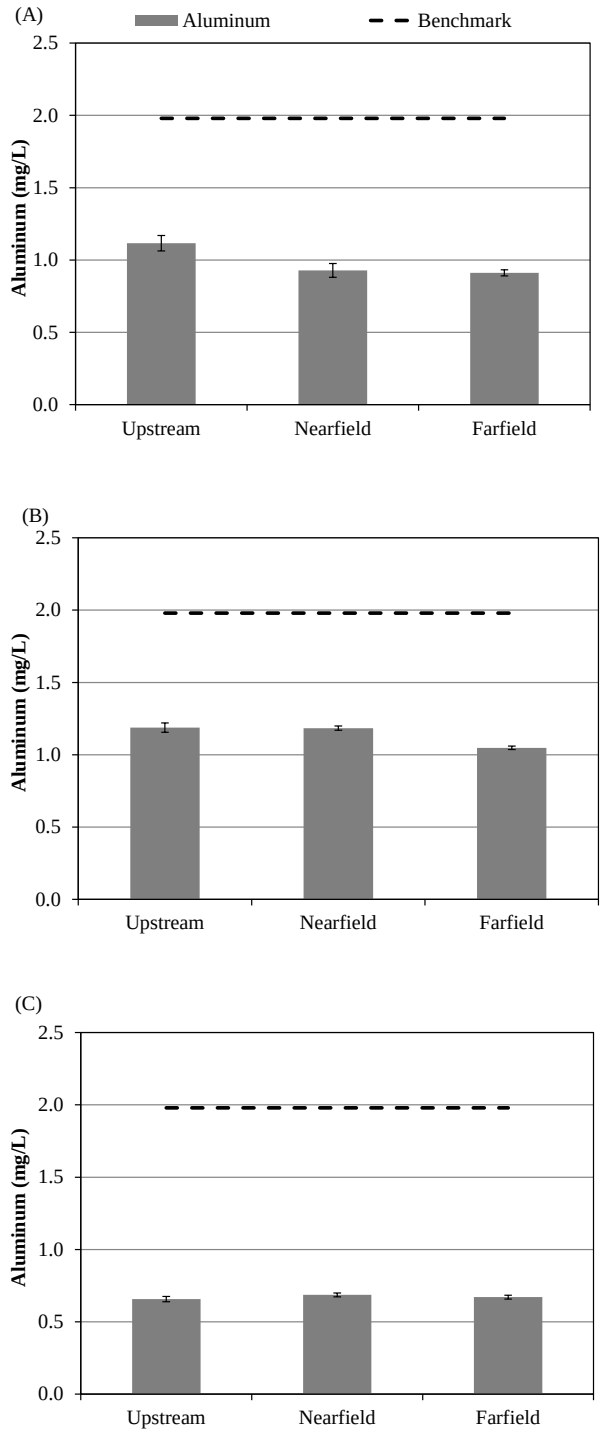

Figure 16: Mean (± SE) aluminum concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

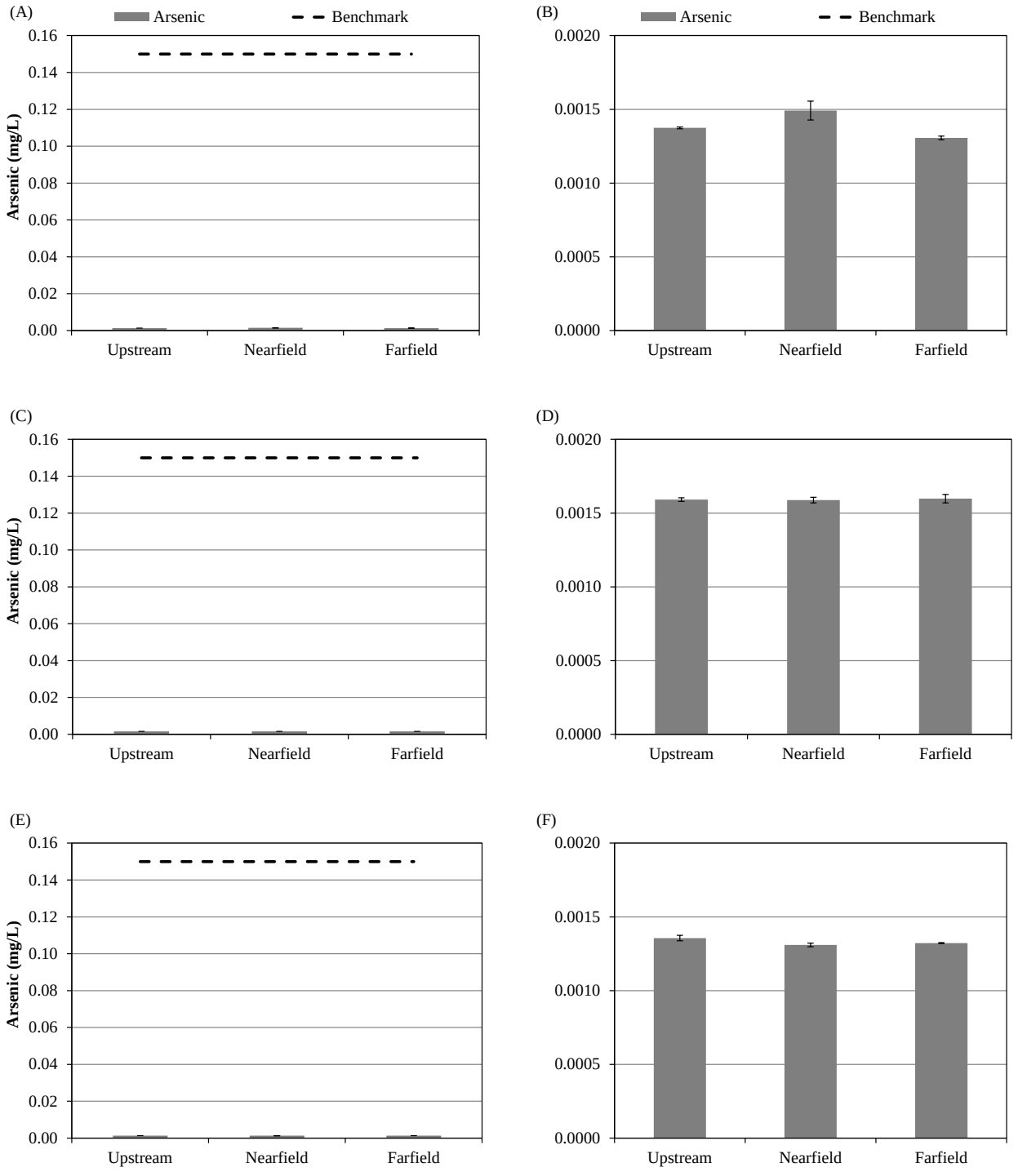

Figure 17: **Mean (± SE) arsenic concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014. Scales are plotted to show the comparison of the data to benchmark values on the left, and the differences in mean values on the right.**

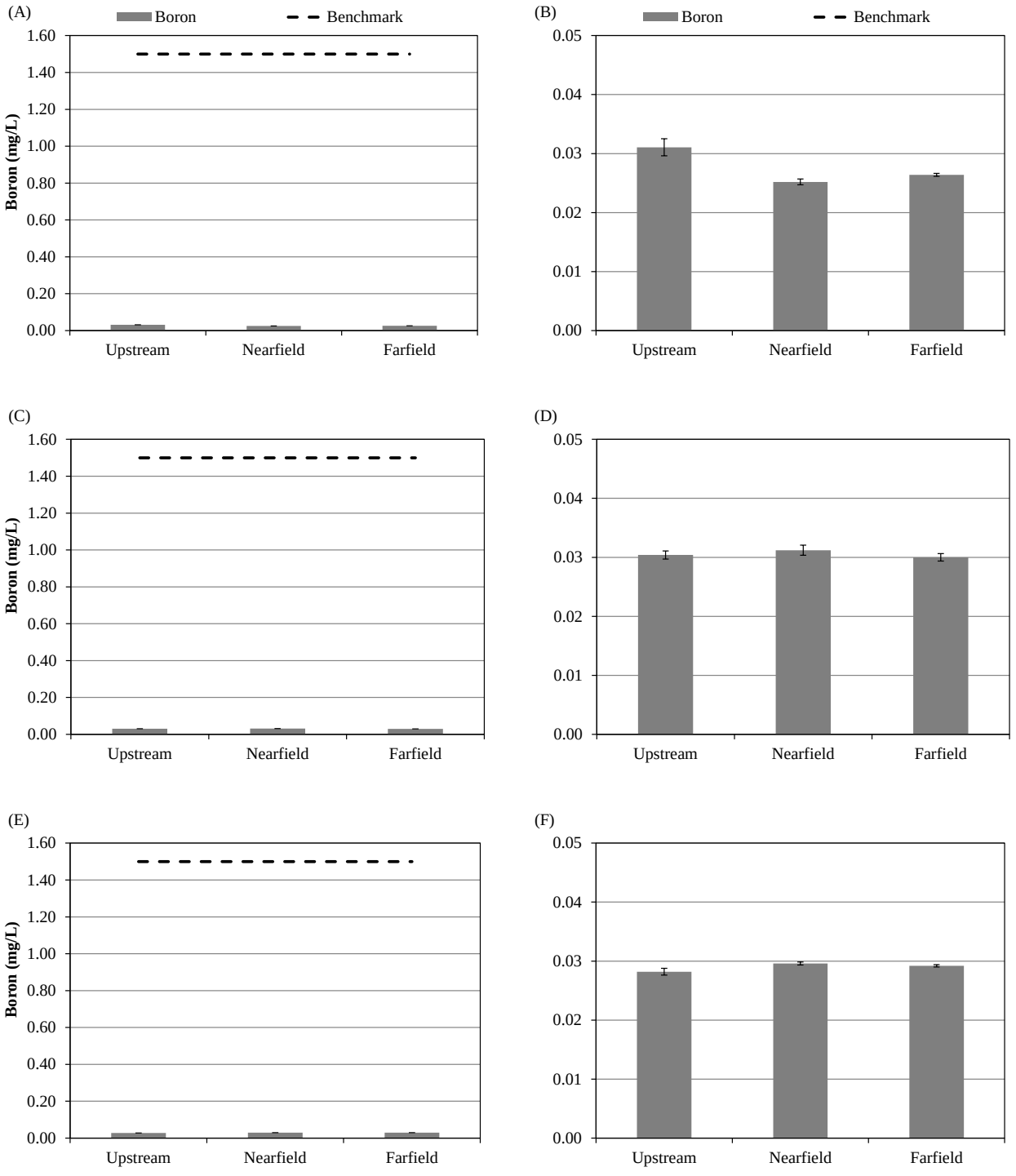

Figure 18: **Mean (± SE) boron concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014. Scales are plotted to show the comparison of the data to benchmark values on the left, and the differences in mean values on the right.**

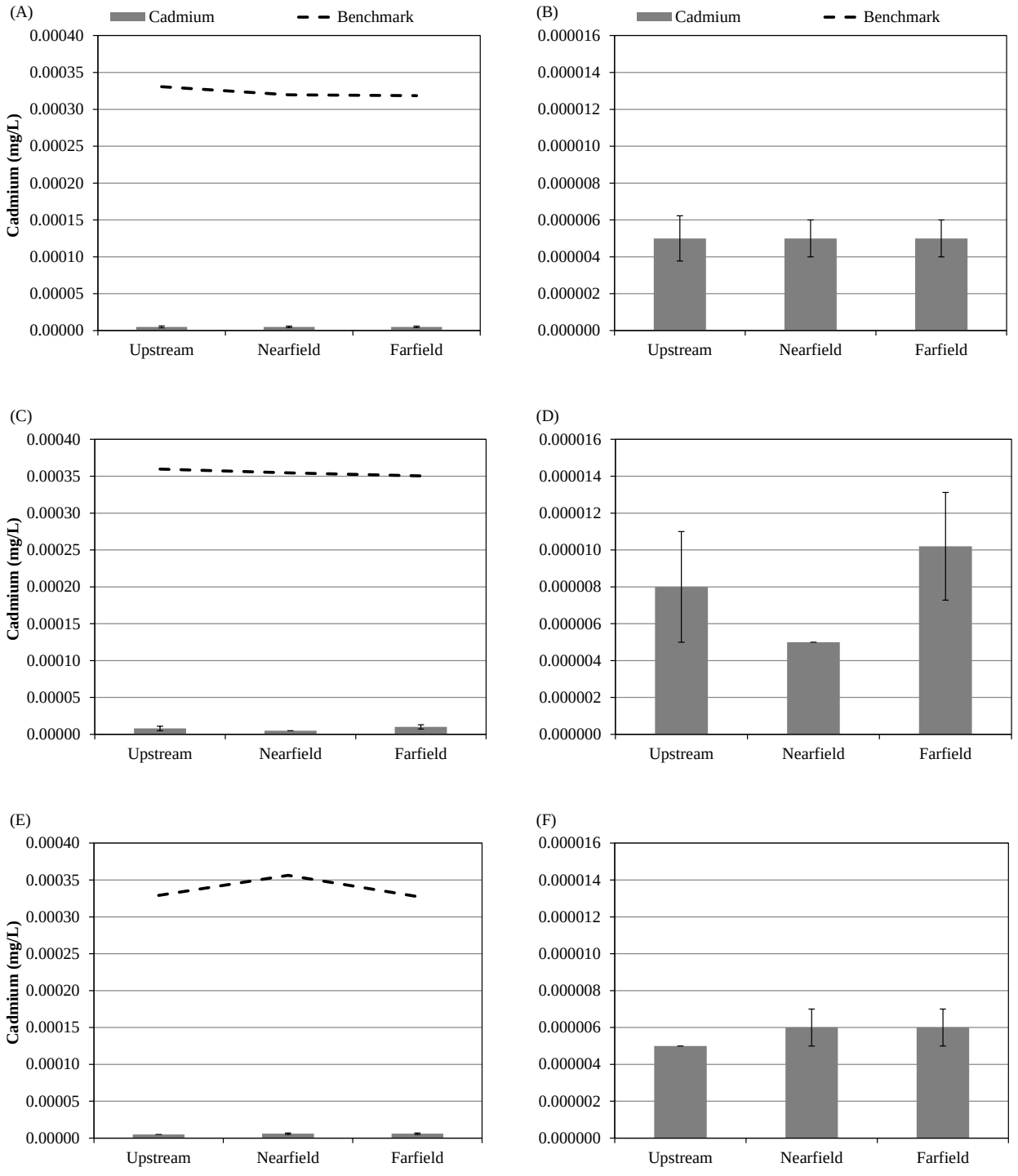

Figure 19: **Mean (± SE) cadmium concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014. Scales are plotted to show the comparison of the data to benchmark values on the left, and the differences in mean values on the right.**

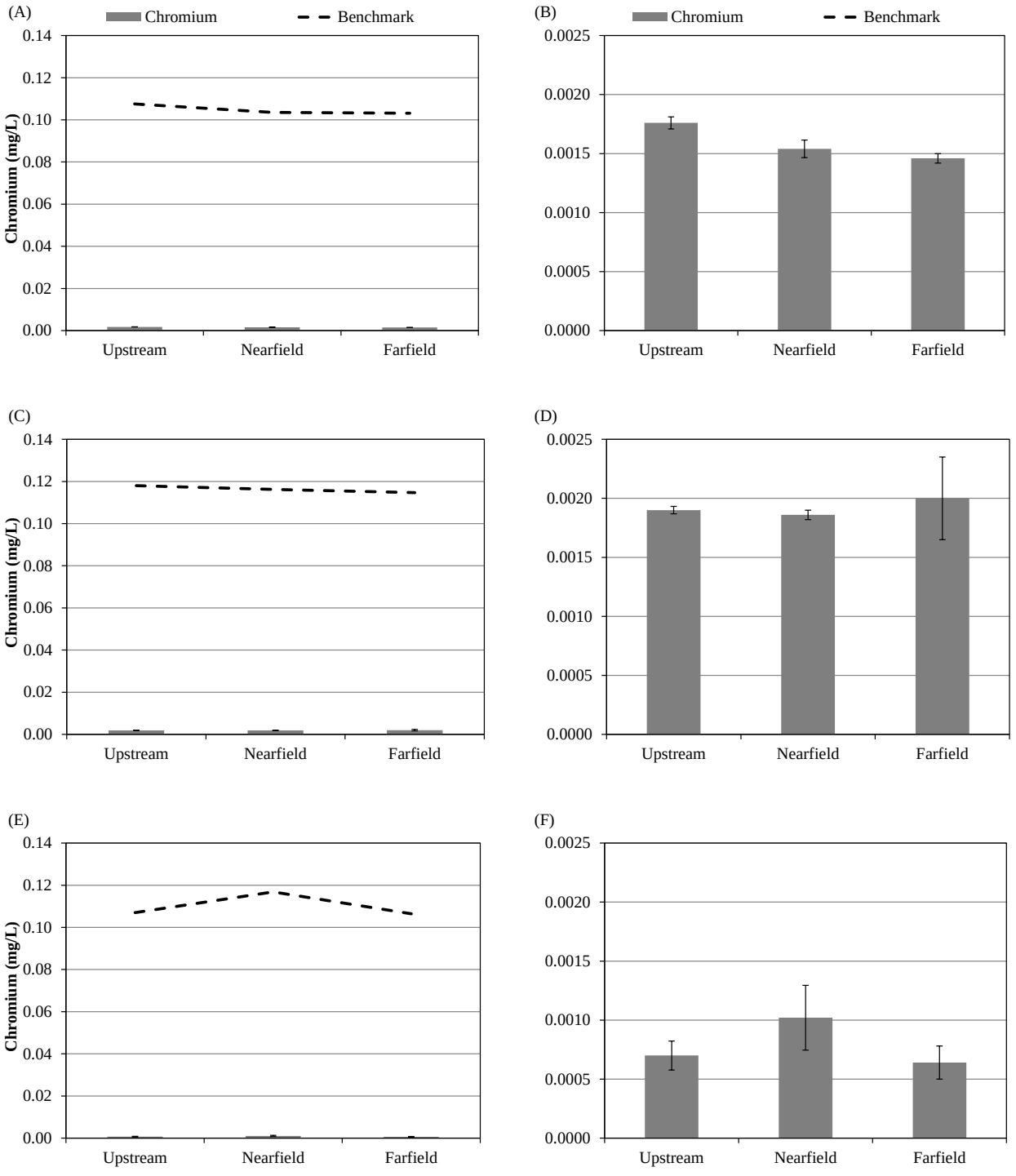

Figure 20: **Mean (± SE) chromium concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014. Scales are plotted to show the comparison of the data to benchmark values on the left, and the differences in mean values on the right.**

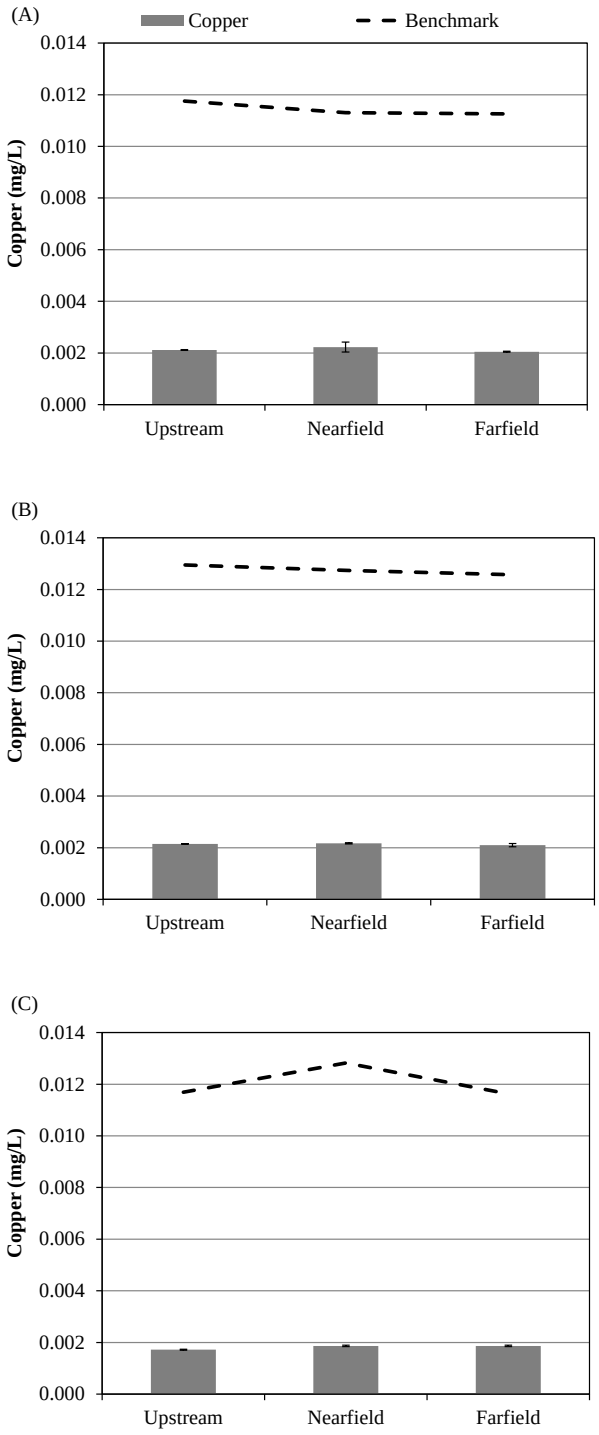

Figure 21: Mean (± SE) copper concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

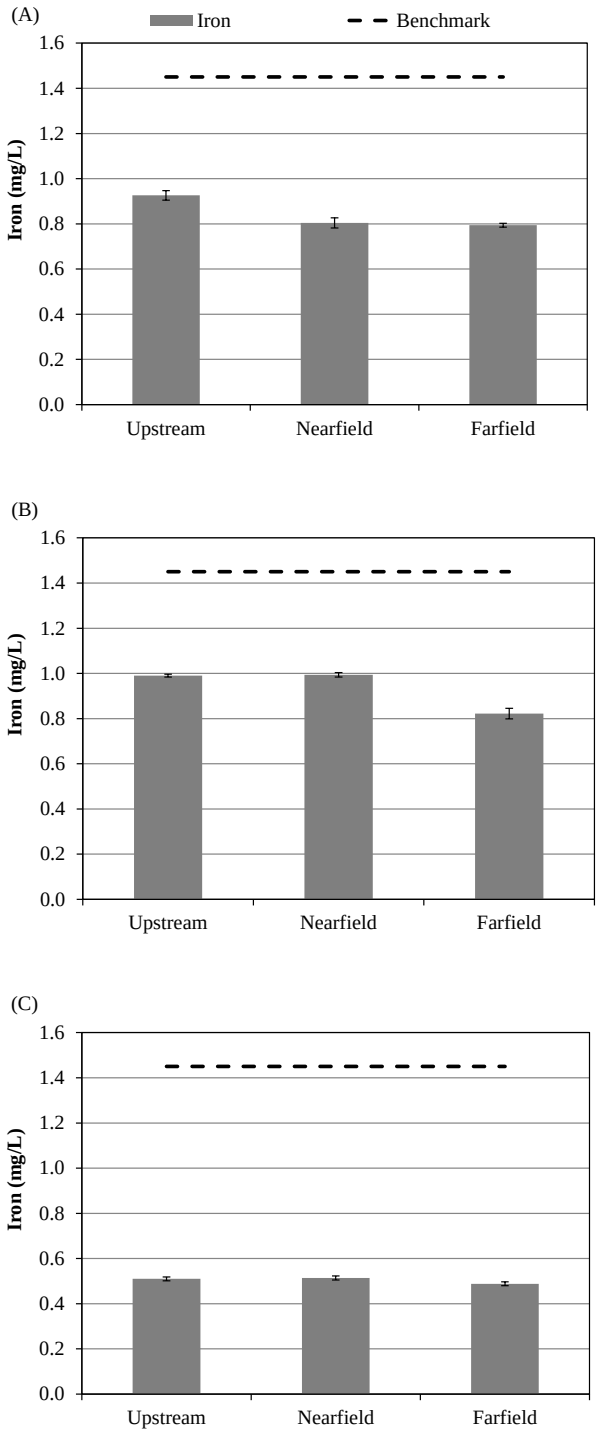

Figure 22: Mean (± SE) iron concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

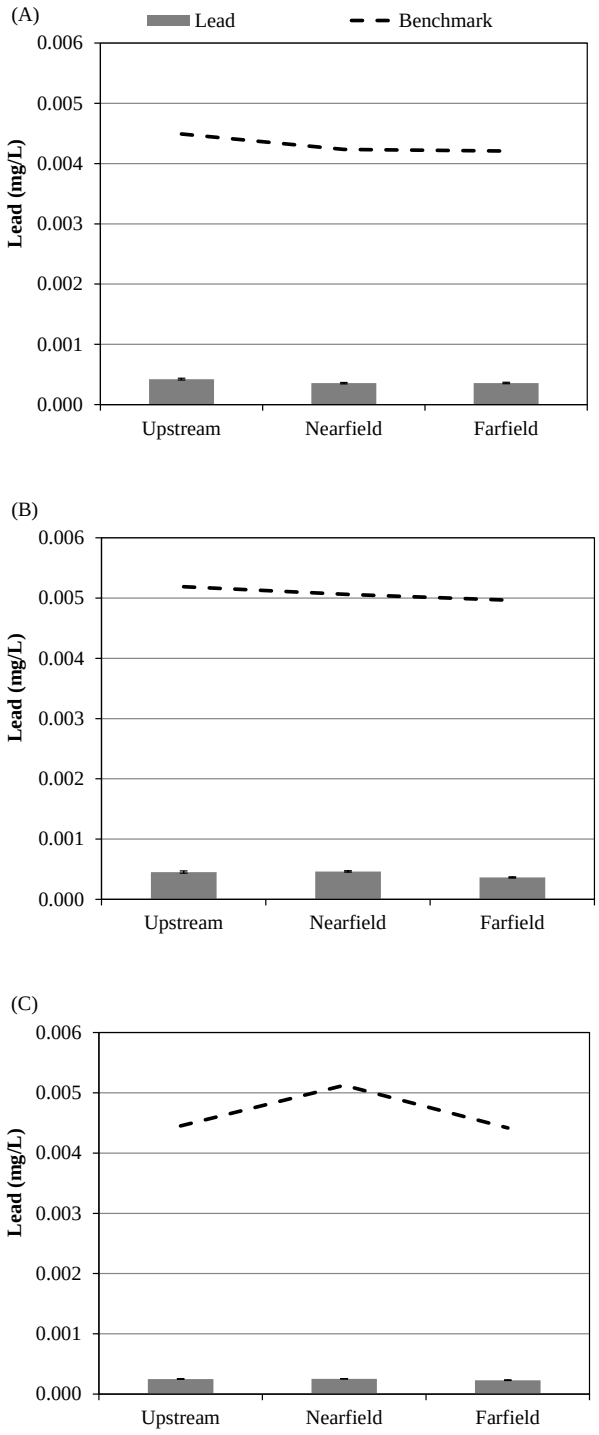

Figure 23: Mean (± SE) lead concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

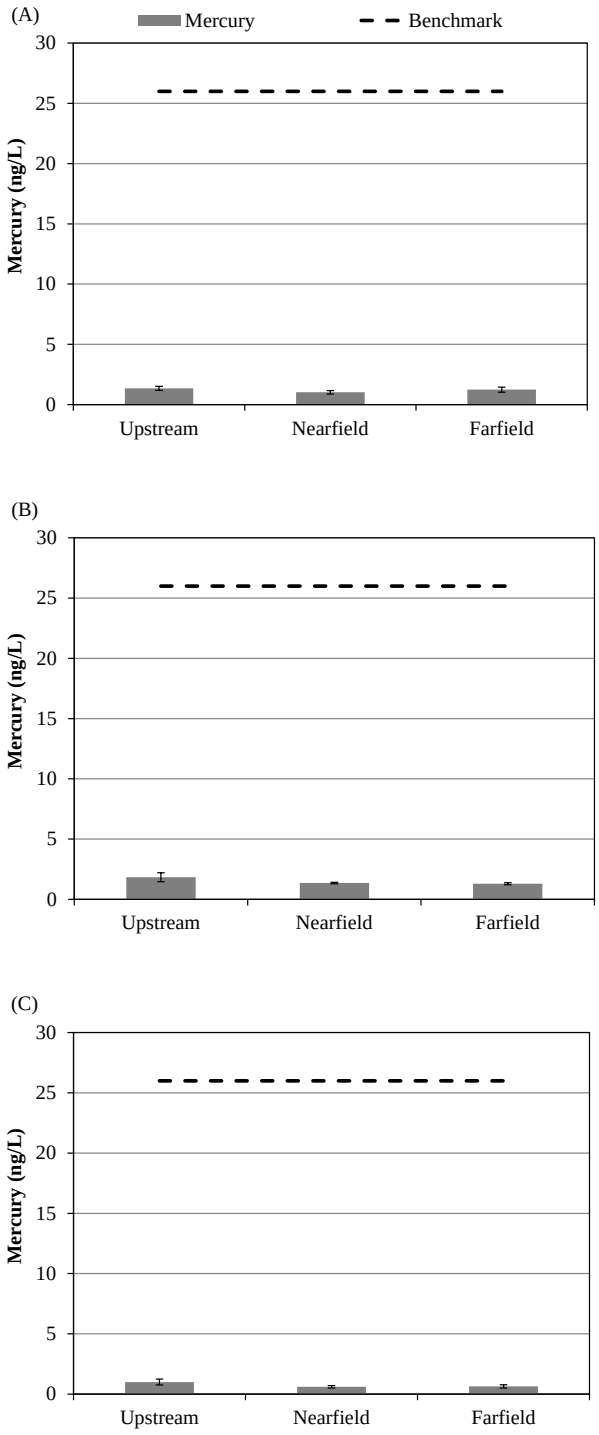

Figure 24: Mean (± SE) mercury concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

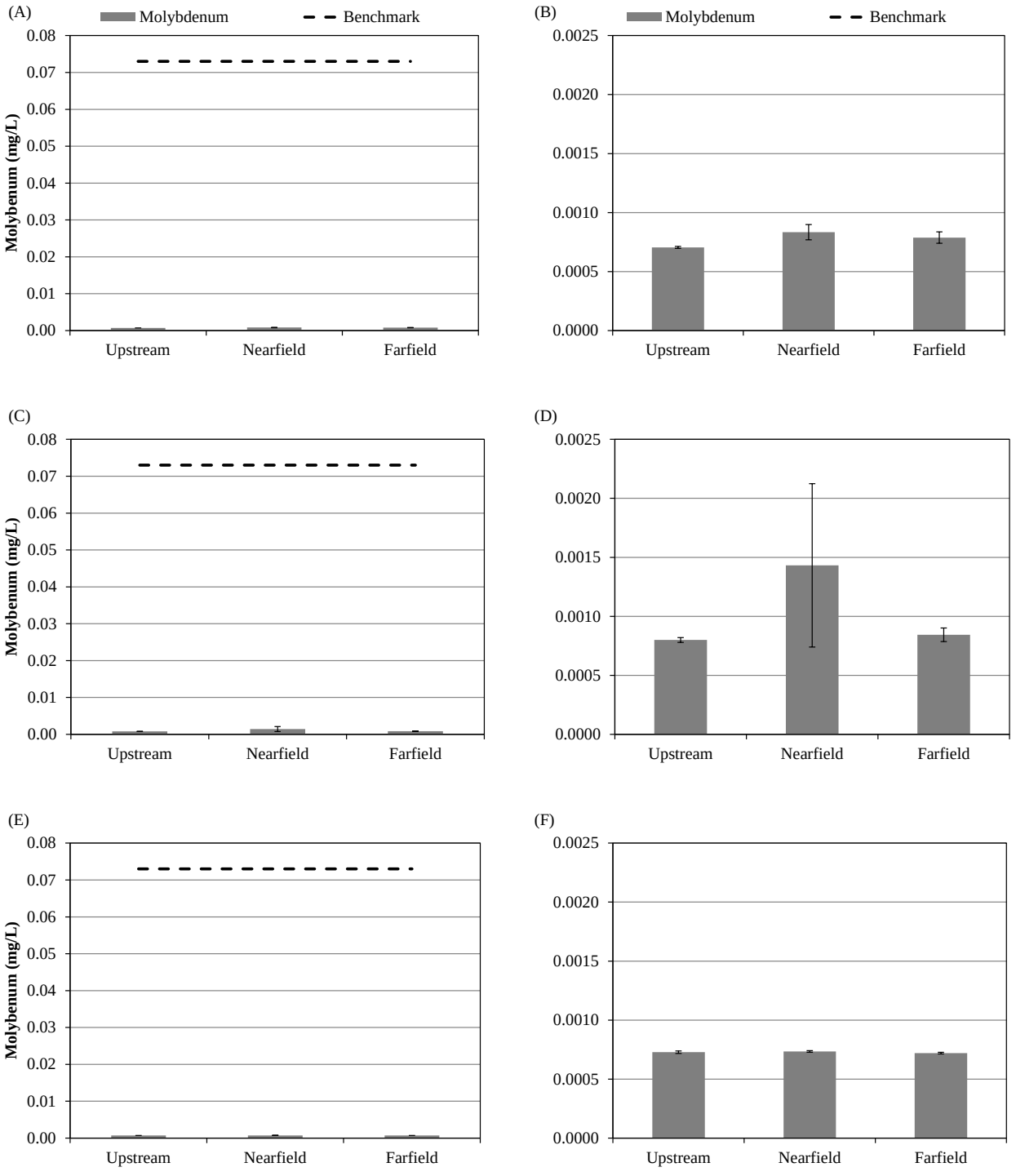

Figure 25: **Mean (± SE) molybdenum concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014. Scales are plotted to show the comparison of the data to benchmark values on the left, and the differences in mean values on the right.**

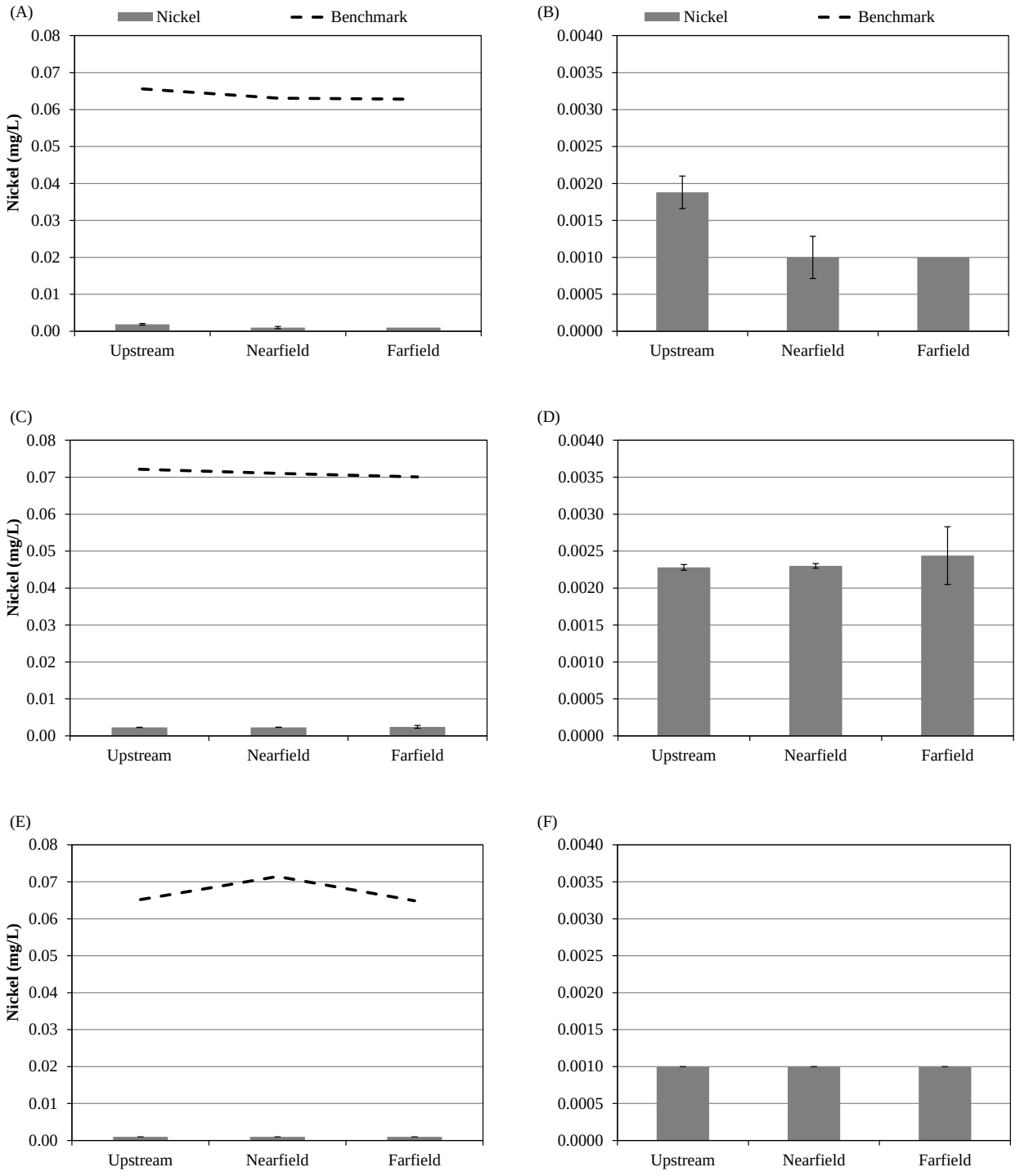

Figure 26: **Mean (± SE) nickel concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014. Scales are plotted to show the comparison of the data to benchmark values on the left, and the differences in mean values on the right.**

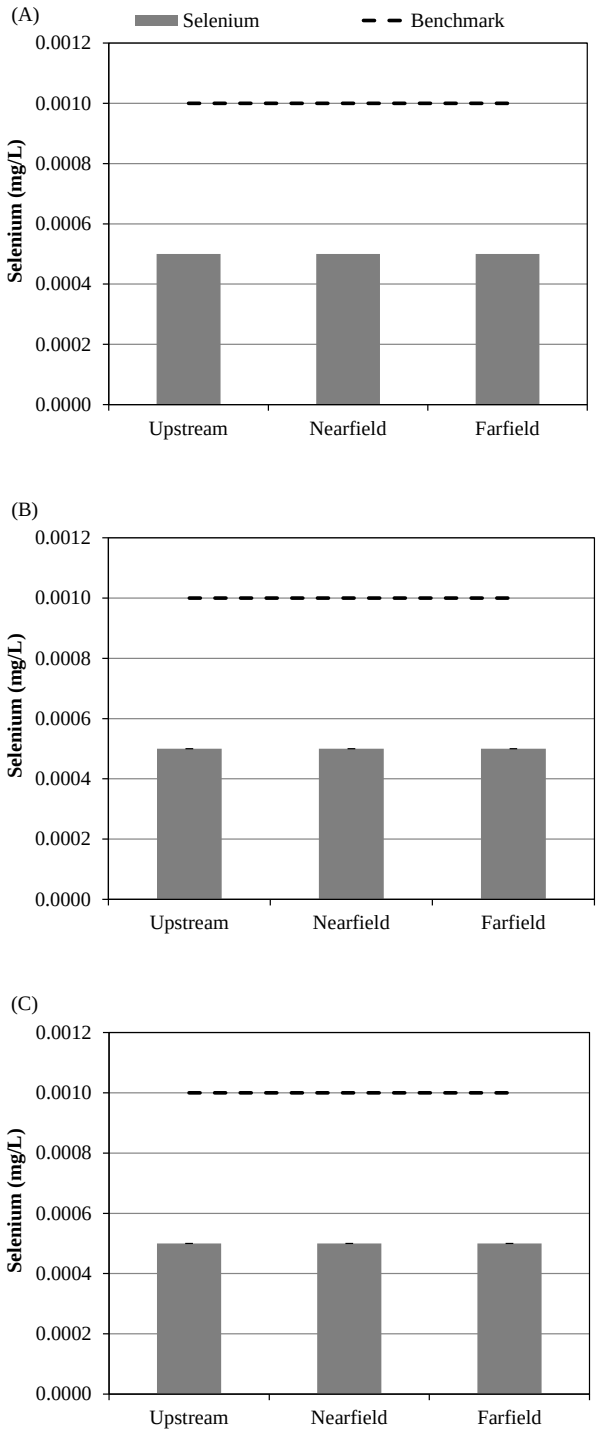

Figure 27: Mean (± SE) selenium concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

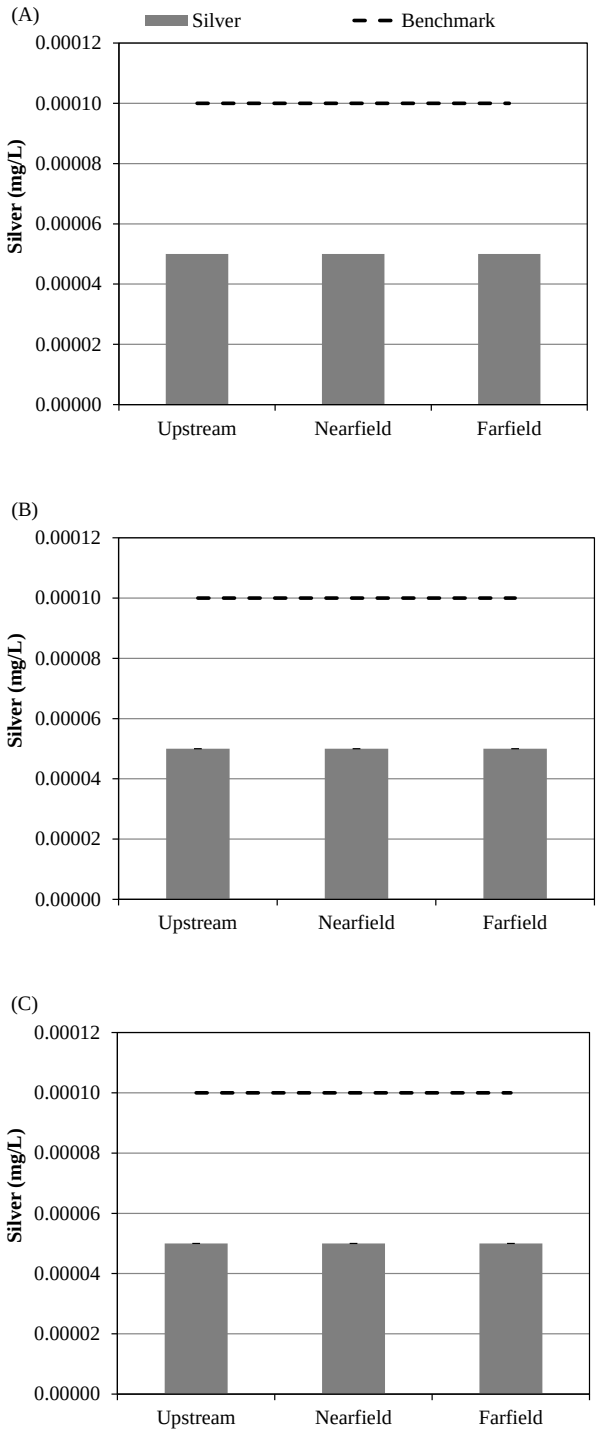

Figure 28: Mean (± SE) silver concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

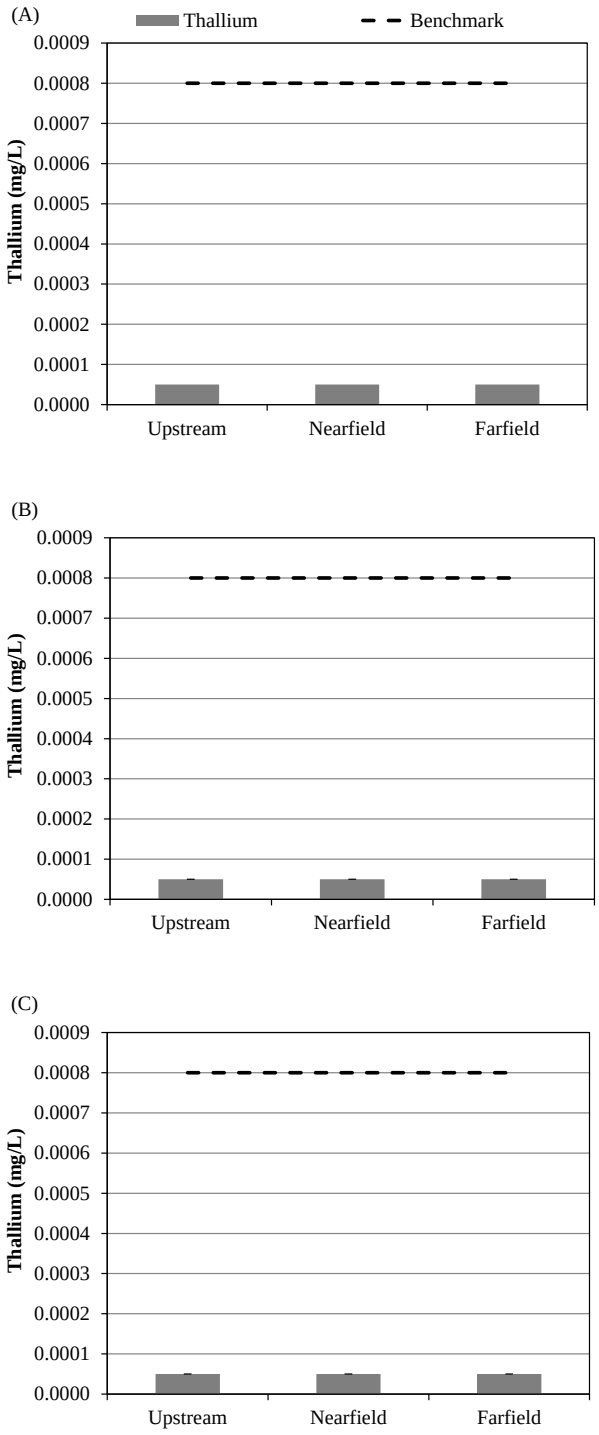

Figure 29: Mean (± SE) thallium concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

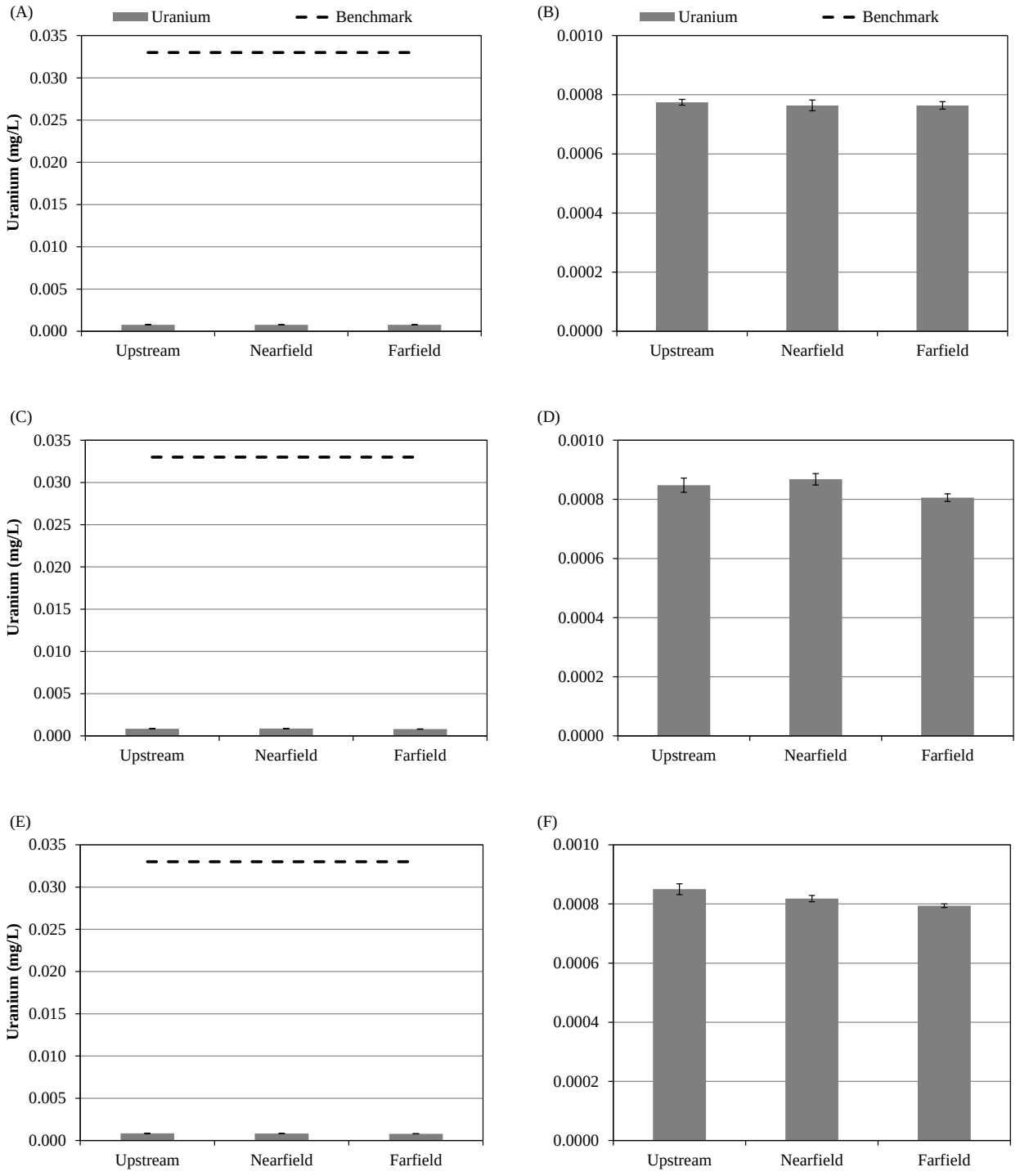

Figure 30: **Mean (± SE) uranium concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014. Scales are plotted to show the comparison of the data to benchmark values on the left, and the differences in mean values on the right.**

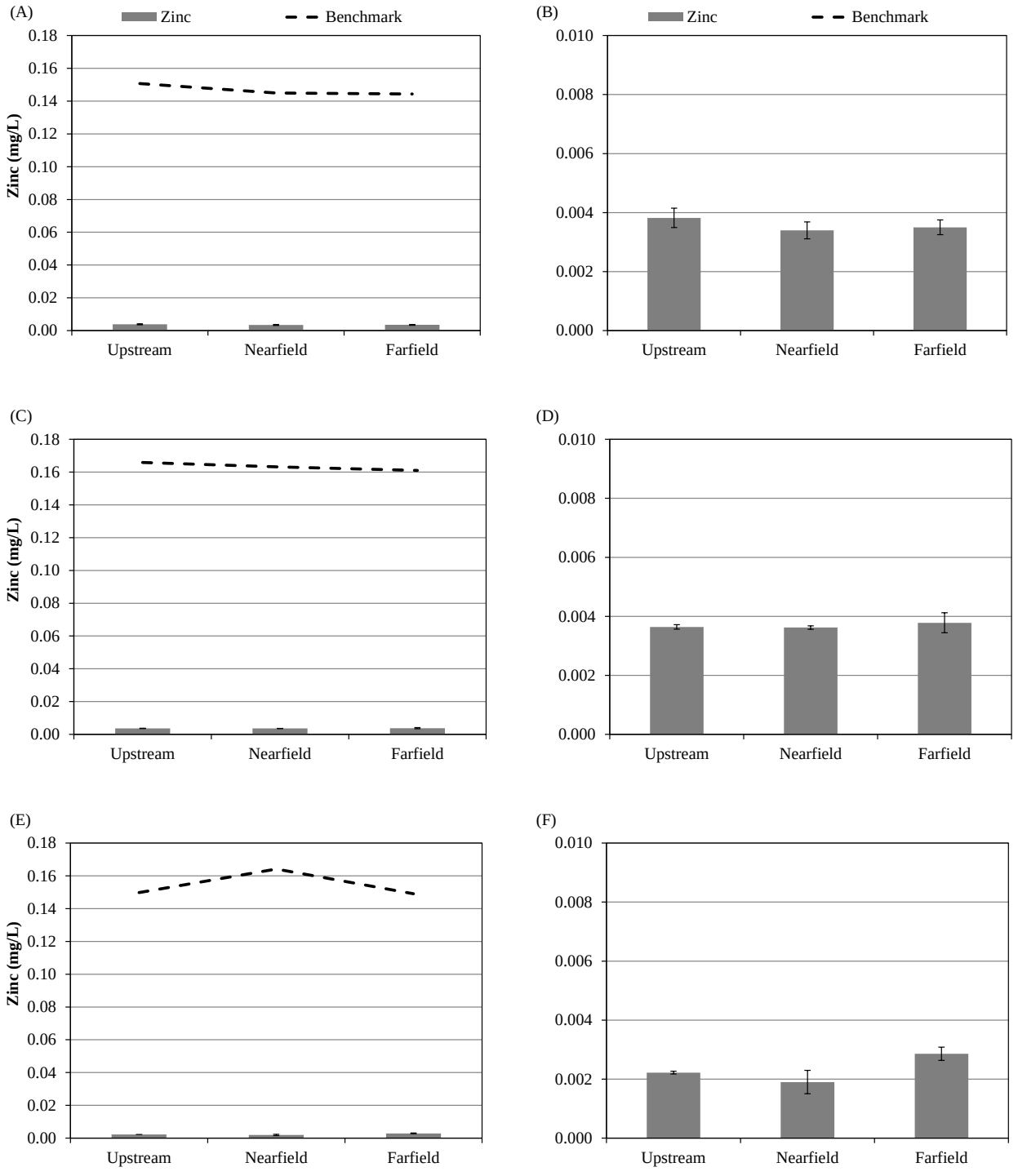

Figure 31: **Mean (± SE) zinc concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014. Scales are plotted to show the comparison of the data to benchmark values on the left, and the differences in mean values on the right.**

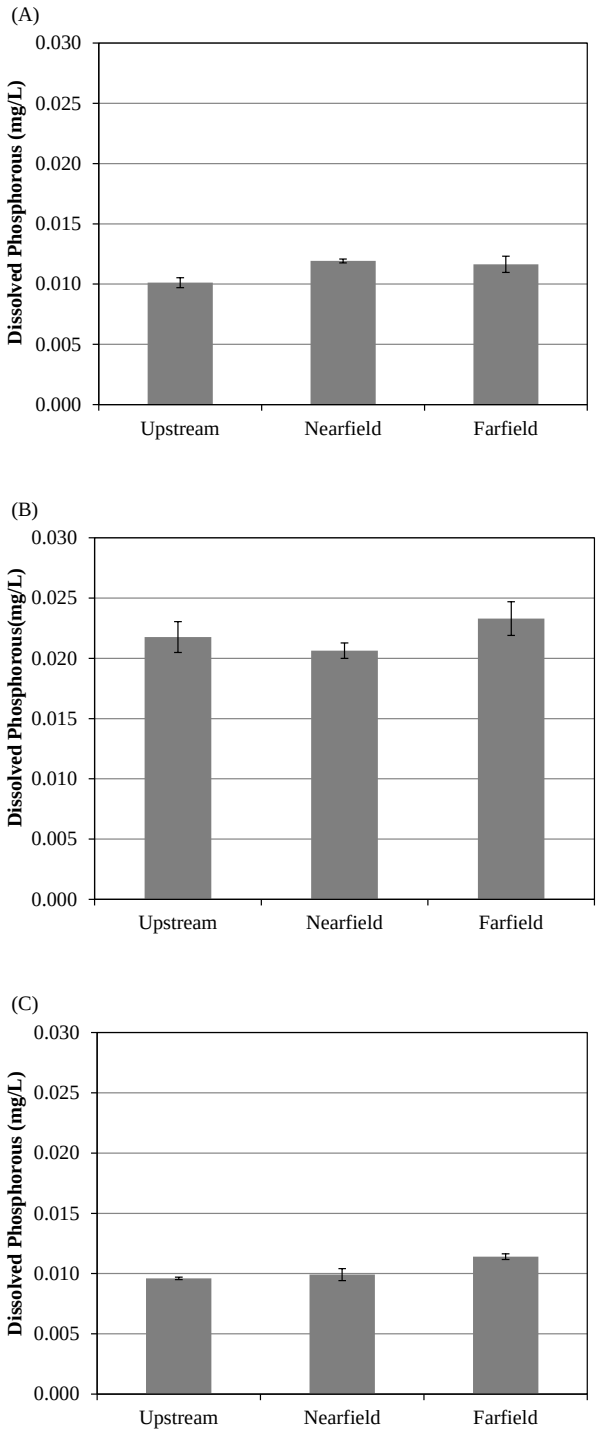

Figure 32: Mean (± SE) dissolved phosphorous concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

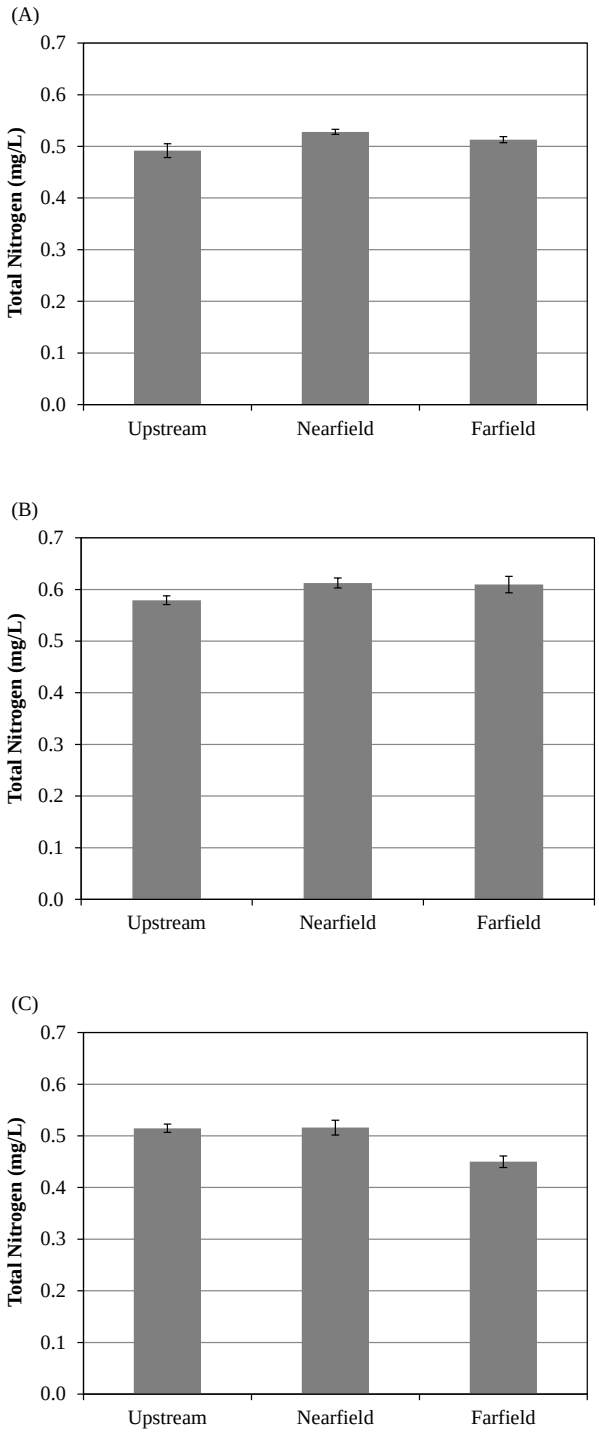

Figure 33: Mean (± SE) total nitrogen concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

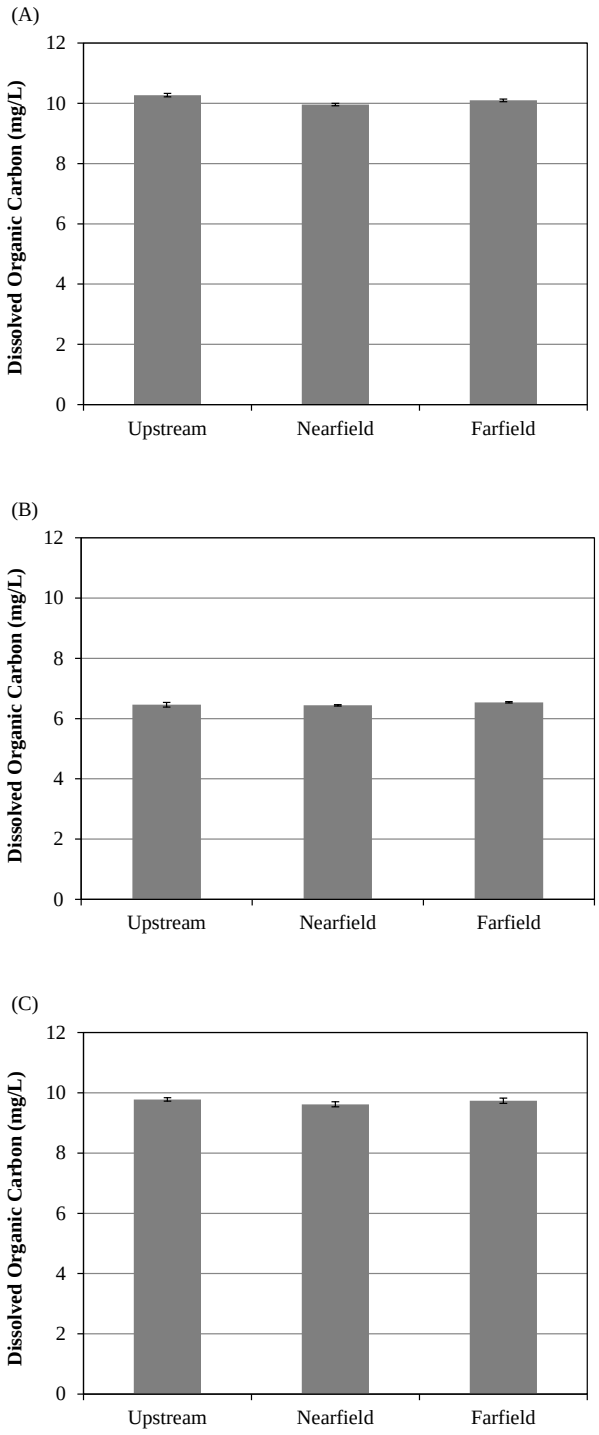

Figure 34: Mean (± SE) dissolved organic carbon concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

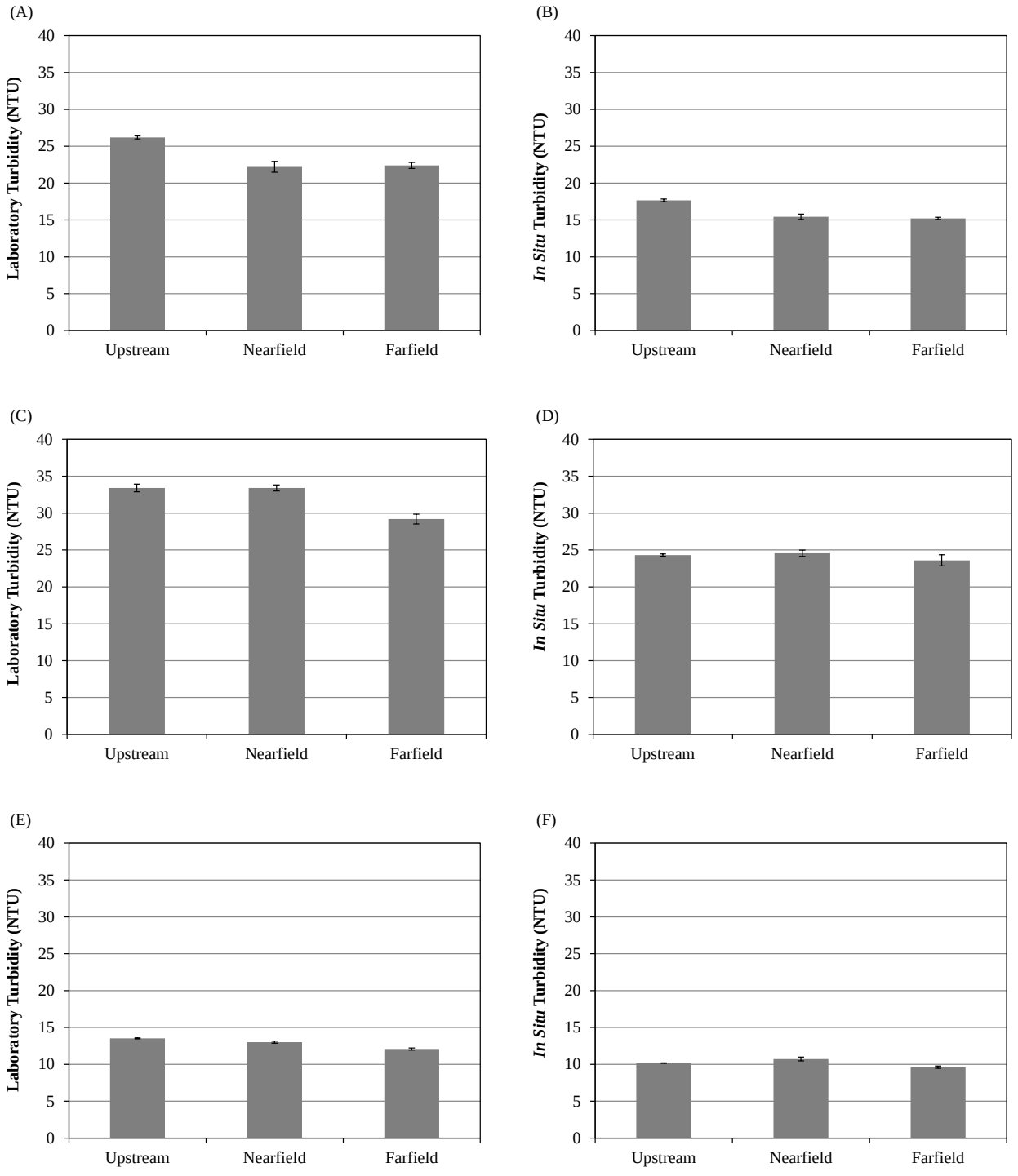

Figure 35: **Mean (± SE) laboratory and *in situ* turbidity measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014. Scales are plotted to show the comparison of the data to benchmark values on the left, and the differences in mean values on the right.**

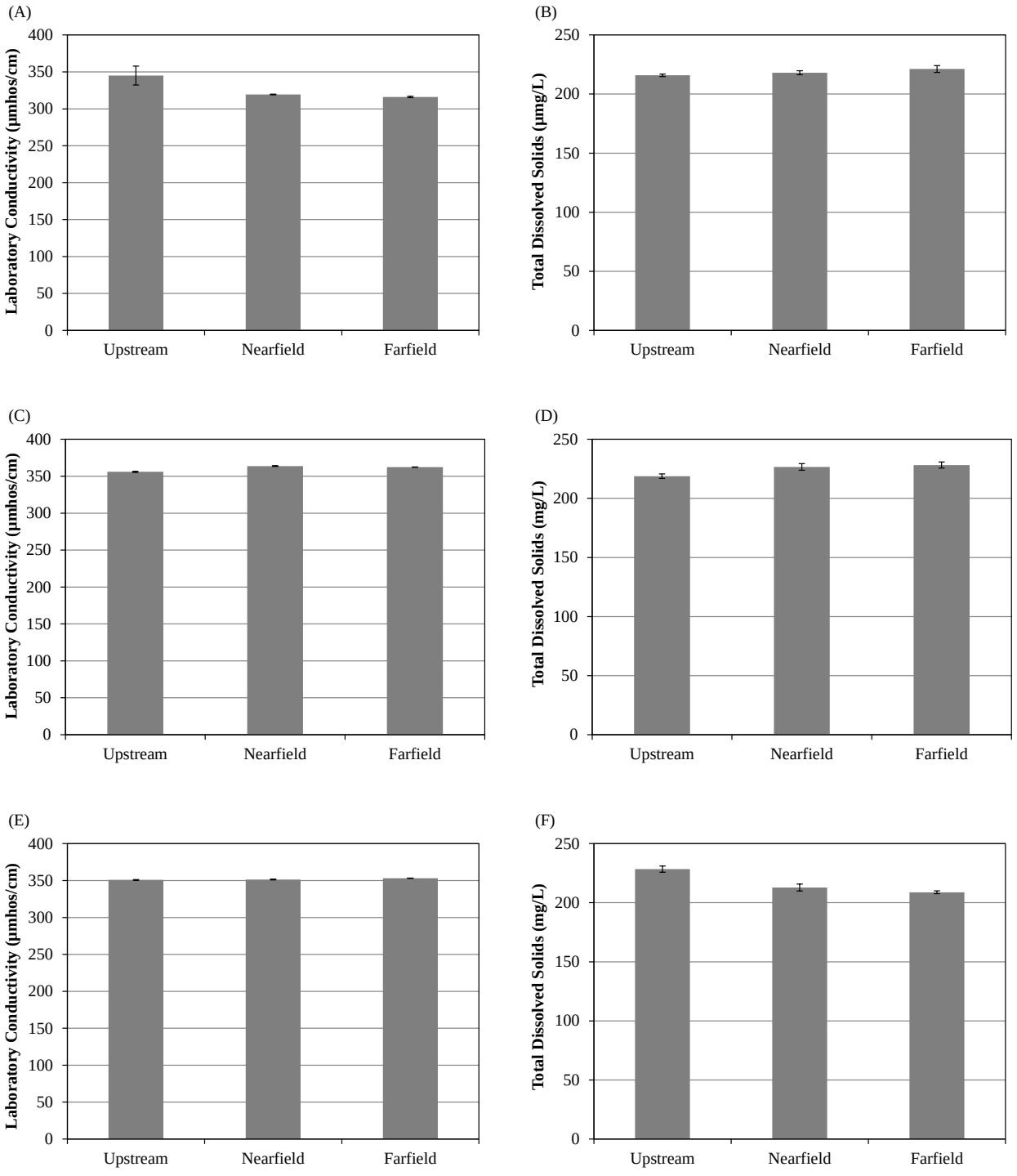

Figure 36: Mean (± SE) laboratory conductance (left side) and total dissolved solid concentrations (right side) measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014.

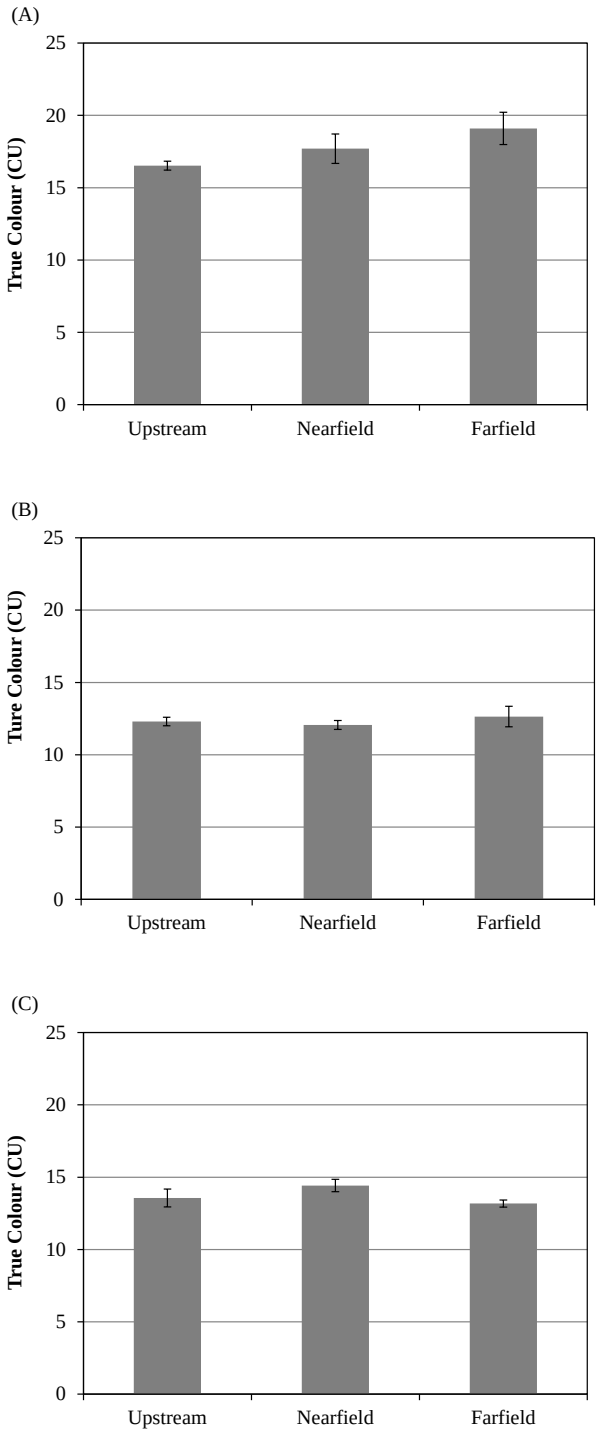

Figure 37: Mean (± SE) colour measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

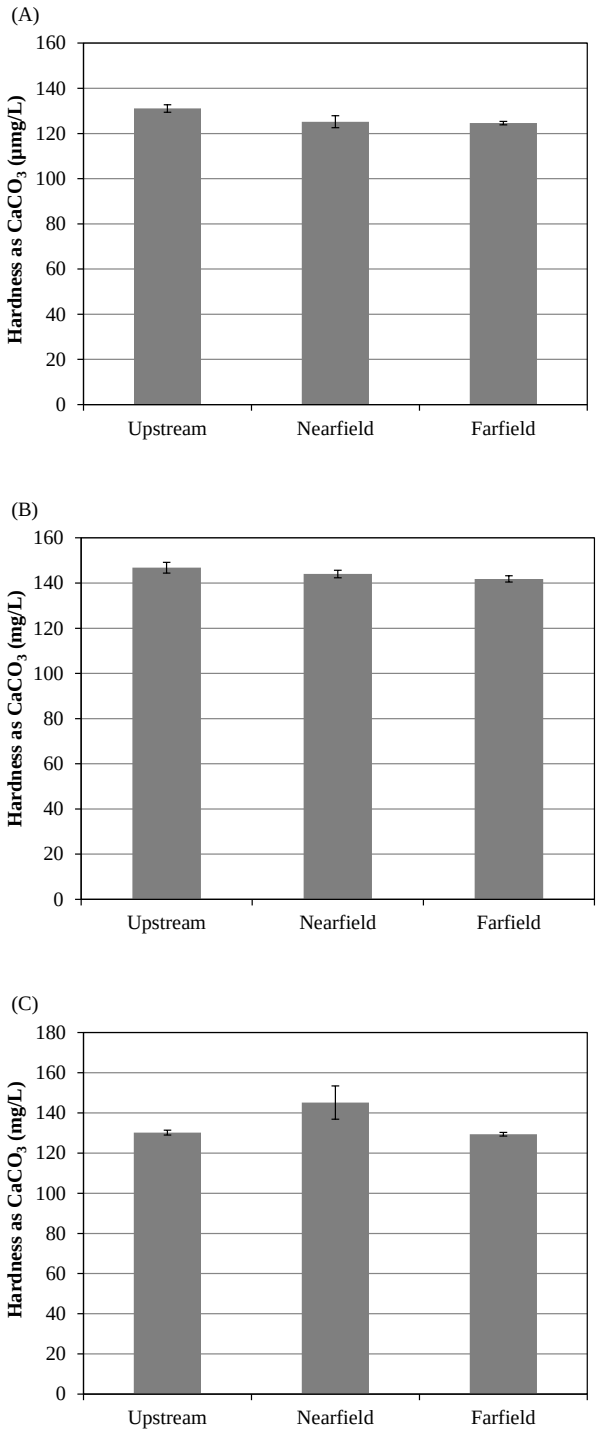

Figure 38: Mean (± SE) hardness measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A) July, (B) August, and (C) September, 2014.

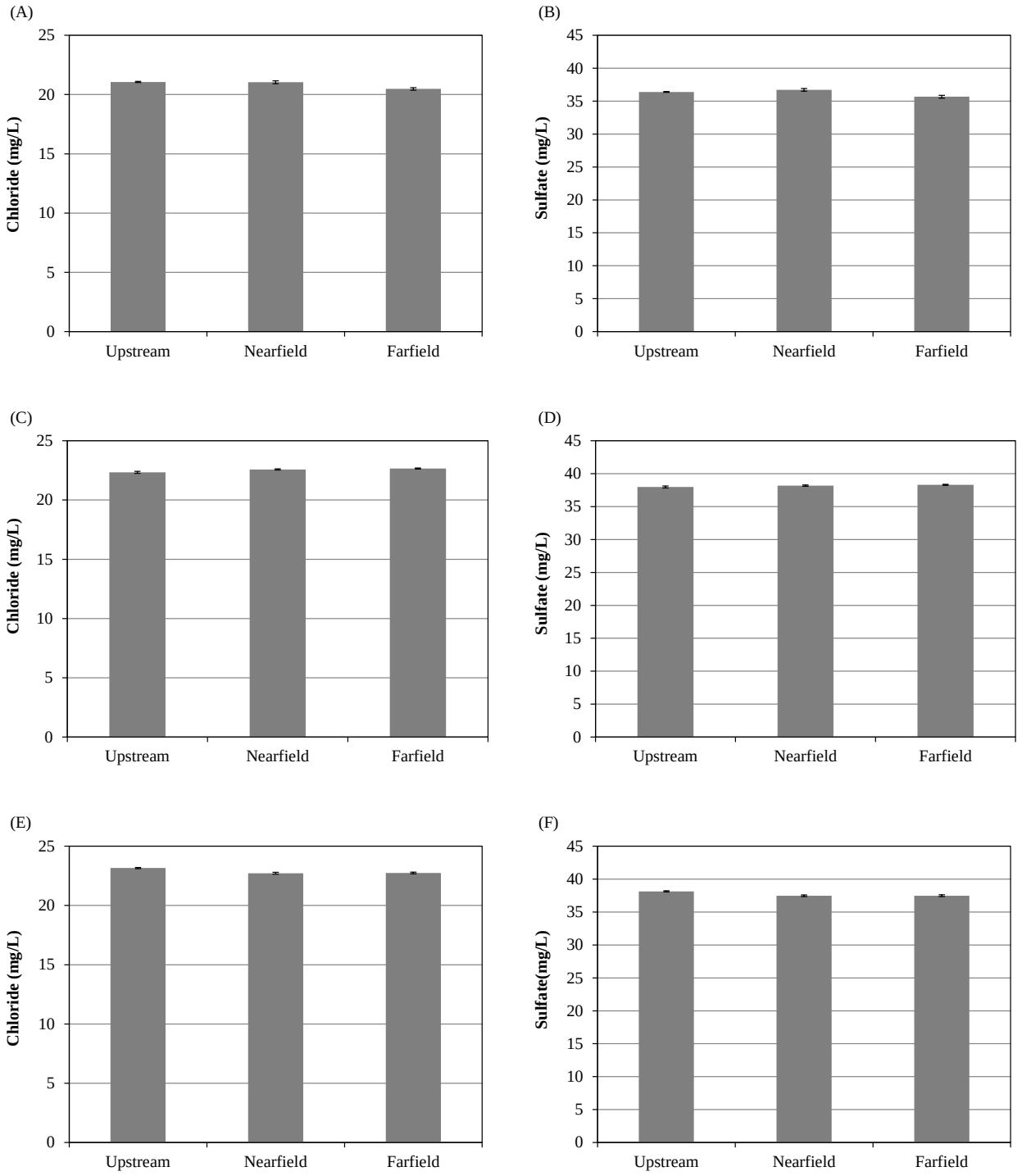

Figure 39: Mean (± SE) chloride (left side) and sulfate (right side) concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014.

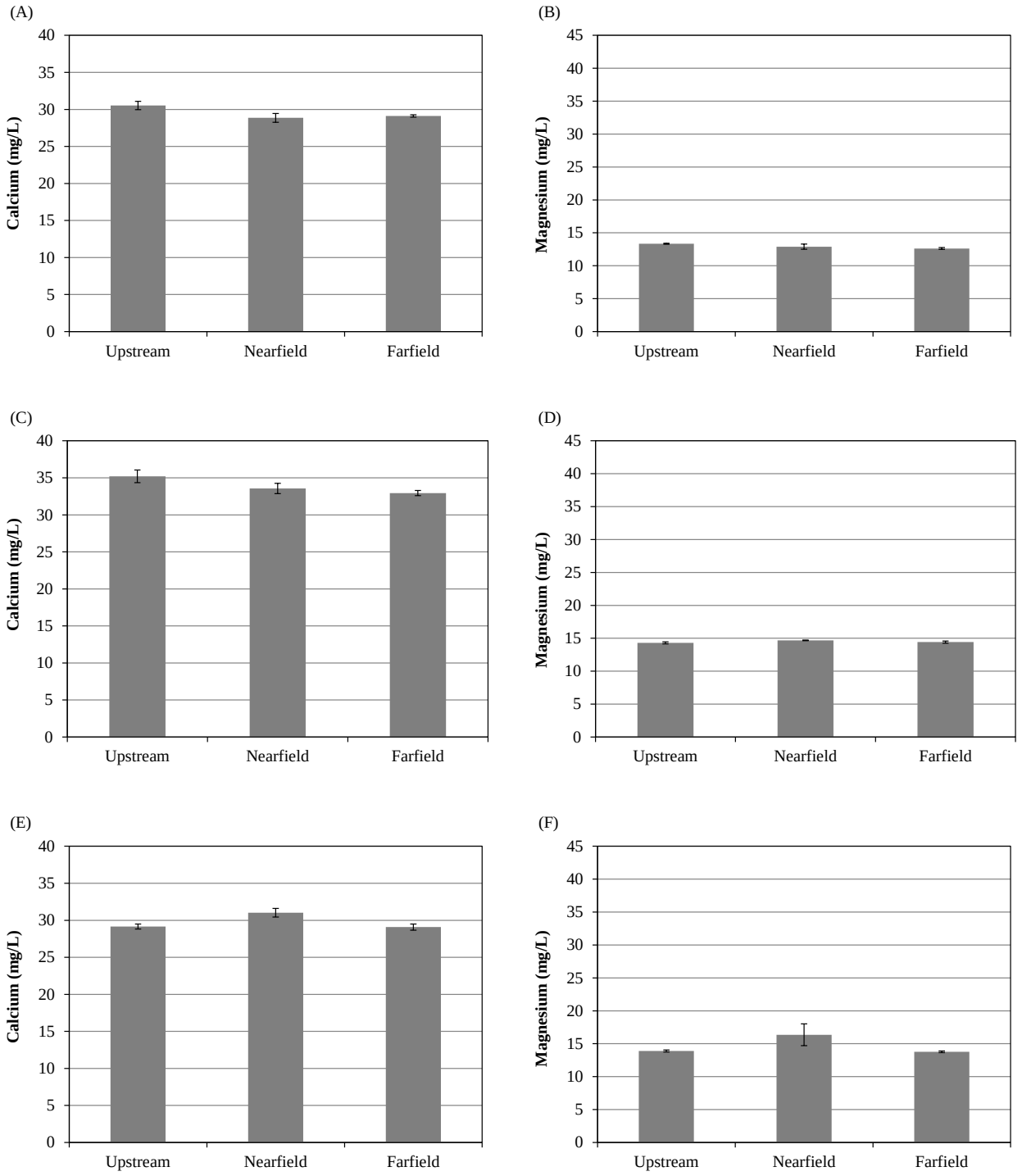

Figure 40: Mean (± SE) calcium (left side) and magnesium (right side) concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014.

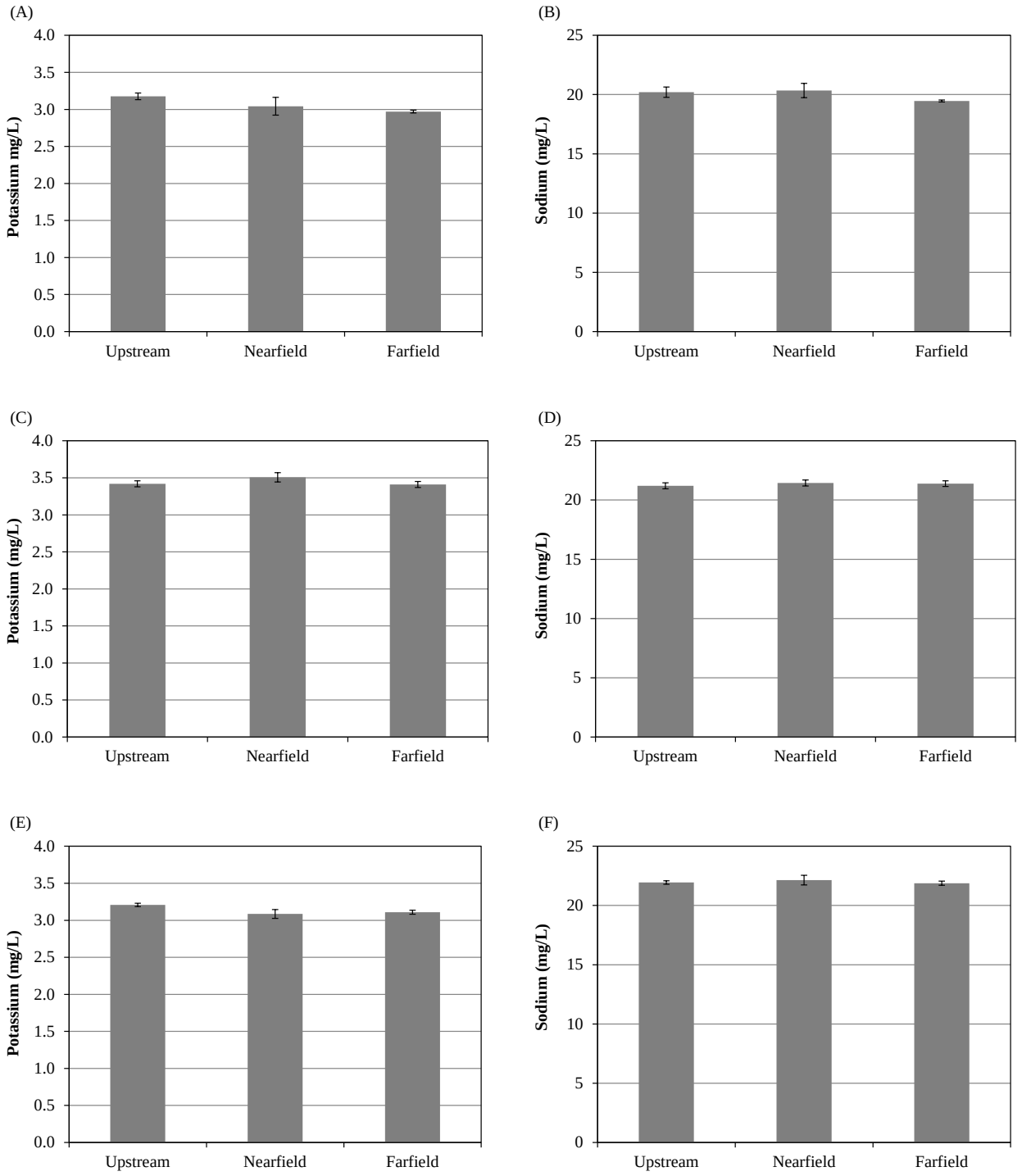

Figure 41: Mean (± SE) potassium (left side) and sodium (right side) concentrations measured in the upstream, near-field, and far-field areas of the Nelson River near the Keeyask GS in (A, B) July, (C, D) August, and (E, F) September, 2014.

APPENDICES

APPENDIX 1:
RESULTS OF WATER QUALITY MONITORING, OPEN-WATER SEASON, 2014

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Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
Nelson River - Upstream # 1	US-1	27-Jul-14	17:10	11.6	0.1	17.7	8.25	9.53	100.00	339.90	17.8	237.9	-
Nelson River - Upstream # 2	US-2	27-Jul-14	16:40	13.1	0.1	17.6	8.24	9.52	100.00	339.90	17.7	246.6	-
Nelson River - Upstream # 3	US-3	27-Jul-14	18:10	11.1	0.1	17.7	8.25	9.52	100.10	339.20	17.1	232.3	-
Nelson River - Upstream # 4	US-4	27-Jul-14	17:30	11.2	0.1	17.7	8.25	9.53	100.10	339.30	17.5	237.6	-
Nelson River - Upstream # 5	US-5	27-Jul-14	16:05	9.1	0.1	17.7	8.24	9.50	100.00	338.30	18.2	246.3	0.20
Stephens Lake - Nearfield # 1	NF-1	28-Jul-14	13:55	17.9	0.3	17.8	8.28	9.76	102.80	343.80	16.2	210.6	0.61
					1	17.7	8.27	9.72	102.10	343.80	17.2	213.4	
					2	17.6	8.26	9.67	101.30	344.10	17.2	215.7	
					3	17.6	8.26	9.64	101.00	344.20	17.1	217.1	
					4	17.6	8.25	9.64	101.00	344.30	17.1	217.8	
					5	17.6	8.26	9.64	101.10	344.10	17.0	218.1	
					6	17.5	8.25	9.60	100.50	344.40	16.9	219.1	
					7	17.5	8.25	9.58	100.20	344.40	17.1	219.6	
					8	17.5	8.25	9.57	100.00	344.40	17.2	220.0	
					9	17.4	8.24	9.54	99.60	344.70	17.1	220.9	
					10	17.4	8.24	9.53	99.50	344.90	17.4	221.6	
					11	17.4	8.24	9.51	99.40	344.90	17.4	222.5	
					12	17.4	8.24	9.50	99.30	344.90	18.0	223.0	
					13	17.4	8.24	9.49	99.10	345.10	17.7	223.9	
					14	17.4	8.24	9.48	99.00	344.90	16.6	224.2	
					15	17.4	8.24	9.47	98.90	344.90	18.3	224.8	
					16	17.4	8.24	9.46	98.80	345.00	18.2	225.1	
Stephens Lake - Nearfield # 2	NF-2	28-Jul-14	15:20	12.3	0.3	18.0	8.33	9.85	104.10	344.90	14.5	210.6	0.37
					1	18.0	8.33	9.86	104.10	344.60	15.4	211.6	

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
					2	18.0	8.33	9.86	104.00	344.80	16.3	212.4	
					3	17.8	8.31	9.71	102.40	344.90	15.0	213.4	
					4	17.7	8.29	9.64	101.30	345.10	15.2	214.2	
					5	17.7	8.28	9.61	101.00	345.10	15.1	215.3	
					6	17.7	8.27	9.59	100.70	345.00	15.6	216.1	
					7	17.7	8.27	9.58	100.50	345.10	14.9	217.1	
					8	17.6	8.27	9.57	100.30	345.50	15.4	207.5	
					9	17.6	8.27	9.55	100.10	345.40	14.8	208.6	
					10	17.6	8.27	9.54	100.10	345.40	15.5	209.1	
					11	17.6	8.27	9.53	99.90	345.30	14.9	210.0	
Stephens Lake - Nearfield # 3	NF-3	28-Jul-14	14:40	18.8	0.3	17.8	8.29	9.75	102.60	343.40	16.4	190.8	0.38
					1	17.8	8.29	9.74	102.50	343.70	16.5	194.9	
					2	17.8	8.29	9.73	102.40	343.20	16.3	198.1	
					3	17.7	8.27	9.68	101.70	343.80	16.4	200.7	
					4	17.7	8.27	9.66	101.50	343.70	16.4	202.1	
					5	17.5	8.24	9.54	99.80	344.50	16.7	206.4	
					6	17.5	8.23	9.54	99.80	344.30	16.7	208.8	
					7	17.4	8.22	9.52	99.50	344.70	16.9	211.9	
					8	17.4	8.21	9.50	99.30	344.80	17.0	213.5	
					9	17.4	8.21	9.50	99.30	344.70	17.0	214.7	
					10	17.5	8.21	9.48	99.10	344.70	17.3	216.5	
					11	17.4	8.21	9.47	98.90	344.80	16.6	217.7	
					12	17.4	8.2	9.47	98.90	345.00	17.1	218.5	
					13	17.4	8.2	9.46	98.90	344.80	17.3	219.0	

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
					14	17.4	8.2	9.45	98.70	344.90	17.3	219.7	
					15	17.4	8.2	9.44	98.70	345.00	17.4	220.6	
					16	17.4	8.2	9.43	98.60	344.80	17.5	221.6	
					17	17.4	8.21	9.42	98.50	345.10	17.5	221.4	
					18	17.4	8.2	9.41	98.40	344.80	22.3	221.6	
Stephens Lake - Nearfield # 4	NF-4	28-Jul-14	13:50	6.7	0.3	18.0	8.32	9.83	103.80	345.30	14.9	210.9	0.39
					1	17.9	8.32	9.83	103.80	345.30	15.0	211.0	
					2	17.9	8.31	9.78	103.10	345.00	15.1	212.7	
					3	17.9	8.3	9.75	102.80	344.80	17.1	213.6	
					4	17.8	8.29	9.69	102.00	345.10	16.4	215.5	
					5	17.8	8.29	9.66	101.60	345.00	15.9	216.4	
					6	17.7	8.29	9.59	100.70	345.00	17.6	217.9	
Stephens Lake - Nearfield # 5	NF-5	28-Jul-14	13:10	19.2	0.3	17.8	8.29	9.84	103.80	344.30	15.3	223.1	0.23
					1	17.7	8.27	9.73	102.20	344.20	17.0	224.5	
					2	17.6	8.26	9.70	101.60	344.10	16.9	225.5	
					3	17.5	8.25	9.65	101.10	344.20	16.9	226.0	
					4	17.5	8.25	9.61	100.50	344.20	17.2	226.7	
					5	17.5	8.24	9.58	100.10	343.90	16.9	227.5	
					6	17.5	8.24	9.57	100.10	344.30	16.8	228.0	
					7	17.5	8.24	9.57	100.00	344.20	17.2	228.2	
					8	17.4	8.24	9.54	99.70	344.40	17.9	229.1	
Stephens Lake - Nearfield # 5	NF-5	28-Jul-14	13:10	19.2	9	17.4	8.23	9.52	99.50	344.40	17.6	229.4	
					10	17.4	8.24	9.50	99.30	344.30	17.5	230.0	
					11	17.4	8.23	9.50	99.30	344.50	17.8	230.3	

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
					12	17.4	8.23	9.49	99.20	344.50	17.7	230.6	
					13	17.4	8.23	9.48	99.10	344.50	17.1	230.8	
					14	17.4	8.23	9.48	99.00	344.50	18.4	231.1	
					15	17.4	8.23	9.47	98.90	344.50	17.5	231.2	
					16	17.4	8.23	9.46	98.80	344.20	17.7	231.7	
					17	17.4	8.23	9.45	98.80	344.40	16.8	231.8	
					18	17.4	8.23	9.44	98.80	344.40	18.4	232.4	
Stephens Lake - Farfield # 1	FF-1	28-Jul-14	8:45	22.7	0.3	17.5	8.16	9.32	97.60	333.90	15.8	214.5	0.40
					1	17.5	8.14	9.32	97.50	334.60	16.2	219.7	
					2	17.5	8.13	9.32	97.50	334.80	16.3	220.7	
					3	17.5	8.12	9.30	97.20	335.20	16.2	222.5	
					4	17.4	8.13	9.30	97.20	335.40	16.1	223.9	
					5	17.4	8.14	9.30	97.20	335.60	15.7	224.7	
					6	17.4	8.14	9.29	97.10	335.80	16.5	225.6	
					7	17.4	8.14	9.29	96.90	335.90	16.3	226.1	
					8	17.4	8.15	9.28	96.90	336.10	16.1	226.6	
					9	17.4	8.15	9.27	96.80	335.90	15.7	227.1	
					10	17.4	8.15	9.27	96.80	336.20	16.5	227.8	
					11	17.4	8.15	9.26	96.60	336.00	16.3	228.2	
					12	17.4	8.15	9.25	96.60	336.00	16.4	228.5	
					13	17.4	8.15	9.25	96.50	336.30	16.6	228.9	
					14	17.4	8.15	9.24	96.40	336.30	16.0	229.1	
					15	17.4	8.16	9.24	96.40	336.30	15.4	229.4	
					16	17.4	8.16	9.22	96.30	336.30	15.8	229.8	

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
					17	17.4	8.16	9.22	96.20	336.50	16.1	230.1	
					18	17.4	8.15	9.21	96.10	336.50	17.3	230.4	
					19	17.4	8.15	9.20	96.00	336.70	17.4	230.7	
					20	17.4	8.16	9.20	95.90	336.60	17.1	231.0	
					22	17.3	8.15	9.18	95.80	336.50	18.4	231.6	
Stephens Lake - Farfield # 2	FF-2	28-Jul-14	10:00	15.5	0.3	17.5	8.23	9.53	99.60	339.10	15.0	230.2	0.38
					1	17.5	8.22	9.49	99.20	339.20	15.8	231.2	
					2	17.4	8.21	9.48	99.00	339.20	16.0	231.6	
					3	17.4	8.2	9.46	98.90	339.00	15.4	232.2	
					4	17.4	8.2	9.46	98.80	339.20	15.4	232.5	
					5	17.4	8.2	9.45	98.70	339.00	15.3	232.8	
					6	17.4	8.2	9.42	98.40	339.20	15.3	233.3	
					7	17.4	8.2	9.41	98.20	339.30	15.5	233.4	
					8	17.4	8.19	9.39	98.00	339.30	15.9	233.8	
					9	17.4	8.19	9.38	97.90	339.20	15.7	234.1	
					10	17.4	8.19	9.37	97.80	339.30	15.5	234.3	
					11	17.4	8.19	9.37	97.70	339.40	15.5	234.5	
					12	17.4	8.19	9.35	97.60	339.30	15.8	234.8	
					13	17.4	8.19	9.35	97.50	339.30	15.6	235.1	
					14	17.4	8.19	9.32	97.30	339.30	15.8	235.3	
Stephens Lake - Farfield # 3	FF-3	28-Jul-14	10:55	26.2	0.3	17.7	8.27	9.66	101.50	339.80	15.1	233.6	0.35
					1	17.7	8.27	9.66	101.50	339.90	16.4	233.7	
					2	17.6	8.25	9.60	100.70	339.90	16.5	234.7	
					3	17.5	8.23	9.51	99.40	340.10	15.5	235.3	

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
					4	17.5	8.22	9.49	99.20	340.30	15.4	235.8	
					5	17.5	8.22	9.48	99.10	340.00	15.2	236.2	
					6	17.4	8.24	9.47	98.90	340.40	15.4	205.6	
					7	17.4	8.23	9.45	98.80	340.60	15.0	207.2	
					8	17.4	8.23	9.44	98.60	340.50	16.3	209.4	
					9	17.4	8.23	9.43	98.60	340.50	16.0	210.8	
					10	17.4	8.23	9.43	98.50	340.30	14.8	211.6	
					11	17.4	8.22	9.41	98.40	340.50	15.3	213.8	
					12	17.4	8.22	9.41	98.30	340.60	15.0	214.7	
					13	17.4	8.22	9.40	98.20	340.70	15.9	215.8	
					14	17.4	8.22	9.39	98.10	340.40	15.3	216.8	
					15	17.4	8.22	9.38	98.00	340.50	16.2	217.5	
					16	17.4	8.21	9.37	97.90	340.60	15.7	218.5	
					17	17.4	8.21	9.36	97.80	340.60	16.0	219.2	
					18	17.4	8.21	9.35	97.70	340.70	15.6	219.8	
					19	17.4	8.21	9.34	97.60	340.90	15.8	221.5	0.35
Stephens Lake - Farfield # 3	FF-3	28-Jul-14	10:55	26.2	20	17.4	8.21	9.33	97.50	340.60	15.8	222.2	
					22	17.4	8.2	9.31	97.30	340.70	16.1	223.4	
					24	17.4	8.2	9.30	97.10	340.90	16.0	224.2	
Stephens Lake - Farfield # 4	FF-4	28-Jul-14	10:30	13.3	0.3	17.6	8.27	9.57	100.20	339.20	15.1	229.1	0.30
					1	17.6	8.26	9.57	100.30	339.50	15.7	229.6	
					2	17.5	8.25	9.54	99.80	339.50	16.5	230.2	
					3	17.5	8.24	9.49	99.20	339.40	15.7	230.9	
					4	17.5	8.24	9.47	99.00	339.50	15.4	231.6	

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
					5	17.4	8.23	9.46	98.90	339.40	15.2	232.1	
					6	17.4	8.22	9.44	98.70	339.40	15.8	233.3	
					7	17.4	8.21	9.43	98.50	339.50	16.0	233.8	
					8	17.4	8.21	9.42	98.40	339.70	16.6	234.0	
					9	17.4	8.21	9.41	98.30	339.70	16.0	234.5	
					10	17.4	8.21	9.39	98.10	339.50	16.7	234.9	
					11	17.4	8.2	9.37	97.90	339.60	16.9	235.3	
					12	17.4	8.2	9.36	97.90	339.60	16.8	235.4	
					13	17.4	8.2	9.33	97.50	339.60	17.9	235.7	
Stephens Lake - Farfield # 5	FF-5	28-Jul-14	9:30	11.7	0.3	17.4	8.25	9.47	98.90	337.40	15.1	231.0	0.38
					1	17.4	8.24	9.46	98.80	337.70	16.0	231.6	
					2	17.3	8.22	9.44	98.50	337.70	15.9	232.2	
					3	17.3	8.21	9.40	98.00	337.70	15.7	232.9	
					4	17.3	8.2	9.38	97.80	337.83	16.1	233.6	
					5	17.3	8.2	9.37	97.70	338.00	15.9	234.0	
					6	17.3	8.2	9.36	97.60	338.10	15.8	234.2	
					7	17.3	8.2	9.35	97.40	338.10	16.0	234.8	
					8	17.3	8.2	9.34	97.30	338.00	16.4	234.9	
					9	17.3	8.19	9.32	97.10	338.50	17.1	235.2	
					10	17.3	8.19	9.31	97.10	338.20	17.1	235.2	
					11	17.3	8.19	9.30	96.90	338.50	17.6	235.7	
Nelson River - Upstream # 1	US-1	27-Aug-14	13:10	12.4	0.1	16.1	8.29	9.40	95.50	368.90	23.9	203.0	-
Nelson River - Upstream # 2	US-2	27-Aug-14	12:15	8.9	0.1	16.2	8.27	9.37	95.40	372.90	24.9	193.0	-
Nelson River - Upstream # 3	US-3	27-Aug-14	12:35	10.4	0.1	16.2	8.29	9.40	95.50	369.60	24.3	198.0	-

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
Nelson River - Upstream # 4	US-4	27-Aug-14	12:50	12.2	0.1	16.1	8.29	9.40	95.60	369.20	24.2	200.0	-
Nelson River - Upstream # 5	US-5	27-Aug-14	11:20	9.8	0.1	16.1	8.26	9.39	95.40	370.30	24.2	178.8	-
Stephens Lake - Nearfield # 1	NF-1	26-Aug-14	17:50	17.7	0.3	16.7	8.33	9.85	101.30	369.80	25.6	221.0	0.25
					1	16.6	8.32	9.82	101.00	370.00	26.4	222.0	
					2	16.6	8.31	9.78	100.40	369.80	24.5	222.0	
					3	16.5	8.29	9.69	99.10	370.00	25.4	223.0	
					4	16.3	8.29	9.63	98.60	370.10	29.1	223.0	
					5	16.3	8.28	9.61	98.10	370.10	26.3	224.0	
					6	16.3	8.27	9.61	98.10	370.20	25.9	224.0	
					7	16.3	8.27	9.60	98.00	370.20	26.1	224.0	
					8	16.3	8.27	9.59	97.90	370.20	26.1	225.0	
					9	16.3	8.27	9.59	98.00	370.20	26.7	225.0	
					10	16.3	8.27	9.59	97.80	370.20	26.3	225.0	
					11	16.3	8.27	9.58	97.80	370.50	26.3	225.0	
					12	16.3	8.27	9.58	97.70	370.50	26.2	225.0	
					13	16.3	8.27	9.57	97.60	370.60	26.7	225.0	
					14	16.3	8.27	9.56	97.50	370.70	26.9	225.0	
					15	16.3	8.28	9.55	97.50	370.80	27.2	226.0	
					16	16.3	8.27	9.55	97.40	370.70	25.8	226.0	
					17	16.3	8.27	9.54	97.30	370.70	26.9	226.0	
Stephens Lake - Nearfield # 2	NF-2	26-Aug-14	18:50	12.6	0.3	16.4	8.34	9.75	99.80	370.90	23.4	243.0	0.30
					1	16.4	8.34	9.73	99.50	370.80	26.1	242.0	
					2	16.3	8.32	9.65	98.50	370.70	27.7	242.0	
					3	16.3	8.31	9.59	97.80	370.80	25.2	242.0	

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
					4	16.2	8.31	9.56	97.50	370.80	24.3	242.0	
					5	16.2	8.3	9.56	97.50	370.80	25.2	242.0	
					6	16.2	8.3	9.54	97.20	370.90	26.9	242.0	
					7	16.2	8.3	9.52	97.10	370.90	26.3	241.0	
					8	16.2	8.3	9.52	96.90	370.90	28.0	241.0	
					9	16.2	8.29	9.48	96.50	371.00	28.9	241.0	
					10	16.1	8.3	9.45	96.10	371.20	26.7	241.0	
					11	16.1	8.3	9.43	95.80	371.30	27.6	241.0	
Stephens Lake - Nearfield # 3	NF-3	26-Aug-14	18:20	18.7	0.3	16.6	8.32	9.83	100.90	370.00	25.4	237.0	0.25
					1	16.6	8.31	9.81	100.70	370.20	24.8	237.0	
					2	16.6	8.31	9.80	100.60	370.20	25.3	236.0	
					3	16.5	8.31	9.79	100.40	370.20	25.5	236.0	
					4	16.5	8.3	9.79	99.80	370.10	25.4	236.0	
Stephens Lake - Nearfield # 3	NF-3	26-Aug-14	18:20	18.7	5	16.3	8.28	9.65	98.60	370.50	25.9	236.0	
					6	16.3	8.28	9.63	98.30	370.40	26.2	236.0	
					7	16.3	8.28	9.62	98.10	370.60	27.1	236.0	
					8	16.3	8.28	9.61	98.10	370.60	26.2	236.0	
					9	16.3	8.28	9.60	98.00	370.60	26.8	236.0	
					10	16.3	8.28	9.59	97.90	370.80	26.6	235.0	
					11	16.3	8.28	9.59	97.90	370.80	27.2	235.0	
					12	16.3	8.28	9.58	97.70	370.80	28.4	234.0	
					13	16.3	8.28	9.58	97.70	370.80	27.4	234.0	
					14	16.3	8.28	9.57	97.70	370.90	28.9	233.0	
					15	16.3	8.28	9.57	97.60	371.00	28.3	233.0	

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
					16	16.3	8.28	9.56	97.60	370.90	27.6	233.0	
					17	16.3	8.28	9.55	97.50	370.90	26.6	233.0	
Stephens Lake - Nearfield # 4	NF-4	26-Aug-14	19:11	6.1	0.3	16.3	8.32	9.69	99.00	370.50	24.5	247.0	0.25
					1	16.3	8.32	9.66	98.70	370.60	27.3	247.0	
					2	16.3	8.32	9.66	98.70	370.60	29.0	246.0	
					3	16.3	8.31	9.63	98.40	370.70	29.7	246.0	
					4	16.3	8.31	9.63	98.40	370.70	27.3	245.0	
					5	16.3	8.31	9.63	98.30	370.70	25.2	245.0	
Stephens Lake - Nearfield # 5	NF-5	26-Aug-14	17:25	18.6	0.3	16.5	8.33	9.74	99.90	368.60	23.9	190.0	0.28
					1	16.5	8.32	9.73	99.80	368.60	23.9	192.0	
					2	16.5	8.32	9.71	99.50	368.60	23.8	193.0	
					3	16.5	8.31	9.69	99.20	368.70	25.1	195.0	
					4	16.5	8.31	9.67	99.10	368.70	23.8	196.0	
					5	16.4	8.3	9.63	98.50	368.80	24.6	198.0	
					6	16.3	8.29	9.58	97.90	368.70	24.7	199.0	
					7	16.3	8.28	9.55	97.40	368.70	24.6	200.0	
					8	16.3	8.28	9.54	97.30	368.60	24.3	201.0	
					9	16.3	8.27	9.54	97.30	368.80	24.8	202.0	
					10	16.3	8.27	9.52	97.10	368.80	24.4	203.0	
					11	16.3	8.27	9.51	97.00	368.90	25.0	203.0	
					12	16.3	8.27	9.50	97.00	369.00	24.2	205.0	
					13	16.3	8.26	9.50	96.90	369.00	24.2	205.0	
					14	16.3	8.26	9.49	96.80	368.90	24.4	206.0	
					15	16.3	8.27	9.48	96.70	369.00	24.5	206.0	

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
Stephens Lake - Nearfield # 5	NF-5	26-Aug-14	17:25	18.6	16	16.3	8.27	9.47	96.60	369.20	24.0	207.0	
					17	16.3	8.27	9.46	96.40	369.10	24.1	207.0	
Stephens Lake - Farfield # 1	FF-1	26-Aug-14	14:00	21.4	0.3	17.1	8.31	9.65	100.20	369.90	26.2	222.0	0.33
					1	16.6	8.28	9.47	97.20	369.50	22.4	223.0	
					2	16.5	8.27	9.44	96.60	369.60	24.7	224.0	
					3	16.3	8.25	9.31	95.00	368.50	23.7	225.0	
					4	16.2	8.25	9.30	94.70	368.40	26.1	226.0	
					5	16.2	8.26	9.27	94.50	368.40	23.0	227.0	
					6	16.2	8.25	9.26	94.40	368.30	23.2	227.0	
					7	16.2	8.25	9.26	94.30	368.30	21.9	228.0	
					8	16.2	8.25	9.25	94.30	368.30	26.6	228.0	
					9	16.2	8.25	9.25	94.20	368.30	22.8	228.0	
					10	16.2	8.25	9.24	94.10	368.30	23.0	228.0	
					11	16.2	8.25	9.22	93.90	367.90	26.5	229.0	
					12	16.2	8.25	9.23	94.00	368.30	27.8	229.0	
					13	16.2	8.26	9.21	93.70	367.90	23.7	229.0	
					14	16.1	8.25	9.19	93.40	367.00	22.6	229.0	
					15	16.1	8.25	9.18	93.20	366.90	22.7	230.0	
					16	16.1	8.26	9.17	93.10	366.70	22.6	231.0	
					17	16.0	8.26	9.17	93.00	366.60	23.0	231.0	
					18	16.0	8.26	9.17	92.90	366.40	21.2	232.0	
					19	16.0	8.26	9.17	92.90	366.30	20.6	231.0	
					20	16.0	8.26	9.17	92.90	366.30	20.1	232.0	
Stephens Lake - Farfield # 2	FF-2	26-Aug-14	15:10	16.4	0.3	18.2	8.33	9.61	102.00	371.90	23.0	221.0	0.28

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
					1	16.6	8.28	9.40	96.60	371.20	22.2	224.0	
					2	16.6	8.26	9.30	95.40	371.30	22.5	225.0	
					3	16.5	8.25	9.27	95.10	371.30	24.3	226.0	
					4	16.5	8.25	9.26	94.90	371.30	22.5	227.0	
					5	16.5	8.25	9.25	94.80	371.20	27.7	227.0	
					6	16.5	8.25	9.24	94.70	371.20	24.4	228.0	
					7	16.5	8.25	9.23	94.60	370.90	24.0	229.0	
					8	16.5	8.25	9.22	94.50	370.90	23.9	229.0	
					9	16.5	8.25	9.22	94.40	370.90	25.3	229.0	
					10	16.5	8.25	9.21	94.40	370.90	24.9	229.0	
					11	16.5	8.25	9.21	94.30	370.90	22.7	230.0	
Stephens Lake - Farfield # 2	FF-2	26-Aug-14	15:10	16.4	12	16.5	8.25	9.21	94.30	370.80	22.9	230.0	
					13	16.5	8.25	9.20	94.20	370.90	23.8	230.0	
					14	16.5	8.25	9.19	94.10	371.00	24.1	230.0	
					15	16.5	8.25	9.19	94.10	370.90	23.8	231.0	
Stephens Lake - Farfield # 3	FF-3	26-Aug-14	16:15	26.1	0.3	17.7	8.37	9.82	102.90	371.70	22.4	229.0	-
					1	17.2	8.34	9.59	99.40	371.60	24.5	230.0	-
					2	16.7	8.3	9.45	97.50	371.60	22.4	231.0	-
					3	16.7	8.29	9.42	96.80	371.50	22.0	232.0	-
					4	16.6	8.29	9.38	96.40	371.60	26.3	232.0	-
					5	16.5	8.28	9.34	95.80	371.60	23.0	233.0	-
					6	16.5	8.27	9.29	95.20	371.70	22.2	233.0	-
					7	16.5	8.27	9.28	94.90	371.70	26.6	234.0	-
					8	16.4	8.27	9.28	94.90	371.70	23.1	234.0	-

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
					9	16.4	8.27	9.27	94.80	371.00	27.1	234.0	-
					10	16.4	8.27	9.27	94.80	371.70	24.5	234.0	-
					11	16.4	8.27	9.27	94.70	371.80	23.7	234.0	-
					12	16.4	8.27	9.27	94.70	371.90	23.7	234.0	-
					13	16.4	8.26	9.26	94.70	371.80	23.5	235.0	-
					14	16.4	8.26	9.27	94.60	372.00	23.4	235.0	-
					15	16.3	8.27	9.26	94.60	372.00	27.7	235.0	-
					16	16.3	8.27	9.27	94.70	372.00	23.6	235.0	-
					17	16.3	8.27	9.27	94.60	371.90	24.2	235.0	-
					18	16.3	8.27	9.26	94.60	371.90	29.4	235.0	-
					19	16.3	8.27	9.26	94.60	372.00	24.0	235.0	-
					20	16.3	8.27	9.26	94.60	372.00	23.9	235.0	-
					22	16.3	8.27	9.25	94.50	372.00	23.8	235.0	-
					24	16.3	8.27	9.25	94.40	372.00	23.7	235.0	-
Stephens Lake - Farfield # 4	FF-4	26-Aug-14	15:40	15.1	0.3	17.5	8.36	9.69	100.90	373.10	22.1	227.0	0.25
					1	16.6	8.29	9.32	95.80	371.90	26.3	229.0	
					2	16.6	8.26	9.28	95.20	371.70	28.8	229.0	
					3	16.6	8.25	9.27	95.10	371.70	23.4	229.0	
					4	16.6	8.24	9.26	95.00	371.70	23.2	230.0	
					5	16.6	8.23	9.25	94.90	371.70	23.1	231.0	
					6	16.6	8.24	9.24	94.80	371.70	23.4	232.0	
					7	16.6	8.24	9.23	94.70	371.80	25.2	232.0	
Stephens Lake - Farfield # 4	FF-4	26-Aug-14	15:40	15.1	8	16.5	8.24	9.22	94.50	371.80	23.5	232.0	
					9	16.4	8.24	9.23	94.40	371.90	24.7	233.0	

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
					10	16.4	8.24	9.23	94.30	371.90	24.6	233.0	
					11	16.3	8.25	9.23	94.20	372.00	27.2	233.0	
					12	16.3	8.25	9.20	93.90	372.10	26.0	233.0	
Stephens Lake - Farfield # 5	FF-5	26-Aug-14	14:40	12.8	0.3	17.5	8.37	9.88	103.40	370.70	24.4	229.0	0.23
					1	17.2	8.37	9.87	102.10	369.20	22.2	229.0	
					2	16.5	8.3	9.53	97.70	369.70	22.6	231.0	
					3	16.3	8.26	9.34	95.40	370.10	24.3	232.0	
					4	16.3	8.26	9.32	95.10	370.00	24.0	232.0	
					5	16.3	8.25	9.30	94.90	370.20	24.6	234.0	
					6	16.3	8.25	9.29	94.90	370.10	23.1	234.0	
					7	16.3	8.25	9.28	94.70	370.00	24.3	235.0	
					8	16.3	8.25	9.27	94.60	370.00	23.3	235.0	
					9	16.3	8.25	9.26	94.50	369.90	27.7	236.0	
					10	16.3	8.25	9.24	94.30	369.90	25.1	236.0	
					11	16.3	8.25	9.24	94.30	370.00	24.7	236.0	
					12	16.3	8.25	9.23	94.20	370.00	25.8	236.0	
Nelson River - Upstream # 1	US-1	25-Sep-14	11:45	13.1	0.1	10.6	8.43	11.05	99.30	339.90	10.2	179.3	-
Nelson River - Upstream # 2	US-2	25-Sep-14	12:10	8.8	0.1	10.6	8.28	11.10	100.00	341.30	10.2	200.8	-
Nelson River - Upstream # 3	US-3	25-Sep-14	13:05	11.6	0.1	10.6	8.31	11.11	100.00	341.10	10.2	205.3	-
Nelson River - Upstream # 4	US-4	25-Sep-14	12:45	11.3	0.1	10.7	8.31	11.06	99.60	339.50	10.0	200.8	-
Nelson River - Upstream # 5	US-5	25-Sep-14	13:30	10.7	0.1	10.6	8.33	11.11	100.00	340.80	10.1	171.2	-
Stephens Lake - Nearfield # 1	NF-1	24-Sep-14	17:00	17.9	0.3	10.8	8.37	11.51	104.00	334.90	11.6	223.1	0.50
					1.0	10.7	8.36	11.42	102.90	335.20	12.5	223.9	
					2.0	10.7	8.35	11.39	102.60	338.00	12.5	224.3	

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
					3.0	10.6	8.35	11.37	102.40	337.80	10.7	224.4	
					4.0	10.6	8.34	11.34	101.90	338.20	10.8	224.9	
					5.0	10.6	8.34	11.32	101.80	338.20	11.0	225.1	
					6.0	10.6	8.34	11.30	101.60	338.30	10.9	225.4	
					7.0	10.5	8.33	11.26	101.00	339.40	10.7	225.6	
					8.0	10.5	8.33	11.25	100.80	339.30	10.8	225.9	
					9.0	10.5	8.33	11.24	100.80	339.40	10.9	226.0	
					10.0	10.5	8.33	11.22	100.60	339.80	10.7	226.2	
					11.0	10.5	8.33	11.21	100.50	339.70	10.8	226.3	
Stephens Lake - Nearfield # 1	NF-1	24-Sep-14	17:00	17.9	12.0	10.5	8.33	11.20	100.40	340.00	11.3	226.4	
					13.0	10.5	8.33	11.19	100.30	339.80	10.9	226.5	
					14.0	10.5	8.33	11.18	100.20	340.00	10.9	226.6	
					15.0	10.5	8.33	11.17	100.20	340.30	10.9	226.7	
					16.0	10.5	8.32	11.16	100.00	340.00	10.7	226.8	
Stephens Lake - Nearfield # 2	NF-2	24-Sep-14	18:20	13	0.3	10.7	8.37	11.31	101.90	339.00	11.0	222.6	0.50
					1.0	10.7	8.36	11.32	102.00	339.40	11.5	224.3	
					2.0	10.6	8.34	11.27	101.30	339.90	12.8	225.1	
					4.0	10.5	8.33	11.22	100.70	340.30	10.5	225.9	
					6.0	10.5	8.33	11.20	100.50	340.60	10.9	226.5	
					8.0	10.5	8.33	11.18	100.30	340.80	10.8	226.9	
					10.0	10.5	8.32	11.16	100.10	340.70	10.5	227.4	
					12.0	10.5	8.32	11.13	99.80	340.80	10.8	227.9	
Stephens Lake - Nearfield # 3	NF-3	24-Sep-14	17:40	19.3	0.3	10.8	8.37	11.41	103.00	337.10	10.3	225.2	0.55
					1.0	10.7	8.35	11.35	102.10	338.00	12.3	226.0	

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
					2.0	10.6	8.34	11.32	101.70	338.60	10.7	226.4	
					4.0	10.5	8.34	11.27	101.20	338.90	10.7	226.9	
					6.0	10.5	8.33	11.24	100.90	339.50	11.0	227.3	
					8.0	10.5	8.33	11.23	100.80	339.70	10.8	227.6	
					10.0	10.5	8.33	11.21	100.50	339.80	11.0	227.8	
					12.0	10.5	8.33	11.19	100.30	340.10	10.9	228.3	
					14.0	10.5	8.33	11.17	100.20	340.00	11.0	228.5	
					16.0	10.5	8.33	11.15	100.00	340.00	10.7	228.8	
					18.0	10.5	8.33	11.13	99.80	340.40	10.9	229.0	
Stephens Lake - Nearfield # 4	NF-4	24-Sep-14	18:40	6.6	0.3	10.7	8.34	11.29	101.60	339.90	10.6	233.2	0.53
					1.0	10.6	8.34	11.29	101.60	340.40	12.1	233.1	
					2.0	10.6	8.34	11.28	101.50	340.20	12.3	233.1	
					3.0	10.6	8.34	11.28	101.50	340.50	10.4	233.0	
					4.0	10.6	8.33	11.26	101.30	340.70	10.2	233.2	
					5.0	10.6	8.33	11.25	101.20	340.50	12.2	233.2	
					6.0	10.6	8.33	11.25	101.10	340.80	10.3	233.3	
Stephens Lake - Nearfield # 5	NF-5	24-Sep-14	16:20	19.5	0.3	11.1	8.4	11.50	104.90	337.80	10.1	207.5	0.53
					1	10.8	8.37	11.39	102.80	338.30	11.0	209.4	
					2	10.6	8.36	11.34	102.10	338.10	10.7	210.8	
					4	10.5	8.34	11.27	101.20	338.50	11.9	212.2	
Stephens Lake - Nearfield # 5	NF-5	24-Sep-14	16:20	19.5	6	10.5	8.33	11.24	100.80	338.90	10.8	213.3	
					8	10.5	8.33	11.21	100.50	339.00	10.7	214.1	
					10	10.5	8.32	11.20	100.40	339.30	12.4	214.8	
					12	10.5	8.32	11.17	100.10	339.30	10.6	215.5	

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
					14	10.5	8.32	11.16	100.00	339.40	12.7	216.0	
					16	10.4	8.32	11.14	99.80	339.50	12.4	217.1	
					18	10.4	8.32	11.12	99.60	339.80	10.7	217.3	
Stephens Lake - Farfield # 1	FF-1	24-Sep-14	13:40	22.4	0.3	10.8	8.24	11.04	99.50	339.00	9.7	192.7	0.50
					1	10.5	8.24	11.03	99.10	339.60	11.1	198.5	
					2	10.3	8.21	11.00	98.20	340.00	11.0	202.5	
					4	10.3	8.19	10.98	98.00	340.80	10.6	205.7	
					6	10.2	8.18	10.94	97.40	341.10	10.7	208.7	
					8	10.1	8.18	10.91	97.10	341.30	10.8	210.5	
					10	10.1	8.21	10.87	96.80	340.40	11.2	216.8	
					12	10.2	8.21	10.87	96.70	341.10	11.0	217.6	
					14	10.1	8.2	10.86	96.60	341.60	10.5	218.3	
					16	10.1	8.2	10.85	96.50	341.50	11.0	218.9	
					18	10.1	8.2	10.84	96.40	341.70	10.7	219.7	
					20	10.1	8.2	10.82	96.20	341.50	11.5	220.4	
Stephens Lake - Farfield # 2	FF-2	24-Sep-14	14:40	16.6	0.3	11.4	8.38	11.27	103.20	339.40	9.5	257.3	0.50
					1	11.1	8.37	11.29	102.60	340.70	10.7	258.5	
					2	10.5	8.34	11.18	100.30	341.10	11.3	260.2	
					4	10.3	8.3	11.08	99.00	341.30	10.5	262.1	
					6	10.3	8.29	11.06	98.80	341.80	10.5	263.4	
					8	10.3	8.28	11.04	98.60	341.90	10.2	264.3	
					10	10.3	8.27	11.01	98.30	342.00	10.6	264.9	
					12	10.3	8.27	10.99	98.20	342.10	10.5	265.1	
					14	10.3	8.27	10.97	97.90	342.10	10.4	265.4	

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
Stephens Lake - Farfield # 3	FF-3	24-Sep-14	15:30	27.2	0.3	11.6	8.37	11.33	104.10	341.00	9.3	237.7	0.55
					1	11.1	8.37	11.35	102.90	341.30	10.8	238.2	
					2	10.4	8.35	11.29	101.30	342.70	11.0	239.9	
					4	10.3	8.31	11.11	99.20	342.70	11.2	242.1	
					6	10.3	8.3	11.08	98.90	342.60	10.9	242.5	
					8	10.3	8.3	11.05	98.70	343.90	10.6	242.8	
					10	10.3	8.29	11.03	98.40	342.90	10.9	243.8	
Stephens Lake - Farfield # 3	FF-3	24-Sep-14	15:30	27.2	12	10.3	8.29	11.02	98.30	343.00	10.4	243.7	
					14	10.3	8.28	11.00	98.20	343.00	11.1	244.0	
					16	10.3	8.28	10.99	98.10	343.20	10.4	244.0	
					18	10.3	8.28	10.97	97.90	343.10	10.7	244.0	
					20	10.3	8.28	10.95	97.70	343.30	12.1	244.1	
					22	10.3	8.28	10.94	97.60	343.20	10.4	244.1	
					24	10.3	8.27	10.92	97.50	343.20	11.1	243.9	
					26	10.3	8.27	10.91	97.30	343.40	11.1	243.7	
Stephens Lake - Farfield # 4	FF-4	24-Sep-14	15:05	14.7	0.3	11.4	8.38	11.29	103.60	339.70	9.4	238.6	0.48
					1	11.3	8.36	11.32	102.50	340.40	9.6	240.5	
					2	11.4	8.35	11.22	100.50	341.80	10.1	242.2	
					4	10.4	8.32	11.11	99.40	341.50	10.5	244.4	
					6	10.3	8.31	11.08	99.00	341.60	10.9	245.9	
					8	10.3	8.3	11.04	98.50	342.00	11.9	246.8	
					10	10.3	8.29	11.01	98.30	342.00	11.2	247.5	
					12	10.3	8.28	10.98	98.00	342.20	11.4	248.5	
					13	10.3	8.28	10.97	97.90	342.30	11.2	248.7	

Table A1- 1: In situ parameters measured in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site ID	Sample Date	Sample Time	Total Water Depth (m)	Sample Depth (m)	Temperature (°C)	pH (pH units)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Specific Conductance (µS/cm)	Turbidity (NTU)	ORP (mV)	Secchi Disk Depth (m)
Stephens Lake - Farfield # 5	FF-5	24-Sep-14	14:20	13.1	0.3	10.9	8.34	11.23	101.90	339.70	10.2	290.9	0.48
					1	10.6	8.32	11.23	101.00	340.50	10.7	294.4	
					2	10.4	8.3	11.13	99.60	341.00	12.5	296.0	
					4	10.2	8.28	11.03	98.30	341.30	11.0	296.5	
					6	10.2	8.27	10.97	97.60	341.50	11.1	297.0	
					8	10.2	8.25	10.94	97.40	341.70	11.2	297.4	
					10	10.1	8.25	10.91	97.10	341.60	11.6	297.2	
					12	10.1	8.25	10.89	96.90	341.70	13.3	296.6	

Table A1- 2: Routine water chemistry parameters measured in the laboratory for sites monitored in the Keeyask local study area during the open-water season of 2014. Values in blue italics are considered suspect.

				Alkalinity				Nitrogen							
Sample Location	Site ID	Sample Date	Sample Time	Total (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Ammonia (mg N/L)	Nitrate and Nitrite (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Total Kjeldahl (mg/L)	Dissolved Inorganic [1] (mg/L)	Total Organic [2] (mg/L)	Total [3] (mg/L)
Detection Limit 2014				**1.0/20**	**1.2/24**	**0.60/12**	**0.34/6.8**	**0.010**	**0.0051**	**0.0050**	**0.0010**	**0.20**			
Nelson River - Upstream # 1	US-1	27-Jul-14	18:10	101	124	<12	<6.8	<0.010	0.0054	0.0054	<0.0010	0.47	0.0104	0.465	0.48
Nelson River - Upstream # 2	US-2	27-Jul-14	16:40	101	124	<12	<6.8	<0.010	<0.0051	<0.0050	<0.0010	0.49	0.0076	0.485	0.49
Nelson River - Upstream # 3	US-3	27-Jul-14	16:05	101	124	<12	<6.8	<0.010	<0.0051	<0.0050	<0.0010	0.48	0.0099	0.476	0.49
Nelson River - Upstream # 4	US-4	27-Jul-14	17:30	101	123	<12	<6.8	<0.010	0.0054	0.0054	<0.0010	0.46	0.0104	0.455	0.47
Nelson River - Upstream # 5	US-5	27-Jul-14	17:10	101	124	<12	<6.8	<0.010	<0.0051	<0.0050	<0.0010	0.54	0.0076	0.535	0.54
Stephens Lake - Nearfield # 1	NF-1	28-Jul-14	13:55	102	124	<12	<6.8	<0.010	<0.0051	<0.0050	<0.0010	0.53	0.0076	0.525	0.53
Stephens Lake - Nearfield # 2	NF-2	28-Jul-14	15:20	102	124	<12	<6.8	<0.010	0.0204	0.0204	<0.0010	0.52	0.0254	0.515	0.54
Stephens Lake - Nearfield # 3	NF-3	28-Jul-14	14:40	102	124	<12	<6.8	0.027	<0.0051	<0.0050	<0.0010	0.52	0.0296	0.493	0.52
Stephens Lake - Nearfield # 4	NF-4	28-Jul-14	13:50	102	124	<12	<6.8	<0.010	<0.0051	<0.0050	<0.0010	0.53	0.0076	0.525	0.53
Stephens Lake - Nearfield # 5	NF-5	28-Jul-14	13:10	102	124	<12	<6.8	<0.010	<0.0051	<0.0050	<0.0010	0.51	0.0076	0.505	0.51
Stephens Lake - Farfield # 1	FF-1	28-Jul-14	8:45	102	124	<12	<6.8	<0.010	<0.0051	<0.0050	<0.0010	0.52	0.0076	0.515	0.52
Stephens Lake - Farfield # 2	FF-2	28-Jul-14	10:00	101	124	<12	<6.8	<0.010	0.0054	0.0054	<0.0010	0.49	0.0104	0.485	0.50
Stephens Lake - Farfield # 3	FF-3	28-Jul-14	10:55	101	124	<12	<6.8	<0.010	<0.0051	<0.0050	<0.0010	0.52	0.0076	0.515	0.52
Stephens Lake - Farfield # 4	FF-4	28-Jul-14	10:30	101	123	<12	<6.8	0.011	<0.0051	<0.0050	<0.0010	0.52	0.0136	0.509	0.52
Stephens Lake - Farfield # 5	FF-5	28-Jul-14	9:30	101	124	<12	<6.8	<0.010	<0.0051	<0.0050	<0.0010	0.50	0.0076	0.495	0.50
Nelson River Upstream # 1	US-1	27-Aug-14	13:10	113	138	<12	<6.8	<0.010	0.0452	0.0424	0.0029	0.54	0.0502	0.535	0.59
Nelson River Upstream # 2	US-2	27-Aug-14	12:15	114	138	<12	<6.8	0.010	0.0454	0.0425	0.0029	0.55	0.0554	0.540	0.60
Nelson River Upstream # 3	US-3	27-Aug-14	12:35	113	138	<12	<6.8	0.012	0.0431	0.0403	0.0028	0.51	0.0551	0.498	0.55
Nelson River Upstream # 4	US-4	27-Aug-14	12:50	113	138	<12	<6.8	<0.010	0.0457	0.0429	0.0028	0.55	0.0507	0.545	0.60
Nelson River Upstream # 5	US-5	27-Aug-14	11:20	113	138	<12	<6.8	<0.010	0.0460	0.0429	0.0030	0.50	0.0530	0.496	0.55

Table A1- 2: Routine water chemistry parameters measured in the laboratory for sites monitored in the Keeyask local study area during the open-water season of 2014. Values in blue italics are considered suspect.

				Alkalinity				Nitrogen							
Sample Location	Site ID	Sample Date	Sample Time	Total (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Ammonia (mg N/L)	Nitrate and Nitrite (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Total Kjeldahl (mg/L)	Dissolved Inorganic [1] (mg/L)	Total Organic [2] (mg/L)	Total [3] (mg/L)
Detection Limit 2014				**1.0/20**	**1.2/24**	**0.60/12**	**0.34/6.8**	**0.010**	**0.0051**	**0.0050**	**0.0010**	**0.20**			
Stephens Lake - Nearfield # 1	NF-1	26-Aug-14	17:50	113	135	<12	<6.8	<0.010	0.0593	0.0552	0.0041	0.58	0.0643	0.575	0.64
Stephens Lake - Nearfield # 2	NF-2	26-Aug-14	18:50	113	133	<12	<6.8	<0.010	0.0572	0.0530	0.0043	0.56	0.0622	0.555	0.62
Stephens Lake - Nearfield # 3	NF-3	26-Aug-14	18:20	113	133	<12	<6.8	<0.010	0.0581	0.0539	0.0043	0.55	0.0631	0.545	0.61
Stephens Lake - Nearfield # 4	NF-4	26-Aug-14	19:11	112	132	<12	<6.8	<0.010	0.0597	0.0556	0.0042	0.52	0.0647	0.515	0.58
Stephens Lake - Nearfield # 5	NF-5	26-Aug-14	17:25	112	132	<12	<6.8	<0.010	0.0589	0.0541	0.0048	0.56	0.0639	0.555	0.62
Stephens Lake - Farfield # 1	FF-1	26-Aug-14	14:00	138	168	<12	<6.8	<0.010	0.0582	0.0536	0.0046	0.54	0.0632	0.535	0.60
Stephens Lake - Farfield # 2	FF-2	26-Aug-14	15:10	122	149	<12	<6.8	<0.010	0.0617	0.0569	0.0048	0.50	0.0667	0.495	0.56
Stephens Lake - Farfield # 3	FF-3	26-Aug-14	16:15	113	138	<12	<6.8	0.010	0.0539	0.0494	0.0045	0.59	0.0639	0.580	0.64
Stephens Lake - Farfield # 4	FF-4	26-Aug-14	15:40	113	138	<12	<6.8	<0.010	0.0581	0.0537	0.0045	0.54	0.0631	0.535	0.60
Stephens Lake - Farfield # 5	FF-5	26-Aug-14	14:40	113	138	<12	<6.8	<0.010	0.0563	0.0516	0.0048	0.59	0.0613	0.585	0.65
Nelson River Upstream # 1	US-1	25-Sep-14	11:45	108	132	<12	<6.8	<0.010	0.0085	0.0085	<0.0010	0.49	0.0135	0.485	0.50
Nelson River Upstream # 2	US-2	25-Sep-14	12:10	108	132	<12	<6.8	<0.010	0.0101	0.0101	<0.0010	0.50	0.0151	0.495	0.51
Nelson River Upstream # 3	US-3	25-Sep-14	13:05	108	132	<12	<6.8	<0.010	0.0084	0.0084	<0.0010	0.49	0.0134	0.485	0.50
Nelson River Upstream # 4	US-4	25-Sep-14	12:45	108	132	<12	<6.8	<0.010	0.0086	0.0086	<0.0010	0.52	0.0136	0.515	0.53
Nelson River Upstream # 5	US-5	25-Sep-14	13:30	108	132	<12	<6.8	<0.010	0.0082	0.0082	<0.0010	0.53	0.0132	0.525	0.54
Stephens Lake - Nearfield # 1	NF-1	24-Sep-14	17:00	107	131	<12	<6.8	<0.010	0.0066	0.0066	<0.0010	0.49	0.0116	0.485	0.50
Stephens Lake - Nearfield # 2	NF-2	24-Sep-14	18:20	108	131	<12	<6.8	<0.010	<0.0051	<0.0050	<0.0010	0.51	0.0076	0.505	0.51
Stephens Lake - Nearfield # 3	NF-3	24-Sep-14	17:40	107	131	<12	<6.8	*0.117*	<0.0051	<0.0050	<0.0010	0.49	0.120	0.373	0.49
Stephens Lake - Nearfield # 4	NF-4	24-Sep-14	18:40	108	132	<12	<6.8	0.011	0.0059	0.0059	<0.0010	0.48	0.0169	0.469	0.49
Stephens Lake - Nearfield # 5	NF-5	24-Sep-14	16:20	108	132	<12	<6.8	<0.010	<0.0051	<0.0050	<0.0010	0.52	0.0076	0.515	0.52

Table A1- 2: Routine water chemistry parameters measured in the laboratory for sites monitored in the Keeyask local study area during the open-water season of 2014. Values in blue italics are considered suspect.

				Alkalinity				Nitrogen							
Sample Location	Site ID	Sample Date	Sample Time	Total (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Ammonia (mg N/L)	Nitrate and Nitrite (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Total Kjeldahl (mg/L)	Dissolved Inorganic [1] (mg/L)	Total Organic [2] (mg/L)	Total [3] (mg/L)
Detection Limit 2014				**1.0/20**	**1.2/24**	**0.60/12**	**0.34/6.8**	**0.010**	**0.0051**	**0.0050**	**0.0010**	**0.20**			
Stephens Lake - Farfield # 1	FF-1	24-Sep-14	13:40	108	132	<12	<6.8	<0.010	0.0078	0.0078	<0.0010	0.41	0.0128	0.405	0.42
Stephens Lake - Farfield # 2	FF-2	24-Sep-14	14:40	108	132	<12	<6.8	<0.010	<0.0051	<0.0050	<0.0010	0.45	0.0076	0.445	0.45
Stephens Lake - Farfield # 3	FF-3	24-Sep-14	15:30	108	132	<12	<6.8	<0.010	0.0068	0.0068	<0.0010	0.45	0.0118	0.445	0.46
Stephens Lake - Farfield # 4	FF-4	24-Sep-14	15:05	108	132	<12	<6.8	<0.010	0.0074	0.0074	<0.0010	0.43	0.0124	0.425	0.44
Stephens Lake - Farfield # 5	FF-5	24-Sep-14	14:20	108	132	<12	<6.8	<0.010	0.0051	0.0051	<0.0010	0.48	0.0101	0.475	0.49

[1] Dissolved inorganic nitrogen calculated as ammonia + nitrate/nitrite
[2] Total organic nitrogen calculated as total Kjeldahl nitrogen –ammonia
[3] Total nitrogen calculated as total Kjeldahl nitrogen + nitrate/nitrite

Table A1-2: Continued.

			Phosphorus		N:P Molar Ratios			Carbon		C:N Molar Ratios				
Sample Location	Site ID	Sample Date	Total (mg/L)	Dissolved (mg/L)	TN:TP	DIN:DP	DIN:TP	Total Organic (mg/L)	Dissolved Organic (mg/L)	TOC:ON	TOC:TN	Lab pH (pH units)	Conductivity (µmhos/cm)	TDS (mg/L)
Detection Limit 2014			**0.0010/0.010**	**0.0010**				**1.0**	**1.0**			**0.10**	**1.0/20**	**5.0**
Nelson River - Upstream # 1	US-1	27-Jul-14	0.044	0.0087	24	3	1	10.2	10.3	26	25	8.27	332	219
Nelson River - Upstream # 2	US-2	27-Jul-14	0.046	0.0112	24	2	0	10.2	10.2	25	24	8.23	332	216
Nelson River - Upstream # 3	US-3	27-Jul-14	0.043	0.0101	25	2	1	10.4	10.4	25	25	8.42	332	213
Nelson River - Upstream # 4	US-4	27-Jul-14	0.047	0.0101	22	2	0	10.4	10.4	27	26	8.26	332	217
Nelson River - Upstream # 5	US-5	27-Jul-14	0.045	0.0105	27	2	0	10.2	10.1	22	22	8.27	333	214
Stephens Lake - Nearfield # 1	NF-1	28-Jul-14	0.048	0.0120	25	1	0	9.9	9.8	22	22	8.22	318	224
Stephens Lake - Nearfield # 2	NF-2	28-Jul-14	0.039	0.0115	31	5	1	10.2	10.0	23	22	8.20	320	218
Stephens Lake - Nearfield # 3	NF-3	28-Jul-14	0.040	0.0116	29	6	2	10.1	10.0	24	23	8.20	319	214
Stephens Lake - Nearfield # 4	NF-4	28-Jul-14	0.038	0.0124	31	1	0	10.3	10.0	23	23	8.22	320	216
Stephens Lake - Nearfield # 5	NF-5	28-Jul-14	0.043	0.0121	26	1	0	10.4	10.0	24	24	8.19	320	218
Stephens Lake - Farfield # 1	FF-1	28-Jul-14	0.039	0.0117	30	1	0	10.3	10.0	23	23	8.21	315	210
Stephens Lake - Farfield # 2	FF-2	28-Jul-14	0.036	0.0091	30	3	1	10.3	10.2	25	24	8.19	317	226
Stephens Lake - Farfield # 3	FF-3	28-Jul-14	0.037	0.0130	31	1	0	10.3	10.0	23	23	8.19	317	222
Stephens Lake - Farfield # 4	FF-4	28-Jul-14	0.035	0.0121	33	2	1	10.3	10.2	24	23	8.18	318	226
Stephens Lake - Farfield # 5	FF-5	28-Jul-14	0.034	0.0123	33	1	0	10.3	10.1	24	24	8.20	313	222
Nelson River Upstream # 1	US-1	27-Aug-14	0.051	0.0200	25	6	2	6.5	6.5	14	13	8.26	353	225
Nelson River Upstream # 2	US-2	27-Aug-14	0.053	0.0200	25	6	2	6.4	6.7	14	13	8.26	357	221
Nelson River Upstream # 3	US-3	27-Aug-14	0.060	0.0210	20	6	2	6.6	6.3	15	14	8.25	356	217
Nelson River Upstream # 4	US-4	27-Aug-14	0.052	0.0210	25	5	2	6.4	6.3	14	13	8.27	357	215
Nelson River Upstream # 5	US-5	27-Aug-14	0.054	0.0251	23	5	2	6.4	6.6	15	14	8.28	357	214
Stephens Lake - Nearfield # 1	NF-1	26-Aug-14	0.052	0.0200	27	7	3	6.5	6.5	13	12	8.34	365	228
Stephens Lake - Nearfield # 2	NF-2	26-Aug-14	0.048	0.0200	28	7	3	6.2	6.4	13	12	8.37	364	223

Table A1-2: Continued.

			Phosphorus		N:P Molar Ratios			Carbon		C:N Molar Ratios				
Sample Location	Site ID	Sample Date	Total (mg/L)	Dissolved (mg/L)	TN:TP	DIN:DP	DIN:TP	Total Organic (mg/L)	Dissolved Organic (mg/L)	TOC:ON	TOC:TN	Lab pH (pH units)	Conductivity (µmhos/cm)	TDS (mg/L)
Detection Limit 2014			**0.0010/0.010**	**0.0010**				**1.0**	**1.0**			**0.10**	**1.0/20**	**5.0**
Stephens Lake - Nearfield # 3	NF-3	26-Aug-14	0.047	0.0232	29	6	3	6.6	6.4	14	13	8.38	364	237
Stephens Lake - Nearfield # 4	NF-4	26-Aug-14	0.046	0.0200	28	7	3	6.3	6.4	14	13	8.37	364	223
Stephens Lake - Nearfield # 5	NF-5	26-Aug-14	0.052	0.0200	26	7	3	6.3	6.5	13	12	8.37	362	222
Stephens Lake - Farfield # 1	FF-1	26-Aug-14	0.048	0.0267	28	5	3	6.4	6.6	14	12	8.26	362	223
Stephens Lake - Farfield # 2	FF-2	26-Aug-14	0.047	0.0200	26	7	3	6.4	6.5	15	13	8.24	363	226
Stephens Lake - Farfield # 3	FF-3	26-Aug-14	0.052	0.0242	27	6	3	6.4	6.5	13	12	8.24	363	226
Stephens Lake - Farfield # 4	FF-4	26-Aug-14	0.054	0.0200	24	7	3	6.4	6.5	14	12	8.29	362	238
Stephens Lake - Farfield # 5	FF-5	26-Aug-14	0.049	0.0256	29	5	3	6.6	6.6	13	12	8.22	362	228
Nelson River Upstream # 1	US-1	25-Sep-14	0.028	0.0097	39	3	1	9.7	9.6	23	23	8.22	349	230
Nelson River Upstream # 2	US-2	25-Sep-14	0.030	0.0093	38	4	1	9.5	9.7	22	22	8.21	352	238
Nelson River Upstream # 3	US-3	25-Sep-14	0.030	0.0099	37	3	1	9.7	9.9	23	23	8.22	351	225
Nelson River Upstream # 4	US-4	25-Sep-14	0.030	0.0095	39	3	1	9.7	9.9	22	21	8.20	350	226
Nelson River Upstream # 5	US-5	25-Sep-14	0.029	0.0096	41	3	1	9.6	9.8	21	21	8.22	352	223
Stephens Lake - Nearfield # 1	NF-1	24-Sep-14	0.027	0.0101	42	3	1	10.1	9.7	24	24	8.19	350	207
Stephens Lake - Nearfield # 2	NF-2	24-Sep-14	0.021	0.0096	54	2	1	9.5	9.7	22	22	8.15	352	210
Stephens Lake - Nearfield # 3	NF-3	24-Sep-14	0.028	0.0115	39	23	9	9.8	9.8	31	23	8.20	350	210
Stephens Lake - Nearfield # 4	NF-4	24-Sep-14	0.022	0.0102	49	4	2	8.7	9.6	22	21	8.18	353	213
Stephens Lake - Nearfield # 5	NF-5	24-Sep-14	0.029	0.0084	40	2	1	9.5	9.7	22	21	8.21	352	224
Stephens Lake - Farfield # 1	FF-1	24-Sep-14	0.030	0.0122	31	2	1	9.7	9.8	28	27	8.20	353	210
Stephens Lake - Farfield # 2	FF-2	24-Sep-14	0.028	0.0117	36	1	1	9.8	9.8	26	25	8.18	353	206
Stephens Lake - Farfield # 3	FF-3	24-Sep-14	0.029	0.0111	35	2	1	9.6	9.8	25	25	8.20	354	212
Stephens Lake - Farfield # 4	FF-4	24-Sep-14	0.031	0.0110	31	2	1	9.6	9.9	26	26	8.20	353	210

Table A1-2: Continued.

			Phosphorus		N:P Molar Ratios			Carbon		C:N Molar Ratios				
Sample Location	Site ID	Sample Date	Total (mg/L)	Dissolved (mg/L)	TN:TP	DIN:DP	DIN:TP	Total Organic (mg/L)	Dissolved Organic (mg/L)	TOC:ON	TOC:TN	Lab pH (pH units)	Conductivity (µmhos/cm)	TDS (mg/L)
Detection Limit 2014			**0.0010/0.010**	**0.0010**				**1.0**	**1.0**			**0.10**	**1.0/20**	**5.0**
Stephens Lake - Farfield # 5	FF-5	24-Sep-14	0.025	0.0110	43	2	1	9.6	9.4	24	23	8.21	353	206

Table A1-2: Continued.

			Water Clarity			Algal Pigments	
Sample Location	**Site ID**	**Sample Date**	**TSS (mg/L)**	**Turbidity (NTU)**	**True Colour (CU)**	**Chlorophyll *a* (µg/L)**	**Phaeophytin *a* (µg/L)**
Detection Limit 2014			**2.0**	**0.10**	**5.0**	**0.10**	**0.10**
Nelson River - Upstream # 1	US-1	27-Jul-14	17.6	26.0	17.2	8.41	3.16
Nelson River - Upstream # 2	US-2	27-Jul-14	20.8	26.0	16.2	7.93	3.30
Nelson River - Upstream # 3	US-3	27-Jul-14	15.5	27.0	16.2	9.29	3.38
Nelson River - Upstream # 4	US-4	27-Jul-14	22.0	26.0	17.3	8.42	3.05
Nelson River - Upstream # 5	US-5	27-Jul-14	23.2	26.0	15.7	8.66	3.06
Stephens Lake - Nearfield # 1	NF-1	28-Jul-14	15.0	23.0	17.0	9.41	2.78
Stephens Lake - Nearfield # 2	NF-2	28-Jul-14	12.3	21.0	15.2	10.5	2.79
Stephens Lake - Nearfield # 3	NF-3	28-Jul-14	13.7	23.0	17.5	9.51	2.81
Stephens Lake - Nearfield # 4	NF-4	28-Jul-14	14.0	20.0	21.4	10.5	2.94
Stephens Lake - Nearfield # 5	NF-5	28-Jul-14	15.7	24.0	17.4	10.3	2.89
Stephens Lake - Farfield # 1	FF-1	28-Jul-14	10.7	23.0	15.4	8.13	2.69
Stephens Lake - Farfield # 2	FF-2	28-Jul-14	14.7	23.0	17.7	9.41	2.99
Stephens Lake - Farfield # 3	FF-3	28-Jul-14	13.7	23.0	21.4	9.00	3.11
Stephens Lake - Farfield # 4	FF-4	28-Jul-14	14.7	22.0	20.7	9.15	2.80
Stephens Lake - Farfield # 5	FF-5	28-Jul-14	15.3	21.0	20.3	8.18	2.86
Nelson River Upstream # 1	US-1	27-Aug-14	19.6	35.0	12.8	5.19	2.85
Nelson River Upstream # 2	US-2	27-Aug-14	20.8	33.0	11.8	4.52	2.57
Nelson River Upstream # 3	US-3	27-Aug-14	19.6	33.0	12.9	4.97	2.81
Nelson River Upstream # 4	US-4	27-Aug-14	22.4	34.0	12.6	5.10	2.70
Nelson River Upstream # 5	US-5	27-Aug-14	20.3	33.0	12.5	5.09	2.80
Stephens Lake - Nearfield # 1	NF-1	26-Aug-14	19.2	34.0	11.3	6.10	2.95
Stephens Lake - Nearfield # 2	NF-2	26-Aug-14	18.8	33.0	11.6	5.14	2.73
Stephens Lake - Nearfield # 3	NF-3	26-Aug-14	19.2	34.0	12.8	5.49	2.86
Stephens Lake - Nearfield # 4	NF-4	26-Aug-14	16.8	34.0	12.8	4.57	2.72

Table A1-2: Continued.

			17.6	32.0	11.8	5.29	2.59
Stephens Lake - Nearfield # 5	NF-5	26-Aug-14					
Stephens Lake - Farfield # 1	FF-1	26-Aug-14	14.0	31.0	13.4	6.33	2.38
Stephens Lake - Farfield # 2	FF-2	26-Aug-14	10.4	29.0	15.0	3.52	1.94
Stephens Lake - Farfield # 3	FF-3	26-Aug-14	13.2	29.0	11.1	8.74	3.05
Stephens Lake - Farfield # 4	FF-4	26-Aug-14	11.6	27.0	11.4	3.35	1.58
Stephens Lake - Farfield # 5	FF-5	26-Aug-14	15.2	30.0	12.3	8.05	3.48
Nelson River Upstream # 1	US-1	25-Sep-14	11.6	13.5	15.9	7.02	2.50
Nelson River Upstream # 2	US-2	25-Sep-14	11.2	13.5	13.5	5.91	2.02
Nelson River Upstream # 3	US-3	25-Sep-14	10.8	13.4	13.3	6.74	2.39
Nelson River Upstream # 4	US-4	25-Sep-14	9.6	13.4	12.6	6.15	1.97
Nelson River Upstream # 5	US-5	25-Sep-14	10.4	13.8	12.5	6.50	2.25
Stephens Lake - Nearfield # 1	NF-1	24-Sep-14	8.5	13.6	15.1	6.52	1.99
Stephens Lake - Nearfield # 2	NF-2	24-Sep-14	8.4	12.8	13.4	7.82	2.34
Stephens Lake - Nearfield # 3	NF-3	24-Sep-14	8.0	13.0	14.1	6.73	1.92
Stephens Lake - Nearfield # 4	NF-4	24-Sep-14	10.4	13.3	14.4	6.46	1.96
Stephens Lake - Nearfield # 5	NF-5	24-Sep-14	9.2	12.6	16.0	7.81	1.98
Stephens Lake - Farfield # 1	FF-1	24-Sep-14	7.2	12.6	13.7	3.84	1.16
Stephens Lake - Farfield # 2	FF-2	24-Sep-14	7.2	12.0	12.9	7.26	2.05
Stephens Lake - Farfield # 3	FF-3	24-Sep-14	5.2	11.8	12.4	7.14	1.95
Stephens Lake - Farfield # 4	FF-4	24-Sep-14	6.4	11.8	13.2	5.50	1.65
Stephens Lake - Farfield # 5	FF-5	24-Sep-14	7.2	12.2	13.7	6.17	1.92

Table A1- 3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the open-water season of 2014. Values in blue italics are considered suspect.

Sample Location	Site 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)	Cesium (mg/L)	Chloride (mg/L)	Chromium (mg/L)
Detection Limit 2014				**0.30**	**0.0050**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.010**	**0.000010**	**0.10**	**0.00010**	**0.20**	**0.0010**
Nelson River - Upstream # 1	US-1	27-Jul-14	18:10	126	1.06	<0.00020	0.00136	0.0399	<0.00020	<0.00020	0.031	0.000010	29.1	<0.00010	21.1	0.0017
Nelson River - Upstream # 2	US-2	27-Jul-14	16:40	131	1.16	<0.00020	0.00139	0.0425	<0.00020	<0.00020	0.036	0.000010	30.3	0.00012	21.1	0.0018
Nelson River - Upstream # 3	US-3	27-Jul-14	16:05	136	1.26	<0.00020	0.00138	0.0421	<0.00020	<0.00020	0.031	<0.000010	32.5	0.00011	20.9	0.0019
Nelson River - Upstream # 4	US-4	27-Jul-14	17:30	132	1.16	<0.00020	0.00138	0.0427	<0.00020	<0.00020	0.030	<0.000010	30.7	<0.00010	21.0	0.0018
Nelson River - Upstream # 5	US-5	27-Jul-14	17:10	130	0.943	0.00020	0.00136	0.0378	<0.00020	<0.00020	0.027	<0.000010	30.0	0.00015	21.2	0.0016
Stephens Lake - Nearfield # 1	NF-1	28-Jul-14	13:55	118	0.840	0.00024	0.00170	0.0372	<0.00020	<0.00020	0.025	<0.000010	27.0	<0.00010	20.6	0.0015
Stephens Lake - Nearfield # 2	NF-2	28-Jul-14	15:20	125	0.892	0.00021	0.00147	0.0380	<0.00020	<0.00020	0.025	<0.000010	28.6	<0.00010	21.1	0.0014
Stephens Lake - Nearfield # 3	NF-3	28-Jul-14	14:40	127	0.923	0.00037	0.00139	0.0401	<0.00020	<0.00020	0.025	0.000010	30.3	<0.00010	21.0	0.0016
Stephens Lake - Nearfield # 4	NF-4	28-Jul-14	13:50	122	0.873	0.00023	0.00134	0.0390	<0.00020	<0.00020	0.024	<0.000010	28.4	<0.00010	21.2	0.0014
Stephens Lake - Nearfield # 5	NF-5	28-Jul-14	13:10	134	1.11	0.00024	0.00156	0.0444	<0.00020	<0.00020	0.027	<0.000010	30.0	<0.00010	21.3	0.0018
Stephens Lake - Farfield # 1	FF-1	28-Jul-14	8:45	123	0.972	<0.00020	0.00130	0.0388	<0.00020	<0.00020	0.026	<0.000010	28.6	<0.00010	20.3	0.0016

Table A1- 3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the open-water season of 2014. Values in blue italics are considered suspect.

Sample Location	Site 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)	Cesium (mg/L)	Chloride (mg/L)	Chromium (mg/L)
Detection Limit 2014				**0.30**	**0.0050**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.010**	**0.000010**	**0.10**	**0.00010**	**0.20**	**0.0010**
Stephens Lake - Farfield # 2	FF-2	28-Jul-14	10:00	127	0.865	<0.00020	0.00128	0.0377	<0.00020	<0.00020	0.027	<0.000010	29.5	<0.00010	20.6	0.0014
Stephens Lake - Farfield # 3	FF-3	28-Jul-14	10:55	125	0.887	<0.00020	0.00133	0.0382	<0.00020	<0.00020	0.026	0.000010	29.1	<0.00010	20.8	0.0015
Stephens Lake - Farfield # 4	FF-4	28-Jul-14	10:30	123	0.881	<0.00020	0.00134	0.0380	<0.00020	<0.00020	0.027	<0.000010	29.0	<0.00010	20.5	0.0014
Stephens Lake - Farfield # 5	FF-5	28-Jul-14	9:30	125	0.951	<0.00020	0.00128	0.0374	<0.00020	<0.00020	0.026	<0.000010	29.4	<0.00010	20.2	0.0014
Nelson River Upstream # 1	US-1	27-Aug-14	13:10	147	1.15	<0.00020	0.00160	0.0459	<0.00020	<0.00020	0.030	<0.000010	35.0	0.00013	22.1	0.0019
Nelson River Upstream # 2	US-2	27-Aug-14	12:15	144	1.18	<0.00020	0.00160	0.0443	<0.00020	<0.00020	0.030	<0.000010	33.7	0.00013	22.4	0.0019
Nelson River Upstream # 3	US-3	27-Aug-14	12:35	144	1.22	0.00020	0.00157	0.0454	<0.00020	<0.00020	0.029	<0.000010	34.5	0.00013	22.2	0.0019
Nelson River Upstream # 4	US-4	27-Aug-14	12:50	143	1.10	<0.00020	0.00156	0.0426	<0.00020	<0.00020	0.030	0.000020	34.3	0.00013	22.5	0.0018
Nelson River Upstream # 5	US-5	27-Aug-14	11:20	152	1.26	0.00019	0.00169	0.0462	<0.00020	<0.00020	0.031	<0.000010	36.0	0.00014	22.5	0.0020
Stephens Lake - Nearfield # 1	NF-1	26-Aug-14	17:50	149	1.22	<0.00020	0.00165	0.0447	<0.00020	<0.00020	0.034	<0.000010	35.8	0.00014	22.6	0.0020
Stephens Lake - Nearfield # 2	NF-2	26-Aug-14	18:50	146	1.19	0.00023	0.00161	0.0438	<0.00020	<0.00020	0.032	<0.000010	34.2	0.00014	22.6	0.0018

Table A1- 3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the open-water season of 2014. Values in blue italics are considered suspect.

Sample Location	Site 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)	Cesium (mg/L)	Chloride (mg/L)	Chromium (mg/L)
Detection Limit 2014				**0.30**	**0.0050**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.010**	**0.000010**	**0.10**	**0.00010**	**0.20**	**0.0010**
Stephens Lake - Nearfield # 3	NF-3	26-Aug-14	18:20	144	1.21	0.00035	0.00158	0.0452	<0.00020	<0.00020	0.031	<0.000010	33.5	0.00014	22.6	0.0018
Stephens Lake - Nearfield # 4	NF-4	26-Aug-14	19:11	140	1.15	0.00023	0.00155	0.0433	<0.00020	<0.00020	0.030	<0.000010	32.2	0.00013	22.7	0.0019
Stephens Lake - Nearfield # 5	NF-5	26-Aug-14	17:25	141	1.15	0.00022	0.00155	0.0445	<0.00020	<0.00020	0.029	<0.000010	32.1	0.00013	22.4	0.0018
Stephens Lake - Farfield # 1	FF-1	26-Aug-14	14:00	145	1.07	<0.00020	0.00171	0.0449	<0.00020	<0.00020	0.032	0.000021	33.6	0.00012	22.5	0.0034
Stephens Lake - Farfield # 2	FF-2	26-Aug-14	15:10	140	1.03	<0.00020	0.00156	0.0423	<0.00020	<0.00020	0.031	0.000010	32.8	0.00011	22.7	0.0016
Stephens Lake - Farfield # 3	FF-3	26-Aug-14	16:15	141	1.02	0.00028	0.00157	0.0434	<0.00020	<0.00020	0.029	<0.000010	33.1	0.00012	22.7	0.0017
Stephens Lake - Farfield # 4	FF-4	26-Aug-14	15:40	138	1.04	0.00022	0.00156	0.0422	<0.00020	<0.00020	0.029	0.000010	31.7	0.00011	22.7	0.0016
Stephens Lake - Farfield # 5	FF-5	26-Aug-14	14:40	145	1.08	0.00033	0.00159	0.0440	<0.00020	<0.00020	0.029	<0.000010	33.5	0.00012	22.7	0.0017
Nelson River Upstream # 1	US-1	25-Sep-14	11:45	127	0.606	0.00042	0.00134	0.0364	<0.00020	<0.00020	0.026	<0.000010	28.5	<0.00010	23.0	<0.0010
Nelson River Upstream # 2	US-2	25-Sep-14	12:10	133	0.710	0.00026	0.00141	0.0366	<0.00020	<0.00020	0.029	<0.000010	30.3	<0.00010	23.3	0.0010
Nelson River Upstream # 3	US-3	25-Sep-14	13:05	133	0.647	0.00026	0.00135	0.0373	<0.00020	<0.00020	0.028	<0.000010	29.4	<0.00010	23.2	<0.0010

Table A1- 3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the open-water season of 2014. Values in blue italics are considered suspect.

Sample Location	Site 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)	Cesium (mg/L)	Chloride (mg/L)	Chromium (mg/L)
Detection Limit 2014				**0.30**	**0.0050**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.010**	**0.000010**	**0.10**	**0.00010**	**0.20**	**0.0010**
Nelson River Upstream # 4	US-4	25-Sep-14	12:45	129	0.687	0.00023	0.00130	0.0375	<0.00020	<0.00020	0.029	<0.000010	28.5	<0.00010	23.1	0.0010
Nelson River Upstream # 5	US-5	25-Sep-14	13:30	129	0.636	<0.00020	0.00138	0.0363	<0.00020	<0.00020	0.029	<0.000010	29.1	<0.00010	23.2	<0.0010
Stephens Lake - Nearfield # 1	NF-1	24-Sep-14	17:00	140	0.732	<0.00020	0.00128	0.0359	<0.00020	<0.00020	0.029	<0.000010	29.5	<0.00010	22.6	0.0022
Stephens Lake - Nearfield # 2	NF-2	24-Sep-14	18:20	131	0.661	<0.00020	0.00130	0.0359	<0.00020	<0.00020	0.029	<0.000010	30.2	<0.00010	22.9	<0.0010
Stephens Lake - Nearfield # 3	NF-3	24-Sep-14	17:40	131	0.727	0.00023	0.00134	0.0369	<0.00020	<0.00020	0.029	<0.000010	30.0	<0.00010	22.6	0.0010
Stephens Lake - Nearfield # 4	NF-4	24-Sep-14	18:40	165	0.666	<0.00020	0.00133	0.0369	<0.00020	<0.00020	0.030	<0.000010	32.6	<0.00010	22.9	0.0020
Stephens Lake - Nearfield # 5	NF-5	24-Sep-14	16:20	133	0.669	0.00026	0.00131	0.0362	<0.00020	<0.00020	0.030	0.000010	30.0	<0.00010	22.7	<0.0010
Stephens Lake - Farfield # 1	FF-1	24-Sep-14	13:40	128	0.714	<0.00020	0.00133	0.0368	<0.00020	<0.00020	0.030	0.000010	29.0	<0.00010	22.5	0.0012
Stephens Lake - Farfield # 2	FF-2	24-Sep-14	14:40	131	0.673	0.00024	0.00132	0.0367	<0.00020	<0.00020	0.029	<0.000010	29.4	<0.00010	22.8	<0.0010
Stephens Lake - Farfield # 3	FF-3	24-Sep-14	15:30	132	0.632	0.00028	0.00132	0.0359	<0.00020	<0.00020	0.029	<0.000010	30.5	<0.00010	22.9	<0.0010
Stephens Lake - Farfield # 4	FF-4	24-Sep-14	15:05	128	0.654	0.00024	0.00131	0.0361	<0.00020	<0.00020	0.029	<0.000010	28.2	<0.00010	22.8	<0.0010

Table A1- 3: Metals and major ions measured in the laboratory for sites monitored in the Keeyask local study area during the open-water season of 2014. Values in blue italics are considered suspect.

Sample Location	Site 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)	Cesium (mg/L)	Chloride (mg/L)	Chromium (mg/L)
Detection Limit 2014				**0.30**	**0.0050**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.010**	**0.000010**	**0.10**	**0.00010**	**0.20**	**0.0010**
Stephens Lake - Farfield # 5	FF-5	24-Sep-14	14:20	128	0.680	0.00024	0.00133	0.0359	<0.00020	<0.00020	0.029	<0.000010	28.3	<0.00010	22.7	<0.0010

Table A1-3: Continued.

Sample Location	Site ID	Sample Date	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (ng/L)	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)
Detection Limit 2014			**0.00020**	**0.00020**	**0.010**	**0.000090**	**0.0020**	**0.010**	**0.00030**	**1.0**	**0.00020**	**0.0020**	**0.10**	**0.020**	**0.00020**
Nelson River - Upstream # 1	US-1	27-Jul-14	0.00043	0.00210	0.910	0.000419	0.0109	13.1	0.0222	1.8	0.00071	0.0021	<0.10	3.16	0.00356
Nelson River - Upstream # 2	US-2	27-Jul-14	0.00045	0.00215	0.920	0.000415	0.0113	13.5	0.0231	1.0	0.00068	0.0021	<0.10	3.25	0.00373
Nelson River - Upstream # 3	US-3	27-Jul-14	0.00045	0.00211	1.00	0.000454	0.0116	13.3	0.0235	1.7	0.00072	0.0021	<0.10	3.25	0.00380
Nelson River - Upstream # 4	US-4	27-Jul-14	0.00044	0.00216	0.930	0.000451	0.0109	13.5	0.0235	1.1	0.00069	0.0021	<0.10	3.22	0.00362
Nelson River - Upstream # 5	US-5	27-Jul-14	0.00042	0.00206	0.870	0.000373	0.0112	13.3	0.0215	1.1	0.00072	<0.0020	<0.10	3.01	0.00356
Stephens Lake - Nearfield # 1	NF-1	28-Jul-14	0.00040	0.00211	0.800	0.000348	0.0092	12.4	0.0187	1.0	0.00084	<0.0020	<0.10	2.89	0.00316

Table A1-3: Continued.

Sample Location	Site ID	Sample Date	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (ng/L)	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)
Detection Limit 2014			**0.00020**	**0.00020**	**0.010**	**0.000090**	**0.0020**	**0.010**	**0.00030**	**1.0**	**0.00020**	**0.0020**	**0.10**	**0.020**	**0.00020**
Stephens Lake - Nearfield # 2	NF-2	28-Jul-14	0.00037	0.00206	0.760	0.000357	0.0094	12.9	0.0166	1.4	0.00108	<0.0020	<0.10	2.94	0.00334
Stephens Lake - Nearfield # 3	NF-3	28-Jul-14	0.00041	0.00204	0.850	0.000375	0.0097	12.4	0.0191	1.0	0.00077	0.0020	<0.10	2.91	0.00350
Stephens Lake - Nearfield # 4	NF-4	28-Jul-14	0.00036	0.00193	0.750	0.000320	0.0095	12.4	0.0167	<1.0	0.00072	<0.0020	<0.10	2.95	0.00317
Stephens Lake - Nearfield # 5	NF-5	28-Jul-14	0.00046	0.00300	0.860	0.000379	0.0104	14.4	0.0219	1.2	0.00076	0.0023	<0.10	3.52	0.00409
Stephens Lake - Farfield # 1	FF-1	28-Jul-14	0.00039	0.00200	0.820	0.000347	0.0101	12.7	0.0176	<1.0	0.00072	<0.0020	<0.10	2.98	0.00323
Stephens Lake - Farfield # 2	FF-2	28-Jul-14	0.00036	0.00207	0.770	0.000352	0.0105	13.0	0.0171	1.4	0.00076	<0.0020	<0.10	3.03	0.00320
Stephens Lake - Farfield # 3	FF-3	28-Jul-14	0.00038	0.00210	0.800	0.000406	0.0102	12.7	0.0179	1.2	0.00098	<0.0020	<0.10	2.96	0.00331
Stephens Lake - Farfield # 4	FF-4	28-Jul-14	0.00037	0.00201	0.780	0.000349	0.0101	12.2	0.0172	1.3	0.00074	<0.0020	<0.10	2.91	0.00315
Stephens Lake - Farfield # 5	FF-5	28-Jul-14	0.00036	0.00205	0.800	0.000339	0.0101	12.5	0.0171	1.8	0.00074	<0.0020	<0.10	2.97	0.00335
Nelson River Upstream # 1	US-1	27-Aug-14	0.00050	0.00212	0.980	0.000432	0.0120	14.4	0.0252	1.2	0.00077	0.0024	<0.10	3.48	0.00400
Nelson River Upstream # 2	US-2	27-Aug-14	0.00050	0.00216	0.980	0.000442	0.0119	14.6	0.0252	1.6	0.00078	0.0023	<0.10	3.39	0.00393
Nelson River Upstream # 3	US-3	27-Aug-14	0.00052	0.00217	1.01	0.000445	0.0119	14.0	0.0251	3.2	0.00078	0.0022	<0.10	3.44	0.00402

Table A1-3: Continued.

Sample Location	Site ID	Sample Date	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (ng/L)	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)
Detection Limit 2014			**0.00020**	**0.00020**	**0.010**	**0.000090**	**0.0020**	**0.010**	**0.00030**	**1.0**	**0.00020**	**0.0020**	**0.10**	**0.020**	**0.00020**
Nelson River Upstream # 4	US-4	27-Aug-14	0.00051	0.00212	0.980	0.000423	0.0120	13.9	0.0248	1.2	0.00079	0.0022	<0.10	3.28	0.00388
Nelson River Upstream # 5	US-5	27-Aug-14	0.00052	0.00222	0.990	0.000467	0.0125	15.0	0.0263	1.7	0.00091	0.0024	<0.10	3.56	0.00416
Stephens Lake - Nearfield # 1	NF-1	26-Aug-14	0.00051	0.00218	0.990	0.000502	0.0134	14.5	0.0258	1.5	*0.00420*	0.0024	<0.10	3.72	0.00411
Stephens Lake - Nearfield # 2	NF-2	26-Aug-14	0.00048	0.00213	0.970	0.000432	0.0124	14.8	0.0243	1.3	0.00078	0.0023	<0.10	3.46	0.00380
Stephens Lake - Nearfield # 3	NF-3	26-Aug-14	0.00050	0.00213	1.03	0.000469	0.0120	14.7	0.0257	1.2	0.00073	0.0023	<0.10	3.52	0.00400
Stephens Lake - Nearfield # 4	NF-4	26-Aug-14	0.00048	0.00225	0.990	0.000466	0.0117	14.6	0.0236	1.3	0.00074	0.0023	<0.10	3.33	0.00371
Stephens Lake - Nearfield # 5	NF-5	26-Aug-14	0.00048	0.00215	0.990	0.000443	0.0116	14.8	0.0241	1.5	0.00071	0.0022	<0.10	3.50	0.00392
Stephens Lake - Farfield # 1	FF-1	26-Aug-14	0.00051	0.00232	0.890	0.000381	0.0119	14.8	0.0218	1.5	0.00107	0.0040	<0.10	3.56	0.00383
Stephens Lake - Farfield # 2	FF-2	26-Aug-14	0.00041	0.00201	0.770	0.000343	0.0119	14.1	0.0188	1.0	0.00078	0.0020	<0.10	3.32	0.00362
Stephens Lake - Farfield # 3	FF-3	26-Aug-14	0.00042	0.00196	0.780	0.000366	0.0117	14.2	0.0197	1.3	0.00078	0.0020	<0.10	3.36	0.00362
Stephens Lake - Farfield # 4	FF-4	26-Aug-14	0.00041	0.00209	0.810	0.000336	0.0114	14.2	0.0186	1.4	0.00077	0.0021	<0.10	3.38	0.00358
Stephens Lake - Farfield # 5	FF-5	26-Aug-14	0.00044	0.00212	0.860	0.000387	0.0120	14.8	0.0201	1.3	0.00082	0.0021	<0.10	3.43	0.00378

Table A1-3: Continued.

Sample Location	Site ID	Sample Date	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (ng/L)	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)
Detection Limit 2014			**0.00020**	**0.00020**	**0.010**	**0.000090**	**0.0020**	**0.010**	**0.00030**	**1.0**	**0.00020**	**0.0020**	**0.10**	**0.020**	**0.00020**
Nelson River Upstream # 1	US-1	25-Sep-14	0.00026	0.00169	0.510	0.000256	0.0099	13.5	0.0136	<1.0	0.00072	<0.0020	<0.10	3.16	0.00249
Nelson River Upstream # 2	US-2	25-Sep-14	0.00026	0.00179	0.540	0.000256	0.0111	13.8	0.0136	1.2	0.00076	<0.0020	<0.10	3.27	0.00267
Nelson River Upstream # 3	US-3	25-Sep-14	0.00025	0.00172	0.500	0.000246	0.0110	14.4	0.0132	<1.0	0.00074	<0.0020	<0.10	3.19	0.00260
Nelson River Upstream # 4	US-4	25-Sep-14	0.00027	0.00171	0.510	0.000260	0.0111	14.1	0.0135	1.0	0.00072	<0.0020	<0.10	3.17	0.00269
Nelson River Upstream # 5	US-5	25-Sep-14	0.00025	0.00169	0.490	0.000236	0.0108	13.7	0.0131	1.8	0.00070	<0.0020	<0.10	3.25	0.00255
Stephens Lake - Nearfield # 1	NF-1	24-Sep-14	0.00028	0.00192	0.560	0.000261	0.0111	13.8	0.0133	<1.0	0.00088	<0.0020	<0.10	3.10	0.00262
Stephens Lake - Nearfield # 2	NF-2	24-Sep-14	0.00024	0.00191	0.500	0.000244	0.0108	13.5	0.0124	<1.0	0.00073	<0.0020	<0.10	3.01	0.00251
Stephens Lake - Nearfield # 3	NF-3	24-Sep-14	0.00026	0.00189	0.530	0.000259	0.0106	13.5	0.0134	<1.0	0.00071	<0.0020	<0.10	2.96	0.00265
Stephens Lake - Nearfield # 4	NF-4	24-Sep-14	0.00025	0.00183	0.500	0.000252	0.0121	20.2	0.0115	1.0	0.00074	<0.0020	<0.10	3.29	0.00243
Stephens Lake - Nearfield # 5	NF-5	24-Sep-14	0.00025	0.00192	0.500	0.000255	0.0111	14.0	0.0127	<1.0	0.00075	<0.0020	<0.10	3.02	0.00257
Stephens Lake - Farfield # 1	FF-1	24-Sep-14	0.00025	0.00198	0.510	0.000245	0.0106	13.5	0.0120	<1.0	0.00073	<0.0020	<0.10	3.04	0.00253
Stephens Lake - Farfield # 2	FF-2	24-Sep-14	0.00026	0.00183	0.490	0.000232	0.0105	14.1	0.0119	<1.0	0.00071	<0.0020	<0.10	3.05	0.00256

Table A1-3: Continued.

Sample Location	Site ID	Sample Date	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (ng/L)	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)
Detection Limit 2014			**0.00020**	**0.00020**	**0.010**	**0.000090**	**0.0020**	**0.010**	**0.00030**	**1.0**	**0.00020**	**0.0020**	**0.10**	**0.020**	**0.00020**
Stephens Lake - Farfield # 3	FF-3	24-Sep-14	0.00022	0.00182	0.460	0.000223	0.0106	13.5	0.0113	<1.0	0.00074	<0.0020	<0.10	3.12	0.00250
Stephens Lake - Farfield # 4	FF-4	24-Sep-14	0.00023	0.00183	0.480	0.000224	0.0109	14.0	0.0114	<1.0	0.00072	<0.0020	<0.10	3.16	0.00251
Stephens Lake - Farfield # 5	FF-5	24-Sep-14	0.00025	0.00187	0.500	0.000228	0.0105	13.8	0.0121	1.2	0.00070	<0.0020	<0.10	3.17	0.00253

Table A1-3: Continued.

Sample Location	Site ID	Sample Date	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)	Sulfate (mg/L)	Strontium (mg/L)	Tellurium (mg/L)	Thallium (mg/L)	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 2014			**0.0010**	**0.10**	**0.00010**	**0.030**	**0.50**	**0.00010**	**0.00020**	**0.00010**	**0.00010**	**0.00020**	**0.00050**	**0.00010**	**0.00010**	**0.00020**	**0.0020**	**0.00040**
Nelson River - Upstream # 1	US-1	27-Jul-14	<0.0010	3.79	<0.00010	20.1	36.4	0.115	0.000360	<0.00010	0.00033	<0.00020	0.0424	<0.00010	0.00076	0.00267	0.0032	0.00098
Nelson River - Upstream # 2	US-2	27-Jul-14	<0.0010	3.92	<0.00010	20.4	36.5	0.111	<0.00020	<0.00010	0.00035	<0.00020	0.0494	<0.00010	0.00076	0.00269	0.0050	0.00163
Nelson River - Upstream # 3	US-3	27-Jul-14	<0.0010	4.38	<0.00010	20.8	36.2	0.119	<0.00020	<0.00010	0.00040	<0.00020	0.0568	<0.00010	0.00081	0.00286	0.0039	0.00134
Nelson River - Upstream # 4	US-4	27-Jul-14	<0.0010	4.01	<0.00010	21.1	36.3	0.116	<0.00020	<0.00010	0.00037	<0.00020	0.0482	<0.00010	0.00077	0.00274	0.0038	0.00109
Nelson River - Upstream # 5	US-5	27-Jul-14	<0.0010	3.38	<0.00010	18.6	36.6	0.120	<0.00020	<0.00010	0.00031	<0.00020	0.0428	<0.00010	0.00077	0.00255	0.0032	0.00087
Stephens Lake - Nearfield # 1	NF-1	28-Jul-14	<0.0010	3.06	<0.00010	19.4	36.0	0.122	<0.00020	<0.00010	0.00030	<0.00020	0.0360	<0.00010	0.00076	0.00234	0.0035	0.00100
Stephens Lake - Nearfield # 2	NF-2	28-Jul-14	<0.0010	3.49	<0.00010	20.5	37.0	0.124	<0.00020	<0.00010	0.00030	<0.00020	0.0342	<0.00010	0.00082	0.00235	0.0031	0.00101
Stephens Lake - Nearfield # 3	NF-3	28-Jul-14	<0.0010	3.28	<0.00010	19.3	36.7	0.126	<0.00020	<0.00010	0.00031	<0.00020	0.0388	<0.00010	0.00078	0.00243	0.0037	0.00104
Stephens Lake - Nearfield # 4	NF-4	28-Jul-14	<0.0010	3.32	<0.00010	19.9	36.8	0.114	<0.00020	<0.00010	0.00027	<0.00020	0.0342	<0.00010	0.00071	0.00223	0.0025	0.00088
Stephens Lake - Nearfield # 5	NF-5	28-Jul-14	<0.0010	3.46	<0.00010	22.6	37.1	0.120	<0.00020	<0.00010	0.00030	<0.00020	0.0504	<0.00010	0.00075	0.00275	0.0042	0.00097
Stephens Lake - Farfield # 1	FF-1	28-Jul-14	<0.0010	3.38	<0.00010	19.2	35.4	0.118	<0.00020	<0.00010	0.00030	<0.00020	0.0389	<0.00010	0.00073	0.00241	0.0035	0.00095
Stephens Lake - Farfield # 2	FF-2	28-Jul-14	<0.0010	3.27	<0.00010	19.6	36.0	0.125	<0.00020	<0.00010	0.00028	<0.00020	0.0337	<0.00010	0.00079	0.00235	0.0044	0.00111

Table A1-3: Continued.

Sample Location	Site ID	Sample Date	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)	Sulfate (mg/L)	Strontium (mg/L)	Tellurium (mg/L)	Thallium (mg/L)	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 2014			**0.0010**	**0.10**	**0.00010**	**0.030**	**0.50**	**0.00010**	**0.00020**	**0.00010**	**0.00010**	**0.00020**	**0.00050**	**0.00010**	**0.00010**	**0.00020**	**0.0020**	**0.00040**
Stephens Lake - Farfield # 3	FF-3	28-Jul-14	<0.0010	3.29	<0.00010	19.6	36.3	0.117	<0.00020	<0.00010	0.00030	<0.00020	0.0340	<0.00010	0.00079	0.00234	0.0035	0.00092
Stephens Lake - Farfield # 4	FF-4	28-Jul-14	<0.0010	3.22	<0.00010	19.3	35.6	0.121	<0.00020	<0.00010	0.00029	<0.00020	0.0584	<0.00010	0.00077	0.00233	0.0032	0.00084
Stephens Lake - Farfield # 5	FF-5	28-Jul-14	<0.0010	3.70	<0.00010	19.6	35.1	0.122	<0.00020	<0.00010	0.00030	<0.00020	0.0369	<0.00010	0.00074	0.00234	0.0029	0.00097
Nelson River Upstream # 1	US-1	27-Aug-14	<0.0010	4.30	<0.00010	21.9	37.5	0.127	<0.00020	<0.00010	0.00038	<0.00020	0.0437	<0.00010	0.00082	0.00288	0.0036	0.00089
Nelson River Upstream # 2	US-2	27-Aug-14	<0.0010	4.64	<0.00010	21.0	38.2	0.128	<0.00020	<0.00010	0.00038	<0.00020	0.0440	<0.00010	0.00085	0.00291	0.0035	0.00101
Nelson River Upstream # 3	US-3	27-Aug-14	<0.0010	4.42	<0.00010	21.1	37.8	0.129	<0.00020	<0.00010	0.00039	<0.00020	0.0472	<0.00010	0.00082	0.00305	0.0035	0.00094
Nelson River Upstream # 4	US-4	27-Aug-14	<0.0010	4.04	<0.00010	20.4	38.2	0.133	<0.00020	<0.00010	0.00036	<0.00020	0.0418	<0.00010	0.00081	0.00279	0.0039	0.00087
Nelson River Upstream # 5	US-5	27-Aug-14	<0.0010	4.52	<0.00010	22.4	38.2	0.133	<0.00020	<0.00010	0.00040	<0.00020	0.0481	<0.00010	0.00086	0.00307	0.0038	0.00100
Stephens Lake - Nearfield # 1	NF-1	26-Aug-14	<0.0010	4.51	<0.00010	21.8	38.3	0.133	<0.00020	<0.00010	0.00041	<0.00020	0.0473	<0.00010	0.00092	0.00294	0.0038	0.00101
Stephens Lake - Nearfield # 2	NF-2	26-Aug-14	<0.0010	4.22	<0.00010	21.1	38.3	0.130	<0.00020	<0.00010	0.00038	<0.00020	0.0454	<0.00010	0.00081	0.00291	0.0037	0.00092
Stephens Lake - Nearfield # 3	NF-3	26-Aug-14	<0.0010	4.46	<0.00010	21.3	38.2	0.123	<0.00020	<0.00010	0.00039	<0.00020	0.0492	<0.00010	0.00086	0.00291	0.0035	0.00098
Stephens Lake - Nearfield # 4	NF-4	26-Aug-14	<0.0010	4.24	<0.00010	20.8	38.3	0.122	<0.00020	<0.00010	0.00039	<0.00020	0.0432	<0.00010	0.00090	0.00280	0.0036	0.00094

Table A1-3: Continued.

Sample Location	Site ID	Sample Date	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)	Sulfate (mg/L)	Strontium (mg/L)	Tellurium (mg/L)	Thallium (mg/L)	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 2014			**0.0010**	**0.10**	**0.00010**	**0.030**	**0.50**	**0.00010**	**0.00020**	**0.00010**	**0.00010**	**0.00020**	**0.00050**	**0.00010**	**0.00010**	**0.00020**	**0.0020**	**0.00040**
Stephens Lake - Nearfield # 5	NF-5	26-Aug-14	<0.0010	4.44	<0.00010	22.2	37.8	0.123	<0.00020	<0.00010	0.00038	<0.00020	0.0442	<0.00010	0.00085	0.00282	0.0035	0.00089
Stephens Lake - Farfield # 1	FF-1	26-Aug-14	<0.0010	4.02	<0.00010	21.7	38.0	0.124	0.000420	<0.00010	0.00031	<0.00020	0.0415	<0.00010	0.00080	0.00276	0.0045	0.00079
Stephens Lake - Farfield # 2	FF-2	26-Aug-14	<0.0010	4.23	<0.00010	21.3	38.4	0.124	<0.00020	<0.00010	0.00030	<0.00020	0.0347	<0.00010	0.00079	0.00256	0.0031	0.00081
Stephens Lake - Farfield # 3	FF-3	26-Aug-14	<0.0010	4.04	<0.00010	21.1	38.4	0.124	<0.00020	<0.00010	0.00031	<0.00020	0.0366	<0.00010	0.00083	0.00260	0.0047	0.00079
Stephens Lake - Farfield # 4	FF-4	26-Aug-14	<0.0010	4.46	<0.00010	20.7	38.4	0.123	<0.00020	<0.00010	0.00030	<0.00020	0.0369	<0.00010	0.00077	0.00255	0.0032	0.00079
Stephens Lake - Farfield # 5	FF-5	26-Aug-14	<0.0010	4.35	<0.00010	22.1	38.4	0.128	<0.00020	<0.00010	0.00034	<0.00020	0.0392	<0.00010	0.00084	0.00275	0.0034	0.00090
Nelson River Upstream # 1	US-1	25-Sep-14	<0.0010	2.24	<0.00010	22.3	37.9	0.110	<0.00020	<0.00010	0.00020	<0.00020	0.0242	<0.00010	0.00092	0.00180	0.0022	0.00060
Nelson River Upstream # 2	US-2	25-Sep-14	<0.0010	2.52	<0.00010	22.0	38.4	0.113	<0.00020	<0.00010	0.00021	<0.00020	0.0266	<0.00010	0.00084	0.00197	0.0024	0.00069
Nelson River Upstream # 3	US-3	25-Sep-14	<0.0010	2.33	<0.00010	22.2	38.2	0.119	<0.00020	<0.00010	0.00022	<0.00020	0.0239	<0.00010	0.00084	0.00193	0.0022	0.00061
Nelson River Upstream # 4	US-4	25-Sep-14	<0.0010	2.49	<0.00010	21.5	38.0	0.112	<0.00020	<0.00010	0.00022	<0.00020	0.0245	<0.00010	0.00084	0.00197	0.0021	0.00068
Nelson River Upstream # 5	US-5	25-Sep-14	<0.0010	2.24	<0.00010	21.7	38.2	0.109	<0.00020	<0.00010	0.00019	<0.00020	0.0239	<0.00010	0.00081	0.00188	0.0022	0.00056
Stephens Lake - Nearfield # 1	NF-1	24-Sep-14	<0.0010	2.73	<0.00010	21.4	37.3	0.113	<0.00020	<0.00010	0.00023	<0.00020	0.0272	<0.00010	0.00080	0.00195	0.0023	0.00070

Table A1-3: Continued.

Sample Location	Site ID	Sample Date	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)	Sulfate (mg/L)	Strontium (mg/L)	Tellurium (mg/L)	Thallium (mg/L)	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 2014			**0.0010**	**0.10**	**0.00010**	**0.030**	**0.50**	**0.00010**	**0.00020**	**0.00010**	**0.00010**	**0.00020**	**0.00050**	**0.00010**	**0.00010**	**0.00020**	**0.0020**	**0.00040**
Stephens Lake - Nearfield # 2	NF-2	24-Sep-14	<0.0010	2.47	<0.00010	22.2	37.8	0.116	<0.00020	<0.00010	0.00021	<0.00020	0.0229	<0.00010	0.00080	0.00183	0.0021	0.00061
Stephens Lake - Nearfield # 3	NF-3	24-Sep-14	<0.0010	2.71	<0.00010	21.4	37.2	0.114	<0.00020	<0.00010	0.00022	<0.00020	0.0269	<0.00010	0.00079	0.00194	0.0030	0.00066
Stephens Lake - Nearfield # 4	NF-4	24-Sep-14	<0.0010	2.39	<0.00010	22.4	37.6	0.117	<0.00020	<0.00010	0.00022	<0.00020	0.0231	<0.00010	0.00085	0.00187	<0.0020	0.00061
Stephens Lake - Nearfield # 5	NF-5	24-Sep-14	<0.0010	2.55	<0.00010	23.5	37.6	0.117	<0.00020	<0.00010	0.00021	<0.00020	0.0268	<0.00010	0.00082	0.00202	0.0024	0.00062
Stephens Lake - Farfield # 1	FF-1	24-Sep-14	<0.0010	2.67	<0.00010	21.6	37.0	0.113	<0.00020	<0.00010	0.00021	<0.00020	0.0281	<0.00010	0.00080	0.00189	0.0037	0.00082
Stephens Lake - Farfield # 2	FF-2	24-Sep-14	<0.0010	2.66	<0.00010	21.9	37.5	0.108	<0.00020	<0.00010	0.00019	<0.00020	0.0221	<0.00010	0.00078	0.00188	0.0026	0.00058
Stephens Lake - Farfield # 3	FF-3	24-Sep-14	<0.0010	2.49	<0.00010	21.5	37.8	0.117	<0.00020	<0.00010	0.00021	0.00024	0.0230	<0.00010	0.00081	0.00179	0.0024	0.00055
Stephens Lake - Farfield # 4	FF-4	24-Sep-14	<0.0010	2.58	<0.00010	21.9	37.7	0.114	<0.00020	<0.00010	0.00019	<0.00020	0.0216	<0.00010	0.00080	0.00183	0.0027	0.00059
Stephens Lake - Farfield # 5	FF-5	24-Sep-14	<0.0010	2.52	<0.00010	22.5	37.4	0.112	<0.00020	<0.00010	0.00020	<0.00020	0.0231	<0.00010	0.00078	0.00196	0.0029	0.00059

Table A1- 4: Hydrocarbons measured in the laboratory for sites monitored in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site 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 2014				**0.00050**	**0.00050**	**0.0010**	**0.00050**	**0.00050**	**0.0015**	**0.10**	**0.10**	**0.44**	**0.25**	**0.25**	**0.25**
Nelson River - Upstream # 1	US-1	27-Jul-14	18:10	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River - Upstream # 2	US-2	27-Jul-14	16:40	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River - Upstream # 3	US-3	27-Jul-14	16:05	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River - Upstream # 4	US-4	27-Jul-14	17:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River - Upstream # 5	US-5	27-Jul-14	17:10	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 1	NF-1	28-Jul-14	13:55	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 2	NF-2	28-Jul-14	15:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 3	NF-3	28-Jul-14	14:40	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 4	NF-4	28-Jul-14	13:50	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 5	NF-5	28-Jul-14	13:10	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Farfield # 1	FF-1	28-Jul-14	8:45	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 2	FF-2	28-Jul-14	10:00	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 3	FF-3	28-Jul-14	10:55	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 4	FF-4	28-Jul-14	10:30	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 5	FF-5	28-Jul-14	9:30	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream # 1	US-1	27-Aug-14	13:10	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River Upstream # 2	US-2	27-Aug-14	12:15	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River Upstream # 3	US-3	27-Aug-14	12:35	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River Upstream # 4	US-4	27-Aug-14	12:50	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River Upstream # 5	US-5	27-Aug-14	11:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 1	NF-1	26-Aug-14	17:50	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 2	NF-2	26-Aug-14	18:50	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 3	NF-3	26-Aug-14	18:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 4	NF-4	26-Aug-14	19:11	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25

Table A1- 4: Hydrocarbons measured in the laboratory for sites monitored in the Keeyask local study area during the open-water season of 2014.

Sample Location	Site 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 2014				**0.00050**	**0.00050**	**0.0010**	**0.00050**	**0.00050**	**0.0015**	**0.10**	**0.10**	**0.44**	**0.25**	**0.25**	**0.25**
Stephens Lake - Nearfield # 5	NF-5	26-Aug-14	17:25	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Farfield # 1	FF-1	26-Aug-14	14:00	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 2	FF-2	26-Aug-14	15:10	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 3	FF-3	26-Aug-14	16:15	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 4	FF-4	26-Aug-14	15:40	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 5	FF-5	26-Aug-14	14:40	-	-	-	-	-	-	-	-	-	-	-	-
Nelson River Upstream # 1	US-1	25-Sep-14	11:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River Upstream # 2	US-2	25-Sep-14	12:10	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River Upstream # 3	US-3	25-Sep-14	13:05	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	-	-	-	-
Nelson River Upstream # 4	US-4	25-Sep-14	12:45	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River Upstream # 5	US-5	25-Sep-14	13:30	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 1	NF-1	24-Sep-14	17:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 2	NF-2	24-Sep-14	18:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 3	NF-3	24-Sep-14	17:40	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 4	NF-4	24-Sep-14	18:40	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 5	NF-5	24-Sep-14	16:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Farfield # 1	FF-1	24-Sep-14	13:40	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 2	FF-2	24-Sep-14	14:40	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 3	FF-3	24-Sep-14	15:30	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 4	FF-4	24-Sep-14	15:05	-	-	-	-	-	-	-	-	-	-	-	-
Stephens Lake - Farfield # 5	FF-5	24-Sep-14	14:20	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX 2:
RESULTS OF QUALITY ASSURANCE/QUALITY CONTROL SAMPLES, OPEN-WATER SEASON, 2014.

Table A2- 1: Quality assurance/quality control results for routine water chemistry variables measured in the laboratory, open-water season 2014. Percent relative standard deviations (PRSD) were calculated for triplicate samples and values above 18% are indicated in bold red. Field and trip blank measurements more than five times the analytical detection limits are also indicated in bold red. Measurements in blue italics are considered suspect.

					Alkalinity				Nitrogen							
Sample Location	Site ID	ALS ID	Sample Date	Sample Time	Total (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Ammonia (mg N/L)	Nitrate and Nitrite (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Total Kjeldahl (mg/L)	Dissolved Inorganic 1 (mg/L)	Total Organic2 (mg/L)	Total3 (mg/L)
Detection Limit 2014					**1.0/20**	**1.2/24**	**0.60/12**	**0.34/6.8**	**0.010**	**0.0051**	**0.0050**	**0.0010**	**0.20**			
Triplicates																
Nelson River Upstream # 3	US-3	L1493478-5	27-Jul-14	16:05	101	123	<12	<6.8	0.012	<0.0051	<0.0050	<0.0010	0.47	0.0146	0.458	0.47
Nelson River Upstream # 3	US-3	L1493478-6	27-Jul-14	16:05	101	124	<12	<6.8	<0.010	<0.0051	<0.0050	0.0011	0.50	0.0076	0.495	0.50
Nelson River Upstream # 3	US-3	L1493478-7	27-Jul-14	16:05	*170*	*185*	<12	<6.8	<0.010	<0.0051	<0.0050	<0.0010	0.48	0.0076	0.475	0.48
Nelson River Upstream # 5	US-3	L1493478-5, 7, 8	27-Jul-14	16:05	124	144	<12	<6.8	<0.010	<0.0051	<0.0050	<0.0010	0.48	0.0099	0.476	0.49
		Mean			**39.8**	**35.5**	**-**	**-**	**-**	**-**	**-**	**-**	**0.015**			
		SD			**32**	**25**	**-**	**-**	**-**	**-**	**-**	**-**	**-**			
		PRSD														
Nelson River Upstream # 5	US-5	L1509715-5	27-Aug-14	11:20	113	138	<12	<6.8	0.011	0.0459	0.0430	0.0029	0.52	0.0569	0.509	0.57
Nelson River Upstream # 5	US-5	L1509715-6	27-Aug-14	11:20	113	138	<12	<6.8	<0.010	0.0458	0.0427	0.0031	0.50	0.0508	0.495	0.55
Nelson River Upstream # 5	US-5	L1509715-7	27-Aug-14	11:20	113	138	<12	<6.8	<0.010	0.0462	0.0431	0.0030	0.49	0.0512	0.485	0.54
Nelson River Upstream # 5	US-5	L1509715-5, 6, 7	27-Aug-14	11:20	113	138	<12	<6.8	<0.010	0.0460	0.0429	0.0030	0.50	0.0530	0.496	0.55
		Mean			**0.0**	**0.0**	**-**	**-**	**-**	**0.00021**	**0.00021**	**0.00010**	**0.015**			
		SD			**0**	**0**	**-**	**-**	**-**	**0**	**0**	**-**	**-**			
		PRSD														
Stephens Lake - Nearfield # 1	NF-1	L1524159-1	24-Sep-14	17:00	107	131	<12	<6.8	<0.010	0.0070	0.0070	<0.0010	0.56	0.0120	0.555	0.57

Table A2- 1: Quality assurance/quality control results for routine water chemistry variables measured in the laboratory, open-water season 2014. Percent relative standard deviations (PRSD) were calculated for triplicate samples and values above 18% are indicated in bold red. Field and trip blank measurements more than five times the analytical detection limits are also indicated in bold red. Measurements in blue italics are considered suspect.

					Alkalinity				Nitrogen							
Sample Location	Site ID	ALS ID	Sample Date	Sample Time	Total (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Ammonia (mg N/L)	Nitrate and Nitrite (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Total Kjeldahl (mg/L)	Dissolved Inorganic 1 (mg/L)	Total Organic2 (mg/L)	Total3 (mg/L)
Detection Limit 2014					**1.0/20**	**1.2/24**	**0.60/12**	**0.34/6.8**	**0.010**	**0.0051**	**0.0050**	**0.0010**	**0.20**			
Stephens Lake - Nearfield # 1	NF-1	L1524159-6	24-Sep-14	17:00	107	131	<12	<6.8	<0.010	0.0075	0.0075	<0.0010	0.47	0.0125	0.465	0.48
Stephens Lake - Nearfield # 1	NF-1	L1524159-7	24-Sep-14	17:00	108	131	<12	<6.8	<0.010	0.0054	0.0054	<0.0010	0.44	0.0104	0.435	0.45
Stephens Lake - Nearfield # 1	NF-1	L1524159-1, 6, 7	24-Sep-14	17:00	107	131	<12	<6.8	<0.010	0.0066	0.0066	<0.0010	0.49	0.0116	0.485	0.50
		Mean			**0.6**	**0.0**	**-**	**-**	**-**	**0.00110**	**0.00110**	**-**	**0.062**			
		SD			**1**	**0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**			
		PRSD														
Field Blanks																
Field Blank	TF-2	L1493970-12	28-Jul-14		1.6	2.0	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	-	-	-
Field Blank	TF-2	L1509386-7	26-Aug-14		1.6	2.0	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	-	-	-
Field Blank	TF-2	L1524164-7	25-Sep-14		2.1	2.6	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	-	-	-
Trip Blanks																
Trip Blank	TF-1	L1493970-11	28-Jul-14		<20	<24	<12	<6.8	<0.010	<0.0051	<0.0050	<0.0010	<0.20	-	-	-
Trip Blank	TF-1	L1509386-6	26-Aug-14		1.4	1.7	<0.60	<0.34	0.012	<0.0051	<0.0050	<0.0010	<0.20	-	-	-
Trip Blank	TF-1	L1524164-6	25-Sep-14		1.9	2.3	<0.60	<0.34	<0.010	<0.0051	<0.0050	<0.0010	<0.20	-	-	-

Table A2-1: Continued

Sample Location	Site ID	ALS ID	Sample Date	Total (mg/L)	Dissolved (mg/L)	TN:TP	DIN:DP	DIN:TP	Total Organic (mg/L)	Dissolved Organic (mg/L)	TOC:ON	TOC:TN	Lab pH (pH units)	Conductivity (µmhos/cm)	TDS (mg/L)
Detection Limit 2014				**0.0010/0.010**	**0.0010**				**1.0**	**1.0**			**0.10**	**1.0/20**	**5.0**
Triplicates															
Nelson River Upstream # 3	US-3	L1493478-5	27-Jul-14	0.044	0.0099	24	3	1	10.3	10.3	26	25	8.27	332	218
Nelson River Upstream # 3	US-3	L1493478-6	27-Jul-14	0.046	0.0093	24	2	0	10.5	10.4	25	24	8.26	331	213
Nelson River Upstream # 3	US-3	L1493478-7	27-Jul-14	0.040	0.0111	27	2	0	10.3	10.4	25	25	8.72	525	209
Nelson River Upstream # 5	US-3	L1493478-5, 7, 8	27-Jul-14	0.043	0.0101	25	2	1	10.4	10.4	25	25	8.42	396	213
		Mean		**0.0031**	**0.00092**				**0.12**	**0.06**			**0.263**	**111.7**	**4.5**
		SD		**-**	**9**				**1**	**1**			**3**	**28**	**2**
		PRSD													
Nelson River Upstream # 5	US-5	L1509715-5	27-Aug-14	0.054	0.0268	23	5	2	6.5	6.5	15	13	8.28	357	216
Nelson River Upstream # 5	US-5	L1509715-6	27-Aug-14	0.052	0.0242	23	5	2	6.3	6.6	15	13	8.30	357	219
Nelson River Upstream # 5	US-5	L1509715-7	27-Aug-14	0.056	0.0244	21	5	2	6.4	6.6	15	14	8.27	357	208
Nelson River Upstream # 5	US-5	L1509715-5, 6, 7	27-Aug-14	0.054	0.0251	23	5	2	6.4	6.6	15	14	8.28	357	214
		Mean		**0.0020**	**0.00145**				**0.10**	**0.06**			**0.015**	**0.0**	**5.7**
		SD		**4**	**6**				**2**	**1**			**0**	**0**	**3**
		PRSD													
Stephens Lake - Nearfield # 1	NF-1	L1524159-1	24-Sep-14	0.022	0.0099	57	3	1	10.8	9.3	23	22	8.17	350	207
Stephens Lake - Nearfield # 1	NF-1	L1524159-6	24-Sep-14	0.030	0.0095	35	3	1	9.7	9.8	24	24	8.20	350	206
Stephens Lake - Nearfield # 1	NF-1	L1524159-7	24-Sep-14	0.029	0.0110	34	2	1	9.7	9.9	26	25	8.19	350	208
Stephens Lake - Nearfield # 1	NF-1	L1524159-1, 6, 7	24-Sep-14	0.027	0.0101	42	3	1	10.1	9.7	24	24	8.19	350	207
		Mean		**0.0044**	**0.00078**				**0.64**	**0.32**			**0.015**	**0.0**	**1.0**
		SD		**-**	**8**				**6**	**3**			**0**	**0**	**0**
		PRSD													
Field Blanks															
Field Blank	TF-2	L1493970-12	28-Jul-14	<0.0010	0.0010	-	-	-	<1.0	<1.0	-	-	5.63	<1.0	<5.0
Field Blank	TF-2	L1509386-7	26-Aug-14	<0.0010	0.0012	-	-	-	<1.0	<1.0	-	-	5.50	<1.0	5.0

Table A2- 1: Quality assurance/quality control results for routine water chemistry variables measured in the laboratory, open-water season 2014. Percent relative standard deviations (PRSD) were calculated for triplicate samples and values above 18% are indicated in bold red. Field and trip blank measurements more than five times the analytical detection limits are also indicated in bold red. Measurements in blue italics are considered suspect.

					Alkalinity				Nitrogen							
Sample Location	Site ID	ALS ID	Sample Date	Sample Time	Total (mg/L)	Bicarbonate (mg/L)	Carbonate (mg/L)	Hydroxide (mg/L)	Ammonia (mg N/L)	Nitrate and Nitrite (mg N/L)	Nitrate (mg N/L)	Nitrite (mg N/L)	Total Kjeldahl (mg/L)	Dissolved Inorganic 1 (mg/L)	Total Organic2 (mg/L)	Total3 (mg/L)
Detection Limit 2014					**1.0/20**	**1.2/24**	**0.60/12**	**0.34/6.8**	**0.010**	**0.0051**	**0.0050**	**0.0010**	**0.20**			
Field Blank	TF-2	L1524164-7	25-Sep-14		<0.0010	<0.0010	-	-	-	<1.0	<1.0	-	-	6.06	<1.0	<5.0
Trip Blanks																
Trip Blank	TF-1	L1493970-11	28-Jul-14		<0.0010	<0.0010	-	-	-	<1.0	<1.0	-	-	5.54	<1.0	<5.0
Trip Blank	TF-1	L1509386-6	26-Aug-14		<0.0010	<0.0010	-	-	-	<1.0	<1.0	-	-	5.66	<1.0	6.0
Trip Blank	TF-1	L1524164-6	25-Sep-14		0.0086	<0.0010	-	-	-	<1.0	<1.0	-	-	5.76	<1.0	<5.0

1 Dissolved inorganic nitrogen calculated as ammonia + nitrate/nitrite
2 Total organic nitrogen calculated as total Kjeldahl nitrogen –ammonia
3 Total nitrogen calculated as total Kjeldahl nitrogen + nitrate/nitrite

Table A2-1: Continued

				Water Clarity			Algal Pigments	
Sample Location	**Site ID**	**ALS ID**	**Sample Date**	**TSS (mg/L)**	**Turbidity (NTU)**	**True Colour (CU)**	**Chlorophyll a (µg/L)**	**Phaeophytin a (µg/L)**
Detection Limit 2014				**2.0**	**0.10**	**5.0**	**0.10**	**0.10**
Triplicates								
Nelson River Upstream # 3	US-3	L1493478-5	27-Jul-14	20.0	27.0	20.4	9.02	3.37
Nelson River Upstream # 3	US-3	L1493478-6	27-Jul-14	14.0	26.0	13.2	8.97	3.18
Nelson River Upstream # 3	US-3	L1493478-7	27-Jul-14	12.4	28.0	15.1	9.89	3.58
Nelson River Upstream # 5	US-3	L1493478-5, 7, 8	27-Jul-14	15.5	27.0	16.2	9.29	3.38
		Mean		**4.01**	**1.00**	**3.73**	**0.517**	**0.200**
		SD		**26**	**4**	**-**	**6**	**6**
		PRSD						
Nelson River Upstream # 5	US-5	L1509715-5	27-Aug-14	20.4	32.0	11.4	5.06	2.78
Nelson River Upstream # 5	US-5	L1509715-6	27-Aug-14	20.8	33.0	14.4	5.15	2.83
Nelson River Upstream # 5	US-5	L1509715-7	27-Aug-14	19.6	34.0	11.7	5.07	2.78
Nelson River Upstream # 5	US-5	L1509715-5, 6, 7	27-Aug-14	20.3	33.0	12.5	5.09	2.80
		Mean		**0.61**	**1.00**	**1.65**	**0.049**	**0.029**
		SD		**3**	**3**	**-**	**1**	**1**
		PRSD						
Stephens Lake - Nearfield # 1	NF-1	L1524159-1	24-Sep-14	8.8	13.3	14.2	7.10	2.16
Stephens Lake - Nearfield # 1	NF-1	L1524159-6	24-Sep-14	8.4	13.5	16.7	7.06	2.07
Stephens Lake - Nearfield # 1	NF-1	L1524159-7	24-Sep-14	8.4	13.9	14.4	5.40	1.74
Stephens Lake - Nearfield # 1	NF-1	L1524159-1, 6, 7	24-Sep-14	8.5	13.6	15.1	6.52	1.99
		Mean		**0.23**	**0.31**	**1.39**	**0.970**	**0.221**
		SD		**-**	**2**	**-**	**15**	**11**
		PRSD						
Field Blanks								
Field Blank	TF-2	L1493970-12	28-Jul-14	<2.0	<0.10	<5.0	<0.10	<0.10

Table A2-1: Continued

				Water Clarity			Algal Pigments	
Sample Location	**Site ID**	**ALS ID**	**Sample Date**	**TSS (mg/L)**	**Turbidity (NTU)**	**True Colour (CU)**	**Chlorophyll a (µg/L)**	**Phaeophytin a (µg/L)**
Detection Limit 2014				**2.0**	**0.10**	**5.0**	**0.10**	**0.10**
Field Blank	TF-2	L1509386-7	26-Aug-14	<2.0	<0.10	<5.0	<0.10	<0.10
Field Blank	TF-2	L1524164-7	25-Sep-14	<2.0	<0.10	<5.0	<0.10	<0.10
Trip Blanks								
Trip Blank	TF-1	L1493970-11	28-Jul-14	<2.0	<0.10	<5.0	<0.10	<0.10
Trip Blank	TF-1	L1509386-6	26-Aug-14	<2.0	<0.10	<5.0	<0.10	<0.10
Trip Blank	TF-1	L1524164-6	25-Sep-14	<2.0	<0.10	<5.0	<0.10	<0.10

Table A2- 2: Quality assurance/quality control results for metals and major ions measured in the laboratory, open-water season 2014. Percent relative standard deviations (PRSD) were calculated for triplicate samples and values above 18% are indicated in bold red. Field and trip blank measurements more than five times the analytical detection limits are also indicated in bold red. Measurements in blue italics are considered suspect.

Sample Location	Site ID	ALS ID	Sample Date	Sample Time	Hardness (as CaCO3) (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)	Cesium (mg/L)	Chloride (mg/L)	Chromium (mg/L)
Detection Limit 2014					**0.30**	**0.0050**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.010**	**0.000010**	**0.10**	**0.00010**	**0.20**	**0.0010**
Triplicates																	
Nelson River Upstream # 3	US-3	L1493478-5	27-Jul-14	16:05	136	1.23	0.00022	0.00137	0.0406	<0.00020	<0.00020	0.032	<0.000010	32.6	0.00011	21.1	0.0019
Nelson River Upstream # 3	US-3	L1493478-6	27-Jul-14	16:05	135	1.23	<0.00020	0.00137	0.0428	<0.00020	<0.00020	0.032	<0.000010	32.7	0.00011	21.0	0.0019
Nelson River Upstream # 3	US-3	L1493478-7	27-Jul-14	16:05	138	1.31	<0.00020	0.00141	0.0428	<0.00020	<0.00020	0.030	<0.000010	32.3	0.00011	20.7	0.0019
Nelson River Upstream # 5	US-3	L1493478-5, 7, 8	27-Jul-14	16:05	136	1.26	<0.00020	0.00138	0.0421	<0.00020	<0.00020	0.031	<0.000010	32.5	0.00011	20.9	0.0019
		Mean			**1.5**	**0.046**	**-**	**0.000023**	**0.00127**	**-**	**-**	**0.0012**	**-**	**0.21**	**0.000000**	**0.21**	**0.00000**
		SD			**1**	**4**	**-**	**2**	**3**	**-**	**-**	**4**	**-**	**1**	**-**	**1**	**-**
		PRSD															
Nelson River Upstream # 5	US-5	L1509715-5	27-Aug-14	11:20	156	1.29	0.00025	0.00163	0.0453	<0.00020	<0.00020	0.033	<0.000010	38.5	0.00015	22.5	0.0020
Nelson River Upstream # 5	US-5	L1509715-6	27-Aug-14	11:20	154	1.33	0.00021	0.00183	0.0506	<0.00020	<0.00020	0.032	0.000010	34.9	0.00014	22.5	0.0021
Nelson River Upstream # 5	US-5	L1509715-7	27-Aug-14	11:20	145	1.15	<0.00020	0.00161	0.0427	<0.00020	<0.00020	0.028	<0.000010	34.5	0.00013	22.4	0.0020
Nelson River Upstream # 5	US-5	L1509715-5, 6, 7	27-Aug-14	11:20	152	1.26	0.00019	0.00169	0.0462	<0.00020	<0.00020	0.031	<0.000010	36.0	0.00014	22.5	0.0020
		Mean			**5.9**	**0.095**	**0.000028**	**0.000122**	**0.00403**	**-**	**-**	**0.0026**	**-**	**2.20**	**0.000010**	**0.06**	**0.00006**
		SD			**4**	**8**	**-**	**7**	**9**	**-**	**-**	**9**	**-**	**6**	**-**	**0**	**-**

Table A2- 2: Quality assurance/quality control results for metals and major ions measured in the laboratory, open-water season 2014. Percent relative standard deviations (PRSD) were calculated for triplicate samples and values above 18% are indicated in bold red. Field and trip blank measurements more than five times the analytical detection limits are also indicated in bold red. Measurements in blue italics are considered suspect.

Sample Location	Site ID	ALS ID	Sample Date	Sample Time	Hardness (as CaCO3) (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)	Cesium (mg/L)	Chloride (mg/L)	Chromium (mg/L)
Detection Limit 2014					**0.30**	**0.0050**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.010**	**0.000010**	**0.10**	**0.00010**	**0.20**	**0.0010**
		PRSD															
Stephens Lake - Nearfield # 1	NF-1	L1524159-1	24-Sep-14	17:00	166	0.708	<0.00020	0.00127	0.0359	<0.00020	<0.00020	0.030	<0.000010	32.3	<0.00010	22.5	0.0011
Stephens Lake - Nearfield # 1	NF-1	L1524159-6	24-Sep-14	17:00	125	0.744	0.00025	0.00129	0.0355	<0.00020	<0.00020	0.028	<0.000010	27.6	<0.00010	22.6	0.0010
Stephens Lake - Nearfield # 1	NF-1	L1524159-7	24-Sep-14	17:00	128	0.743	<0.00020	0.00128	0.0364	<0.00020	<0.00020	0.029	<0.000010	28.6	<0.00010	22.6	0.0046
Stephens Lake - Nearfield # 1	NF-1	L1524159-1, 6, 7	24-Sep-14	17:00	140	0.732	<0.00020	0.00128	0.0359	<0.00020	<0.00020	0.029	<0.000010	29.5	<0.00010	22.6	0.0022
		Mean			**22.9**	**0.0205**	**-**	**0.000010**	**0.00045**	**-**	**-**	**0.0010**	**-**	**2.48**	**-**	**0.06**	**0.00205**
		SD			**16**	**3**	**-**	**1**	**1**	**-**	**-**	**3**	**-**	**8**	**-**	**0**	**-**
		PRSD															
Field Blanks																	
Field Blank	TF-2	L1493970-12	28-Jul-14		<0.30	<0.0050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.010	<0.000010	<0.10	<0.00010	<0.20	<0.0010
Field Blank	TF-2	L1509386-7	26-Aug-14		<0.30	<0.0050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.010	<0.000010	0.11	<0.00010	<0.20	<0.0010
Field Blank	TF-2	L1524164-7	25-Sep-14		<0.30	<0.0050	<0.00020	<0.00020	0.00023	<0.00020	<0.00020	<0.010	<0.000010	0.11	<0.00010	<0.20	<0.0010
Trip Blanks																	
Trip Blank	TF-1	L1493970-11	28-Jul-14		<0.30	<0.0050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.010	<0.000010	<0.10	<0.00010	<0.20	<0.0010

Table A2- 2: Quality assurance/quality control results for metals and major ions measured in the laboratory, open-water season 2014. Percent relative standard deviations (PRSD) were calculated for triplicate samples and values above 18% are indicated in bold red. Field and trip blank measurements more than five times the analytical detection limits are also indicated in bold red. Measurements in blue italics are considered suspect.

Sample Location	Site ID	ALS ID	Sample Date	Sample Time	Hardness (as CaCO3) (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)	Cesium (mg/L)	Chloride (mg/L)	Chromium (mg/L)
Detection Limit 2014					**0.30**	**0.0050**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.00020**	**0.010**	**0.000010**	**0.10**	**0.00010**	**0.20**	**0.0010**
Trip Blank	TF-1	L1509386-6	26-Aug-14		<0.30	<0.0050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.010	<0.000010	<0.10	<0.00010	<0.20	<0.0010
Trip Blank	TF-1	L1524164-6	25-Sep-14		<0.30	<0.0050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.010	<0.000010	<0.10	<0.00010	<0.20	<0.0010

Table A2-2: Routine

Sample Location	Site ID	ALS ID	Sample Date	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (ng/L)	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)
Detection Limit 2014				**0.00020**	**0.00020**	**0.010**	**0.000090**	**0.0020**	**0.010**	**0.00030**	**1.0**	**0.00020**	**0.0020**	**0.10**	**0.020**	**0.00020**
Triplicates																
Nelson River Upstream # 3	US-3	L1493478-5	27-Jul-14	0.00045	0.00210	0.990	0.000468	0.0117	13.2	0.0233	1.2	0.00072	0.0021	<0.10	3.27	0.00375
Nelson River Upstream # 3	US-3	L1493478-6	27-Jul-14	0.00042	0.00207	0.980	0.000431	0.0118	12.8	0.0224	2.0	0.00072	0.0021	<0.10	3.20	0.00379
Nelson River Upstream # 3	US-3	L1493478-7	27-Jul-14	0.00049	0.00215	1.03	0.000462	0.0114	13.8	0.0249	1.9	0.00073	0.0021	<0.10	3.27	0.00387
Nelson River Upstream # 5	US-3	L1493478-5, 7, 8	27-Jul-14	0.00045	0.00211	1.00	0.000454	0.0116	13.3	0.0235	1.7	0.00072	0.0021	<0.10	3.25	0.00380
		Mean		**0.000035**	**0.000040**	**0.026**	**0.0000199**	**0.00021**	**0.50**	**0.00127**	**0.44**	**0.000006**	**0.00000**	**-**	**0.040**	**0.000061**

Table A2-2: Routine

Sample Location	Site ID	ALS ID	Sample Date	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (ng/L)	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)
Detection Limit 2014				**0.00020**	**0.00020**	**0.010**	**0.000090**	**0.0020**	**0.010**	**0.00030**	**1.0**	**0.00020**	**0.0020**	**0.10**	**0.020**	**0.00020**
		SD		**-**	**2**	**3**	**-**	**2**	**4**	**5**	**-**	**-**	**-**	**-**	**1**	**2**
		PRSD														
Nelson River Upstream # 5	US-5	L1509715-5	27-Aug-14	0.00050	0.00216	1.00	0.000521	0.0136	14.6	0.0255	2.0	0.00088	0.0023	<0.10	3.51	0.00412
Nelson River Upstream # 5	US-5	L1509715-6	27-Aug-14	0.00056	0.00240	0.990	0.000440	0.0124	16.3	0.0283	1.5	0.00110	0.0026	<0.10	3.84	0.00439
Nelson River Upstream # 5	US-5	L1509715-7	27-Aug-14	0.00050	0.00211	0.980	0.000440	0.0115	14.2	0.0251	1.6	0.00075	0.0023	<0.10	3.32	0.00398
Nelson River Upstream # 5	US-5	L1509715-5, 6, 7	27-Aug-14	0.00052	0.00222	0.99	0.000467	0.0125	15.0	0.0263	1.7	0.00091	0.0024	<0.10	3.56	0.00416
		Mean		**0.000035**	**0.000155**	**0.010**	**0.0000468**	**0.00105**	**1.12**	**0.00174**	**0.26**	**0.000177**	**0.00017**	**-**	**0.263**	**0.000208**
		SD		**-**	**7**	**1**	**-**	**8**	**7**	**7**	**-**	**-**	**-**	**-**	**7**	**5**
		PRSD														
Stephens Lake - Nearfield # 1	NF-1	L1524159-1	24-Sep-14	0.00026	0.00177	0.540	0.000260	0.0120	20.6	0.0122	<1.0	0.00074	<0.0020	<0.10	3.15	0.00261
Stephens Lake - Nearfield # 1	NF-1	L1524159-6	24-Sep-14	0.00027	0.00183	0.550	0.000268	0.0106	13.7	0.0140	1.2	0.00070	<0.0020	<0.10	3.07	0.00262
Stephens Lake - Nearfield # 1	NF-1	L1524159-7	24-Sep-14	0.00030	0.00217	0.590	0.000255	0.0108	13.8	0.0138	<1.0	0.00119	0.0029	<0.10	3.09	0.00264
Stephens Lake - Nearfield # 1	NF-1	L1524159-1, 6, 7	24-Sep-14	0.00028	0.00192	0.560	0.000261	0.0111	16.0	0.0133	<1.0	0.00088	<0.0020	<0.10	3.10	0.00262
		Mean		**0.000021**	**0.000216**	**0.0265**	**0.0000066**	**0.00076**	**3.96**	**0.00099**	**-**	**0.000272**	**-**	**-**	**0.042**	**0.000015**
		SD		**-**	**11**	**5**	**-**	**7**	**25**	**7**	**-**	**-**	**-**	**-**	**1**	**1**
		PRSD														
Field Blanks																

Table A2-2: Routine

Sample Location	Site ID	ALS ID	Sample Date	Cobalt (mg/L)	Copper (mg/L)	Iron (mg/L)	Lead (mg/L)	Lithium (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Mercury (ng/L)	Molybdenum (mg/L)	Nickel (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Rubidium (mg/L)
Detection Limit 2014				**0.00020**	**0.00020**	**0.010**	**0.000090**	**0.0020**	**0.010**	**0.00030**	**1.0**	**0.00020**	**0.0020**	**0.10**	**0.020**	**0.00020**
Field Blank	TF-2	L1493970-12	28-Jul-14	<0.00020	<0.00020	<0.010	<0.000090	<0.0020	<0.010	<0.00030	<1.0	<0.00020	<0.0020	<0.10	<0.020	<0.00020
Field Blank	TF-2	L1509386-7	26-Aug-14	<0.00020	<0.00020	<0.010	<0.000090	<0.0020	<0.010	<0.00030	<1.0	<0.00020	<0.0020	<0.10	<0.020	<0.00020
Field Blank	TF-2	L1524164-7	25-Sep-14	<0.00020	<0.00020	<0.010	<0.000090	<0.0020	<0.010	<0.00030	<1.0	<0.00020	<0.0020	<0.10	<0.020	<0.00020
Trip Blanks																
Trip Blank	TF-1	L1493970-11	28-Jul-14	<0.00020	<0.00020	<0.010	<0.000090	<0.0020	<0.010	<0.00030	<1.0	<0.00020	<0.0020	<0.10	<0.020	<0.00020
Trip Blank	TF-1	L1509386-6	26-Aug-14	<0.00020	<0.00020	<0.010	<0.000090	<0.0020	<0.010	<0.00030	<1.0	<0.00020	<0.0020	<0.10	<0.020	<0.00020
Trip Blank	TF-1	L1524164-6	25-Sep-14	<0.00020	<0.00020	<0.010	<0.000090	<0.0020	<0.010	<0.00030	<1.0	<0.00020	<0.0020	<0.10	<0.020	<0.00020

Table A2-2: Routine

Sample Location	Site ID	Sample Date	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)	Sulfate (mg/L)	Strontium (mg/L)	Tellurium (mg/L)	Thallium (mg/L)	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 2014			**0.0010**	**0.10**	**0.00010**	**0.030**	**0.50**	**0.00010**	**0.00020**	**0.00010**	**0.00010**	**0.00020**	**0.00050**	**0.00010**	**0.00010**	**0.00020**	**0.0020**	**0.00040**

Table A2-2: Routine

Sample Location	Site ID	Sample Date	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)	Sulfate (mg/L)	Strontium (mg/L)	Tellurium (mg/L)	Thallium (mg/L)	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 2014			**0.0010**	**0.10**	**0.00010**	**0.030**	**0.50**	**0.00010**	**0.00020**	**0.00010**	**0.00010**	**0.00020**	**0.00050**	**0.00010**	**0.00010**	**0.00020**	**0.0020**	**0.00040**
Triplicates																		
Nelson River Upstream # 3	US-3	27-Jul-14	<0.0010	4.21	<0.00010	21.3	36.3	0.120	<0.00020	<0.00010	0.00041	<0.00020	0.0550	<0.00010	0.00084	0.00289	0.0037	0.00153
Nelson River Upstream # 3	US-3	27-Jul-14	<0.0010	4.48	<0.00010	20.1	36.3	0.124	<0.00020	<0.00010	0.00037	<0.00020	0.0492	<0.00010	0.00079	0.00281	0.0040	0.00123
Nelson River Upstream # 3	US-3	27-Jul-14	<0.0010	4.46	<0.00010	21.0	36.0	0.114	<0.00020	<0.00010	0.00041	<0.00020	0.0661	<0.00010	0.00081	0.00288	0.0040	0.00127
Nelson River Upstream # 5	US-3	27-Jul-14	<0.0010	4.38	<0.00010	20.8	36.2	0.119	<0.00020	<0.00010	0.00040	<0.00020	0.0568	<0.00010	0.00081	0.00286	0.0039	0.00134
	Mean		**-**	**0.150**	**-**	**0.62**	**0.17**	**0.0050**	**-**	**-**	**0.00002 3**	**-**	**0.00859**	**-**	**0.00002 5**	**0.000044**	**0.0001 7**	**0.000163**
	SD		**-**	**3**	**-**	**3**	**0**	**4**	**-**	**-**	**-**	**-**	**15**	**-**	**3**	**2**	**-**	**-**
	PRSD																	

Table A2-2: Routine

Sample	Site	Sample	Selenium	Silicon	Silver	Sodium	Sulfate	Strontium	Tellurium	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc	Zirconium
Location	ID	Date	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Detection Limit																		
2014			**0.0010**	**0.10**	**0.00010**	**0.030**	**0.50**	**0.00010**	**0.00020**	**0.00010**	**0.00010**	**0.00020**	**0.00050**	**0.00010**	**0.00010**	**0.00020**	**0.0020**	**0.00040**
Nelson River Upstream # 5	US-5	27-Aug-14	<0.0010	4.76	<0.00010	21.6	38.2	0.147	<0.00020	<0.00010	0.00044	<0.00020	0.0454	<0.00010	0.00094	0.00306	0.0037	0.00123
Nelson River Upstream # 5	US-5	27-Aug-14	<0.0010	4.33	<0.00010	24.3	38.4	0.131	<0.00020	<0.00010	0.00038	<0.00020	0.0532	<0.00010	0.00081	0.00325	0.0041	0.00091
Nelson River Upstream # 5	US-5	27-Aug-14	<0.0010	4.48	<0.00010	21.2	38.1	0.120	<0.00020	<0.00010	0.00039	<0.00020	0.0456	<0.00010	0.00084	0.00290	0.0036	0.00086
Nelson River Upstream # 5	US-5	27-Aug-14	<0.0010	4.52	<0.00010	22.4	38.2	0.133	<0.00020	<0.00010	0.00040	<0.00020	0.0481	<0.00010	0.00086	0.00307	0.0038	0.00100
	Mean		**-**	**0.218**	**-**	**1.69**	**0.15**	**0.0136**	**-**	**-**	**0.000032**	**-**	**0.00445**	**-**	**0.000068**	**0.000175**	**0.00026**	**0.000201**
	SD		**-**	**5**	**-**	**8**	**0**	**10**	**-**	**-**	**-**	**-**	**9**	**-**	**8**	**6**	**-**	**-**
	PRSD																	

Table A2-2: Routine

Sample Location	Site ID	Sample Date	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)	Sulfate (mg/L)	Strontium (mg/L)	Tellurium (mg/L)	Thallium (mg/L)	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 2014			**0.0010**	**0.10**	**0.00010**	**0.030**	**0.50**	**0.00010**	**0.00020**	**0.00010**	**0.00010**	**0.00020**	**0.00050**	**0.00010**	**0.00010**	**0.00020**	**0.0020**	**0.00040**
Stephens Lake - Nearfield # 1	NF-1	24-Sep-14	<0.0010	2.72	<0.00010	21.2	37.2	0.118	<0.00020	<0.00010	0.00024	<0.00020	0.0242	<0.00010	0.00083	0.00185	<0.0020	0.00065
Stephens Lake - Nearfield # 1	NF-1	24-Sep-14	<0.0010	2.74	<0.00010	21.4	37.4	0.107	<0.00020	<0.00010	0.00022	<0.00020	0.0265	<0.00010	0.00078	0.00200	0.0027	0.00065
Stephens Lake - Nearfield # 1	NF-1	24-Sep-14	<0.0010	2.72	<0.00010	21.5	37.3	0.114	<0.00020	<0.00010	0.00023	<0.00020	0.0309	<0.00010	0.00080	0.00199	0.0032	0.00079
Stephens Lake - Nearfield # 1	NF-1	24-Sep-14	<0.0010	2.73	<0.00010	21.4	37.3	0.113	<0.00020	<0.00010	0.00023	<0.00020	0.0272	<0.00010	0.00080	0.00195	0.0023	0.00070
	Mean		**-**	**0.012**	**-**	**0.15**	**0.10**	**0.0056**	**-**	**-**	**0.000010**	**-**	**0.00340**	**-**	**0.000025**	**0.000084**	**0.00115**	**0.000081**
	SD		**-**	**0**	**-**	**1**	**0**	**5**	**-**	**-**	**-**	**-**	**13**	**-**	**3**	**4**	**-**	**-**
	PRSD																	
Field Blanks																		

Table A2-2: Routine

Sample Location	Site ID	Sample Date	Selenium (mg/L)	Silicon (mg/L)	Silver (mg/L)	Sodium (mg/L)	Sulfate (mg/L)	Strontium (mg/L)	Tellurium (mg/L)	Thallium (mg/L)	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 2014			**0.0010**	**0.10**	**0.00010**	**0.030**	**0.50**	**0.00010**	**0.00020**	**0.00010**	**0.00010**	**0.00020**	**0.00050**	**0.00010**	**0.00010**	**0.00020**	**0.0020**	**0.00040**
Field Blank	TF-2	28-Jul-14	<0.0010	<0.10	<0.00010	<0.030	<0.50	<0.00010	<0.00020	<0.00010	<0.00010	<0.00020	<0.00050	<0.00010	<0.00010	<0.00020	<0.0020	<0.00040
Field Blank	TF-2	26-Aug-14	<0.0010	<0.10	<0.00010	<0.030	<0.50	<0.00010	<0.00020	<0.00010	<0.00010	<0.00020	<0.00050	<0.00010	<0.00010	<0.00020	<0.0020	<0.00040
Field Blank	TF-2	25-Sep-14	<0.0010	<0.10	<0.00010	<0.030	<0.50	<0.00010	<0.00020	<0.00010	<0.00010	<0.00020	<0.00050	<0.00010	<0.00010	<0.00020	<0.0020	<0.00040
Trip Blanks																		
Trip Blank	TF-1	28-Jul-14	<0.0010	<0.10	<0.00010	<0.030	<0.50	<0.00010	<0.00020	<0.00010	<0.00010	<0.00020	<0.00050	<0.00010	<0.00010	<0.00020	<0.0020	<0.00040
Trip Blank	TF-1	26-Aug-14	<0.0010	<0.10	<0.00010	<0.030	<0.50	<0.00010	<0.00020	<0.00010	<0.00010	<0.00020	<0.00050	<0.00010	<0.00010	<0.00020	<0.0020	<0.00040
Trip Blank	TF-1	25-Sep-14	<0.0010	<0.10	<0.00010	<0.030	<0.50	0.00013	<0.00020	<0.00010	<0.00010	<0.00020	<0.00050	<0.00010	<0.00010	<0.00020	<0.0020	<0.00040

Table A2- 3: Quality assurance/quality control results for hydrocarbons measured in the laboratory, open-water season 2014. Percent relative standard deviations (PRSD) were calculated for triplicate samples and values above 18% are indicated in bold red. Field and trip blank measurements more than five times the analytical detection limits are also indicated in bold red.

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 2014					**0.00050**	**0.00050**	**0.0010**	**0.00050**	**0.00050**	**0.0015**	**0.10**	**0.10**	**0.44**	**0.25**	**0.25**	**0.25**
Triplicates																
Nelson River Upstream # 3	US-3	L1493478-5	27-Jul-14	16:05	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River Upstream # 3	US-3	L1493478-6	27-Jul-14	16:05	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River Upstream # 3	US-3	L1493478-7	27-Jul-14	16:05	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River Upstream # 5	US-3	L1493478-5, 7, 8	27-Jul-14	16:05	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
		Mean			-	-	-	-	-	-	-	-	-	-	-	-
		SD			-	-	-	-	-	-	-	-	-	-	-	-
		PRSD														
Nelson River Upstream # 5	US-5	L1509715-5	27-Aug-14	11:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River Upstream # 5	US-5	L1509715-6	27-Aug-14	11:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River Upstream # 5	US-5	L1509715-7	27-Aug-14	11:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Nelson River Upstream # 5	US-5	L1509715-5, 6, 7	27-Aug-14	11:20	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
		Mean			-	-	-	-	-	-	-	-	-	-	-	-

Table A2- 3: Quality assurance/quality control results for hydrocarbons measured in the laboratory, open-water season 2014. Percent relative standard deviations (PRSD) were calculated for triplicate samples and values above 18% are indicated in bold red. Field and trip blank measurements more than five times the analytical detection limits are also indicated in bold red.

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 2014					**0.00050**	**0.00050**	**0.0010**	**0.00050**	**0.00050**	**0.0015**	**0.10**	**0.10**	**0.44**	**0.25**	**0.25**	**0.25**
		SD			-	-	-	-	-	-	-	-	-	-	-	-
		PRSD														
Stephens Lake - Nearfield # 1	NF-1	L1524159-1	24-Sep-14	17:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 1	NF-1	L1524159-6	24-Sep-14	17:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 1	NF-1	L1524159-7	24-Sep-14	17:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Stephens Lake - Nearfield # 1	NF-1	L1524159-1, 6, 7	24-Sep-14	17:00	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
		Mean			-	-	-	-	-	-	-	-	-	-	-	-
		SD			-	-	-	-	-	-	-	-	-	-	-	-
		PRSD														
Field Blanks																
Field Blank	TF-2	L1493970-12	28-Jul-14		<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Field Blank	TF-2	L1509386-7	26-Aug-14		<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Field Blank	TF-2	L1524164-7	25-Sep-14		<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Trip Blanks																
Trip Blank	TF-1	L1493970-11	28-Jul-14		<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25

Table A2- 3: Quality assurance/quality control results for hydrocarbons measured in the laboratory, open-water season 2014. Percent relative standard deviations (PRSD) were calculated for triplicate samples and values above 18% are indicated in bold red. Field and trip blank measurements more than five times the analytical detection limits are also indicated in bold red.

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 2014					**0.00050**	**0.00050**	**0.0010**	**0.00050**	**0.00050**	**0.0015**	**0.10**	**0.10**	**0.44**	**0.25**	**0.25**	**0.25**
Trip Blank	TF-1	L1509386-6	26-Aug-14		<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25
Trip Blank	TF-1	L1524164-6	25-Sep-14		<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.0015	<0.10	<0.10	<0.44	<0.25	<0.25	<0.25