CanNorth
Canada North Environmental Services
Limited Partnership

EASTERN ATHABASCA REGIONAL MONITORING PROGRAM 2012 TECHNICAL REPORT

Final Report

Prepared by:

Canada North Environmental Services
Saskatoon, Saskatchewan

Prepared for:

Government of Saskatchewan
Regina, Saskatchewan

Project No. 1611

February 2014

211 Wheeler Street, Saskatoon, Saskatchewan, Canada S7P 0A4
Telephone: (306) 652-4432 Facsimile: (306) 652-4431 E-mail: info@cannorth.com
A First Nations Environmental Services Company
www.cannorth.com
ISO 9001, ISO 14001 and OHSAS 18001 Registered

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

The Eastern Athabasca Regional Monitoring Program (EARMP) was established in 2011 under the Province of Saskatchewan's Boreal Watershed Initiative. The EARMP framework includes two sub-programs: a community program and a technical program. The community program was established to monitor the safety of traditionally-harvested country foods and the results are presented in a separate report. The technical program, which is the focus of this report, was established to monitor long-term changes in the aquatic downstream of the intersection of watersheds within which uranium mines operate. These locations are generally tens of kilometers downstream of any particular mine operation and are at locations that are subject to potential cumulative effects. The focus of the current technical program is on gathering a two-year baseline of water quality, sediment quality, fish chemistry, and benthic invertebrate community data from far far-field exposure locations (hereafter referred to as far-field exposure) and reference locations in northern Saskatchewan. The data collected during this two-year baseline will be used to assess if changes are occurring over time throughout the lifespan of this monitoring program.

In 2011 and 2012, long-term monitoring stations at far-field exposure and regional reference locations were established and water quality, sediment quality, benthic invertebrate community, and fish tissue chemistry data were collected. Far-field exposure locations include two locations in Wollaston Lake (at each outlet: Fond du Lac River and Cochrane River), the outlet of Waterbury Lake, and Crackingstone Inlet of Lake Athabasca. Reference areas utilized for the program are not influenced by any upstream uranium mining and/or milling activities and include Cree Lake, Pasfield Lake, Ellis Bay of Lake Athabasca, Bobby's Lake[1], and RF-4[1] in Shallow Bay of Wollaston Lake. Reference areas are included in this program to characterize natural background variability, which provides important context within which to consider any variations observed at the far-field exposure locations.

Both chemical and benthic invertebrate community endpoints were selected for assessment. Benthic invertebrate community endpoints included density, taxon richness, and biomass. Chemical endpoints included parameters identified as Constituents of

[1] Data collected from Bobby's Lake in 2009 and 2012 and RF-4 in 2008 and 2012 as part of separate sampling programs were utilized to standardize the EARMP sediment chemistry data for particle size. Other data collected from these additional reference lakes were also utilized, where available. This included water quality data from both lakes, benthic invertebrate community data from both lakes, and fish tissue chemistry data from Bobby's Lake.

Potential Concern (COPCs) in uranium mining and milling environmental assessment processes. The COPCs are summarized in the following table:

Constituents of Potential Concern	
Aluminum	*Organic Carbon*
*Ammonia**	*pH**
Arsenic	*Polonium-210*
Cadmium	*Radium-226*
Cobalt	*Selenium*
Copper	*Specific Conductivity**
Iron	*Total Hardness**
Lead	*Thorium-230*
Lead-210	*Uranium*
*Mercury***	*Vanadium*
Molybdenum	*Zinc*
Nickel	

**For water only.*
***Mercury is not associated with the uranium mining and milling process, but it is a concern of the communities so it was included as a COPC.*

Water chemistry, sediment chemistry, benthic invertebrate community, and fish tissue chemistry endpoints were assessed against available guidelines and the reference range to establish if endpoints are currently within expected background levels of the region. The reference range is defined as the reference mean ± 2 standard deviations or the 95% confidence interval. With few exceptions, endpoints were found to be below guidelines and/or within the reference range. The few exceptions include:

- *Copper concentrations in the 2012 water sample from the Fond du Lac River were above Canadian Water Quality Guidelines (CWQG) and the reference range. The 2012 concentration was also notably higher than the concentration observed at the same location in 2011, suggesting it may be anomalous; this will be verified during the next monitoring phase.*
- *Mean vanadium concentrations and thorium-230 activities were higher in Crackingstone Inlet sediment as compared to the reference range and the mean vanadium concentration in 2011 exceeded the available guideline. However, the Crackingstone Inlet benthic invertebrate community endpoints were comparable to the reference areas. This would suggest the vanadium and thorium-230 levels in the sediment are not cause for concern.*

- *While fish flesh chemistry in the far-field exposure areas was generally similar to reference, differences were noted in northern pike bone concentrations of uranium and selenium from the Crackingstone Inlet*[2]*, and sucker bone concentrations of molybdenum from the Cochrane River, Fond du Lac River, and Waterbury Lake sampling areas. However, a relatively small reference area sample size was available for these species; thus, it is unclear if the natural variability of the region was sufficiently characterized. The samples collected during future monitoring phases from the reference areas will allow for a more complete characterization of the expected concentration of these COPCs in the region.*

The 2011 and 2012 EARMP technical program results present a baseline to which future monitoring phases can compare and assess for temporal changes. Future phases should consider the low reference area sample sizes of northern pike, longnose sucker, and white sucker and expend additional effort to sample these species.

[2] *Note: no sucker were captured in Crackingstone Inlet.*

1.0 INTRODUCTION

1.1 Background

The Eastern Athabasca Regional Monitoring Program (EARMP) was established in 2011 under the Province of Saskatchewan's Boreal Watershed Initiative with additional financial contributions from Cameco Corporation (Cameco) and AREVA Resources Canada Inc. (AREVA). One of the primary goals of the Boreal Watershed Initiative is to assess the ecological integrity of Saskatchewan's northern watersheds to address potential environmental concerns and to identify sustainable management practices in the region. The EARMP was designed to provide long-term environment information and identify potential cumulative impacts downstream of uranium mining and milling operations in the Eastern Athabasca region of northern Saskatchewan (Figure 1).

Cumulative effects are defined as impacts on the environment that result from the incremental impact of an action when added to other past, present, and foreseeable future actions (Joint Panel 1992). Cumulative effects might occur when similar projects overlap spatially, such as when two watersheds exposed to mining activities converge. Cumulative effects may also occur temporally due to the potential long-range transport of contaminants over extended periods of time. The EARMP was designed to assess both potential spatial and temporal cumulative effects of uranium mining and milling activities.

Numerous environmental monitoring programs are currently conducted at mining and milling operations that are regulated by Environment Canada (EC; Metal Mining Effluent Regulations (MMER)), the Saskatchewan Ministry of Environment (MOE), and the Canadian Nuclear Safety Commission (CNSC). These monitoring programs are completed in the vicinity of each mining and milling operation. In addition, regional sampling occurs through the Athabasca Working Group (AWG) Environmental Monitoring Program. The EARMP is intended to complement, rather than overlap, the information gathered by the above mentioned monitoring programs and provide a framework for the evaluation of potential cumulative effects in northern Saskatchewan.

The EARMP framework includes two sub-programs: a community program and a technical program. The community program, the subject of a separate report, was established to monitor the safety of traditionally-harvested country foods. The

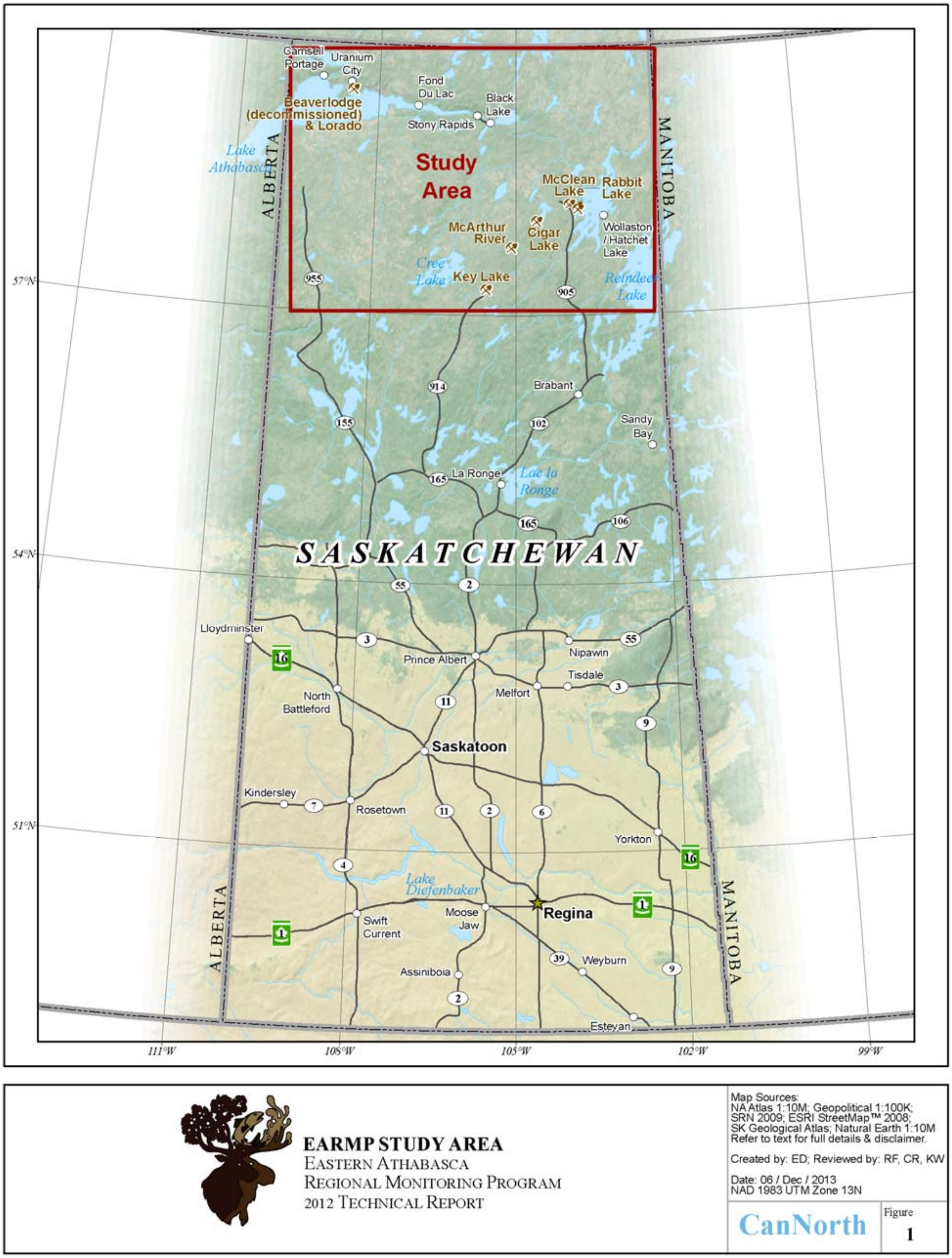


Figure 1
Study location.

technical program, the subject of the current report, was established to monitor potential long-term changes in the aquatic environment far-field downstream of uranium mining and milling operations in the Eastern Athabasca region. The objective of this document is to discuss the study design and results of the EARMP technical program.

1.1.1 Communities in the Region

There are seven communities in the region, including Black Lake, Fond du Lac Denesuline First Nation, Stony Rapids, Wollaston Lake, Hatchet Lake Denesuline First Nation, Camsell Portage, and Uranium City. Figure 2 shows the community locations in relation to the uranium mining and milling operations.

1.1.2 Uranium Mining and Milling Operations in the Region

There are five active uranium mines and/or mills in the Eastern Athabasca region. These include Key Lake, McArthur River, McClean Lake, Rabbit Lake, and Cigar Lake. In addition, the decommissioned Eldorado and Lorado uranium mining and/or milling operations as well as a number of abandoned uranium mines are located within the region and near to the community of Uranium City. The locations of these uranium mining and milling operations are presented in Figure 2. As a result of the licensing and approval requirements for uranium mining and milling operations in Saskatchewan, each site completes extensive monitoring in their local study areas. This includes monitoring of the air, soil, aquatic environment, and terrestrial environment. Detailed results of the environmental monitoring programs completed at each site are available in the most recent Status of the Environment (SOE) reports and/or Technical Information Documents (TID). These reports provide a regular update to regulatory agencies on the results of the various monitoring programs and special investigations completed in each study area and also include an assessment of the current environmental conditions as compared to those predicted in each sites most recent Environmental Assessment (EA). The most recent reports/documents include:

- Status of the Environment Report for the Cigar Lake Project 1998 to 2010 (SENES 2012);
- Key Lake Operation Status of the Environment Report 2005 to 2009 (EcoMetrix 2010a);

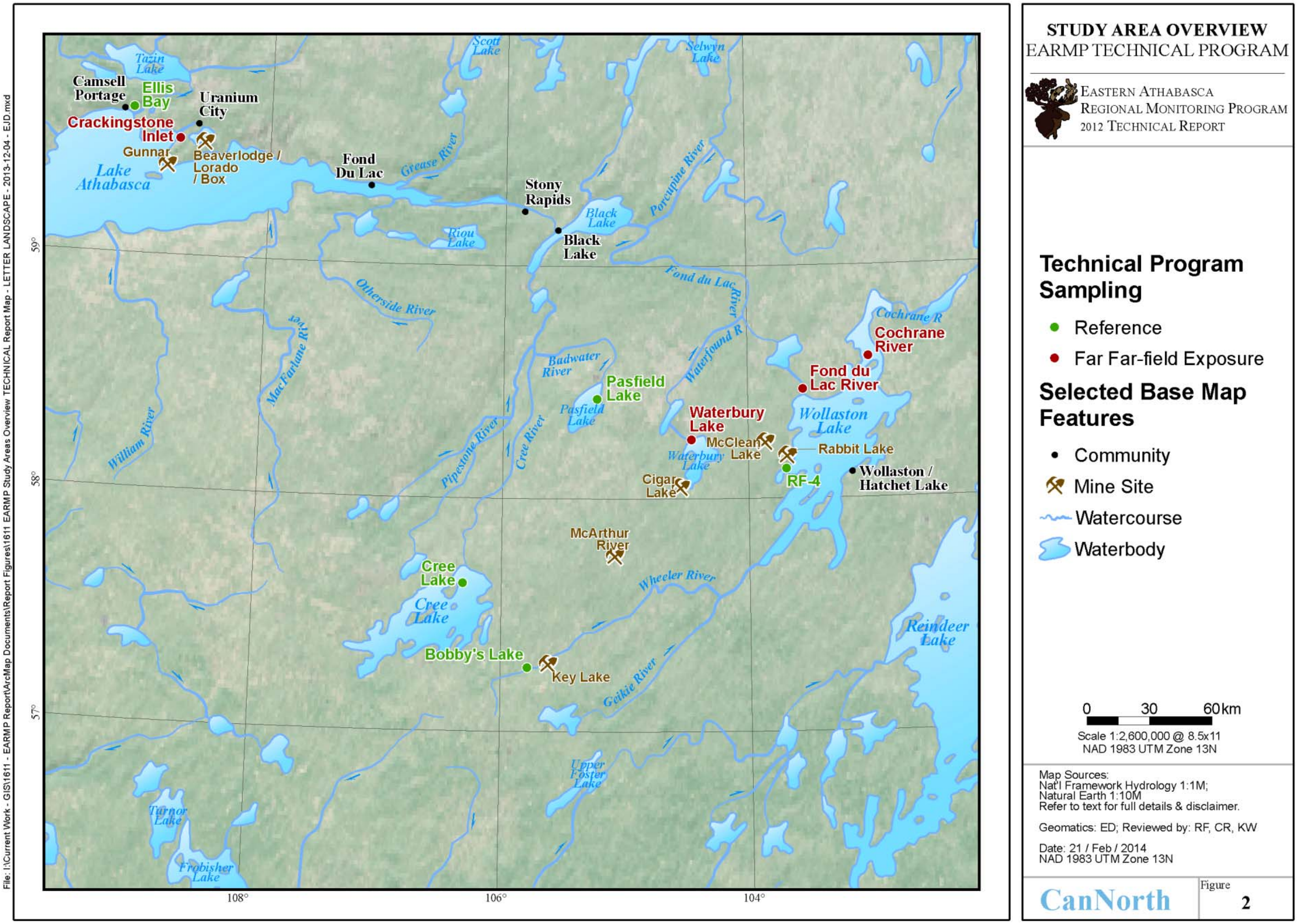


Figure 2
Study area overview.

- McArthur River Operation Status of the Environment Report 2005 to 2009 (EcoMetrix 2010b);
- McClean Lake Operation Technical Information Document Environmental Performance (AREVA 2012); and,
- Rabbit Lake Operation Integrated Environmental Risk Assessment and State of the Environment Report 2005 to 2009 (SENES 2010).

1.1.2.1 Key Lake

Cameco's Key Lake Operation is located in north-central Saskatchewan approximately 570 km north of Saskatoon. The Key Lake Operation lies within the Waterfound River drainage area, which is a tributary of the Fond du Lac River. The Fond du Lac River discharges to the Slave River via Lake Athabasca and ultimately discharges to the Beaufort Sea via the Mackenzie River.

Mining at the Key Lake Operation began in 1982 with open pit mining of the Gaertner orebody followed by open pit mining of the Deilmann orebody beginning in 1986. Once stockpiles from the Deilmann orebody were consumed in late 1999, the mill began processing ore from the McArthur River Operation. The Key Lake Operation has two treated effluent receiving environments: the David Creek drainage and the McDonald Lake drainage, both of which are tributaries of the Wheeler River.

1.1.2.2 McArthur River

The McArthur River Operation is located approximately 80 km north of the Key Lake Operation and is managed and operated by Cameco. Similar to the Key Lake Operation, it is located within the Waterfound River drainage area.

McArthur River has been operational since 1999 and is currently the world's largest, high-grade uranium deposit. The operation includes underground mining, processing systems, an ore handling system, and camp infrastructure. Specialized mining equipment is used to extract the high-grade uranium ore and mineralized wastes are blended with high-grade ore to produce a slurry, which is trucked to the Key Lake Operation for processing. Treated mine water is released into East Boomerang Lake, part of the Read Creek watershed. Read Creek flows east into Little Yalowega followed by Yalowega Lake, the Whitford River, and Waterbury Lake.

1.1.2.3 McClean Lake

The McClean Lake Operation is located approximately 15 km west of Wollaston Lake in north-eastern Saskatchewan approximately 350 km north of La Ronge. AREVA is the majority owner and operator of the McClean Lake Operation. The McClean Lake Operation lies within both the Collins Creek and Moffatt Creek watersheds.

Uranium mineralization was first discovered in the McClean Lake region in early 1979, with mining of uranium ore beginning in 1996 and processing it into yellowcake product beginning in 1999. The McClean Lake Operation consists of several ore bodies, a milling operation, permanent camp, and various supporting facilities. Treated effluent from the McClean Lake Operation is discharged into the Sink/Vulture treated effluent management system, which provides for the controlled discharge of treated effluent into the east basin of McClean Lake, which flows into Collins Creek and ultimately discharges to Collins Bay of Wollaston Lake.

1.1.2.4 Rabbit Lake

The Rabbit Lake Operation, owned and operated by Cameco, is the longest-operating uranium production facility in Saskatchewan (since 1975). It is located on the west side of Wollaston Lake approximately 350 km north of La Ronge.

The Rabbit Lake Operation includes the Eagle Point underground mine, Rabbit Lake mill, four mined-out open pit mines, of which the original Rabbit Lake pit is being used as the Rabbit Lake In-Pit Tailings Management Facility, the Rabbit Lake Above Ground Tailings Management Facility, overburden stockpiles, waste rock stockpiles, effluent treatment facilities, and camp infrastructure. Currently, uranium ore is sourced from the Eagle Point underground mine and hauled to the mill for processing. Treated effluent from the Operation is released into Horseshoe Creek. Horseshoe Creek flows approximately 9 km from the point of effluent release, via Unknown Pond and Horseshoe Pond, and discharges into Hidden Bay of Wollaston Lake.

1.1.2.5 Cigar Lake

The Cigar Lake Project is located approximately 80 km west of Wollaston Lake and 40 km inside the eastern margin of the Athabasca Basin region of northern Saskatchewan.

The project is currently managed and operated by Cameco. The Project is situated near the southern shore of Waterbury Lake, between the watersheds of two principal inflowing tributaries, the Whitford River to the southeast and the Thin River to the northwest. Waterbury Lake flows into the Waterfound River, which in turn flows into the Fond du Lac River downstream of Hatchet Lake.

The initial discovery of the Cigar Lake uranium deposit occurred in May 1981. Following the acquisition of the construction license in December 2004, underground construction activities commenced. Site construction activities were expected to take 24 months to 36 months; however, in 2006 and 2008 the mine experienced two inflow events that caused flooding of all underground workings of the Cigar Lake Project. Treated effluent was discharged into a muskeg area that flows into Aline Lake between 1988 and 2013. Aline Lake discharges into the south end of Seru Bay of Waterbury Lake through Aline Creek. Since August 7th, 2013, treated effluent has been released into Seru Bay of Waterbury Lake.

1.1.2.6 Other Properties

The decommissioned Eldorado uranium mining and milling operation is located approximately 8 km east of Uranium City north-east of Beaverlodge Lake in northern Saskatchewan. The mine operated for almost 30 years between 1953 and 1982. Decommissioning of the site occurred from 1983 to 1985 and transition phase monitoring continues today. Upon its inception as a publicly traded company, Cameco was assigned responsibility for the managing and reclamation of the decommissioned site. Post-decommissioning activities include the ongoing monitoring and maintenance of the site, regular water quality monitoring at stations within the area, and a variety of special investigations to assess specific environmental concerns.

In addition, Beaverlodge Lake is the receiving environment for the discharges from at least nine other abandoned uranium mine sites and one former uranium mill tailings area (the Lorado Uranium Mining Ltd. mill site), which are managed by the Saskatchewan Research Council (SRC). SRC is managing Project Cleans, which is also responsible for the assessment and reclamation of the Gunnar uranium mine and mill site and over 30 abandoned satellite mines in the Uranium City area.

Water flows from Beaverlodge Lake into Martin Lake, Cinch Lake, and then into the Crackingstone River, which flows southwest and eventually discharges into Crackingstone Inlet of Lake Athabasca.

1.2 EARMP Technical Program

The focus of the current technical program is on gathering a two-year baseline of water quality, sediment quality, fish chemistry, and benthic invertebrate community data from reference areas and from exposure areas in northern Saskatchewan. The exposure areas are located tens of kilometres downstream of uranium mining and/or milling operations at locations that are subject to potential cumulative effects (hereafter referred to as far-field exposure). The data collected during this two-year baseline will be used to assess if changes are occurring over time throughout the lifespan of this long-term monitoring program.

1.2.1 Technical Program Objectives

The EARMP technical monitoring program objectives are:

1. To establish long-term monitoring stations at far-field exposure and reference locations;
2. To monitor for temporal changes in water quality, sediment quality, benthic invertebrate community, and fish chemistry over the long-term; and,
3. To communicate monitoring results to stakeholders, through public media and stakeholder meetings.

Water, sediment, and fish tissue chemistry were selected to monitor for potential changes in Constituents of Potential Concern (COPCs). Benthic invertebrate communities were assessed as an indicator of the condition of fish habitat (EC 2012).

1.2.2 Technical Program Study Area

The EARMP technical program focused on establishing four far-field exposure areas as well as reference areas in the Eastern Athabasca region. Far-field exposure locations include two locations in Wollaston Lake (at each outlet), the outlet of Waterbury Lake, and Crackingstone Inlet of Lake Athabasca (Figure 2). The far-field exposure locations are situated in depositional areas further afield than each operations' local study area in order to assess potential cumulative effects not captured by the extensive monitoring already completed by each mine and/or mill site. In addition, the far-field exposure areas are positioned where watersheds separately exposed to uranium projects overlap. Reference areas utilized for the program are not influenced by any upstream uranium mining and/or milling activities.

1.2.2.1 Wollaston Lake and the Cochrane River

Wollaston Lake is a distinctive lake in that it has two drainage systems. The primary outlet of Wollaston Lake is the Cochrane River, which flows out the northeast end of the lake and into Reindeer Lake, before draining into the Churchill River system and out to Hudson Bay. The outflow of Wollaston Lake to the Cochrane River and was sampled as a far-field exposure area as it is located downstream of treated effluent release from the McClean Lake, Rabbit Lake, and Key Lake operations.

1.2.2.2 Wollaston Lake and the Fond du Lac River

Wollaston Lake's secondary outlet flows into the Fond du Lac River at Cunning Bay, located approximately 25 km from Collins Bay on the west side of Wollaston Lake. The Fond du Lac River then flows northwest and eventually discharges into Lake Athabasca, which in turn drains into the Slave River, and ultimately into the Mackenzie River. The outlet of Cunning Bay is located downstream of treated effluent release from the McClean Lake, Rabbit Lake, and Key Lake operations. Depositional habitat was not available to complete the sediment and benthic invertebrate community sampling in the immediate outlet area. Therefore, sediment was collected downstream from Cunning Bay in a Fond du Lac River backwater area.

1.2.2.3 Waterbury Lake and the Waterfound River

The outlet of Waterbury Lake close to Kelly Bay is located at the northwest end of Waterbury Lake approximately 25 km downstream from the Cigar Lake Project. This location is also far-field downstream of the McArthur River Operation, which is located 75 km upstream of Waterbury Lake. Waterbury Lake then flows northeast through Theriau (Unknown) Lake, Durrant Lake, and the Waterfound River to join the Fond du Lac River at Waterfound Bay.

1.2.2.4 Lake Athabasca and the Crackingstone River

Beaverlodge Lake is the receiving environment for water exiting the Beaverlodge decommissioned site and at least nine other abandoned uranium mine sites and one former uranium mill tailings area (Lorado) within the Beaverlodge Lake watershed. In addition, a number of small sites without tailings are located downstream of Martin Lake. Martin Lake is immediately downstream of Beaverlodge Lake and flows northwest into Cinch Lake and continues west from Cinch Lake into the Crackingstone River, which flows southwest and empties into Crackingstone Inlet of Lake Athabasca. The Crackingstone Inlet of Lake Athabasca was the final far-field exposure area selected for the EARMP technical program.

1.2.2.5 Reference Areas

Reference areas are included in the EARMP technical program to characterize natural background variability. Understanding natural background spatial and temporal variability provides important context within which to consider the variations observed at the far-field exposure locations.

Three reference areas were established specifically for the EARMP technical program. These include Cree Lake, Pasfield Lake, and Ellis Bay of Lake Athabasca (Figure 2). As shown in Figure 2, the sampling location in Cree Lake was re-located in 2012 in an effort to minimize the particle size differences across sampling areas. However, it was still not completely possible to match particle size across all the sampling areas. Therefore, two additional reference areas were included in the reference area dataset so that the reference area particle size data encompassed the particle size present in the exposure areas.

Data collected from Bobby's Lake in 2009 and 2012 and a bay located at the south end of Wollaston Lake (subsequently referred to as RF-4) in 2008 and 2012 were utilized to standardize the EARMP sediment chemistry[3] data by particle size. These data were collected during monitoring programs conducted by uranium operations (CanNorth 2009; CanNorth 2010; CanNorth 2013a; CanNorth 2013b). Water chemistry, benthic invertebrate community, and fish tissue chemistry data collected from these additional reference areas were also utilized where available. This included water quality data from

[3] No strong relationship between benthic invertebrate community endpoints and particle size occurred, therefore, the benthic invertebrate community data was not standardized by particle size (see Appendix A for further details).

both areas, benthic invertebrate community data from both areas, and fish tissue chemistry data from Bobby's Lake. It should be noted that data were collected from RF-4 during a winter sampling cycle, while the remaining EARMP data were collected on a fall sampling cycle. Both the fall and winter are periods of low emergence for benthic invertebrates; thus it was deemed acceptable to include the RF-4 data in the reference dataset.

.

1.3 Report Structure

This report is structured to provide a summary of the most important information in the main text with additional detailed analyses and background information provided in appendices. The main text consists of seven sections:

1.0 Introduction
2.0 Study Design
3.0 Surface Water Quality
4.0 Sediment Quality
5.0 Benthic Invertebrate Communities
6.0 Fish Chemistry
7.0 Moving Forward

Section 2 provides a summary of the overall study design, including the data analysis approach used for the EARMP technical program, while sections 3 to 6 are stand-alone chapters, each including their specific objectives, sampling and data analysis methods, and results. Section 7 provides an overall summary of the 2011 and 2012 results and ties it into the objectives of the EARMP technical program moving forward. Appendix A presents additional detailed results relating to the analysis of the 2011 and 2012 data, while the raw data are presented in Appendix B.

2.0 STUDY DESIGN RATIONALE

The overall approach used for the EARMP technical monitoring program includes the assessment of both chemical and benthic invertebrate community endpoints over the long-term. The initial focus of the program is to establish baseline conditions at the far-field exposure locations, with the intent of follow-up monitoring over the long-term (over decades, if possible) to discern if there are any temporal changes occurring. The sampling and data analysis protocol was developed in consideration of the long-term monitoring aspect of this program.

The following design is based on the core elements of the EARMP technical program remaining relatively consistent over time. However, the program is also adaptive and may be refined in response to new information or changes associated with the development in the region. Some things to consider are:

- Regional Development: The development of additional mining and milling operations in the region may influence the sampling locations.
- EARMP Technical Program results: Changes to the design of the EARMP technical program may occur based on results and conclusions from each monitoring cycle.

2.1 Sampling Components

The EARMP technical program focuses on four monitoring components: water quality, sediment quality, benthic invertebrate community, and fish tissue chemistry. All four of these components are monitored within uranium mine and/or mill site local study areas as a federal and provincial regulatory requirement (CNSC and MOE). Furthermore, the sampling methods associated with the monitoring components are relatively simple and reliable, have a long history of application, and will not likely change over the long-term duration of the EARMP.

Water and sediment quality data provide supporting information for the benthic invertebrate and fish components of the EARMP technical program. Furthermore, they provide an indication of the suitability of a waterbody to support aquatic life.

Benthic invertebrate community data provide an indication of the condition of fish habitat (EC 2012) and, due to the relatively short life span of benthic invertebrates, can provide an early warning of potential effects on fish communities or populations (Kilgour and Barton 1999). Numerous studies have established a link between benthic invertebrate community composition and the condition of fish communities (Matuszek 1978; Berkman et al. 1986; Elliott 1986; Boisclair and Leggett 1989; Morgan and Ringler 1994; Kilgour and Barton 1999). Thus, there is justification in using benthic invertebrate community data as a means of assessing potential effects on fish communities, particularly for use as an early warning tool (Kilgour et al. 2005).

Fish tissue chemistry data provide a means of monitoring the potential accumulation of COPCs identified in the water and/or sediment quality components of the EARMP technical program as well as potential accumulation through the food chain. The EARMP technical program targeted both predatory and bottom-feeding fish species for the analysis of flesh and bone tissue chemistry. Both flesh and bone were assessed since different constituents may accumulate in different tissues at different rates. Predatory fish species targeted include lake trout (*Salvelinus namaycush*) and northern pike (*Esox lucius*) and bottom-feeding species include longnose sucker (*Catostomus catostomus*), white sucker (*Catostomus commersonii*), and lake whitefish (*Coregonus clupeaformis*).

2.2 Sampling Frequency

The EARMP technical program has been established as an initial two-year baseline assessment (2011 and 2012) followed by monitoring phases to be completed every three years. The intent of sampling for two consecutive years for the establishment of baseline conditions was to capture some of the natural temporal variability within the baseline dataset. It was also considered beneficial to monitor sediment, benthic invertebrate community, and fish tissue chemistry at the same frequency that regulatory agencies (EC, CNSC, and MOE) require of uranium mining and milling operations in the region.

Sampling of each component is conducted during one fall field program completed in late September and early October. Sampling is completed in the fall as it is a period of low emergence for benthic invertebrates. For national consistency, fall, as opposed to winter, is the preferred sampling season by Environment Canada (EC 2012) for benthic invertebrate communities, thus the EARMP technical program is consistent with regulatory requirements for benthic invertebrate community sampling at each operation.

2.3 Data Assessment Approach

2.3.1 Chemical Endpoints

A full suite of parameters is assessed for each chemistry sample; however, this report focuses on a reduced list of parameters, which have been identified in uranium mining and milling environmental assessment process as COPCs. Table 1 summarizes the COPCs assessed for the EARMP Technical Program.

TABLE 1

Constituents of Potential Concern selected for the EARMP.

Constituents of Potential Concern	
Aluminum	Organic Carbon
Ammonia*	pH*
Arsenic	Polonim-210
Cadmium	Radium-226
Cobalt	Selenium
Copper	Specific Conductivity*
Iron	Total Hardness*
Lead	Thorium-230
Lead-210	Uranium
Mercury**	Vanadium
Molybdenum	Zinc
Nickel	

*For water only.
**Mercury is not associated with the uranium mining and milling process.

While mercury is included in Table 1, it is not associated with uranium mining and milling operations. Monitoring programs completed in each mine sites' local study area have repeatedly shown that mercury concentrations in the treated effluent are below laboratory method detection limits (EcoMetrix 2010a, 2010b; SENES 2010, 2012; AREVA 2012). Mercury occurs naturally in the environment and can be found at low levels in most soils and rocks. In northern Saskatchewan, natural deposits associated with lead, zinc, copper, silver, and gold are likely the cause of higher levels of mercury in fish in some lakes (SE 2011). Since mercury has been identified as a concern to community members in the Athabasca Region, it has been included in the assessment.

When dealing with chemistry related endpoints, one important consideration is the laboratory method detection limits (MDLs). Metals and trace elements analysis for the

EARMP technical program is completed by ICP-MS because it is a fast, multi-elemental technique similar to ICP-AES, but with better detection limits. In addition, ICP-MS is an accepted methodology for the assessment of metals and trace elements in the MMER (EC 2012). For most elements, ICP-MS is able to achieve detection limits similar to or lower than Graphite Furnace AAS (Wolf 2005). It should be noted, however, that even with the use of ICP-MS, concentrations of many metals and trace elements in the EARMP sampling media are at levels below the MDLs. For values that are below the MDL, it is not possible to determine the actual concentration; therefore, all values are set equal to the MDL for computing averages and standard deviations. This is a conservative approach as the actual concentrations could be substantially lower than the MDL.

2.3.2 Benthic Invertebrate Community Endpoints

Benthic invertebrate community data are summarized with a number of community metrics, including density, taxon richness (at the lowest practical level), and biomass. Density and taxon richness were selected as comparison endpoints because large changes in these measures can only occur if substantial changes in community composition have occurred (Kilgour et al. 2004). Extreme high densities and low richness tend to co-occur with changes in water quality that negatively impact on fish communities (Kilgour et al. 2005). Biomass was also assessed as a supporting endpoint and provides an indication of productivity in the waterbody. Other benthic invertebrate community measures could be calculated including diversity (e.g., Simpson's Diversity Index), evenness (e.g., Simpson's Evenness Index), and multivariate ordination, and may be assessed as supporting endpoints in future monitoring phases.

2.3.3 Comparison Criteria

To evaluate the technical program data during the baseline period, endpoints are compared to:

- available guidelines;
- the regional reference range; and,
- in cases where no guidelines are available and endpoints are outside the regional reference range, to available literature.

The above comparison criteria are used for each sampling component to establish if the endpoints are within the expected background levels for the region and within applicable guidelines. This will allow for a full characterization of the current conditions at the far-field exposure areas. As additional monitoring phases are completed, the assessment will focus on comparing the current monitoring phase to baseline conditions. Data sources for the information used are further described below.

2.3.3.1 Guidelines

Federal, provincial, and literature-based guidelines are available for some COPCs in water, sediment, and fish tissue. The various guidelines are discussed below in context of the media assessed. Although multiple guidelines may be available for a given COPC, the data assessment focuses on the most locally relevant guideline available.

Water Quality

Both provincial and federal water quality guidelines are available for the protection of freshwater aquatic life. These include the Canadian Water Quality Guidelines (CWQGs; CCME 2013) and the Saskatchewan Surface Water Quality Objectives (SSWQO, SE 2006). Since the SSWQO are the same as the CWQGs, the CWQGs were taken as the primary source of information. For those parameters where the values depend on hardness, the hardness concentration from each location was used to establish the guideline. Table 2 summarizes the CWQG used for comparison to the EARMP technical program water quality data.

TABLE 2

Water quality guidelines used for the EARMP technical program.

COPC	CWQG
Aluminum	0.005-0.1[1]
Ammonia as nitrogen	0.7-32.4[2]
Arsenic (µg/L)	5
Cadmium (µg/L)	0.04-0.05[3]
Copper	0.002[3]
Dissolved oxygen	6.5- 9.5
Iron	0.3
Lead	0.001[3]

COPC	CWQG
Lead-210 (Bq/L)	-
Mercury (µg/L)	0.026
Molybdenum	0.073
Nickel	0.025-0.035[3]
pH (pH units)	6.5-9.0
Radium-226 (Bq/L)	-
Selenium	0.001
Uranium (µg/L)	15
Zinc	0.03

All values in mg/L unless specified otherwise.
[1]Adjusted to pH of each waterbody.
[2]Adjusted according to water temperature and pH of each waterbody.
[3]Adjusted to water hardness in each waterbody.

Sediment Quality

Various sediment quality guidelines are available for comparison. These include the Canadian sediment quality guidelines for the protection of aquatic life (CSQG; CCME 2013), the sediment quality guidelines recommended for the uranium mining and milling industry (Thompson et al 2005), the regional toxicity benchmark (Liber et al. 2011), and the sediment quality values (SQVs) for uranium operations in northern Saskatchewan (Burnett-Seidel and Liber 2013). The CCME interim sediment quality guideline (ISQG) represents the concentration below which there is unlikely to be any adverse biological effects (CCME 2013). The CCME probable effect level (PEL) is the guideline level above which adverse effects are expected to frequently occur (CCME 2013). The Lowest Effect Level (LEL) is the concentration below which harmful effects on benthic invertebrates are not expected (Thompson et al. 2005). The regional toxicity benchmarks are based on laboratory spiked sediment toxicity tests on *Hyallella azteca* and *Chironomus dilutus* to determine the acute and chronic toxicity of uranium, molybdenum, nickel, and arsenic (Liber et al. 2011).

The “No Effects” (NE2) and reference (REF) benchmarks were determined specifically for Saskatchewan waterbodies (Burnett-Seidel and Liber 2013), and respectively refer to exposed areas with no significant effect on benthic invertebrate abundance, richness, and evenness, and locations upstream of mining or milling activities or located within separate, but nearby, drainages.

In an effort to compare to the most applicable guidelines, the EARMP technical data was first compared to guidelines available for the region. In cases where local guidelines were not available, the other criteria were used. Table 3 summarizes the available sediment quality guidelines, with those used as the primary benchmark for comparison highlighted.

TABLE 3

Sediment quality guidelines used for the EARMP technical program.

COPC	CSQG[1]		LEL[2]	Regional Toxicity Benchmark[3]				SQVs[4]	
	ISQG	PEL		NOEC	LOEC	IC25	IC50	NE2	REF
Copper	35.7	197.0	22.2	-	-	-	-	-	-
Lead	35.0	91.3	36.7	-	-	-	-	-	-
Molybdenum	-	-	13.8	3589	-	-	-	245.0	22.6
Nickel	-	-	23.4	-	210	189	312	326.0	21.4
Selenium	-	-	1.9	-	-	-	-	29.7	3.6
Uranium	-	-	104.4	740	1819	694	1918	2296.0	96.7
Zinc	123.0	315.0	-	-	-	-	-	-	-
Radium-226	-	-	0.6	-	-	-	-	-	-
Arsenic	5.9	17.0	9.8	-	39	174	342	522.0	20.8
Vanadium	-	-	35.2	-	-	-	-	-	-

All values in µg/g dry weight unless specified otherwise. Shaded values were used as the primary benchmark for comparison.
[1]Canadian Sediment Quality Guidelines for the protection of Aquatic Life (CCME 2013). ISQG = Interim Sediment Quality Guidelines, PEL = Probable Effects Level.
[2]LEL = Lowest Effect Level (Thompson et. al. 2005).
[3]NOEC = no-observed-effect concentration; LOEC = lowest-observed-effect concentration; IC25 and IC50 = inhibitory-concentrations for growth (Liber et al. 2011).
[4]Sediment quality values. NE2 = No Effect; REF = Reference sediment value (Burnett-Seidel and Liber 2013)

Fish Tissue

Tissue-based draft effects guidelines are available for selenium concentrations in fish. Three guideline values have been presented in Table 4 to illustrate the range in concentrations expected to be protective of fish populations.

The suitability of the United States Environmental Protection Agencies (USEPA) draft tissue criteria for cold-water fish species has been questioned because several species, including northern pike and white sucker, have shown increased tolerance to dietary selenium compared to the warm-water species upon which the criterion was based (Chapman 2007). Despite the questions about the suitability of the various guidelines for cold-water fish species, the guidelines do provide a context for evaluating whether selenium in fish flesh poses a risk to fish populations within the EARMP study area.

TABLE 4

Selenium tissue-based effects guidelines used for the EARMP technical program.

Source or Tissue Residue	Effects Concentration Toxicity Benchmark	Affected Group	Toxic Effect
Fish Tissue	10.2 µg/g (dw)[1]	Forage Fish	EC20 – based on survival
Whole Body Fish Tissue-muscle	7.9 µg/g (dw)[2] 8.8 µg/g (dw)[3]	Predatory Fish	Reproductive failure

[1] McIntyre et al. 2008.

[2] USEPA 2004.

[3] Lemly 1993.

Although mercury is not related to uranium mining and milling, community members in the Athabasca region have expressed concern about mercury levels in fish. Therefore, the EARMP technical program fish data are also screened against the provincial mercury in fish consumption guidelines (SE 2011). Data are screened against the lowest guideline, 0.5 µg/g, below which no consumption restrictions are required.

2.3.3.2 Reference Range

To establish the current condition of the far-field exposure areas as compared to the expected background conditions, the EARMP technical program endpoints are compared to the reference range. The reference range is defined as the normal range of variability in the reference areas (i.e., the 95% region or the mean ± 2 standard deviations). In terms of the benthic invertebrate community data, changes in indices of benthic community composition beyond two standard deviations of the reference mean often coincide with effects on fish communities (Yoder and Rankin 1995; Kilgour et al. 2005; Kilgour and Stanfield 2006). Furthermore, this approach is consistent with that of EC, which established two standard deviations from the reference mean as a critical effect size for benthic invertebrate metrics in EEM programs (EC 2012).

2.3.4 Data Presentation

The EARMP technical data are presented in both summary tables and figures. Descriptive statistics are calculated for each endpoint and presented in tables with reference and guideline values. A graphical presentation of the data is used to assess for levels above guidelines, levels outside of the reference range, and for changes over time. Two different graphical approaches were used, depending on the available data set.

An example graph is provided in Figure 3, which incorporates guidelines, the reference range, and temporal changes into a single image for each endpoint in each sampling component.

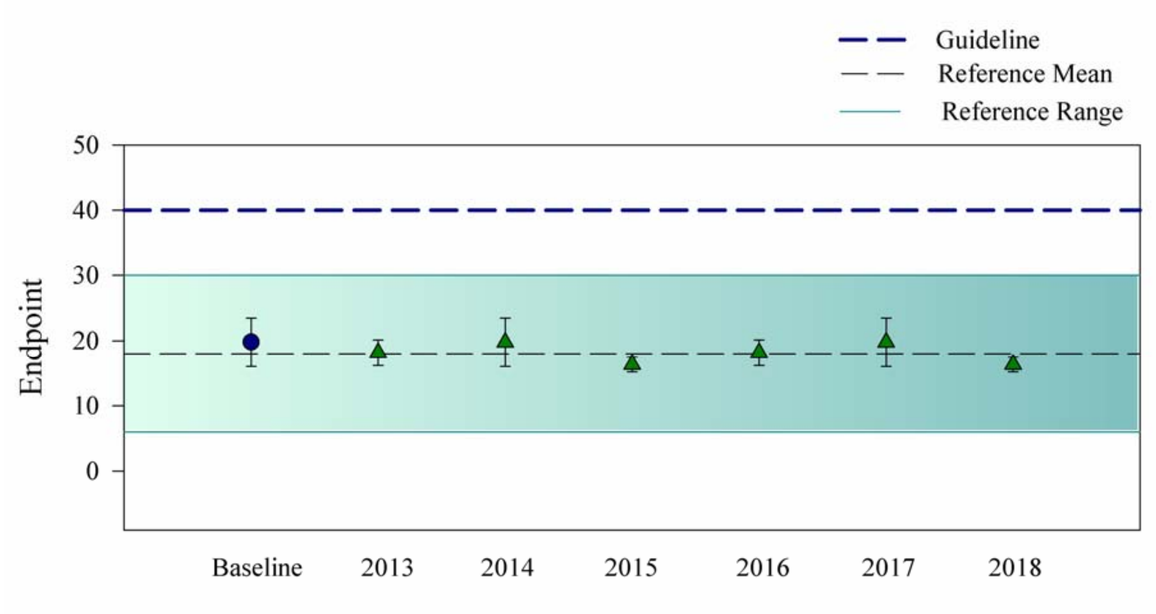


Figure 3
An example of the graphical presentation of water quality, sediment quality, and benthic invertebrate community data by endpoints.

The blue line represents a guideline concentration. The shaded area represents the reference range (reference mean ± 2 standard deviations), with the black line showing the regional reference mean. The average concentration in the far-field exposure area is shown as a circle for the baseline year and a triangle for those sampling years following the baseline data collection. The error bars represent one standard deviation. The above graph is a very useful visual tool for assessing the EARMP technical program data against the comparison criteria at a glance. It also allows for the qualitative assessment of increasing or decreasing concentrations of individual endpoints over time.

An additional approach can be used in the case of the fish chemistry data. Given that multiple species, multiple tissue types, and multiple COPCs are assessed, Principal Component Analysis (PCA) can be used as a means to evaluate fish tissue chemistry relative to the variations in tissue chemistry found at reference locations. PCA plots (e.g.,

Figure 4) can then be used to assess how chemically similar (or different) the fish samples are according to the distance between each specimens' position in the PCA plot (i.e., the greater the distance the greater the difference). Each axis in a PCA represents a combination of various COPC concentrations, and the eigenvectors for each COPC represent the amount and direction of "pull" each COPC has along each axis.

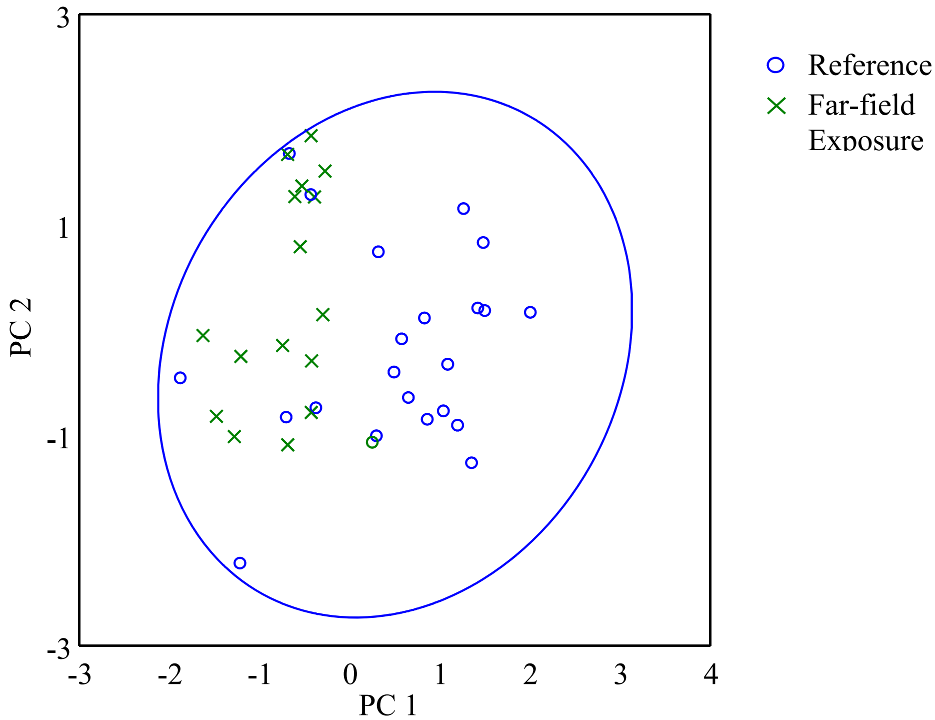


Figure 4

An example of the graphical presentation of fish tissue chemistry data using PCA.

The 95% confidence ellipse of the reference area fish can be superimposed on the graph. The chemical profile of any far-field exposure fish that fall outside the ellipse could then be examined closer for specific COPCs that may exceed the reference range. PCA produces multidimensional results (e.g., four, five, or more axes in multidimensional space); the majority of variation is typically summarized in the first two axes. Plots including more than two axes (or dimensions) become increasingly abstract and difficult to interpret. Therefore, the focus of the results will be on first two principal components (PC1 and PC2); however, consideration will be given to all axes that explained ≥ 10% of the variation.

2.4 Reporting and Communication Plan

Following each monitoring phase, a report will be completed to assess the EARMP technical data. The report, along with the raw data, will be available for download from the EARMP website: www.earmp.ca.

In addition to the report, Eastern Athabasca community visits will be completed to present the results of the monitoring program. The community visits will be an opportunity to receive feedback on the program from community members. Feedback on the program can also be provided through the EARMP website.

In 2012 and 2013, the EARMP took the opportunity to engage communities about their environment while also disseminating information about the new project. This included initial community visits to train local community members on the sampling program, a presentation of the year one results to the Northern Saskatchewan Environmental Quality Committee (NSEQC), and visits to communities in the region to provide general information to community members about the first year of the program. Brochures describing the year one results were also disseminated to each community.

3.0 SURFACE WATER QUALITY

Water quality data are collected as part of the EARMP technical program to monitor potential changes over time and to provide supporting information for the sediment quality, benthic invertebrate community, and fish tissue chemistry components of the program. Limnological profiles and water chemistry samples were collected from one station in each far-field exposure area and each reference area (Appendix A, Figures 1 to 9). The water quality sampling station was also co-located with one of the sediment and benthic invertebrate community replicate sampling stations in each area.

3.1 Sampling Methods

Limnological measurements of temperature, dissolved oxygen, specific conductance, and pH were collected *in situ* with a YSI multi-meter probe. Measurements were collected at 1.0 m depth intervals at each water quality sampling station. In addition, water transparency was measured using a black and white Secchi disc (20 cm diameter).

Water chemistry samples consisted of a composite water sample collected from 15 cm below the surface, mid-point of the water column, and 0.5 m above the bottom with a Kemmerer water-sampler. Prior to field collections, sample bottles, preservative, and QA/QC trip blanks were obtained from SRC laboratories in Saskatoon (results presented in Appendix C). Detailed sample-specific information (e.g., date, location, GPS coordinates, and composite depths) were collected during sampling. Preserved samples were placed in coolers and transferred to a refrigerator for storage until submission to SRC for chemical analysis (refer to Section 2.3.1 for information on lab analysis).

3.2 Data Analysis

To provide supporting habitat information for the benthic invertebrate community and fish components of this program, limnological parameters are compared against the CWQG for the protection of freshwater aquatic life (CCME 2013) and between sampling areas.

Data analysis of the water chemistry information focuses on the concentration of COPCs from the far-field exposure areas as compared to available CWQG and the expected concentrations for the region (i.e., regional reference range). The far-field exposure

COPC concentration was considered to be within the reference range if values were within two standard deviations of the reference mean[4]. A graphical approach was used to assess the far-field exposure data against the available guidelines and regional reference range. In addition, this will allow for an easy integration for the assessment of temporal changes in future monitoring phases. Only those COPCs that were measured above MDL in more than 50% of the samples from a given far-field exposure area were included in the graphical presentation.

3.3 Results

3.3.1 Limnology

The limnology profiles are discussed in detail in Appendix A and the main points are summarized below.

TABLE 5

Average limnology measurements from the EARMP technical program study area, 2011 and 2012.

Sampling Area	Date	Temp. (°C)	DO (mg/L)	Sp. Cond. (µS/cm)	pH	Secchi Depth (m)	Max. Depth (m)
Far-Field Exposure							
Cochrane River	26-Sep-11	12.4	9.03	32	7.73	5.3	7.3
	19-Sep-12	10.4	10.11	14	6.28	5.5	7.5
Crackingstone Inlet	2-Oct-11	10.9	10.30	63	8.08	4.2	7.8
	29-Sep-12	11.8	10.90	97	7.61	6.5	7.7
Fond du Lac River	26-Oct-11	3.4	11.93	32	8.12	4.1	7.6
	22-Sep-12	10.3	10.07	15	6.80	6.1	7.8
Waterbury Lake	22-Sep-11	12.2	9.77	21	7.91	4.5	7.1
	20-Sep-12	11.3	9.21	10	6.51	6.1	7.8
Reference							
Bobby's Lake	14-Oct-09	9.0	9.70	18	6.67	N/A	5.5
	2-Oct-12	9.9	9.79	18	5.81	2.7	4.0
Cree Lake	28-Sep-11	12.5	9.52	19	7.99	4.8	7.4
	26-Sep-12	11.1	10.18	20	7.59	4.6	8.0
Ellis Bay	4-Oct-11	10.6	9.69	60	7.96	5.8	7.2
	2-Oct-12	10.6	10.81	65	7.86	6.5	7.0
Pasfield Lake	24-Sep-11	11.5	9.99	17	7.89	6.7	6.7
	24-Sep-12	10.3	7.87	8	6.40	6.4	6.4
RF-4	24-Mar-08	0.6	12.41	19	7.00	N/A	6.4
	12-Apr-12	0.7	12.94	36	6.63	N/A	6.4

Temp. = Temperature; DO = Dissolved Oxygen; Sp. Cond. = Specific Conductance; N/A = data not available

[4] Values below the MDL were set equal to the MDL for calculation of descriptive statistics.

Profiles collected in the fall[5] of both 2011 and 2012 varied little with depth (Appendix A); therefore average measurements are presented in Table 5. Fall water temperature ranged between a mean of 9.0°C and 12.5°C across all waterbodies, except at the Fond du Lac River in 2011 where temperatures were lower (3.4°C) as a result of a later fall sampling date. Mean dissolved oxygen concentrations were high in all waterbodies meeting the CWQG of 6.5 mg/L for most aquatic life stages (CCME 2013). The mean dissolved oxygen concentrations in most waterbodies also met the CWQG for early life stages (9.5 mg/L; CCME 2013). Specific conductance was typical of northern oligotrophic waterbodies, with mean concentrations ranging between 8 µS/cm and 36 µS/cm in all areas except Lake Athabasca. Specific conductance was higher in Lake Athabasca (Crackingstone Inlet and Ellis Bay), with mean concentrations ranging between 60 µS/cm and 97 µS/cm. With few exceptions, the pH values generally met the CWQG (6.5 to 9.0) and were within the expected range for the region. The pH was slightly lower than the CWQG in the 2012 profiles collected from sampling areas in the Cochrane River, Bobby's Lake, and Pasfield Lake.

3.3.2 Water Chemistry

A detailed assessment of the water chemistry data is presented in Appendix A. The raw water chemistry data are presented in Appendix B, Table 1. The following section summarizes the main findings of the 2011 and 2012 sampling program.

The majority of the COPCs assessed in water quality samples collected from the far-field exposure areas were at concentrations at or below the MDLs. This included concentrations/activities of cadmium, lead, mercury, lead-210, polonium-210, thorium-230, and cobalt. Furthermore, the concentrations/activities of nickel, selenium, radium-226, arsenic, and vanadium were often at or below the MDL. Figure 5 summarizes the concentrations of the remaining six COPCs, which were measured above MDL in more than 50% of the samples in an area, in context of the available guidelines and the reference range. Note that no reference range is available for copper and uranium because all reference values were below MDL.

[5] RF-4 sampling occurred in the winter.

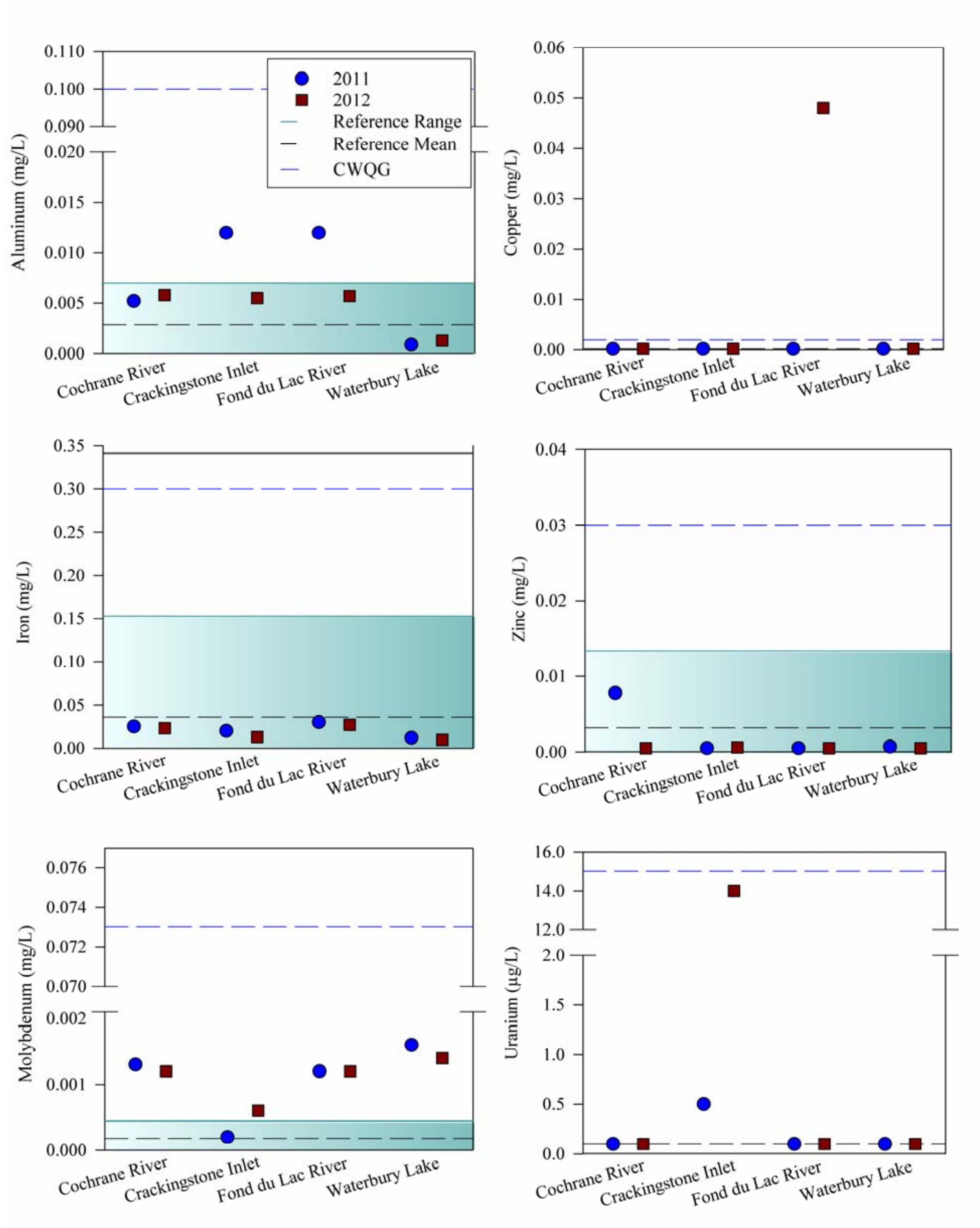


Figure 5
Select COPCs in the EARMP technical program study area, 2011 and 2012.

Although in some instances concentrations of aluminum, copper, molybdenum, and uranium were outside the reference range, they remained below the available CWQG for the protection of freshwater aquatic life at all sampling areas during both sampling years. One copper sample collected from Fond du Lac River in 2012 contained copper concentrations elevated above the reference range and above the available CWQG of 0.002 mg/g (Figure 5). The copper concentration measured in the water sample from this location in 2011 was low (<0.0002 mg/L) and similar to concentrations measured at the other sampling locations. Since water sampling captures a point-in-time measurement, further monitoring phases are required to determine if the 2012 copper concentration is anomalous. All other COPCs in the water were measured at concentrations below MDLs or guidelines at all far-field exposure areas during both sampling years.

4.0 SEDIMENT QUALITY

Sediment quality (chemistry and particle size distribution) is an important aspect of aquatic ecosystems, as it can influence the quality of overlying waters and the benthic invertebrate community residing in the sediment. Sediment quality data are collected as part of the EARMP technical program to monitor for the potential accumulation of COPCs in the benthic environment and to assess for potential changes in COPCs over time. Sediment quality samples were collected from five replicate stations in each far-field exposure area and each reference area (Appendix A, Figures 1 to 9). The sediment quality sampling stations were co-located with the benthic invertebrate community sampling areas.

4.1 Sampling Methods

Sediment chemistry and sediment particle size samples were collected at five replicate stations per waterbody using a Tech-ops sediment corer at depths generally ranging from 6.0 m to 8.0 m. The location of each sediment sampling station was recorded using a hand held GPS unit and the sample collection depth was noted (Appendix D). A sediment profile description was recorded at each station and a photograph was also taken. Sediment core logs are provided in Appendix D.

Sediment cores collected for chemical analyses were divided into 0 to 2 cm, 2 to 4 cm, and 4 to 6 cm horizons and each horizon was a composite of two or three[6] cores. Duplicate samples were collected from 10% of the stations for QA/QC purposes (see Appendix C for details). Samples collected for analysis of particle size composition and total organic carbon (TOC) content were composed of a single core collected from the 0 to 5 cm sediment horizon. All sediment samples were double bagged and frozen prior to submission to SRC for analysis. The 2 to 4 cm and 4 to 6 cm horizons were archived.

Sediment samples collected from Bobby's Lake and RF4 followed the same procedures as described above, except in the case of station depth. The station depths on Bobby's Lake ranged between 5.5 m and 6.2 m in 2009 and 3.5 m and 6.0 m in 2012, which varies slightly from the depths described above for the EARMP sampling areas. Station depths at RF4 were comparable (~6.3 m).

[6] Depending on the particle size composition, two or three cores may have been required to achieve sufficient material to complete the chemical analysis.

4.2 Data Analysis

Particle size composition and TOC content of the sediment were described to provide supporting information for the sediment chemistry data as well as the benthic invertebrate community data. Lake sediments are an important indicator of past water quality and of long-term trends in surface water quality. An important factor influencing the transportation of constituents in the environment is particle size distribution of the sediment present. The concentrations of parameters in sediment tend to increase with decreasing particle size, due to an increase in surface area per unit mass (Muller and Tisue 1997). Sediment particle size is, therefore, also useful in predicting the transportation of bound constituents if there is a predicted change in water flow (Walling and Moorehead 1989).

Sediment chemistry data analysis focused on comparing COPC concentrations to the most relevant sediment quality guidelines and to expected background conditions (i.e., reference range). Various sediment quality guidelines are available (i.e., CCME 2013; Thompson et al. 2005; Burnett-Seidel and Liber 2013; see Section 2.3.3.1); however, analysis focused on comparing COPCs to the most locally available guideline (see Table 3 in Section 2.3.3.1).

The far-field exposure COPC concentrations were considered to be within the reference range if mean concentrations were within two standard deviations of the reference mean. A graphical approach was used to assess the far-field exposure data in the context of the available guidelines and reference range. Similar to the water quality data analysis, this graphical approach will allow for an easy integration of temporal comparison for future monitoring phases.

Since it was difficult to control for particle size between sampling areas, and because a significant relationship was identified between fine particle content and COPC concentrations, the sediment chemistry data were standardized for fine particle content. Adjustments for fine particle content was achieved using the COPC concentration adjusted means (standardized at an average fine particle content) resulting from analysis of covariance (ANCOVA). However, for some of the Fond du Lac River samples, COPC concentrations did not correlate with fine particle content and in these cases, no adjustments were made (see Appendix A for further details).

4.3 Results

4.3.1 Sediment Particle Size

Sediment particle size and TOC is summarized in Table 6, and detailed in Appendix A. The raw particle size data are available in Appendix B, Table 2.

TABLE 6

Summary of particle size and total organic carbon content in sediment samples collected for the EARMP technical program, 2011 and 2012.

Area	Year	Sample	Clay	Silt	Fine Sand	Coarse Sand	Gravel	Organic Carbon
Far-Field Exposure								
Cochrane River	2011	Average	26.9	65.6	6.9	0.5	0.2	7.2
		S.D.	2.8	1.5	2.5	0.3	0.2	0.3
	2012	Average	13.9	82.6	3.2	0.3	0.1	6.9
		S.D.	2.3	2.9	2.0	0.1	-	0.6
Crackingstone Inlet	2011	Average	6.1	52.9	34.1	6.8	0.1	1.3
		S.D.	3.7	11.3	10.5	4.0	-	0.4
	2012	Average	4.3	58.2	29.3	8.1	0.1	1.4
		S.D.	1.2	13.4	10.2	4.4	-	0.3
Fond du Lac River	2011	Average	6.1	85.6	3.6	4.7	0.1	10.0
		S.D.	1.6	10.2	1.9	8.3	-	1.4
	2012	Average	19.2	55.4	11.3	14.1	0.1	8.9
		S.D.	9.3	18.5	11.8	14.2	-	2.4
Waterbury Lake	2011	Average	4.4	12.7	28.5	54.3	0.2	3.0
		S.D.	3.1	7.1	7.1	13.4	0.1	1.2
	2012	Average	3.3	13.3	34.8	48.6	0.1	3.3
		S.D.	1.3	6.4	6.7	11.6	0	1.9
Reference								
Bobby's Lake	2009	Average	25.2	51.4	18.6	4.6	1.0	7.6
		S.D.	6.9	12.4	15.3	4.6	-	1.9
	2012	Average	11.3	46.0	32.5	10.3	0.1	7.3
		S.D.	6.7	21.1	20.0	8.8	-	4.2
Cree Lake	2011	Average	2.8	28.2	27.1	41.8	0.2	4.0
		S.D.	2.4	22.1	7.6	23.8	0.2	3.3
	2012	Average	3.0	14.8	37.8	44.4	0.1	3.7
		S.D.	0.8	3.3	2.7	5.2	-	0.8
Ellis Bay	2011	Average	38.6	60.5	0.6	0.3	0.1	4.1
		S.D.	3.3	3.6	0.5	0.2	-	0.5
	2012	Average	29.9	69.4	0.4	0.3	0.1	4.5
		S.D.	4.6	4.1	0.4	0.3	-	0.5
Pasfield Lake	2011	Average	1.1	4.3	15.3	79.3	0.2	2.1
		S.D.	2.2	6.3	5.4	13.7	0.1	2.1
	2012	Average	1.2	4.1	12.5	82.1	0.1	2.5
		S.D.	1.0	4.8	4.9	10.4	0.03	2.3

Area	Year	Sample	Clay	Silt	Fine Sand	Coarse Sand	Gravel	Organic Carbon
RF-4	2008	Average	35.2	43.0	19.8	1.8	1.0	9.6
		S.D.	5.8	2.4	5.5	1.3	-	5.4
	2012	Average	7.1	54.2	29.4	9.3	0.1	7.6
		S.D.	1.9	2.6	3.3	2.1	0.03	2.2
Pooled References		Average	16	38	19	27	0.3	5
		S.D.	14.9	24.6	14.6	32.3	0.4	3.5

All measures are in % dry weight; S.D. = standard deviation.

As shown in Table 6, sediment particle size tended to vary between areas in terms of fine particle (clay + silt) content, although the range of fine particle content in the exposure areas was similar to the range observed in the reference areas. In the exposure areas, fine particle content was lowest in Waterbury Lake in 2012 (16.6%) and highest in the Cochrane River in 2012 (96.6%). In the reference areas, fine particle content was lowest in Pasfield Lake (5.3%) and highest in Ellis Bay (99.3%).

4.3.2 Sediment Chemistry

A detailed assessment of the sediment chemistry data is presented in Appendix A. The raw sediment chemistry data are presented in Appendix B, Table 3. The following section summarizes the main findings of the 2011 and 2012 sampling program.

As indicated above, sediment particle size varied between sampling areas, particularly in terms of fine particle content (i.e., silt and clay). Furthermore, with few exceptions[7], a significant relationship was identified in sediment chemistry COPC concentrations and fine particle content in the EARMP study area (e.g., Figure 6). As a result, the sediment chemistry data were adjusted to the fine particle content at each sampling area. A summary of the COPC concentrations, adjusted to fine particle content, in the context of available guidelines and the reference range is presented in Figures 7 to 11. The unadjusted results for the eight COPCs in the Fond du Lac River that were not significantly related to particle size are presented in figure panels adjacent to the other waterbodies in Figure 7.

[7] In the case of some Fond du Lac River COPCs, concentrations did not correlate with fine particle content and in these cases, no adjustments were made. This included aluminum, iron, nickel, uranium, zinc, radium-226, cobalt, and vanadium.

The majority of COPC concentrations in the far-field exposure areas remained within the regional reference range and below guidelines in 2011 and 2012. The exceptions included mean cadmium, molybdenum, nickel, selenium, uranium, zinc, radium-226, thorium-230, cobalt, and vanadium concentrations/activities in at least one sampling location in at least one year. Of these COPCs, only the mean vanadium concentration in one study area exceeded available guidelines. Geometric mean vanadium concentrations exceeded the LEL of 35.2 µg/g in the Crackingstone Inlet in 2011 (49.1 µg/g), but not 2012 (34.8 µg/g; Figure 8). The applicability of the LELs to waterbodies in northern Saskatchewan has recently been questioned given the LELs are often similar to concentrations found in reference waterbodies in northern Saskatchewan (Burnet-Seidel and Liber 2012). The vanadium LEL (35.2 µg/g) in particular was found to be very similar to reference values (35.1 µg/g) derived for northern Saskatchewan by Burnet-Seidel and Liber (2013).

There are no available guidelines for cobalt or thorium-230 in sediment. Mean cobalt concentrations only marginally exceeded the reference range in the Fond du Lac River in 2012, but not 2011 (Figure 8). However, the geometric mean thorium-230 activity in Crackingstone Inlet was elevated in comparison to the reference range and the other far-field exposure areas (Figure 10). The geometric mean thorium-230 activity in Crackingstone Inlet was 6.62 Bq/g in 2011 and 3.56 Bq/g in 2012 as compared to an upper bound of 0.08 Bq/g in the reference areas. Further discussion of the potential effect of vanadium and thorium-230 levels on the aquatic environment in the Crackingstone Inlet is provided in Section 5.3.

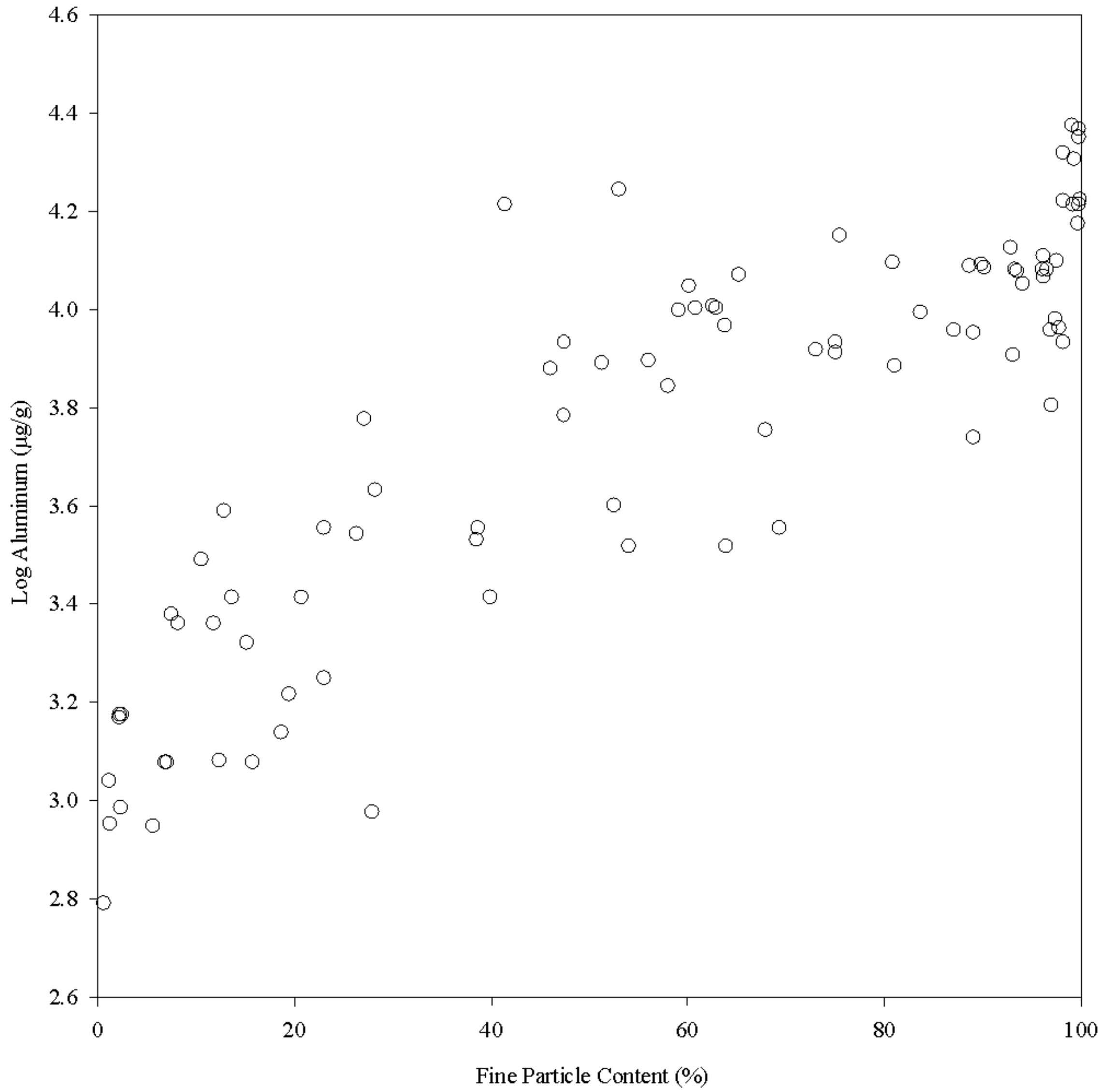


Figure 6
Typical relationship between COPC concentration and fine particle content in the EARMP technical program study area.

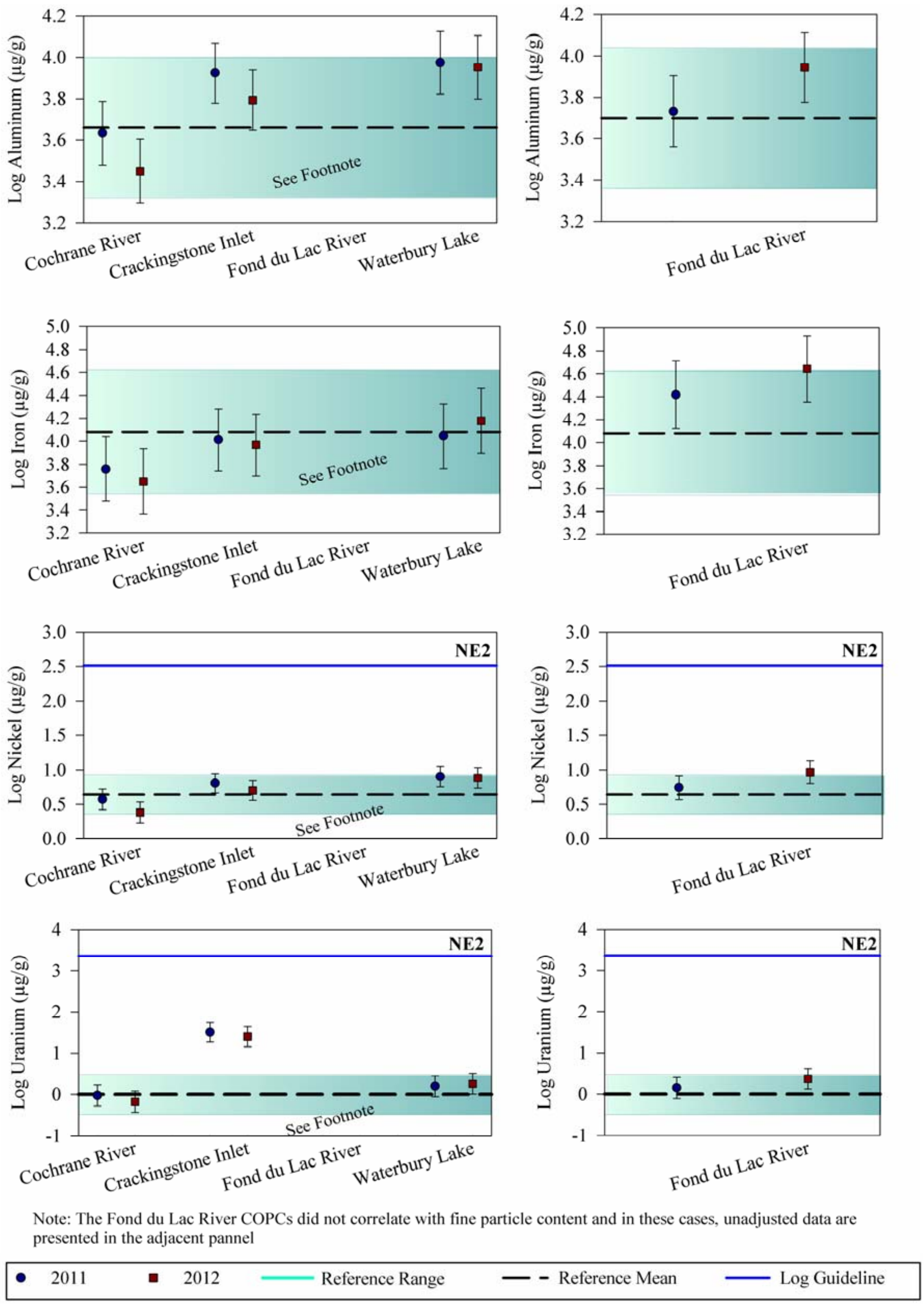


Figure 7
Aluminum, iron, nickel, and uranium in sediment from the EARMP technical program study area, 2011 and 2012.

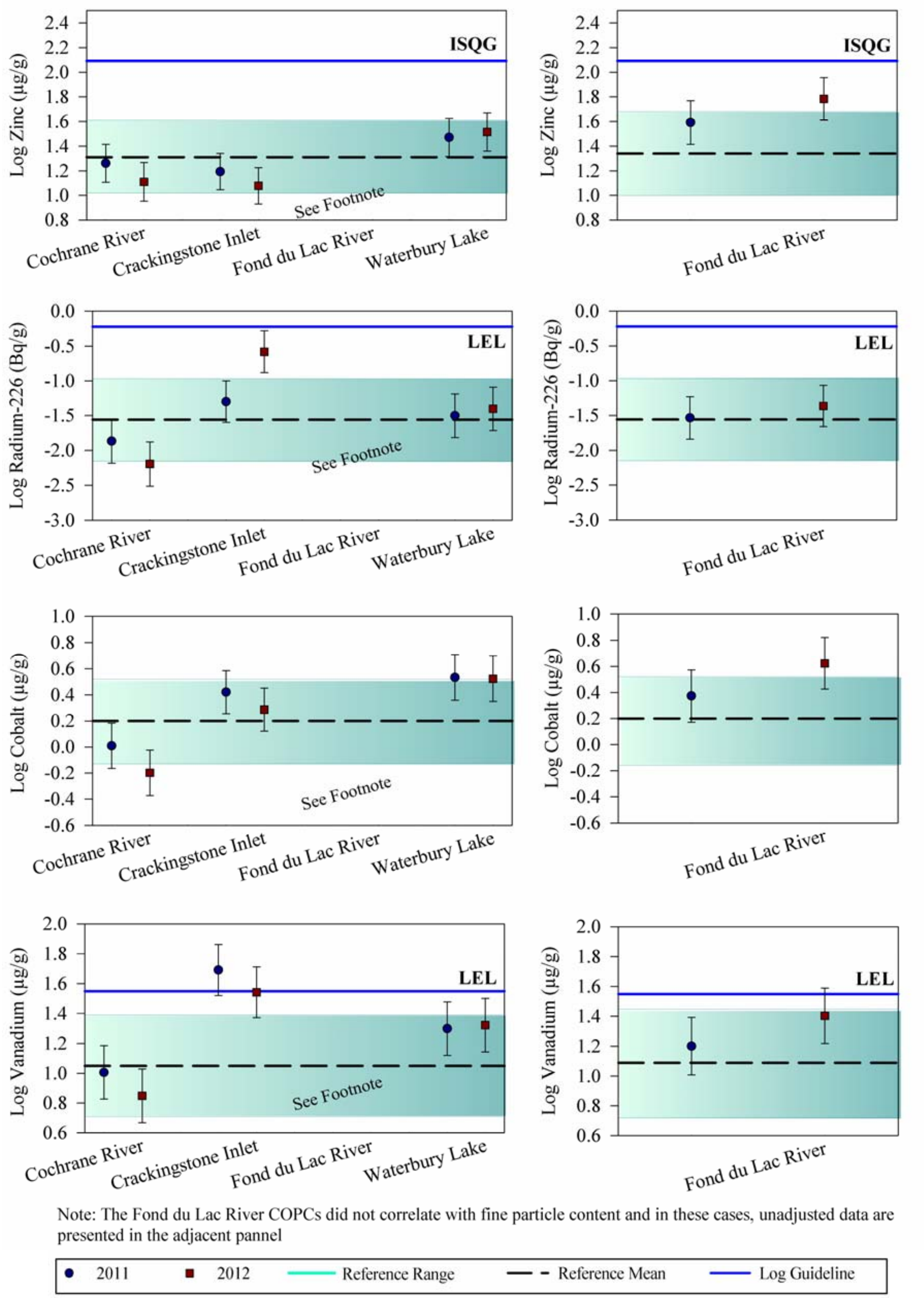


Figure 8
Zinc, radium-226, cobalt, and vanadium in sediment from the EARMP technical program study area, 2011 and 2012.

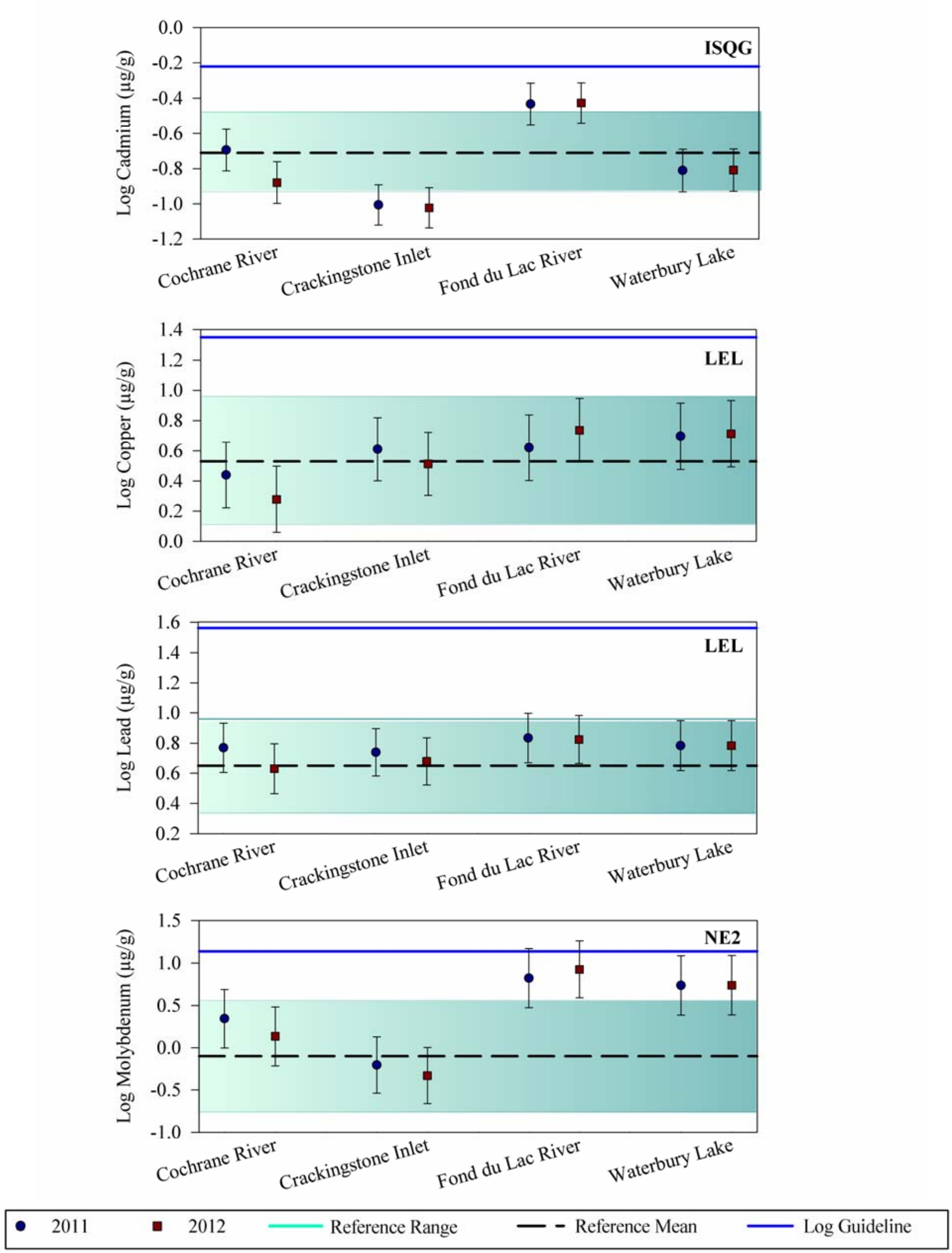


Figure 9
Cadmium, copper, lead, and molybdenum in sediment from the EARMP technical program study area, 2011 and 2012.

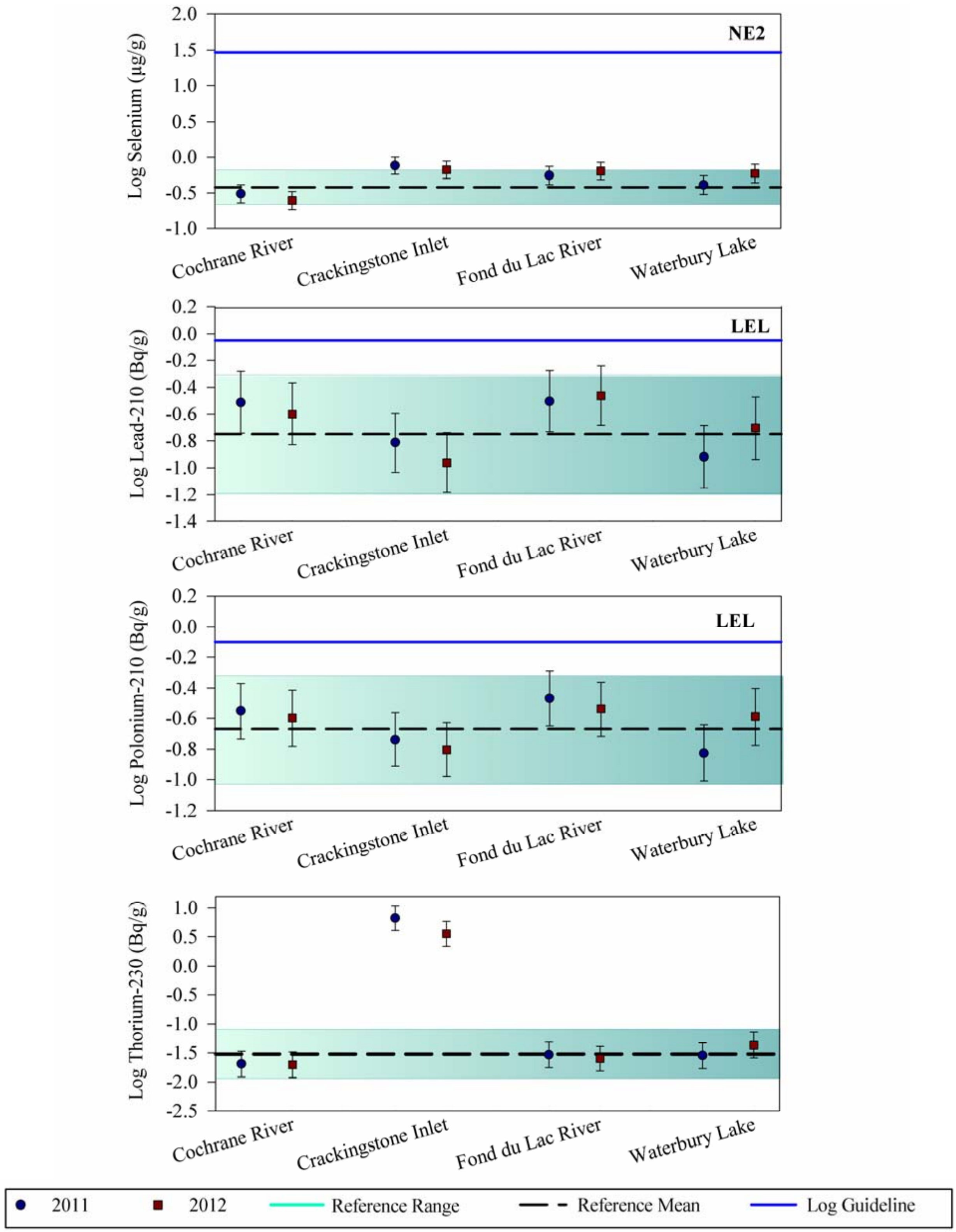


Figure 10
Selenium, lead-210, polonium-210, and thorium-230 in sediment from the EARMP technical program study area, 2011 and 2012.

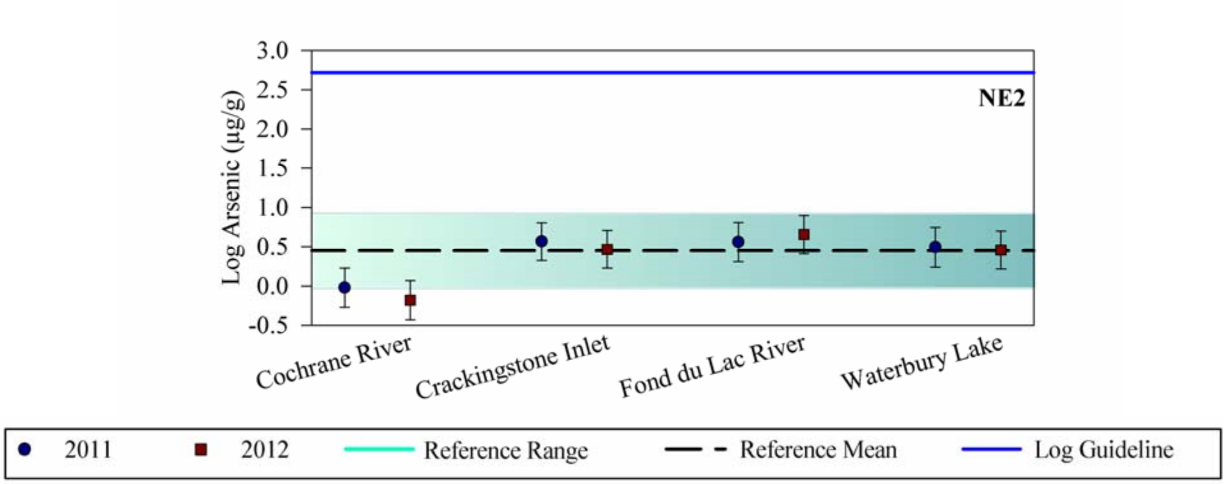


Figure 11
Arsenic in sediment from the EARMP technical program study area, 2011 and 2012.

5.0 BENTHIC INVERTEBRATE COMMUNITY

Benthic invertebrate community data provide an indication of the quality of fish habitat, and because benthic invertebrates have a shorter life span than most fish species, effects on benthic invertebrate communities can provide an early indication of potential effects on fish communities or populations. Benthic invertebrate community samples were collected from five replicate stations in each far-field exposure area and each reference area co-located with the sediment quality sampling stations (Appendix A, Figures 1 to 9).

5.1 Sampling Methods

A composite sample of five Ekman dredges (0.052 m^2) was collected at each of the five replicate stations in the Cochrane River, Crackingstone Inlet, Fond du Lac River, Waterbury Lake, Cree Lake, Ellis Bay, and Pasfield Lake sampling areas. Reference data available for Bobby's Lake and RF-4 were collected as part of separate programs, and therefore the sampling procedure varied slightly (CanNorth 2009; CanNorth 2010; CanNorth 2013a; CanNorth 2013b). The samples collected from Bobby's Lake in 2009 were composites of three large Ekman dredges (0.052 m^2), while in 2012, samples were composites of five large Ekman dredges (0.052 m^2). For RF-4, samples were composites of 10 small Ekman dredges (0.0225 m^2) in both 2008 and 2012. Data were assessed on a per m^2 basis to standardize the sampling area differences. For all areas and years, samples were concentrated through a 500 µm Nitex sieve and preserved in the field using 10% buffered formalin. A detailed assessment of potential implications relating to sampling method and particle size differences is presented in Appendix A.

Preserved benthic invertebrate samples were sorted and keyed according to the latest methods (Appendix E) and taxonomic keys by a qualified taxonomist, Dr. Jack Zloty, a Professor Emeritus from the University of Calgary. Invertebrates were separated from other material, enumerated under a dissecting microscope, and identified to the lowest taxonomic level feasible (typically to genus or species). Wet weight mass of major invertebrate groups was measured using an analytical balance to a precision of 0.1 mg. A reference collection was retained by the taxonomist for all taxa identified from the samples. Sample sorting efficiency averaged 98.8% (details presented in Appendix C).

5.2 Data Analysis

To prepare the data for community analysis, the taxa considered as non-benthic (Copepoda and Hydracarina) were removed prior to calculation of the indices used for comparison. To assist in the interpretation of the benthic invertebrate results, the data are presented in several formats. For each station, benthic invertebrate density (mean number of organisms/m^2), richness (the total and average number of taxa assessed at the lowest practical level), and biomass are reported. Similar to the sediment chemistry comparisons, all benthic invertebrate endpoints were presented graphically in comparison to the regional reference range (two standard deviations of the reference mean). As additional monitoring phases are completed, temporal comparisons to the baseline monitoring years will be completed.

5.3 Results

A detailed assessment of the benthic invertebrate community data is presented in Appendix A and the raw data are presented in Appendix B, Tables 5 and 6. The following section summarizes the main findings of the 2011 and 2012 sampling program.

The benthic invertebrate community composition within the EARMP technical program study area included 87 taxa. Common taxa included Hirudinea (leeches), Oligochaeta (aquatic earthworms), Bivalvia (clams), Gastropoda (snails), Amphipoda (scuds), Cladocera (water fleas), Trichoptera larvae (caddisflies), and Chironomidae larvae (non-biting midges). Ephemeroptera nymphs (mayflies), Megaloptera larvae (fishflies), and Odonata nymphs (dragonflies) also occurred, but generally only in a few samples. In terms of biomass, amphipods and chironomids tended to be the dominant taxa in most samples, although Gastropoda and Hirudinea dominated the sample biomass in some samples.

Benthic invertebrate densities varied widely between replicate stations within waterbodies, between years, and between waterbodies, with the lowest density observed in the Fond du Lac River (2012: 1,112 ± 91 organisms/m^2) and Bobby's Lake (2009: 1,144 ± 775 organisms/m^2) and the highest density observed in Pasfield Lake (2011: 25,441 ± 11,063 organisms/m^2) (Figure 12; Appendix A, Table 6). Densities measured at all far-field exposure locations were within the established reference range.

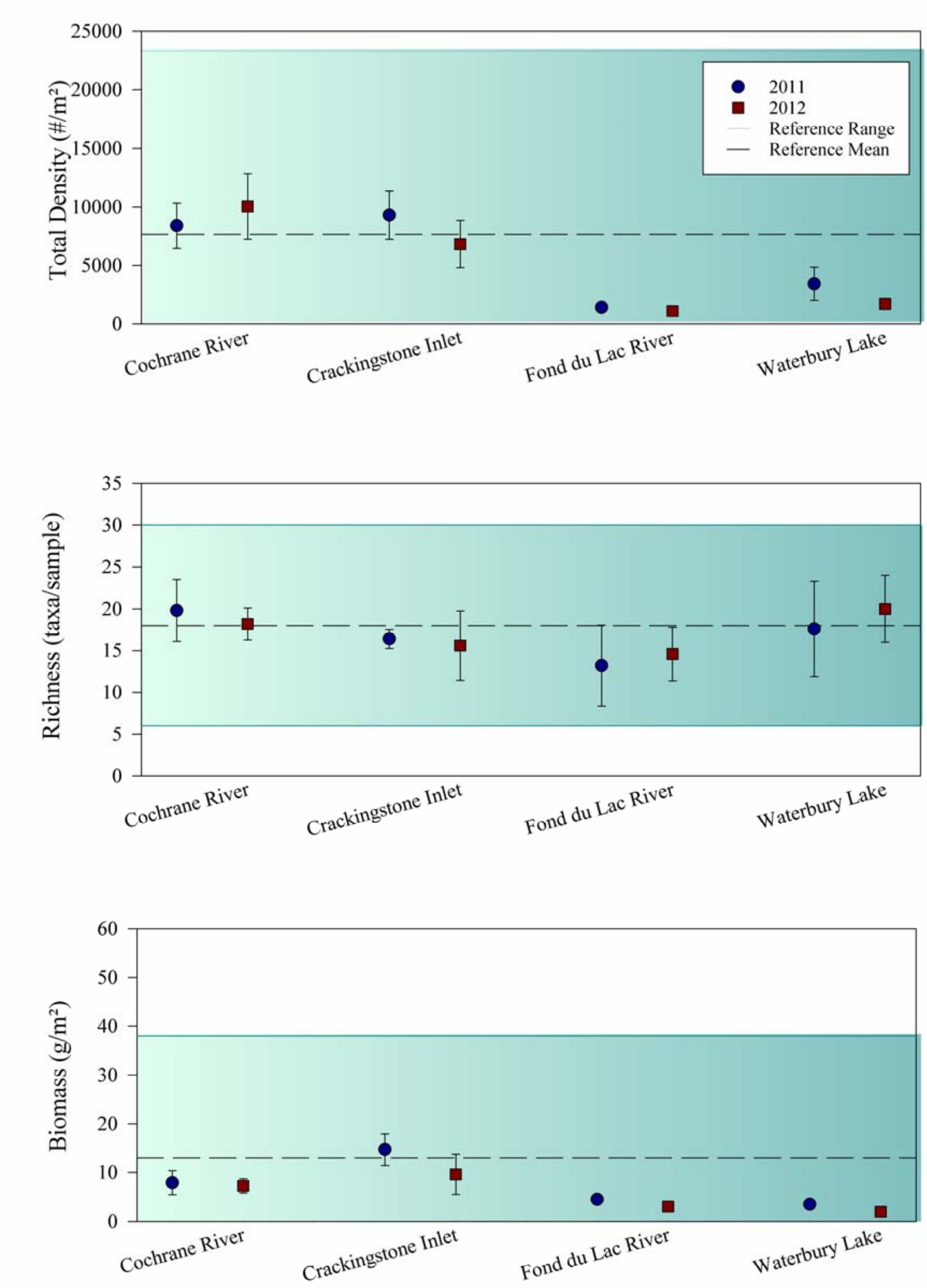


Figure 12
Benthic invertebrate community endpoints assessed for the EARMP technical program, 2011 and 2012.

Biomass variability between samples, between years, and between waterbodies followed a similar pattern to that observed for density. The lowest biomass observed was in Bobby's Lake (2.1 ± 0.5 g/m^2) and Waterbury Lake (2.0 ± 0.4 g/m^2) and the highest biomass observed was in Pasfield Lake in 2011 (30.4 ± 20.3 g/m^2) (Figure 12; Appendix A, Table 6). Biomass measured at all far-field exposure locations were within the established reference range.

Mean taxon richness ranged between a low of 11 ± 2 taxa observed in RF-4 in 2008 to a high of 23 ± 4 taxa observed in Cree Lake in 2011. Far-field exposure taxon richness ranged between an average of 13 ± 5 taxa observed in the Fond du Lac River (2011) to an average of 20 ± 4 taxa observed in both Waterbury Lake (2012) and the Cochrane River (2011) (Figure 12). In all cases, the taxon richness at the far-field exposure areas was within the reference range, suggesting that richness falls within the expected range for the region.

As discussed in Section 4.0, there was a high degree of variability in particle size composition between stations and study areas. Habitat factors such as particle size and TOC content can cause differences in benthic invertebrate community assemblages. However, as described in detail in Appendix A, no strong relationship between particle size and benthic invertebrate endpoints was established in the EARMP data.

Crackingstone Inlet was the only far-field exposure area with one COPC above sediment quality guidelines (mean vanadium concentration in 2011) and the sediment also contained elevated thorium-230 values. The benthic invertebrate community in the Crackingstone Inlet is very comparable to the reference areas in terms of average density, taxon richness, and biomass (Appendix A, Table 6; Figure 12). This would indicate that COPC concentrations in Crackingstone Inlet sediment are not impairing the benthic invertebrate community.

6.0 FISH CHEMISTRY

Fish tissue chemistry data provides a means of monitoring the potential accumulation of COPCs in biological tissue. Bone and flesh samples were collected from both predatory (northern pike and lake trout) and bottom-feeding (longnose sucker, white sucker, and lake whitefish) fish species. This included the assessment of five samples from each species from each sampling location from each year when possible. However, sample sizes were not achieved for all species in all sampling locations due to time constraints related to the sampling program and due to the sampling season (i.e., fall spawning species such as lake trout and lake whitefish are easier to capture in the fall than spring spawning species). Table 7 summarizes the fish tissue chemistry sample sizes achieved for the 2011 and 2012 technical program. Sampling locations are shown in detail in Appendix A, Figures 1 to 9.

TABLE 7

Fish chemistry sample sizes for the 2011 and 2012 EARMP technical program.

Species	Far-field Exposure							
	Cochrane River		Crackingstone Inlet		Fond du Lac River		Waterbury Lake	
	2011	2012	2011	2012	2011	2012	2011	2012
Longnose sucker	2	2	0	0	5	3	5	1[1]
White sucker	0	4	0	0	5	5	0	1
Lake whitefish	5	5	5	5	5	5	3	5
Lake trout	5	5	5	5	2	5	5	5
Northern pike	5	4	5	5	5	5	3	5

Species	Reference									
	Bobby's Lake		Cree Lake		Ellis Bay		Pasfield Lake		RF-4[3]	
	2009	2012	2011	2012	2011	2012	2011	2012	2008	2012
Longnose sucker	0	0	5	5	0	0	3	3[2]	0	0
White sucker	4	0	5	5	0	0	0	0	0	0
Lake whitefish	0	0	5	5	5	2	5	5	0	0
Lake trout	0	0	5	5	5	5	5	5	0	0
Northern pike	5	0	0	5	0	5	1	2	0	0

[1]This sample was a composite of three specimens, two longnose sucker and one white sucker.

[2]One of these samples was a composite of three specimens, two longnose sucker and one white sucker.

[3] Fish chemistry sampling was not part of the sampling program at RF-4.

6.1 Sampling Methods

The fish captured for chemistry were collected under the authority of Special Collection Permits issued by the MOE in La Ronge and Meadow Lake. It is noted that during the fish collections, every effort was made to reduce incidental fish mortality.

Methods used to capture fish included mainly spawning nets and angling, although half standard gangs of gill nets were also used in Bobby's Lake in 2009. Angling was performed using casting rods and commercial spinning spoons. Fishing effort for this method was measured in person-minutes of angling. The spawning nets used were 10 m long and 1.8 m high with 7.6 cm mesh (stretch measure). Generally between 3 and 10 panels were connected to increase fish catch success. Each angling or gill net deployment location was recorded with a hand held GPS unit. Spawning nets were the main fishing method used in each waterbody and produced the greatest number of fish samples. On several occasions, however, overnight net sets were utilized due to poor catch success.

All fish captured were identified to species, measured (fork length) to the nearest 1 mm, weighed to the nearest 20 g, sexed, and their spawning condition was recorded. In addition, a visual external health assessment was completed for each fish. For all fish retained for chemical analyses, the stomach contents were described. Ageing structures (otoliths for lake trout and lake whitefish, cleithra for northern pike, and fin rays for white and longnose sucker) were removed and submitted to North Shore Environmental Services for ageing analysis. The fish were submitted to SRC for chemical analysis of the flesh and bone. Some samples consisted of a composite of two or more fish in order to provide sufficient sample material to reach desired MDLs.

6.2 Data Analysis

Similar to the water, sediment, and benthic invertebrate analyses, fish chemistry results from the far-field exposure areas were compared to the reference range and available guidelines. However, given the multiple species, multiple tissue types, and number of COPCs assessed, Principal Component Analysis (PCA) was used to assess the fish chemistry results. The main focus of the results was on two-axis (two-dimensional) scatterplots of the PCA results. PCA plots synthesize how chemically similar (or different) the fish samples are according to the distance between each specimens' dot on the PCA plot (i.e., the greater the distance, the greater the difference). Each axis represents a combination of various COPC concentrations, and the eigenvectors for each COPC represent the amount and direction of "pull" each COPC has along each axis. Although PCA produces multidimensional results (e.g., four, five, or more axes in multidimensional space), plots including more than two axes (or dimensions) become increasingly abstract and difficult to interpret. Therefore, the focus of the results is on the first two principal components (PC1 and PC2); however, consideration was given to all axes that explained ≥ 10% of the variation in the data.

PCA was carried out using only those COPCs that were measured above the MDL in more than 50% of the samples in at least one waterbody. Correlations of ≥ |0.6| between COPC concentrations and PCA axis scores were considered to indicate a strong degree of correlation. PCA scores were computed only for axes with eigenvalues of ≥ 1.0 or that accounted for ≥ 10% of the variation in the data. Variations in PCA scores for far-field exposure area fish tissue were compared to the 95% confidence ellipse around the reference scores. Data points falling outside this ellipse were assessed further to determine if any COPCs were outside the expected range for the region. For cases where a COPC correlated by more than |0.6| with PC3 or PC4 axis scores, data were assessed graphically against the reference range similar to the presentation used in previous sections.

Mercury and selenium concentrations in fish flesh from the far-field exposure areas were also assessed relative to guidelines presented in Section 2.3.3.1 and presented graphically. Mercury was compared to the 0.5 µg/g guideline (SE 2011) and selenium was compared to the lowest available draft guideline for muscle tissue (8.8 µg/g (dw); Lemly 1993) converted to a wet weight basis of 2.9 µg/g. A representative wet weight-to-dry weight conversion factor of 77% moisture was used for this conversion.

6.3 Results

The 2011 and 2012 fish sampling program resulted in the capture of 528 fish from 8 species including lake whitefish, lake trout, longnose sucker, white sucker, northern pike, yellow perch (*Perca flavescens*), walleye (*Sander vitreus*), and burbot (*Lota lota*). A detailed assessment of the fish chemistry data is presented in Appendix A and the raw data, including fish capture statistics, are presented in Appendix B, Tables 8 to 27. The following section summarizes the main findings of the 2011 and 2012 fish chemistry sampling program.

6.3.1 Fish Flesh

Of the 18 COPCs assessed in fish flesh, 10 were often at or below the MDL in more than 50% of the samples in all species. These COPCs included aluminum, cadmium, lead, molybdenum, nickel, uranium, lead-210, radium-226, thorium-230, and vanadium. PCA was completed separately for each species using the remaining eight COPCs and the results are summarized graphically in Figures 13 and 14. As shown, the chemical profiles present in fish flesh from the far-field exposure areas were generally within the 95% confidence ellipse of the reference areas. This was the case for all far-field exposure lake trout and northern pike. A few minor exceptions were noted in the case of the bottom-feeding species, which are discussed below.

Lake whitefish from the far-field exposure areas contained chemical profiles within the expected range for the region. However, as shown in Figure 14, one of the 27 far-field exposure lake whitefish fell outside the 95% confidence ellipse of the reference areas. Further analysis revealed that this was largely attributed to slightly higher cobalt (0.008 µg/g vs. reference range upper bound of 0.0049 µg/g) and mercury (0.070 µg/g vs. reference upper bound of 0.064 µg/g) concentrations in this one sample. Although marginally higher than the reference range, these concentrations are still considered very low. This fish was at the upper end of the age range of lake whitefish captured (32 years vs. 2 to 33 years in the reference areas), which may explain the slightly higher concentrations of mercury. The cobalt concentration was comparable to reference waterbodies assessed in the region for the AWG program (range: <0.002 µg/g to 0.015 µg/g; CanNorth 2013c). In addition, the mercury concentrations were well below guideline concentrations (Figure 15).

For the longnose sucker data, chemical profiles of the far-field exposure fish[8] were within the 95% confidence ellipse in all cases except two (Figure 14). Both fish that fell outside the confidence ellipse were from the Fond du Lac River and contained slightly higher mercury concentrations than the reference fish (0.20 µg/g vs. reference range upper bound of 0.041 µg/g). Both of these fish were at the high end of the age range of

[8] Note: No sucker were captured in Crackingstone Inlet.

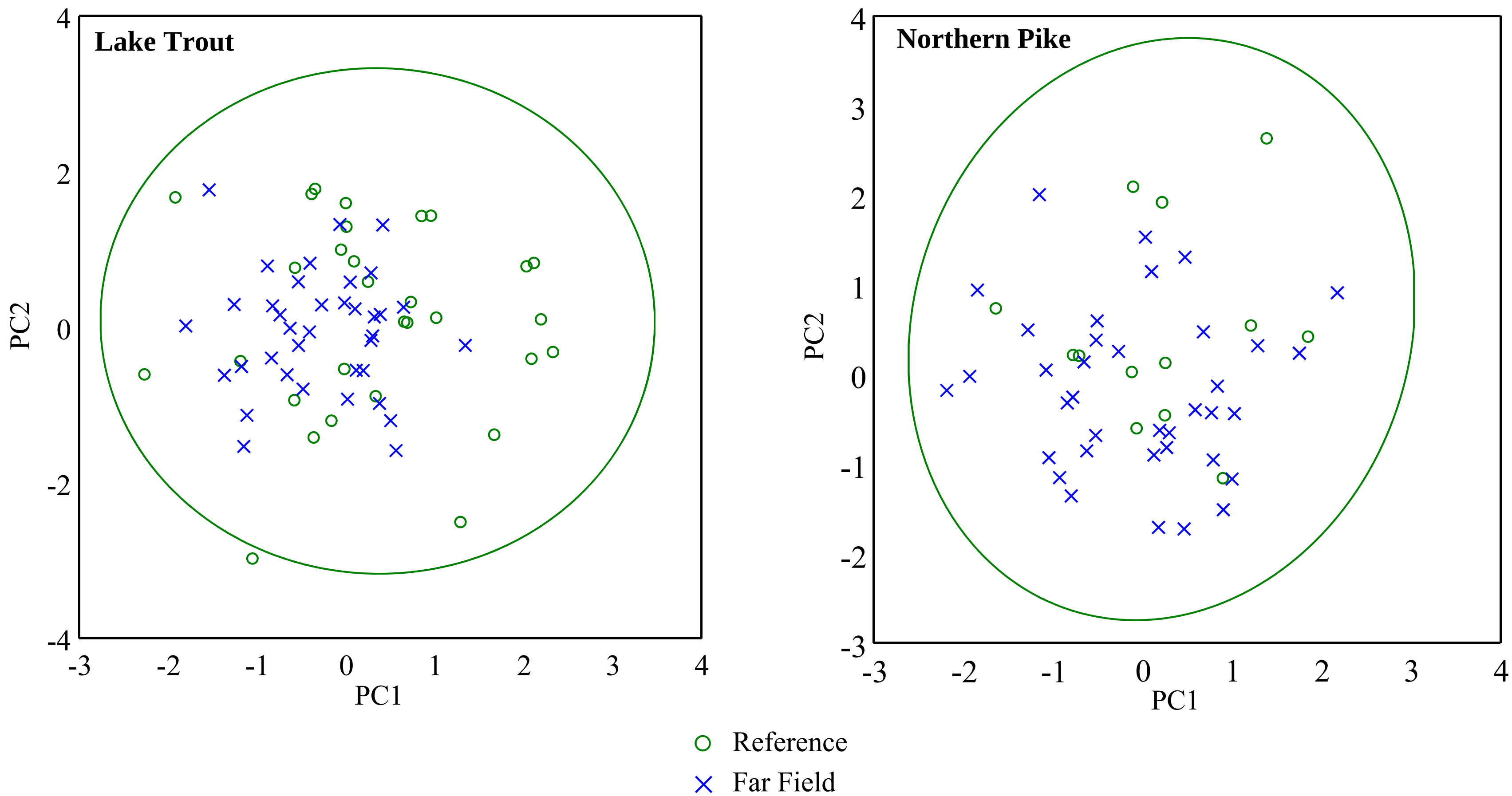


Figure 13
Predatory fish flesh chemistry PCA results for axes 1 and 2 and 95% confidence ellipse of reference samples from the EARMP technical program study area, 2011 and 2012.

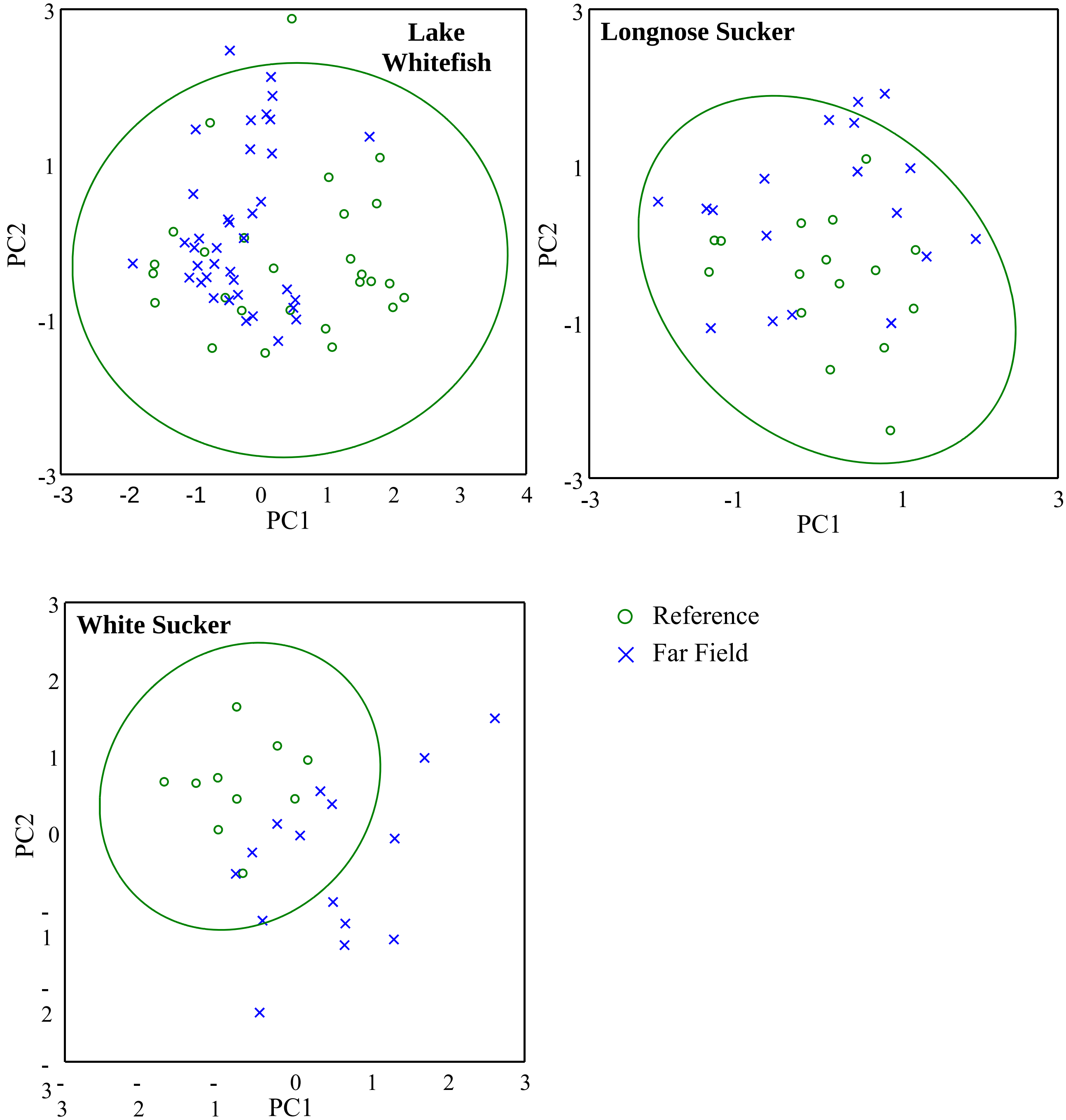


Figure 14
Bottom-feeding fish flesh chemistry PCA results for axes 1 and 2 and 95% confidence ellipse of reference samples from the EARMP technical program study area, 2011 and 2012.

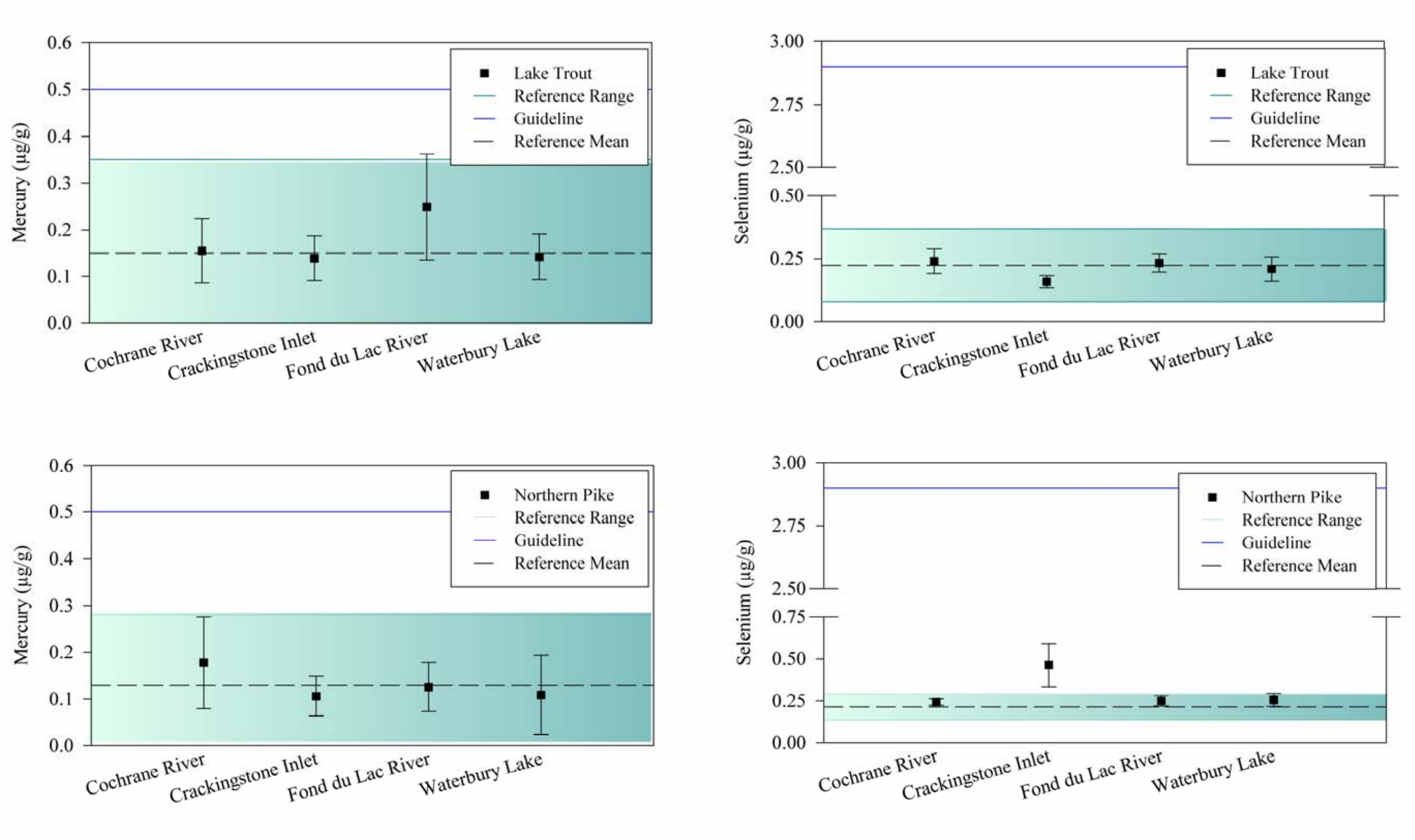


Figure 15
Mercury and selenium concentrations in predatory fish flesh from the EARMP technical program study area, 2011 and 2012.

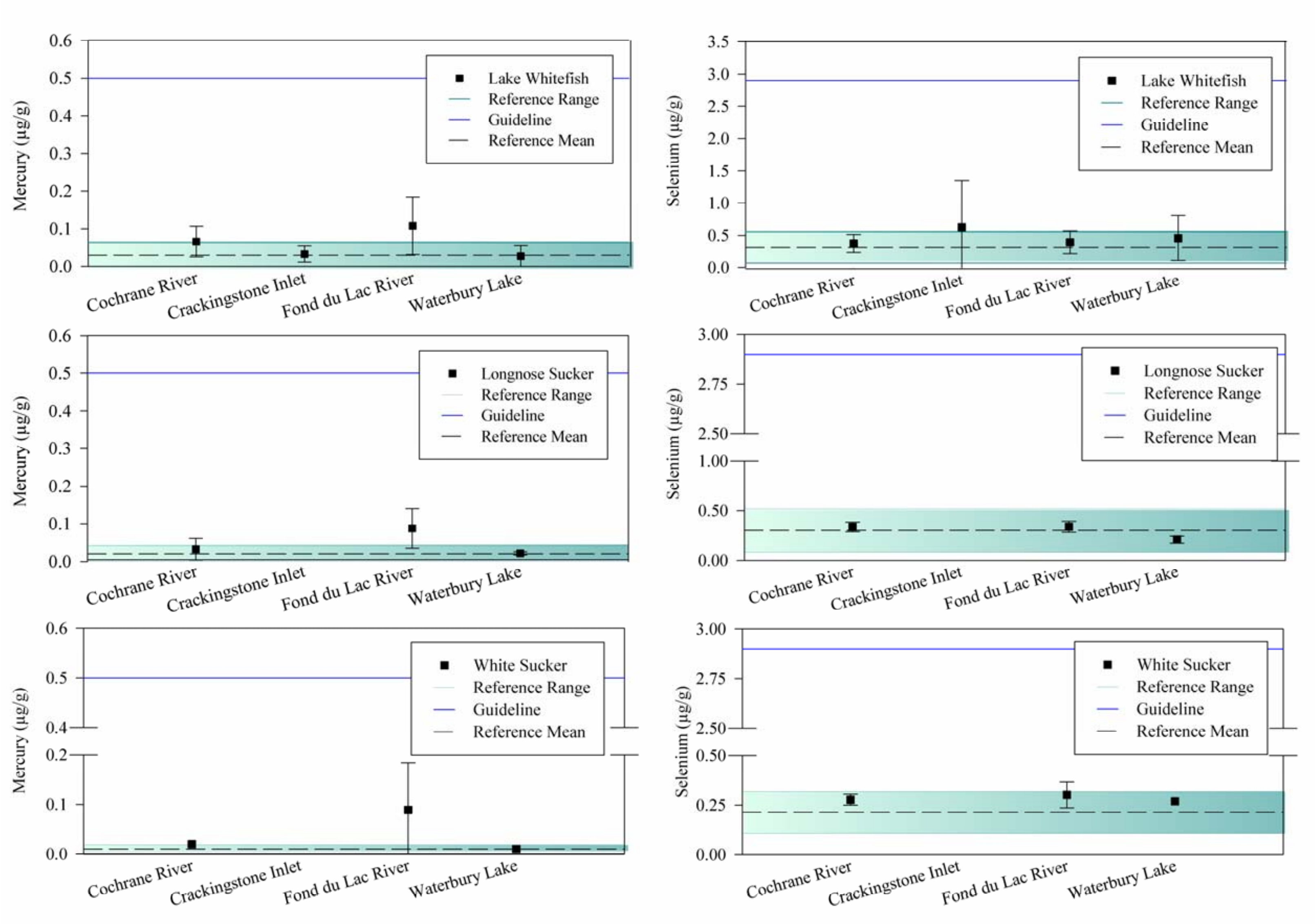


Figure 16
Mercury and selenium concentrations in bottom-feeding fish flesh from the EARMP technical program study area, 2011 and 2012.

longnose sucker captured for this program (27 and 23 years vs. 6-23 years in the reference areas), which may explain the slightly higher mercury concentrations. The mercury concentrations in these two fish remained well below the guideline of 0.5 µg/g (Figure 16). In the case of longnose sucker, PC3 also explained more than 10% of the variability and arsenic and cobalt concentrations correlated well with this axes. These two COPCs were assessed against the reference range in Figure 17. As shown, mean arsenic concentrations in the Cochrane River exceeded the reference range; however, the mean concentrations only marginally exceeded this range and, currently, the sample size used to create the reference range is low.

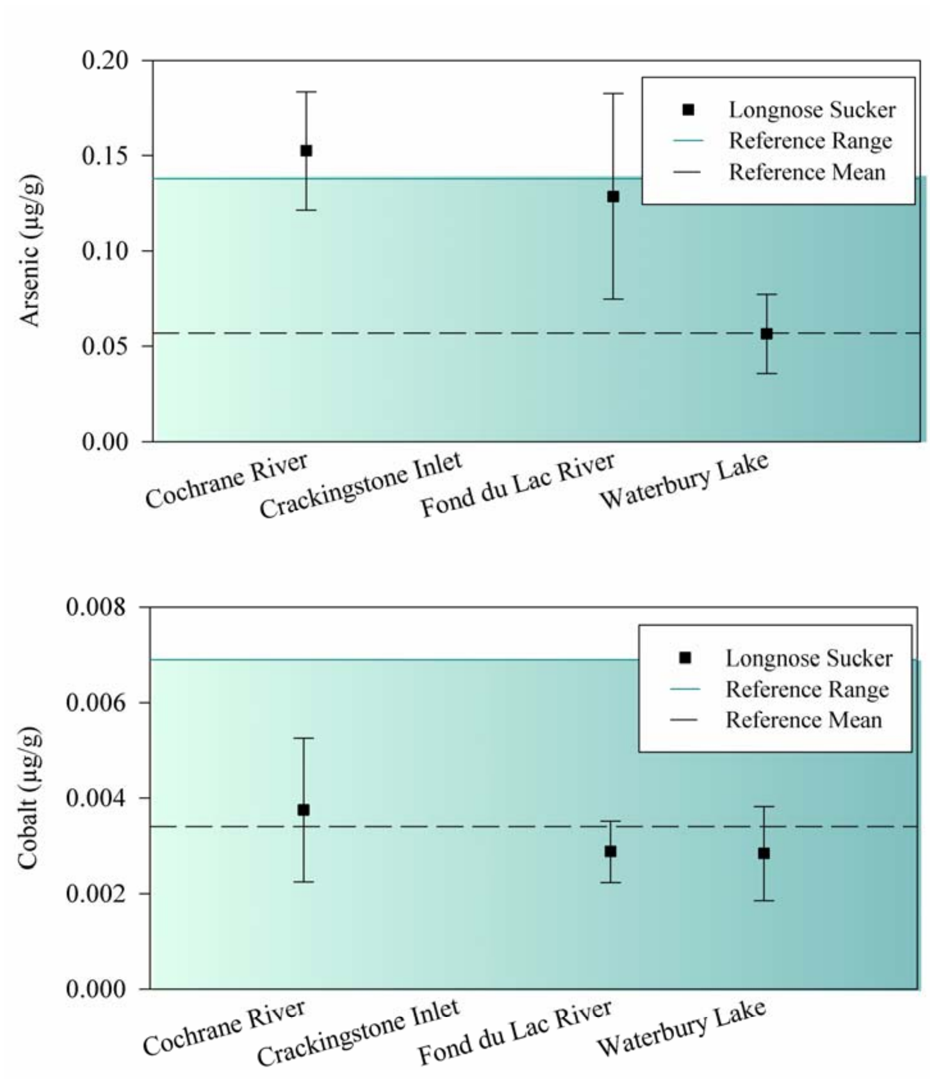


Figure 17
Arsenic and cobalt concentrations in longnose sucker flesh from the EARMP technical program study area, 2011 and 2012.

For the white sucker data, eight of the far-field exposure fish[9] fell outside of the 95% confidence ellipse of the reference areas, six from the Fond du Lac River and two from the Cochrane River. The two Cochrane River samples generally had slightly higher polonium-210 levels, while the departures from the reference ellipse were largely due to slightly higher selenium and mercury concentrations in the Fond du Lac River white sucker samples. Average concentrations of both selenium and mercury were below available guidelines and, when assessed independent of the other COPCs, within the established reference range (Figure 16).

6.3.2 Fish Bone

Of the 18 COPCs assessed in fish bone, cadmium, lead-210, radium-226, and thorium-230 were less than or equal to the MDL in more than 50% of the samples across all species. In addition, aluminum and lead were often at or below the MDL in more than 50% of the samples in all species except lake whitefish. Because of the variability in bone chemistry between species, the list of COPCs included in the PCA differed between species and is summarized in Table 8.

TABLE 8

COPCs included in the fish bone PCA of each target species from the EARMP technical program.

COPC	Lake Trout	Northern Pike	Lake Whitefish	Longnose Sucker	White Sucker
Aluminum			✓		
Copper	✓	✓	✓	✓	✓
Iron	✓	✓	✓	✓	✓
Lead			✓		
Mercury	✓	✓	✓		
Molybdenum				✓	✓
Nickel	✓	✓	✓	✓	✓
Selenium	✓	✓	✓	✓	✓
Uranium		✓	✓		✓
Zinc	✓	✓	✓	✓	✓
Polonium-210		✓	✓	✓	✓
Arsenic	✓	✓	✓	✓	✓
Cobalt		✓	✓	✓	✓

[9] Note: No sucker were captured in Crackingstone Inlet.

COPC	Lake Trout	Northern Pike	Lake Whitefish	Longnose Sucker	White Sucker
Vanadium			✓		
Total COPCs	**7**	**10**	**13**	**9**	**10**

In lake trout bone, seven COPCs were included in the PCA (Table 8). As shown in Figure 18, all but three far-field exposure lake trout bone samples fell within the 95% confidence ellipse of the reference areas. This was a result of lower copper concentrations in these three samples as compared to the reference areas; thus, is not considered a concern (Appendix A, Table 13).

In northern pike bone, 10 COPCs were included in the PCA (Table 8). Several northern pike bone samples from the far-field exposure areas fell outside the 95% confidence ellipse of the reference areas (Figure 18). These samples were from the Cochrane River (n=6), Crackingstone Inlet (n=10), and Waterbury Lake (n=1). The northern pike bone samples from the Cochrane River and Waterbury Lake fell outside the 95% confidence ellipse for varying reasons relating to slightly higher or slightly lower COPC concentrations as compared to the reference areas (Appendix A, Table 14). In the case of the Crackingstone Inlet, all 10 northern pike bone samples fell outside the ellipse as a result of higher selenium and uranium concentrations as compared to the reference areas (Appendix A, Table 14). PC3 also explained more than 10% of the variability and cobalt correlated well with this axes. Cobalt was assessed against the reference range in Figure 19. As shown, mean cobalt concentrations were well within the reference range.

In lake whitefish bone, 13 COPCs were included in the PCA (Table 8). Only one of the far-field exposure lake whitefish bone samples fell outside the 95% confidence ellipse of the reference areas (Figure 20). This sample was from the Crackingstone Inlet and was characterized by higher selenium, uranium, and vanadium concentrations as compared to the reference areas (Appendix A, Table 15).

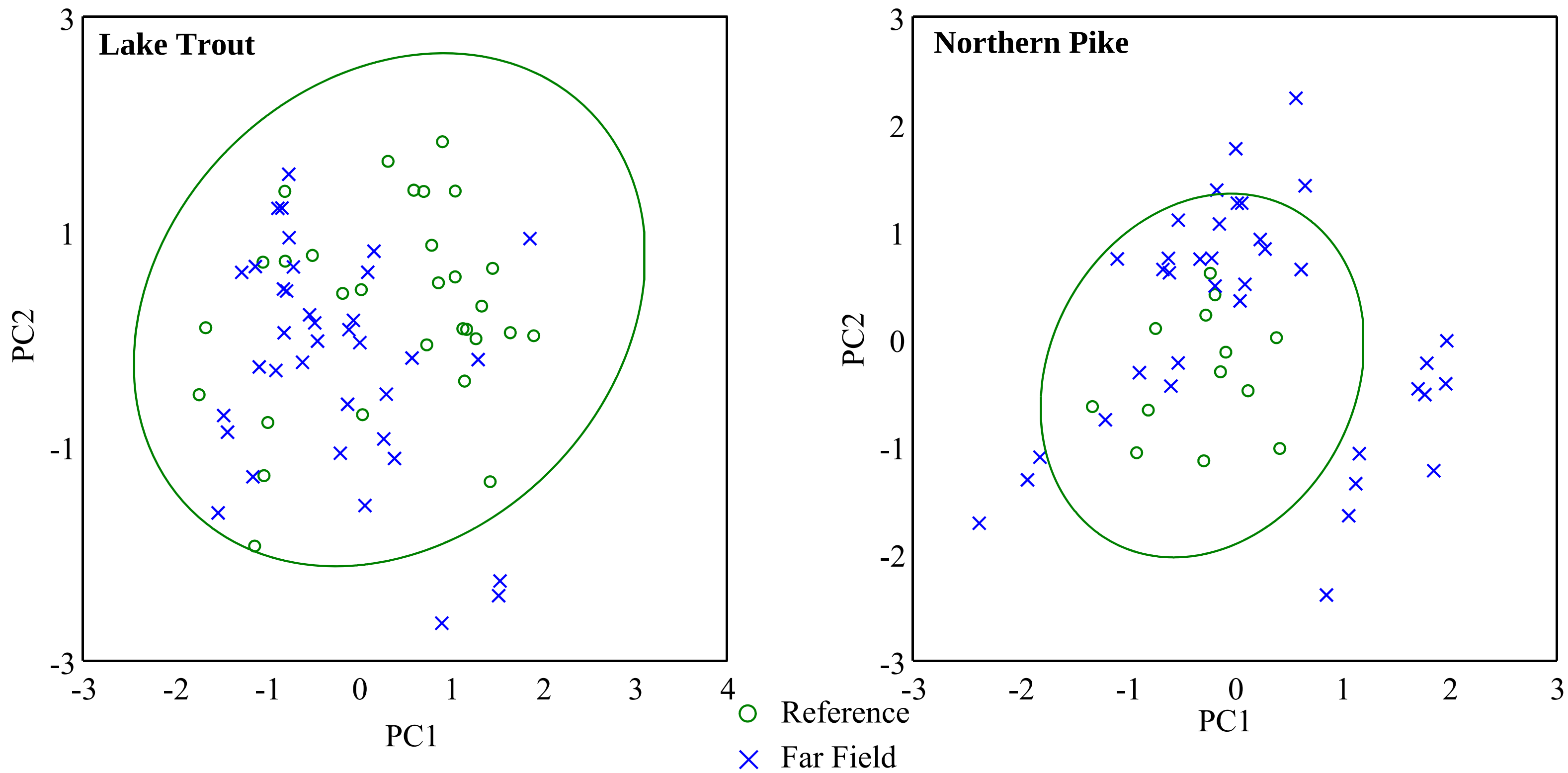


Figure 18
Predatory fish bone chemistry PCA results for axes 1 and 2 and 95% confidence ellipse of reference samples from the EARMP technical program study area, 2011 and 2012.

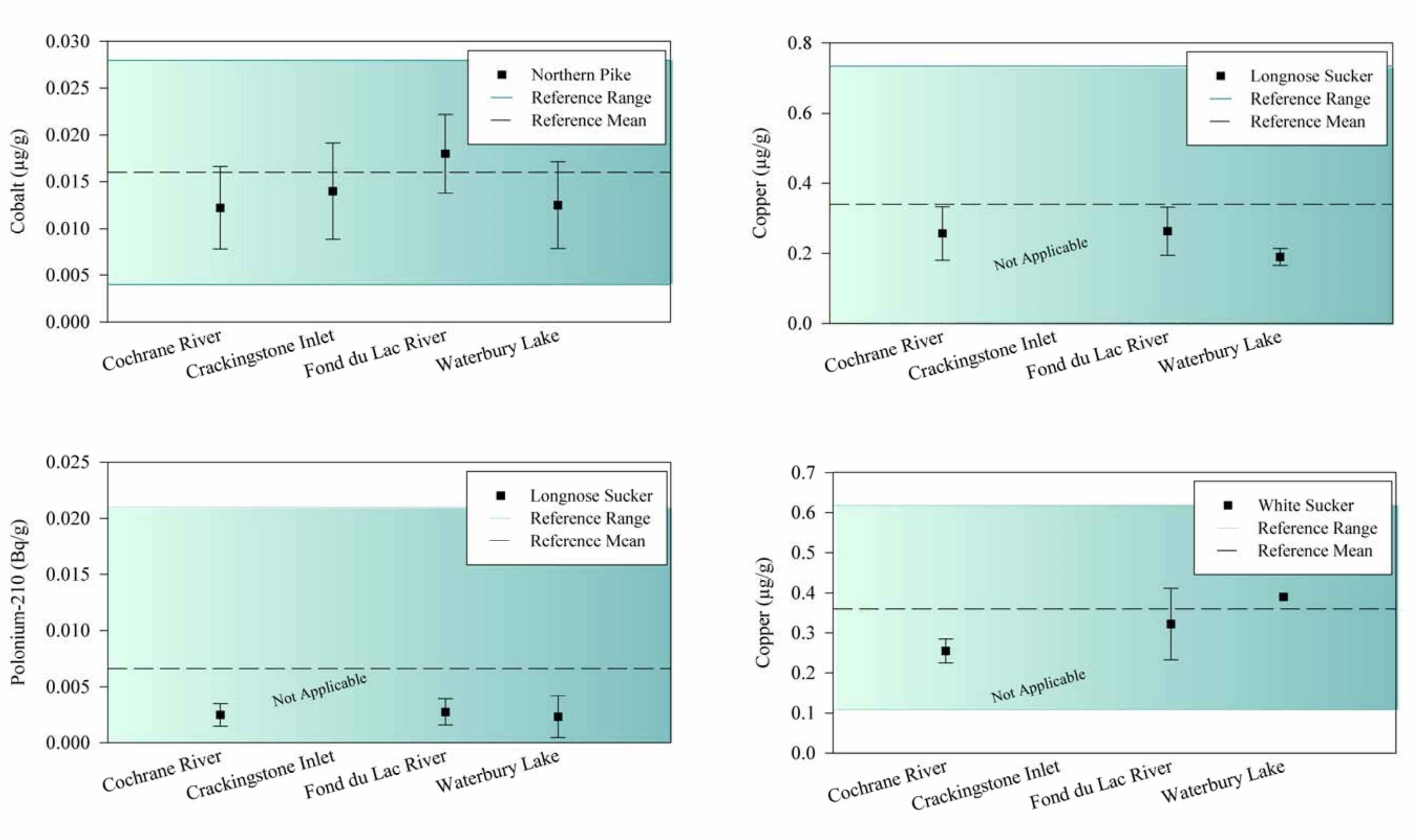


Figure 19
Concentrations of COPCs in fish bone strongly correlated with the third or fourth PCA axis for the EARMP technical study program, 2011 and 2012.

In longnose sucker bone, nine COPCs were included in the PCA (Table 8). The majority of the far-field exposure longnose sucker[10] bone samples fell outside of the 95% confidence ellipse of the reference areas (Figure 20). These samples were characterized mainly by higher molybdenum concentrations as compared to the reference areas, although a few samples also had higher concentrations of other COPCs such as iron, nickel, selenium, and arsenic (Appendix A, Table 16). Polonium-210 and copper also correlated strongly with the third and fourth PC axis; however, concentrations of these COPCs fell within the reference range (Figure 19).

In white sucker bone, 10 COPCs were included in the PCA (Table 8). All bone samples from the far-field exposure areas[10] fell outside the 95% confidence ellipse of the reference areas (Figure 20). Similar to the longnose sucker, the far-field exposure white sucker bone samples were characterized mainly by elevated molybdenum concentrations as compared to the reference areas, although other COPCs also contributed to the overall differences observed in the PCA (Appendix A, Table 17). Copper correlated strongly with the fourth axis; however, copper concentrations remained within the reference range (Figure 22).

It should be noted that the reference area sample sizes for northern pike (n = 18), longnose sucker (n = 16) and white sucker (n = 14) were relatively low and may not accurately represent the natural variability in bone chemistry. Future monitoring phases will allow for an increased reference area sample size for these species and therefore a better characterization of the expected background conditions in the region.

[10] Note: No sucker were captured in Crackingstone Inlet.

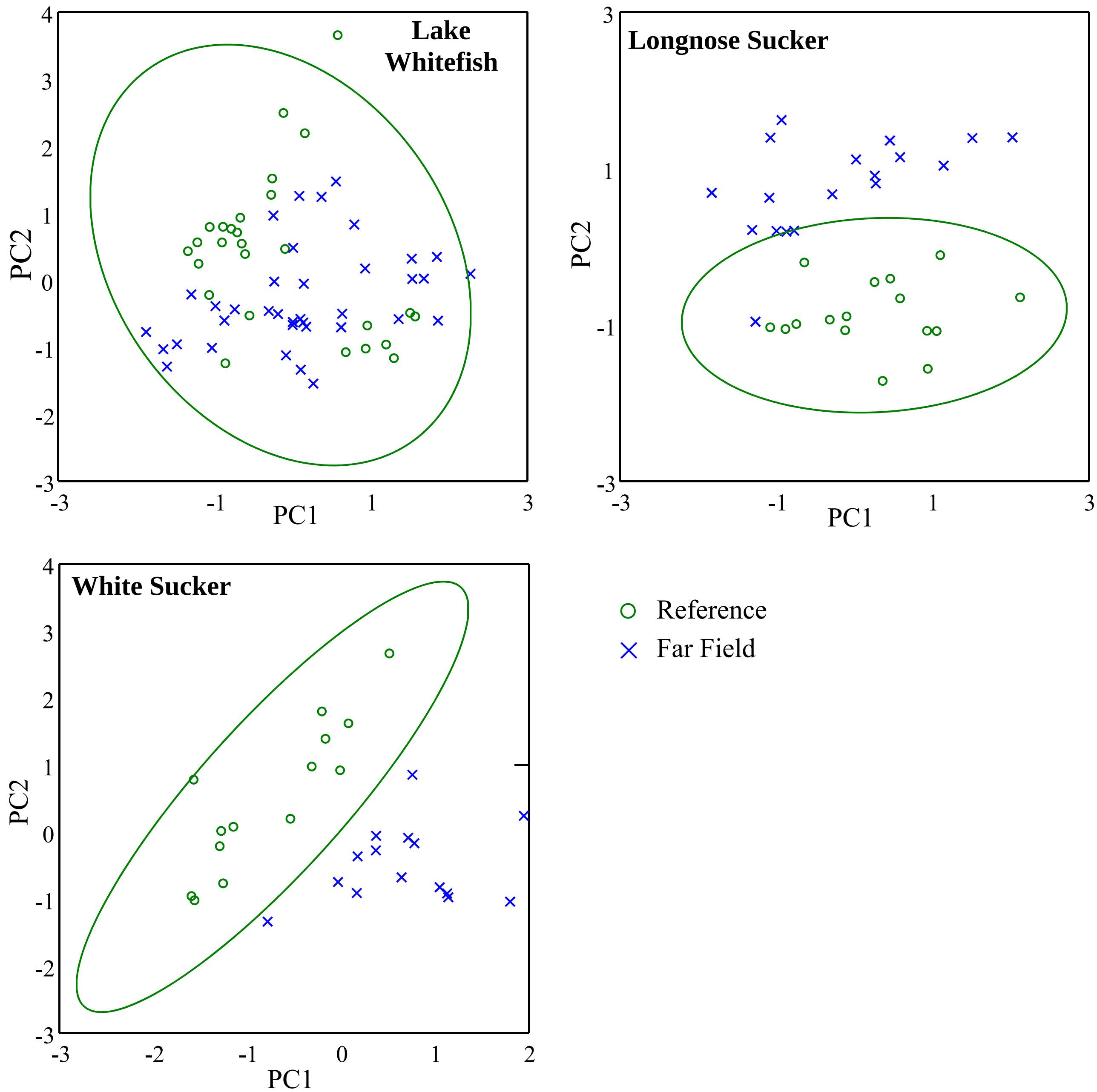


Figure 20
Bottom-feeding fish bone chemistry PCA results for axes 1 and 2 and 95% confidence ellipse of reference samples from the EARMP technical program study area, 2011 and 2012.

7.0 MOVING FORWARD

In 2011 and 2012, long-term monitoring stations at far-field exposure and regional reference locations were established and water quality, sediment quality, benthic invertebrate community, and fish tissue chemistry data were collected. Water, sediment, benthic invertebrate, and fish tissue endpoints were assessed against available guidelines and the reference range (i.e., reference mean ± 2 standard deviations or the 95% confidence interval) to establish if endpoints are currently within expected background levels of the region. With few exceptions, endpoints were found to be below guidelines and/or within the reference range.

The EARMP technical program was established to monitor long-term changes in the aquatic environment far downstream of uranium mining and milling operations in the Eastern Athabasca region of northern Saskatchewan. The results of the 2011 and 2012 EARMP technical program form a baseline to which future monitoring phases can compare to assess for temporal changes. Future phases should consider the low reference area sample sizes of northern pike, longnose sucker, and white sucker and expend additional effort to sample these species.

8.0 LITERATURE CITED

AREVA Resources Canada Inc. (AREVA). 2012. McClean Lake Operation Technical Information Document Environmental Performance.

Berkman, H.E., C.F. Rabeni and R.P. Boyle. 1986. Biomonitors of stream quality in agricultural areas: fish versus invertebrates. Environmental Management, 10:413-419.

Boisclair, D. and W.C. Leggett. 1989. Among-population variability of fish growth: Influence of the quantity of food consumed. Canadian Journal of Fisheries and Aquatic Sciences 46:457–467.

Burnett-Seidel, C. and K. Liber. 2012. Evaluation of sediment quality guidelines derived using the screening-concentration level approach for application at uranium operations in Saskatchewan, Canada. Environmental Monitoring and Assessment. 184: 1593-1602.

Burnett-Seidel, C. and K. Liber. 2013. Derivation of no-effect and reference-level sediment quality values for application at Saskatchewan uranium operations. Environmental Monitoring and Assessment. DOI: 10.1007/s10661-013-3267-3.

Canada North Environmental Services (CanNorth). 2009. Rabbit Lake Operation 2008 comprehensive aquatic environment monitoring report. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

Canada North Environmental Services (CanNorth). 2010. Millennium Project 2009 additional aquatic baseline investigations. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

Canada North Environmental Services (CanNorth). 2013a. Wheeler River aquatic studies program. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

Canada North Environmental Services (CanNorth). 2013b. Rabbit Lake Operation 2012 environment monitoring program. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

Canada North Environmental Services (CanNorth). 2013c. Athabasca Working Group Environmental Monitoring Program for the Athabasca communities 2012 annual report. Unpublished.

Canadian Council of Ministers of the Environment (CCME). 2013. Canadian Environmental Quality Guidelines summary table. Website: http://st-ts.ccme.ca/. Accessed November 2013.

Chapman, P.M. 2007. Selenium thresholds for fish from cold freshwaters. Human and Ecological Risk Assessment: an International Journal 13: 20-24.

EcoMetrix Incorporated (EcoMetrix). 2010a. Key Lake Operation – Status of the Environment Report 2005 to 2009. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

EcoMetrix Incorporated (EcoMetrix). 2010b. McArthur River Operation: Status of the Environment Report 2005 to 2009. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

Elliott, S.T. 1986. Reduction of a dolly varden population and macrobenthos after removal of logging debris. Transactions of the American Fisheries Society, 115:392-400.

Environment Canada (EC). 2012. Metal mining technical guidance for environmental effects monitoring. Environment Canada, National Environmental Effects Monitoring Office, Science Policy and Environmental Quality Branch, Ottawa, Ontario.

Joint Panel. 1992. Assessing cumulative effects of Saskatchewan uranium mines development. Prepared for Joint Federal/Provincial Panel on uranium mining in northern Saskatchewan.

Kilgour, B.W. and D.R. Barton. 1999. Associations between stream fish and benthos across environmental gradients in southern Ontario, Canada. Freshwater Biology, 41:553-566.

Kilgour, B.W., K.M. Somers, and D.R. Barton. 2004. A comparison of the sensitivity of stream benthic community indices to effects associated with mines, pulp and paper mills and urbanization. Environmental Toxicology and Chemistry, 23:212-221.

Kilgour, B.W., K.R. Munkittrick, C.B. Portt, K. Hedley, J. Culp, S. Dixit, and G. Pastershank. 2005. Biological criteria for municipal wastewater effluent monitoring programs. Water Quality Research Journal of Canada, 40:374-387.

Kilgour, B.W. and L.W. Stanfield. 2006. Hindcasting reference conditions in streams. In, R. M. Hughes, L. Wang, and P. W. Seelbach (eds). Influences of landscape on stream habitats and biological assemblages. American Fisheries Society, Symposium 48, Bethesda, Maryland.

Lemly, A.D. 1993. Metabolic stress during winter increases the toxicity of selenium to fish. Aquatic Toxicology, 27: 133-158.

Liber, K., Doig, L.E., and S.L. White-Sobey. 2011. Toxicity of uranium, molybdenum, nickel, and arsenic to *Hyalella azteca* and *Chironomus dilutus* in water-only and spiked-sediment toxicity tests. Ecotoxicology and Environmental Safety, 74: 1171-1179.

Matuszek, J.E. 1978. Empirical predictions of fish yields of large North American lakes. Transactions of the American Fisheries Society, 107:385-394.

McIntyre, D.O., M.A. Pacheco, D. Wallschällger, and C.G. Delos. 2008. Effect of selenium on bluegill sunfish at reduced temperature. EPA-822-R-020. 9. U.S. Environmental Protection Agency, Washington, D.C.

Morgan, C. and N. Ringler. 1994. Influence of benthic predatory fish (*Cottus cognatus*) on invertebrate community structure and secondary production in a tributary of the Susquehanna River. Journal of Freshwater Ecology, 9:63-78.

Muller R.N. and G.T. Tisue. 1997. Preparative-scale size fractionation of soils and sediments and an application to studies of plutonium geochemistry. Soil Sci. 124:191-198.

Saskatchewan Environment (SE). 2006. Surface water quality objectives (SSWQO). Environmental Protection Branch, Regina, Saskatchewan.

Saskatchewan Ministry of the Environment (SE). 2011. Mercury in Saskatchewan fish: guidelines for consumption. Website: http://www.environment.gov.sk.ca/adx/aspx/adxGetMedia.aspx?DocID=2a256b90-19c2-4865-9e89-a5723f5b990c&MediaID=5066&Filename=Mercury+in+Fish+Guide+June+2011.pdf&l=English. Accessed July 24th, 2013.

SENES Consultants Limited (SENES). 2010. Rabbit Lake Operation Integrated Environmental Risk Assessment and State of the Environment Report 2005 to 2009. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

SENES Consultants Limited (SENES). 2012. Status of the Environment Report for the Cigar Lake Project 1998 – 2010. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

Thompson, P.A., J. Kurias, and S. Mihok. 2005. Derivation and use of sediment quality guidelines for ecological risk assessment of metals and radionuclides released to the environment from uranium mining and milling activities in Canada. Environ. Monitor. Assess. 110:71-85.

U.S. Environmental Protection Agency. 2004. Draft aquatic life water quality criteria for selenium. EPA-822-D-04-001. Office of Water, Washington D.C.

Walling, D.E. and P.W. Moorehead. 1989. The particle size characteristics of fluvial suspended sediment: and overview. Hydrobiologia 176:125-149.

Wolf, R.E. 2005. Introduction to ICP-MS. United States Geological Survey/Central-Region/Crustal Imaging & Characterization Team, March 2005.

Yoder, C.O. and E.T. Rankin. 1995. Biological criteria program development and implementation in Ohio. In, W.S. Davis and T.P. Simon (eds), Biological Assessment and Criteria, Tools for Water Resource Planning and Decision Making. Lewis Publishers, Boca Raton, FL.

9.0 MAP SOURCES AND DISCLAIMERS

Canada North Environmental Services Ltd. (CanNorth) has exercised all reasonable care in the compilation, interpretation, and production of the map figures contained in this document. However, it is not possible to warrant or guarantee the accuracy, precision, currency, suitability, or reliability of any of the displayed or underlying data contained in the figures. Therefore, these are presented for reference and/or illustrative purposes; they are neither intended for legal delineation of any geographic feature nor for navigational use. The user must accept the data “as is" and CanNorth assumes no responsibility for loss or damage incurred as a result of any user reliance on this data.

Map figures produced using ESRI ArcGIS 10.0 Service Pack 4.

Base map imagery. Natural Earth. 2012. “Natural Earth I with Shaded Relief and Water.” Version 2.0.0.

Communities. Tele Atlas North America, Inc. with ESRI. 2008. “City and settlement points from ESRI® Data & Maps: StreetMap™.”

Latitude/longitude grid. ESRI®. 2010. “10 Update – World Europe and Untied States: World Latitude and Longitude Grids.”

Provincial boundary. ©Department of Natural Resources Canada. 2003. “Canadian Geopolitical Boundaries.”

Road network (1). Her Majesty the Queen in right of Saskatchewan. 2009. “Saskatchewan Road Network dataset of 2009, (SRN09).” The incorporation of data sourced from Her Majesty the Queen in Right of Saskatchewan within this product shall not be construed as constituting an endorsement by Her Majesty the Queen in Right of Saskatchewan of such product. Reproduced with the permission of Her Majesty the Queen in Right of Saskatchewan.

Road network (2). ESRI®. 2008. “ESRI StreetMap™ 2008.”

Rivers. (1). ©Department of Natural Resources Canada. 2010. "North American Atlas – Hydrology." 1:10,000,000. All rights reserved.

Rivers (2). ©Department of Natural Resources Canada. 2003. "Atlas of Canada, 1:1,000,000 National Framework Data." 1:1,000,000. All rights reserved.

Waterbodies (1). ©Department of Natural Resources Canada. 2010. "North American Atlas - Hydrology" 1:10,000,000. All rights reserved.

Waterbodies (2). ©Department of Natural Resources Canada. 2003. "Atlas of Canada, 1:1,000,000 National Framework Data." 1:10,000,000. All rights reserved.

APPENDICES

LIST OF APPENDICES

APPENDIX A

DETAILED DATA ANALYSIS

APPENDIX A: DETAILED DATA ANALYSIS

1.0 WATER QUALITY

Water quality data are collected as part of the EARMP technical program to monitor potential changes over time and to provide supporting information for the sediment quality, benthic invertebrate community, and fish tissue chemistry components of the program. The 2011 and 2012 EARMP technical program data were collected to establish a baseline to which future monitoring phases could be compared. The water quality sampling locations were co-located with the sediment/benthic invertebrate community sampling areas (Appendix A, Figures 1 to 9). The following section provides a detailed data analysis of the 2011 and 2012 water quality sampling program.

To provide supporting habitat information for the benthic invertebrate community and fish components of this program, limnological profiles are discussed in terms of the Canadian Water Quality Guidelines (CWQG) for the protection of freshwater aquatic life (CCME 2013) and in terms of differences between sampling areas. Data analysis of the water chemistry information focuses on the concentration of Constituents of Potential Concern (COPCs) from the far-field exposure areas as compared to available CWQG and the expected concentrations for the region (i.e., reference range).

1.1 Limnology

The limnology profiles collected from the EARMP technical program study area are detailed in Appendix A, Table 1. Maximum station depths ranged between 6.4 m and 8.0 m, except for the Bobby's Lake reference area, where maximum depths were 5.5 m in 2009 and 4.0 m in 2012. Most Secchi disk depths ranged between 4.1 m and 6.7 m, indicating overall good water transparency. Bobby's Lake was an exception to this in 2012 when the Secchi disk depth was 2.7 m, which indicated that this lake's water was less transparent than the other lakes that year.

During fall sampling completed in both 2011 and 2012, water temperatures varied little with depth, usually ranging between 8.8 °C and 12.5 °C, except at the Fond du Lac River in 2011 where temperatures were lower (3.4 °C or 3.5 °C) as a result of the later fall sampling date (Appendix A, Table 1). Water temperature at the RF-4 reference area was also lower (0 °C to 1.5 °C); however, this was the result of winter sampling.

Dissolved oxygen (DO) levels were high in all waterbodies and reflected typical levels for the region, ranging between approximately 7.65 mg/L and 12.72 mg/L in the waterbodies sampled in the fall (Appendix A, Table 1). Like temperature, DO differed little across depths or between areas. The DO levels at all depths and in all areas met the CWQG of 6.5 mg/L for aquatic life stages other than early stages (CCME 2013). The majority of values for most waterbodies also met the CWQG for early life stages (9.5 mg/L).

Specific conductance differed little with depth and was typical of northern oligotrophic waterbodies, ranging between 8 µS/cm and 37 µS/cm in all areas except Lake Athabasca. Specific conductance was higher in Lake Athabasca (Crackingstone Inlet and Ellis Bay), measuring between 60 µS/cm and 65 µS/cm throughout the water column, with the exception of measurements taken at Crackingstone Inlet in September 2012 (range of 87 to 114 µS/cm).

The pH values in the EARMP technical program study area ranged from slightly acidic to slightly basic, decreasing slightly with depth in some waterbodies and years (e.g., Pasfield Lake). Most values met the CWQG of between 6.5 and 9.0, although some measurements in Bobby's Lake, Pasfield, Lake, and the Cochrane River were slightly below this guideline (Appendix A, Table 1).

1.2 Water Chemistry

A summary of the water chemistry results is provided in Appendix A, Tables 2 and 3 along with available CWQGs. Detailed raw data are provided in Appendix B, Table 1. Detailed QA/QC results are presented in Appendix C.

Concentrations of most COPCs were very low, and in the case of 7 of the 18 COPCs (cadmium, lead, mercury, lead-210, polonium-210, thorium-230, and cobalt), all far-field exposure values were at or below the method detection limit (MDL; Appendix A, Tables 2 and 3). Among the remaining 12 COPCs, 5 (nickel, selenium, radium-226, arsenic, and vanadium) had only one or two values that were above the MDL and these values were at most twice the MDL. There is a high uncertainty level associated with values near the MDL (EC 2012) and none of the concentrations of these five COPCs exceeded the CWQGs. Thus, the concentrations of selenium, radium-226, arsenic, and vanadium in the four far-field exposure locations are considered low.

The remaining six COPCs are presented graphically in Appendix A, Figure 10 against the reference range and available guidelines. Among these, iron and zinc concentrations in all four far-field exposure areas were within the reference range and below available guidelines. Aluminum, molybdenum, and uranium concentrations were also below the guidelines, although, in a few instances they were outside the reference range.

Copper concentrations were generally low in both years in all four far-field exposure areas, except in 2012 in the Fond du Lac River (0.048 mg/L) where the copper concentration was higher than in 2011 (<0.0002 mg/L), exceeded the reference range (upper bound: 0.0002 mg/L), and exceeded the CWQG of 0.002 mg/L (CCME 2013). Given that the copper concentration in 2012 was considerably higher than the 2011 concentration from the Fond du Lac River and considerably higher than concentrations measured at all other sampling locations for the program, this value is considered anomalous at this time.

In summary, aside from the 2012 copper concentration in the Fond du Lac River, all other COPCs in the water were in low concentrations and were below the guidelines or within the reference range.

2.0 SEDIMENT QUALITY

Sediment quality data are collected as part of the EARMP technical program to monitor for the potential accumulation of COPCs in the benthic environment and to assess for potential changes in COPCs over time. Sediment quality samples were collected from five replicate stations in each far-field exposure area and each reference area in 2011 and 2012 to establish a baseline for the EARMP technical program (Appendix A, Figures 1 to 9). The sediment quality sampling stations were co-located with the benthic invertebrate community sampling areas.

Sediment particle size composition and total organic carbon (TOC) content are described to provide supporting information for the sediment chemistry data as well as the benthic invertebrate community data. Sediment chemistry data analysis focused on comparing COPC concentrations to relevant sediment quality guidelines and to expected background conditions (i.e., reference range). Various sediment quality guidelines are available (i.e., CCME 2013; Thompson et al. 2005; Burnett-Seidel and Liber 2013); however, analysis focused on comparing COPCs to the most locally available guideline (see Section 2.3.3.1 of the Main Document for further discussion of available guidelines).

2.1 Sediment Particle Size

Particle size and TOC content was measured in the 0 cm to 5 cm horizon from each sediment and benthic invertebrate community replicate sampling station. Similar to limnology, these data serve as useful supporting information for the sediment chemistry and benthic invertebrate community analyses. Sediment particle size data are summarized in Appendix A, Table 4 and detailed in Appendix B, Table 2.

Gravel content was generally similar in all areas, usually present in only small amounts or less than the MDL (Appendix B, Table 2). Other particle sizes varied more widely between areas, notably in terms of fine particle content (clay + silt). However, the range of fine particle contents between the far-field exposure areas was similar to the range in the reference areas. In the exposure areas, average fine particle content ranged from 16.6% in Waterbury Lake in 2012 to 96.6% in the Cochrane River in 2012 (Appendix A, Table 4). In the references, average fine particle content ranged from 5.3% in Pasfield Lake in 2012 to 99.3% in Ellis Bay in 2012 (Appendix A, Table 4). The fine particle content in Waterbury Lake was similar to that of Pasfield and Cree lakes, while Crackingstone Inlet was similar to RF-4 and Bobby's Lake. The fine particle content of the Fond du Lac and Cochrane River sampling areas were similar to those in Bobby's Lake and Ellis Bay.

Because a relationship often occurs between fine particle content and sediment chemistry, the fine particle content was compared between each far-field exposure area and the pooled references via analysis of variance (ANOVA). The Cochrane River and the Fond du Lac River contained a significantly larger proportion (overall 94.5% and 83.1%, respectively) of fine particles than the pooled references ($p = 0.017$ and $p = 0.039$, respectively), and vice-versa, Waterbury Lake contained a significantly lower proportion of fine particles (overall 16.8%) compared to the pooled references ($p = 0.013$). Crackingstone Inlet, with an intermediate amount of fine particles (overall 60.8%), did not significantly differ from the pooled references ($p = 0.260$).

The concentrations of compounds in sediment tend to increase with decreasing particle size, due to an increase in surface area per unit mass (Muller and Tisue 1997).

Therefore, the significant differences observed in fine particle contents imply that sediment chemistry results may need to be corrected for fine particle content. Additionally, potential differences between benthic invertebrate communities could also follow from differences in fine particle content.

2.2 Sediment Chemistry

A summary of the EARMP technical program sediment chemistry results is presented in Appendix A, Table 5 along with the available guidelines. Detailed raw data and descriptive statistics are presented in Appendix B, Tables 3 and 4, respectively. Detailed QA/QC are presented in Appendix C. Core log sheets are provided in Appendix D.

As a result of particle size differences between some of the far-field exposure areas and the reference areas (refer to Section 2.1), the potential relationship between COPC concentrations and fine particle content was investigated with scatterplots. Overall, it was determined that COPC concentrations increased with increasing fine particle content (a typical example is shown in Appendix A, Figure 11). Therefore, sediment chemistry data comparisons between the far-field exposures and the pooled references required an adjustment for particle size differences to prevent fine particle content-induced biases. Adjustments for fine particle content was achieved using the COPC concentration adjusted means (standardized at an average fine particle content) resulting from analysis of covariance (ANCOVA). However, COPC concentrations in the Fond du Lac River sediment chemistry did not always correlate with fine particle content and in these specific cases, no adjustments for fine particle content could be made for the Fond du Lac River[1] sediment samples.

COPC concentrations (adjusted, when required) in the far-field exposure areas are shown in Appendix A, Figure 12 where they are compared to the relevant guidelines and to the reference range (adjusted, when required). The unadjusted results for the eight COPCs in the Fond du Lac River that were not significantly related to particle size are presented in figure panels adjacent to the other waterbodies in Appendix A, Figure 12.

[1] In the preliminary ANCOVA tests, the Fond du Lac River's slope significantly differed from the other areas' slopes, with p ranging from <0.001 to 0.031 for aluminum, iron, nickel, uranium, zinc, radium-226, cobalt, and vanadium.

Average concentrations of 7 of the 17 COPCs assessed in the EARMP technical program study area were within the reference range in both 2011 and 2012. This included average concentrations of aluminum, copper, iron, lead, lead-210, polonium-210, and arsenic (Appendix A, Figure 12). Exceptions to this included cadmium (Fond du Lac River, both years), molybdenum (Fond du Lac River and Waterbury Lake, both years), nickel (Fond du Lac River, 2012), selenium (Crackingstone Inlet, 2011), uranium (Crackingstone Inlet, both years), zinc (Fond du Lac River, 2012), radium-226 (Crackingstone Inlet, 2012), thorium-230 (Crackingstone Inlet, both years), cobalt (Fond du Lac River, 2012 and Waterbury Lake, 2011), and vanadium (Crackingstone Inlet, both years).

Of the COPCs with guidelines, only vanadium exceeded the most relevant guideline available. Geometric mean vanadium concentrations exceeded the available LEL of 35.2 µg/g in the Crackingstone Inlet in 2011 (49.1 µg/g), but not 2012 (34.8 µg/g; Appendix A, Figure 12). Sediment Station 4 in the Crackingstone Inlet contained vanadium concentrations that were substantially higher than all other stations measuring 131 µg/g in 2012 and 280 µg/g in 2011. Some of the other stations in the Crackingstone Inlet contained vanadium concentrations below the LEL (Appendix B, Table 3). The applicability of the vanadium LEL to waterbodies in northern Saskatchewan has recently been questioned given the LEL for vanadium is similar to concentrations found in reference waterbodies in northern Saskatchewan (Burnett-Seidel and Liber 2013).

There are no available guidelines for cobalt or thorium-230 in sediment. Mean cobalt concentrations only marginally exceeded the reference range in the Fond du Lac River in 2012, but not 2011 (Appendix A, Figure 12). However, the geometric mean thorium-230 activity in Crackingstone Inlet was notably higher than the reference range and the other far-field exposure areas (Appendix A, Figure 12). The geometric mean thorium-230 activity in Crackingstone Inlet was 6.62 Bq/g in 2011 and 3.56 Bq/g in 2012 as compared to an upper bound of 0.08 Bq/g in the reference areas. Similar to vanadium, Station 4 had notably higher thorium-230 activity levels (26 Bq/g in 2011 and 14 Bq/g in 2012) compared to the other stations sampled in the Crackingstone Inlet (Appendix B, Table 3).

3.0 BENTHIC INVERTEBRATE COMMUNITIES

Benthic invertebrate community data provide an indication of the quality of fish habitat, and because benthic invertebrates have a shorter life span than most fish species, effects on benthic invertebrate communities can provide an early indication of potential effects on fish communities or populations. Benthic invertebrate community samples were collected from five replicate stations in each far-field exposure area and each reference area co-located with the sediment quality sampling stations (Appendix A, Figures 1 to 9). The following section characterizes baseline (i.e., 2011 and 2012) benthic invertebrate community indices in the far-field exposure areas and relates the indices to the reference areas. Similar to the sediment chemistry comparisons, all benthic invertebrate endpoints were presented graphically in comparison to the regional reference range.

3.1 Community Composition Overview

A total of 87 benthic invertebrate taxa (identified at the lowest practical level of taxonomic resolution) occurred in the study areas (Appendix B, Tables 5 and 6). Common taxa included Hirudinea (leeches), Oligochaeta (aquatic earthworms), Bivalvia (clams), Gastropoda (snails), Amphipoda (scuds), Cladocera (water fleas), Trichoptera larvae (caddisflies), and Chironomidae larvae (non-biting midges). Ephemeroptera nymphs (mayflies), Megaloptera larvae (fishflies), and Odonata nymphs (dragonflies) also occurred but generally only in a few samples. In terms of biomass, amphipods and chironomids tended to be the dominant taxa in most samples, although Gastropoda and Hirudinea dominated the sample biomass in some samples (Appendix B, Table 7).

Differences in community composition between areas or years were not further addressed herein because the aim of this study is to characterize the baseline communities collected during the 2011 and 2012 sampling periods. These data will be compared to monitoring data collected by the EARMP during future campaigns to examine potential temporal changes over time. The large amount of benthic invertebrate community data and their high level of taxonomic resolution (Appendix B, Tables 5 and 6) can readily serve in multivariate community composition analyses in the future. For the purpose of the current study, comparisons of benthic invertebrate communities will focus on three benthic invertebrate community indices: density, taxon richness, and biomass.

3.2 Community Indices

A summary of the benthic invertebrate community indices (density, taxon richness, and biomass) is presented in Appendix A, Table 6. Detailed taxonomic enumeration is presented in Appendix B, Tables 5 and 6, and detailed biomass is presented in Appendix B, Table 7.

3.2.1 Densities

Benthic invertebrate densities varied widely between replicate stations within waterbodies, between years, and between waterbodies. Within-waterbody variation between samples reached as much as a five-fold difference in Pasfield Lake in 2012, ranging from 1,931 organisms/m^2 to 9,077 organisms/m^2 (Appendix A, Table 6). Similarly, the density differences between years reached as much as a five-fold difference, with a mean density of 25,441 organisms/m^2 in 2011 compared to 5,277 organisms/m^2 in 2012 in Pasfield Lake. The between waterbody differences were even wider, with a 20-fold difference in mean densities between 25,441 organisms/m^2 in Pasfield Lake in 2011 compared to 1,112 organisms/m^2 in the Fond du Lac River in 2012.

The benthic invertebrate densities of the four far-field exposure areas were compared to the reference range (Appendix A, Figure 13). While benthic invertebrate average densities varied between years and between areas, all remained within the reference range. This indicates that the densities found in the EARMP far-field exposure areas are within the expected range for the region.

3.2.2 Biomass

Biomass variability between samples, between years, and between waterbodies was not as wide as that of density. Biomass differences between samples within a waterbody were usually between one and up to five-fold different, although Bobby's Lake biomass in 2012 varied by as much as 18-fold (Appendix A, Table 6). The difference between samples in Bobby's Lake in 2012 was largely the result of differences in Chironomidae biomass between samples, which ranged from 0.654 g/m^2 to 23.421 g/m^2 (Appendix B, Table 7). Between-year variability was generally low, ranging overall from 2% to approximately two-fold, although the differences were approximately five-fold in Bobby's Lake and Pasfield Lake (Appendix A, Table 6). Between-waterbody variability was wide, ranging from approximately 2 g/m^2 (in Waterbury Lake in 2012 and in Bobby's Lake in 2009) to over 30 g/m^2 in Pasfield Lake in 2011 (Appendix A, Table 6). The larger biomass values in Pasfield Lake in 2011 were accounted for by mostly Chironomidae (Appendix B, Table 7).

The average biomass for each of the four far-field exposure areas was compared to the reference range[2] in Appendix A, Figure 13. Average biomass in all four far-field exposure areas was within the reference range, indicating they were within the expected range for the region.

3.2.3 Taxon Richness

Taxon richness was assessed at the lowest practical taxonomic level, with the mean number of taxa per sample presented in Appendix A, Table 6 and Appendix A, Figure 13. Like biomass, taxon richness variability was of a much lower amplitude than what was observed for density. The typical difference between samples within a waterbody in a given year was between 10% and 80%, although some areas showed higher variability. The largest taxon richness difference between samples within a waterbody in a given year was approximately three-fold in Bobby's Lake in 2009, where the highest richness was 23 taxa compared to the lowest richness of 7 taxa (Appendix A, Table 6). The difference in average taxon richness between waterbodies was also smaller than what was observed for densities, with average richness varying between 11 taxa per sample (in RF-4 in 2008) and 23 taxa per sample (Bobby's Lake in 2012, Cree Lake in 2011, and Ellis Bay in 2011). The difference in average taxon richness between years in a given waterbody was of only 1 or 2 taxa for all waterbodies, except for Bobby's Lake that had 9 more taxa in 2012 compared to 2009.

Average taxon richness in all four far-field exposure areas was compared to the reference range (Appendix A, Figure 13). Like average density, some variability was observed between years and waterbodies, and like average density, average taxon richness in all four far-field exposure areas was within the reference range.

3.2.4 Other Considerations

In this section, two potentially important sources of variation or bias are discussed in greater detail with regards to the above benthic invertebrate analyses. First, the potential effect of sediment particle size variability between areas on benthic invertebrate density, biomass, and taxon richness was tested. Second, the potential differences in the benthic invertebrate indices from differences in sampling methods were explored. A third aspect

[2] Since benthic invertebrate biomass was not measured in RF-4, the pooled reference range did not include biomass values from RF-4.

relating benthic invertebrate results to Crackingstone Inlet sediment chemistry is also addressed below.

3.2.4.1 Potential Particle Size Effects

Because of the potential effect of particle size on benthic invertebrate communities, the relationship between the two was tested via ANCOVA for each of density, biomass, and taxon richness. The ANCOVA results revealed that there was no significant effect of fine particle content on either richness or biomass (ANCOVA $p = 0.150$ and 0.401, respectively), and therefore, richness and biomass did not need to be standardized for differences in fine particle content of the study areas. Fine particle content, however, had a statistically significant effect on benthic invertebrate density (ANCOVA $p = 0.007$), but the relationship was weak (ANCOVA $R^2 = 0.40$). The original (unadjusted) results were similar to those for density adjusted for fine particle content. Therefore, it was considered preferable to present the original (unadjusted) results and remain consistent with taxon richness and biomass.

3.2.4.2 Potential Method-Induced Biases across Waterbodies

In the Cochrane River, Crackingstone Inlet, Fond du Lac River, Waterbury Lake, Cree Lake, Ellis Bay, and Pasfield Lake, all samples were composites of five subsamples in both 2011 and 2012. The total area sampled each year in these lakes was therefore 0.260 m^2 per sample ($5 \times 0.052\ m^2 = 0.260\ m^2$). In RF-4, 10 smaller subsamples were composited per sample, which amounted to 0.225 m^2 per sample ($10 \times 0.0225\ m^2 = 0.225\ m^2$). The sample surface area difference at RF-4 was deemed minimal, especially since density and biomass were converted to a m^2 basis. In Bobby's Lake, differences in sampling methods were more important. Bobby's Lake samples were composites of three subsamples in 2009 ($3 \times 0.052\ m^2 = 0.156\ m^2$) compared to five subsamples in 2012 ($5 \times 0.052\ m^2 = 0.260\ m^2$). The total area sampled at each station in Bobby's Lake in 2009 was therefore 40% smaller than in 2012 and 40% smaller than in most other areas. Because of the smaller sampling area compared to other waterbodies or years, the likelihood of not capturing a particular taxa occurring at lower densities was higher in 2009.

In addition to the sampling area differences, the more widely spread replicate stations in 2012 likely lead to higher habitat variability between replicate stations compared to 2009 in Bobby's Lake, enhancing the likelihood of capturing a wider variety of benthic invertebrate taxa in 2012 relative to 2009. This, in addition to the smaller surface area sampled in 2009, may have biased low the 2009 benthic invertebrate taxon richness estimate in Bobby's Lake compared to other areas and years. Benthic invertebrate taxon richness was therefore re-analyzed without the Bobby's Lake 2009 taxon richness, and the results of this analysis were similar to those obtained when these data were included. Although the Bobby's Lake 2009 taxon richness may potentially be biased low, this potential bias had no effect on the outcome of the analyses. The results of these analyses were therefore considered robust.

3.2.4.3 Crackingstone Inlet

Crackingstone Inlet was the only far-field exposure area with one COPC above sediment quality guidelines (mean vanadium concentration in 2011) and the sediment also contained elevated thorium-230 activity levels. The benthic invertebrate community in the Crackingstone Inlet is very comparable to the reference areas in terms of average density, taxon richness, and biomass (Appendix A, Table 6; Appendix A, Figure 13). Furthermore, both mayfly and caddisfly species (i.e., EPT taxa), which are generally considered to be the more sensitive groups, were found in the Crackingstone Inlet in both 2011 and 2012 (Appendix B, Tables 5 and 6).

Station 4 in the Crackingstone Inlet contained vanadium and thorium-230 levels that were notably higher than all other stations and sampling areas in both years (Appendix B, Table 3). In both 2011 and 2012, the benthic invertebrate density and richness at this station were within the range of the other stations sampled at the Crackingstone Inlet and the regional reference ranges (Appendix A, Table 6). In 2012, biomass was lower at Station 4 (4.4 g/m^2) compared to the other stations sampled at the Crackingstone Inlet in 2012 (6.4 to 13.4 g/m^2); however, it was well within the regional reference range. The taxonomic assemblage at Station 4 was similar to the other stations sampled at the Crackingstone Inlet and included a wide variety of taxa such as leeches, aquatic earthworms, scuds, chironomids, caddisflies, clams, and snails (Appendix B, Tables 5 and 6).

The benthic invertebrate community metrics and assemblages collectively indicate that COPC concentrations in Crackingstone Inlet sediment are not impairing the benthic invertebrate community.

4.0 FISH

Fish tissue chemistry data provide a means of monitoring the potential accumulation of COPCs in biological tissue. The following section characterizes the 2011 and 2012 baseline fish chemistry data from the far-field exposure areas and relates the COPC concentrations to those found in reference areas and to available guidelines.

The detailed fish capture data are provided in Appendix B, Table 8, and basic descriptive statistics on the length, weight, and age of fish kept for chemistry are provided in Appendix B, Table 9. The flesh chemistry detailed results are presented in Appendix B, Tables 10 to 17, followed with the flesh chemistry descriptive statistics in Appendix B, Table 18. The detailed bone chemistry results are presented in Appendix B, Tables 19 to 26, while the bone chemistry descriptive statistics are presented in Appendix B, Table 27.

4.1 Fish Collection Results

Five hundred and twenty eight fish were captured, and included eight species: lake whitefish, lake trout, longnose sucker, white sucker, northern pike, yellow perch (*Perca flavescens*), walleye (*Sander vitreus*), and burbot (*Lota lota*) (Appendix B, Table 8). Among these fish, 290[3] fish were kept and analyzed for chemistry. No burbot, walleye, or yellow perch were kept for chemistry as they were too rarely caught to provide sufficient data.

Although five target species were chosen for collection (longnose sucker, white sucker, lake whitefish, lake trout, and northern pike), the capture success of spring spawning species (i.e., northern pike, longnose sucker, and white sucker) was often poor in some of the sampling areas. Therefore, the target samples size (n = 5 samples per year per species) was not always achieved for each sampling area. In Bobby's Lake and RF-4, which were sampled as part of other studies (CanNorth 2009; CanNorth 2010; CanNorth 2013a; CanNorth 2013b), the target species did not include all five of the EARMP species; therefore, the calculated reference range does not include data from longnose sucker, lake whitefish, and lake trout from Bobby's Lake and includes no fish from RF-4. The available fish chemistry data from Bobby's Lake included only northern pike and white sucker from 2009.

[3] Because some specimens were small and required compositing to reach an appropriate mass for chemical analysis, the sample size amounted to 249.

4.2 Fish Chemistry

Similar to the analyses of the other component in the EARMP technical program, fish chemistry data from the far-field exposure areas were compared to the reference range. However, given the multiple species, multiple tissue types, and number of COPCs assessed, Principal Component Analysis (PCA) was used to assess the fish chemistry results. This allowed for the analysis of multiple COPCs in flesh and bone from each species (2 tissues x 5 species = 10 comparisons), irrespective of separate far-field exposure areas. This was a simpler approach than focussing on each COPC separately in each far-field exposure area for each species and tissue using univariate statistics such as ANOVA (18 COPCs x 2 tissues x 5 species x 4 far-field exposure areas = up to 720 comparisons). Only COPCs that measured above the MDL in more than 50% of the samples in most of the far-field exposure area were included in the analyses.

The main focus of the results was on two-axis (two-dimensional) scatterplots of the PCA results. PCA plots synthesize how chemically similar (or different) the fish samples are according to the distance between each specimen's position on the PCA plot (i.e., the greater the distance the greater the difference). Each axis represents a combination of various COPC concentrations, and the eigenvectors for each COPC represent the amount and direction of "pull" each COPC has along each axis. Although PCA produces multidimensional results (e.g., four, five, or more axes in multidimensional space), plots including more than two axes (or dimensions) become increasingly abstract and difficult to interpret.

The first two components (PC1 and PC2) expressed between 44% and 62% of all the variability in sample chemistry. This suggests that the first two components expressed a large amount of the variability in sample chemistry. Because of the additional complexity of the results associated to PC3 and PC4, and because PC3 and PC4 usually explained ≤ 15% of the variability in sample chemistry, more emphasis will be put on the PC1 and PC2 results than on PC3. The fish chemistry was thus analyzed for each species flesh and bone separately and compared to the 95% confidence interval ellipse around the reference samples.

Correlations of ≥ |0.6| between COPC concentrations and PCA axis scores were considered to indicate a strong degree of correlation. PCA scores were computed only for axes with eigenvalues of ≥ 1.0 or that accounted for ≥ 10% of the variation in the data.

Variations in PCA scores for far-field exposure area fish tissue were compared to the 95% confidence ellipse around the reference scores. Data points falling outside this ellipse were assessed further to determine if any COPCs were outside the expected range for the region. For cases where a COPC correlated by more than |0.6| with PC3 or PC4 axis scores, data were assessed graphically against the reference range similar to the presentation used in previous sections.

Mercury and selenium concentrations in fish flesh from the far-field exposure areas were also assessed relative to available guidelines using the graphical approach presented in the water, sediment, and benthic invertebrate community sections. Mercury was compared to the 0.5 µg/g guideline (SE 2011) and selenium was compared to the lowest available draft guideline for muscle tissue (8.8 µg/g (dw); Lemly 1993) converted to a wet weight basis of 2.9 µg/g. A representative wet weight-to-dry weight conversion factor of 77% moisture was used for this conversion.

4.2.1 Fish Flesh

Of the 18 COPCs assessed in fish flesh, 10 were often at or below the MDL in more than 50% of the samples in all species. (Appendix A, Table 7). These included aluminum, cadmium, lead, molybdenum, nickel, uranium, lead-210, radium-226, thorium-230, and vanadium and are not addressed further (Appendix A, Table 7). Cobalt concentrations were also at or below MDL in 50% or more of the samples of the predatory fish species assessed, but less so for the bottom-feeding species.

The remaining eight COPCs included copper, iron, mercury, selenium, zinc, polonium-210[4], arsenic, and cobalt[5] and will be the focus of the remainder of the analyses on fish flesh chemistry. Correlations, eigenvalues, and the proportion of the variation explained by each PCA axis for each species are presented in Appendix A, Table 8. As seen in greater details below, the PCA results demonstrated that most COPCs were in low concentrations in the far-field exposure areas and were within the 95% confidence ellipse of the reference areas. In addition, those COPCs with available guidelines (i.e., selenium and mercury) were found at levels below those guidelines in all fish flesh samples.

[4] Polonium-210 specific activity levels were above the MDL in more than 50% of the samples most of the time, except for lake trout (Appendix A, Table 7). Therefore, while polonium-210 was generally included in flesh analysis, it was not for lake trout.

[5] Only for longnose sucker, white sucker, and lake whitefish, as discussed above.

4.2.1.1 Lake Trout

The PCA results are summarized graphically in Appendix A, Figure 14. Although only the first two axes are depicted in the figure, the first three axes each explained > 10% of the total variation in COPC concentrations, with the first two axes together explaining 62% of the total variation (Appendix A, Table 8). The first axis (PC1, the x-axis), reflected mainly copper, iron, and zinc concentrations, these three COPCs increasing to the right of the plot (positive values ≥ 0.60, Appendix A, Table 8), with otherwise no COPCs strongly increasing to the left of the plot (all negative values > -0.6). The second axis (PC2, the y-axis) reflected increasing concentrations of selenium to the top of the plot and increasing concentrations of arsenic to the bottom of the plot. Overall, as seen in Appendix A, Figure 14, all lake trout flesh samples from the far-field exposure areas fell within the 95% confidence ellipse of the reference areas, which meant that copper, iron, selenium, zinc, and arsenic concentrations in the far-field exposure areas were within the ranges of values expected for reference areas.

The third axis (i.e., the third dimension, not plotted for simplicity) represented mainly differences in mercury concentrations between samples, and these results as well as those for selenium were separately compared with both the available guidelines and the reference range (Appendix A, Figure 15). Lake trout flesh average mercury and selenium concentrations fell within the reference ranges and below the guideline/draft guideline in all four far-field exposure areas. Overall, the lake trout flesh chemistry in the far-field exposure areas is reflective of background conditions in the region.

4.2.1.2 Northern Pike

In northern pike flesh, the first four axes each explained > 10% of the total variation in COPC concentrations, with the first two explaining 51% of the variation (Appendix A, Table 8). The first axis reflected increasing copper, iron, and zinc concentrations to the right of the plot, with no COPCs strongly increasing to the left of the plot (Appendix A, Table 8 and Figure 14). The second axis reflected increasing polonium-210 specific activity levels to the bottom and increasing concentrations of arsenic to the top of the plot. All northern pike flesh samples from the far-field exposure areas fell within the 95% confidence ellipse of the reference areas (Appendix A, Figure 14). This indicates that copper, iron, zinc, polonium-210, and arsenic levels in the far-field exposure areas were within the ranges of values expected for reference areas.

The third axis (not shown) corresponded to differences in mercury and selenium concentrations between samples, and these results are separately compared with both the available guidelines and the reference range (Appendix A, Figure 15). All average mercury concentrations fell below the guideline and within the reference range. All average selenium levels were below the draft guideline, and were within the reference range except for Crackingstone Inlet where average selenium levels exceeded the reference range. The fourth axis of the PCA (not shown) explained relatively little of the total variation, with no COPC having a strong gradient along that axis (all values < |0.6|; Appendix A, Table 8).

Overall, the northern pike flesh chemistry in the far-field exposure areas is reflective of background conditions in the region (i.e., within reference range or below guidelines).

4.2.1.3 Lake Whitefish

In lake whitefish flesh, the first three axes explained > 10% of the total variation in COPC concentrations, the first two explaining 53% of the variation (Appendix A, Table 8). The first axis corresponded to increasing levels of copper, zinc, and polonium-210 to the right of the plot, and mercury increasing to the left of the plot (Appendix A, Table 8 and Figure 14). The second axis represented increasing concentrations of iron and cobalt to the top of the plot (Appendix A Table 8 and Figure 14). As seen in Appendix A, Figure 14, 1 of the 27 lake whitefish flesh samples from the far-field exposure areas fell outside the 95% confidence ellipse of the references along the second axis. This sample was from the Cochrane River, and it was characterized by mercury and cobalt concentrations above the reference range (Appendix A, Table 9). These exceedances were, however, minor. The cobalt concentration was within the range of concentrations observed in reference waterbodies assessed in the region for the AWG program (range: <0.002 µg/g to 0.015 µg/g; CanNorth 2013c). The third PCA axis represented selenium concentration differences between samples, and these results, as well as those for mercury, are compared with both the available guidelines and the reference range below (Appendix A, Figure 15). Average mercury levels in lake whitefish flesh from the Cochrane and Fond du Lac rivers exceeded the reference range; however, concentrations were below the guideline in all four far-field exposure areas. For selenium, average concentrations were in all cases below the draft guideline, and were within the reference range in all far-field exposure areas except Crackingstone Inlet, which marginally exceeded the reference range.

Overall, the lake whitefish flesh chemistry in the far-field exposure areas is reflective of background conditions in the region (i.e., within reference range or below guidelines).

4.2.1.4 Longnose Sucker

Longnose sucker were captured in all far-field exposure areas except Crackingstone Inlet. Therefore, the longnose sucker PCA did not include any results for Crackingstone Inlet. Using the available results for the other waterbodies, the first three axes each explained > 10% of the total variation in COPC concentrations, the first two explaining 50% of the variation (Appendix A, Table 8). The first axis reflected increasing levels of copper, iron, and polonium-210 to the right of the plot (Appendix A, Table 8). The second axis reflected increasing concentrations of mercury to the top and increasing concentrations of zinc to the bottom of the plot.

The majority of the longnose sucker flesh samples from the far-field exposure areas fell within the 95% confidence ellipse of the references, with two exceptions lying marginally outside the confidence ellipse along the second axis (Appendix A, Figure 14). These were two samples from the Fond du Lac River that had higher mercury concentrations than the references range (Appendix A, Table 10). With the exception of the Fond du Lac River, average mercury concentrations were within the reference range and below the guideline in all far-field exposure areas (Appendix A, Figure 15). Average selenium levels were also below the draft guideline and fell within the reference range in all waterbodies.

The third axis of the PCA reflected differences in arsenic and cobalt concentrations between samples. Average arsenic and cobalt concentrations were in most cases within the reference ranges, except for the Cochrane River where arsenic concentrations marginally exceeded the reference range (Appendix A, Figure 15).

Overall, the longnose sucker flesh chemistry in the far-field exposure areas is reflective of background conditions in the region (i.e., within reference range or below guidelines).

4.2.1.5 White Sucker

White sucker were captured in each far-field exposure area except Crackingstone Inlet. Therefore, the white sucker PCA did not include any results for that area. Using the available results for the other waterbodies, the first three axes of the PCA each explained > 10% of the total variation in COPC concentrations, the first two explaining 61% of the variation (Appendix A, Table 8). The first axis represented copper, iron, selenium, polonium-210, and cobalt levels increasing to the right of the plot, with no COPCs strongly increasing to the left of the plot. The second axis represented increasing concentrations of iron to the top and increasing concentrations of arsenic to the bottom of the plot.

The majority of the white sucker flesh samples from the far-field exposure areas fell outside the 95% confidence ellipse of the reference areas, in the lower right portion of the PCA plot (Appendix A, Figure 14). Six of these samples were from the Fond du Lac River and two were from the Cochrane River. Among these samples, several COPCs departed from the reference ranges (Appendix A, Table 11), although most of these departures were small. The Fond du Lac River samples departed from the references mostly in terms of higher selenium and mercury concentrations, among which selenium largely explained the departure from the reference ellipse (mercury was not strongly correlated to either of the first two axes). Despite these isolated samples, average selenium levels in the Fond du Lac River were within the reference range (Appendix A, Figure 15), as were the averages for the other far-field exposure areas. The Cochrane River samples departed from the reference ellipse mostly because of higher polonium-210 levels (Appendix A, Table 11).

The third PCA axis represented mainly differences in mercury and zinc concentrations between samples (Appendix A, Table 8). Except for the Fond du Lac River, average mercury concentrations were within the reference range (Appendix A, Figure 15). Despite the Fond du Lac River average mercury concentration exceeding the reference range, it was below the guideline, as were the averages for the other far-field exposure areas (Appendix A, Figure 15). Zinc levels were also within the reference range except for the sample from Waterbury Lake that marginally exceeded the reference range (Appendix A, Figure 15). Only one sample was assessed from Waterbury Lake; therefore, no real conclusions can be drawn from the zinc level.

Overall, the white sucker flesh chemistry in the far-field exposure areas is reflective of background conditions in the region (i.e., within reference range or below guidelines).

4.2.2 Fish Bone

The fish bone chemistry results were analyzed in the same manner as the fish flesh results. While many of the 18 COPCs were also in low concentrations (Appendix B, Tables 19 to 26), more COPCs were in concentrations above the MDL than what was observed for flesh (Appendix A, Table 12). Also, fish bone chemistry varied more between species than flesh. Lake trout had the fewest number of COPCs in concentrations greater than the MDL in more than 50% of the samples, followed by northern pike. Longnose sucker, white sucker, and especially lake whitefish had more COPCs with values greater than the MDL in more than 50% of the samples.

COPCs that were generally less or equal to the MDL in 50% or more of the samples in all five species included cadmium, lead-210, radium-226, and thorium-230 (Appendix A, Table 12). Since these COPCs were in very low concentrations in the majority of the samples, these COPCs were not considered further. Additionally, aluminum, lead, and cobalt were also in concentrations below or equal to the MDL in 50% or more of the samples in all species except lake whitefish. There was a high degree of variability in sample sizes and bone chemistry data between species thus the list of COPCs included in the PCA differed between species. It is important to note that the lower reference sample sizes in northern pike, longnose sucker, and white sucker (n = 18, 16, and 14, respectively; Appendix B, Table 27) may have been insufficient to appropriately capture the natural variability in these species' bone chemistry. For each species, the COPC list included in the PCA as well as correlations, eigenvalues, and the proportion of the variation explained by each PCA axis for each species are presented in Appendix A, Table 8.

4.2.2.1 Lake Trout

In lake trout bone, seven COPCs were included in the PCA (Appendix A, Table 8). The first two axes each explained > 10% of the total variation in COPC concentrations, together explaining 60% of the variation (Appendix A, Table 8). The first axis reflected increasing iron, nickel, and selenium concentrations to the right of the plot and arsenic increasing to the left of the plot. The second axis reflected increasing concentrations of copper and zinc to the top of the plot with no COPCs strongly increasing to the bottom of the plot. The third and higher axes explained little of the variations among samples, and no COPC were strongly correlated with these axes' scores (all COPC correlations < |0.6|; Table 8).

Overall, as seen in Appendix A, Figure 16, all but three lake trout bone samples from the far-field exposure areas fell within the 95% confidence ellipse of the references. The three far-field exposure area samples falling outside the ellipse were from the Cochrane River, and they were outside the ellipse on the second axis because they contained less copper than the references (Appendix A, Table 13). Thus, lake trout bone chemistry in the far-field exposure areas was similar to reference fish chemistry.

4.2.2.2 Northern Pike

In northern pike bone, 10 COPCs were included in the PCA, and the first four axes explained > 10% of the total variation in COPC concentrations (Appendix A, Table 8). The first two axes explained 46% of the variation. The first axis reflected increasing concentrations of selenium, uranium, and arsenic to the right of the plot, with no COPCs strongly increasing to the left of the plot (Appendix A, Table 8). The second axis reflected increasing mercury and polonium-210 levels to the top of the plot with no COPCs strongly increasing to the bottom of the plot. The third axis of the PCA (not shown) corresponded mostly to differences in cobalt between samples, and these results are separately compared with the reference range further below (Appendix A, Figure 17). The fourth axis of the PCA (not shown) explained relatively little of the variation in northern pike bone chemistry, with no COPC having a strong gradient along that axis (all values < |0.6|; Appendix A, Table 8).

Along the first and second axes of the PCA, several northern pike bone samples from the far-field exposure areas fell outside the 95% confidence ellipse of the references (Appendix A, Figure 16). These exceedances occurred on both axes and were from Cochrane River, Crackingstone Inlet, and Waterbury Lake samples. In Cochrane River, six of the nine samples fell outside the reference ellipse (including one very marginally so). These samples were characterized by varying combinations of higher iron, mercury, zinc, and polonium-210 levels, and varying combinations of lower nickel and zinc levels (Appendix A, Table 14). Aside from iron, zinc, and mercury (the latter in only one sample), the differences between these samples and the pooled reference ranges were small. The Waterbury Lake sample that fell outside the reference ellipse was characterized by higher mercury and polonium-210 levels than the reference range, although these differences were small. In Crackingstone Inlet, all 10 northern pike bone samples fell outside the reference ellipse, and all 10 were characterized by higher selenium and uranium concentrations than the reference areas (Appendix A, Table 14). The differences in selenium concentrations were usually smaller than those of uranium. Cobalt, which was strongly correlated with the third axis scores, fell within the reference range in all four far-field exposure areas (Appendix A, Figure 17).

The low reference sample size (n = 18) in this species may have led to an inaccurate measure of the natural variability of fish bone chemistry in the region. Future monitoring phases will allow for an increased reference area sample size for northern pike and, therefore, a better characterization of the expected background conditions in the region.

4.2.2.3 Lake Whitefish

In lake whitefish bone, the first three axes explained > 10% of the variation in COPC concentrations, the first two explaining 44% of the variation (Appendix A, Table 8). The first axis corresponded to increasing levels of aluminum, uranium, and vanadium to the right of the plot, with no COPCs strongly increasing to the left of the plot (Appendix A, Table 8). The second axis represented increasing concentrations of iron, nickel, and polonium-210 to the top of the plot. The third axis of the PCA (not shown) explained relatively little of the variation in lake whitefish bone chemistry, with no COPC having a strong gradient along this axis (all values < |0.6|; Appendix A, Table 8).

As seen in Appendix A, Figure 16, 1 of the 27 lake whitefish bone samples from the far-field exposure areas fell marginally outside the 95% confidence ellipse of the references along the first axis. This sample was from Crackingstone Inlet and was characterized by higher selenium, uranium, and vanadium concentrations than in the pooled reference ranges (Appendix A, Table 15). Nonetheless, the exceedance outside the reference ellipse was very marginal. Overall the lake whitefish bone chemistry in the far-field exposure areas was similar to reference fish chemistry.

4.2.2.4 Longnose Sucker

Longnose sucker were captured in all far-field exposure areas except Crackingstone Inlet. Therefore, the longnose sucker PCA did not include any results for that area. Using the available results for the other waterbodies, the first four axes each explained > 10% of the variation in COPC concentrations, the first two explaining 52% of the variation (Appendix A, Table 8). The first axis reflected increasing levels of nickel, zinc, and cobalt to the right of the plot (Appendix A, Table 8). The second axis reflected increasing concentrations of molybdenum and arsenic to the top of the plot. The third and fourth axes of the PCA reflected differences in polonium-210 and copper levels, respectively, and the results for these two COPCs are discussed further below.

The majority of the longnose sucker bone samples from the far-field exposure areas fell outside the 95% confidence ellipse of the references, differing from the references along the second axis (PC2; Appendix A, Figure 16). These samples were from each of the far-field exposure areas where they were captured, namely the Cochrane and the Fond du Lac rivers, and Waterbury Lake (Appendix A, Table 16). These samples were characterized by mainly higher molybdenum levels than the reference range, although some samples also had higher concentrations of one or more COPCs including iron, nickel, selenium, and arsenic (Appendix A, Table 16). The exceedances of iron, nickel, selenium, and arsenic over the reference ranges were, however, quite small. The molybdenum exceedances were more notable, which corroborated with the exceedances over the PCA reference ellipse along the second axis (Appendix A, Figure 16). Polonium-210 and copper, which were strongly correlated with the third and fourth axes, fell within the reference ranges in all three far-field exposure areas where longnose sucker were captured (Appendix A, Figure 17). Thus, aside from the molybdenum concentrations, the 2011 and 2012 baseline longnose sucker bone chemistry in the far-field exposure areas was similar to reference fish chemistry. In this species, the low reference sample size ($n = 16$) may have contributed to the observed differences in molybdenum if the reference samples did not encompass a sufficient amount of natural variability.

4.2.2.5 White Sucker

White sucker, like longnose sucker, were captured in only three of the four far-field exposure areas (i.e., everywhere except Crackingstone Inlet). The white sucker PCA did not include any results for Crackingstone Inlet. The first four PCA axes each explained > 10% of the variation in COPC concentrations, the first two explaining 57% of the variation (Appendix A, Table 8). The first axis reflected increasing levels of molybdenum, uranium, polonium-210, and arsenic to the right of the plot (Appendix A, Table 8). The second axis reflected increasing concentrations of iron, nickel, zinc, and cobalt to the top of the plot. Along the third axis, no COPCs were strongly correlated to the axis scores. The fourth axis reflected differences in copper between samples, and these results are addressed further below.

In white sucker, all bone samples from the far-field exposure areas fell outside the 95% confidence ellipse of the references, differing from the references along the first axis (Appendix A, Figure 16). These samples were from all three far-field exposure areas where that species was captured. These samples were characterized by mainly higher molybdenum, uranium, polonium-210, and arsenic levels than the reference range, although some samples also had higher concentrations of selenium and/or cobalt (Appendix A, Table 17). The exceedances of selenium, uranium, polonium-210, arsenic, and cobalt over the reference range were generally small, as well as a number of the molybdenum exceedances. Some of the molybdenum exceedances were larger, and this corroborated with the exceedances over the PCA reference ellipse on the first axis (Appendix A, Figure 16). Copper, which was strongly correlated with the fourth axis, fell within the reference range in all three far-field exposure areas where this species was captured (Appendix A, Figure 17). Thus, aside from the molybdenum concentrations in some of the samples, the 2011 and 2012 baseline white sucker bone chemistry in the far-field exposure areas was similar to reference fish chemistry. Similar to longnose sucker, the low reference sample size (n = 14) may have contributed to the observed differences in molybdenum if the reference samples did not encompass a sufficient amount of natural variability of this COPC.

4.3 Summary

In fish flesh, all COPCs were either in low concentrations, within the reference ranges or nearly so, or below the guidelines. In fish bone, COPC concentrations were usually more variable than in flesh. In lake trout, northern pike, and lake whitefish, COPC concentrations in bone were in the majority of cases within or near the reference ranges, except for the Crackingstone Inlet northern pike where uranium and selenium appeared higher than the expected background concentrations. In longnose sucker and white sucker bone, COPC concentrations were also in the majority of cases within or near the reference ranges, although molybdenum levels in three far-field exposure areas appeared higher than the expected background concentrations. Sample sizes for northern pike, longnose sucker, and white sucker in the reference areas were relatively low; therefore, the expected background concentrations for the region may not have been sufficiently characterised. Larger sample sizes for these species would be desirable for future monitoring phases.

5.0 LITERATURE CITED

Burnett-Seidel, C. and K. Liber. 2013. Derivation of no-effect and reference-level sediment quality values for application at Saskatchewan uranium operations. Environmental Monitoring and Assessment. DOI: 10.1007/s10661-013-3267-3.

Canada North Environmental Services (CanNorth). 2009. Rabbit Lake Operation 2008 comprehensive aquatic environment monitoring report. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

Canada North Environmental Services (CanNorth). 2010. Millennium Project 2009 additional aquatic baseline investigations. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

Canada North Environmental Services (CanNorth). 2013a. Wheeler River aquatic studies program. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

Canada North Environmental Services (CanNorth). 2013b. Rabbit Lake Operation 2012 environment monitoring program. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

Canadian Council of Ministers of the Environment (CCME). 2013. Canadian Environmental Quality Guidelines summary table. Website: http://st-ts.ccme.ca/. Accessed November 2013.

Environment Canada (EC). 2012. Metal mining Environmental Effects (EEM) guidance document. Environment Canada, National EEM Office, Science Policy and Environmental Quality Branch, Ottawa, Ontario.

Lemly, A.D. 1993. Metabolic stress during winter increases the toxicity of selenium to fish. Aquatic Toxicology, 27: 133-158.

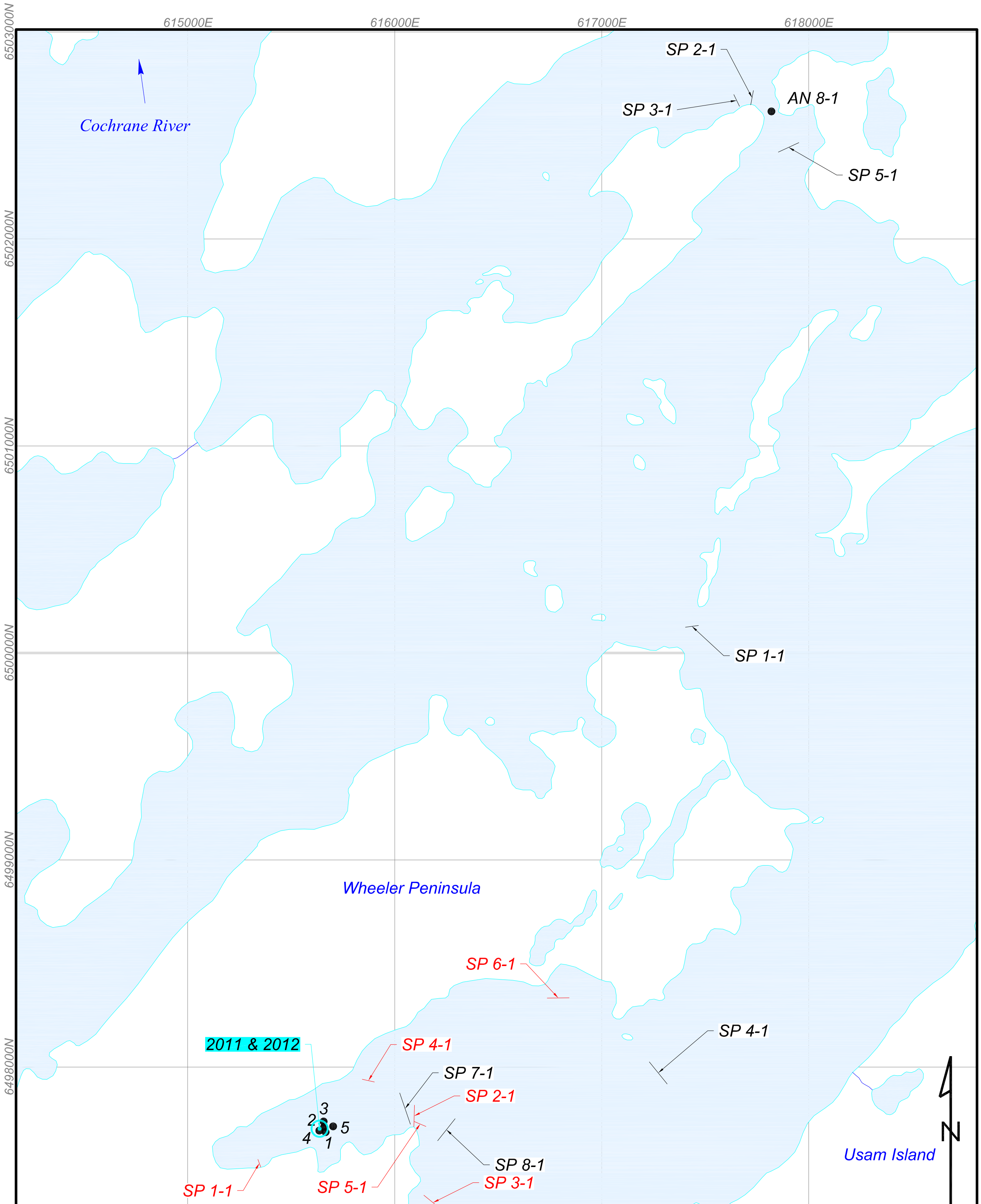
Muller R.N. and G.T. Tisue. 1997. Preparative-scale size fractionation of soils and sediments and an application to studies of plutonium geochemistry. Soil Sci. 124:191-198.

Saskatchewan Environment (SE). 2006. Surface water quality objectives (SSWQO). Environmental Protection Branch, Regina, Saskatchewan.

Saskatchewan Ministry of the Environment (SE). 2011. Mercury in Saskatchewan fish: guidelines for consumption. Website: http://www.environment.gov.sk.ca/ adx/aspx/adxGetMedia.aspx?DocID=2a256b90-19c2-4865-9e89-a5723f5b990c&MediaID=5066&Filename=Mercury+in+Fish+Guide+June+2011.pdf&l=English. Accessed July 24th, 2013.

Thompson, P.A., J. Kurias, and S. Mihok. 2005. Derivation and use of sediment quality guidelines for ecological risk assessment of metals and radionuclides released to the environment from uranium mining and milling activities in Canada. Environ. Monitor. and Assess. 110:71-85.

LIST OF FIGURES



UTM = NAD83 for Zone 13

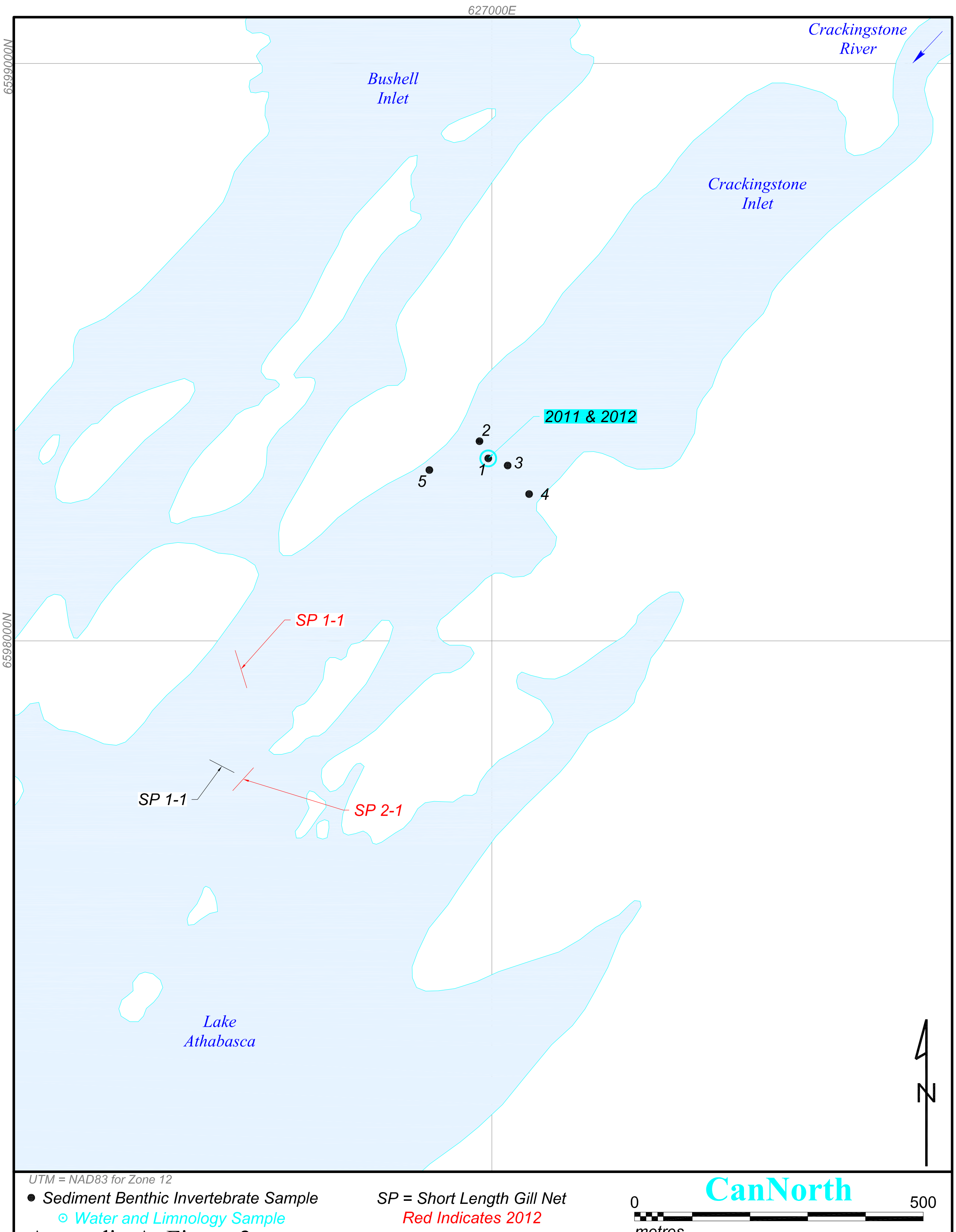
● Sediment Benthic Invertebrate Sample
⊙ Water and Limnology Sample

AN = Angling
SP = Short Length Gill Net
Red Indicates 2012

0 1500
metres

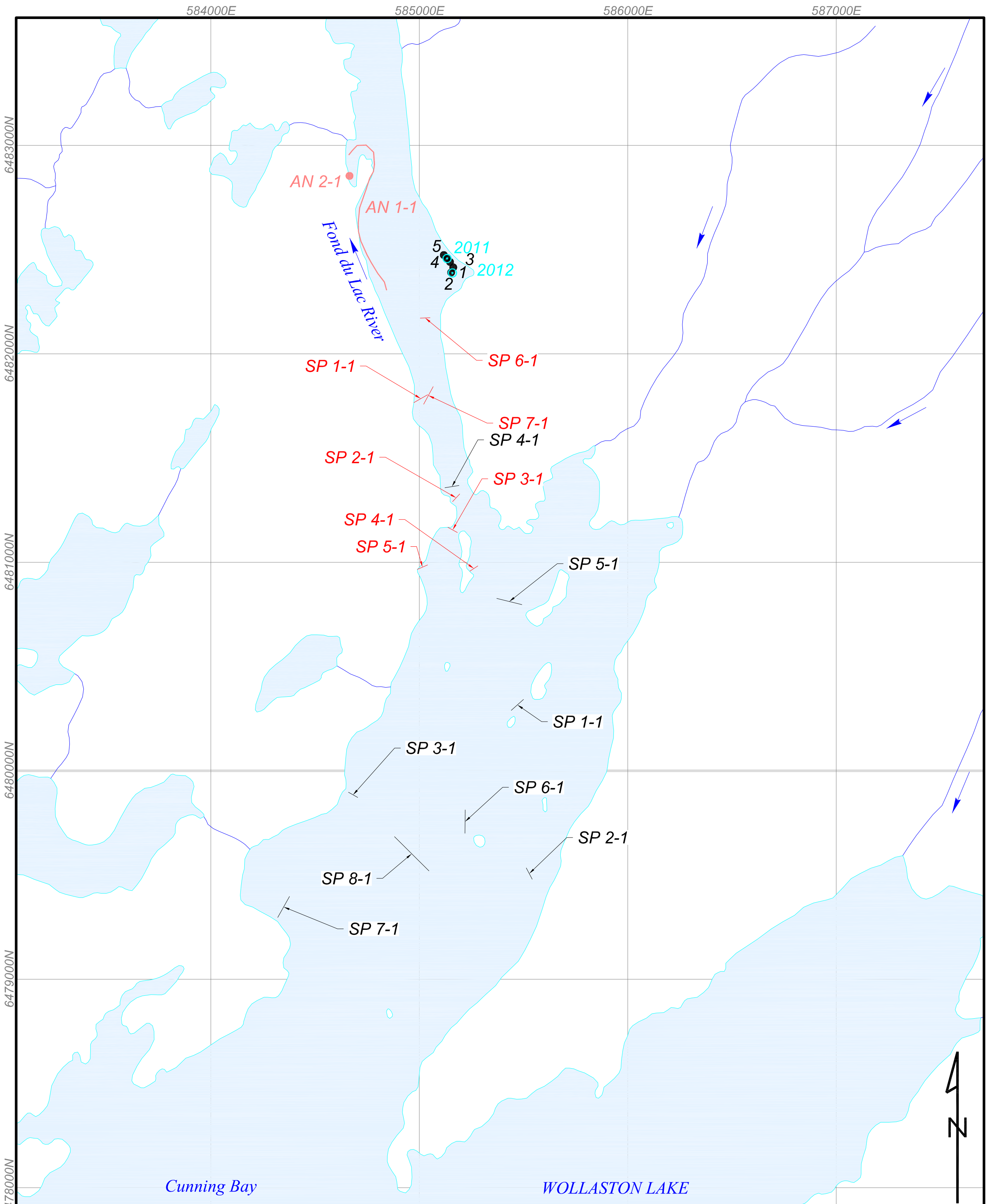
CanNorth

Appendix A, Figure 1
Detailed sampling locations in the Cochrane River for the EARMP technical program, 2011 and 2012.



Appendix A, Figure 2

Detailed sampling locations in Crackingstone Inlet of Lake Athabasca for the EARMP technical program, 2011 and 2012.



UTM = NAD83 for Zone 13

● Sediment Benthic Invertebrate Sample

⊙ Water and Limnology Sample

AN = Angling

SP = Short Length Gill Net

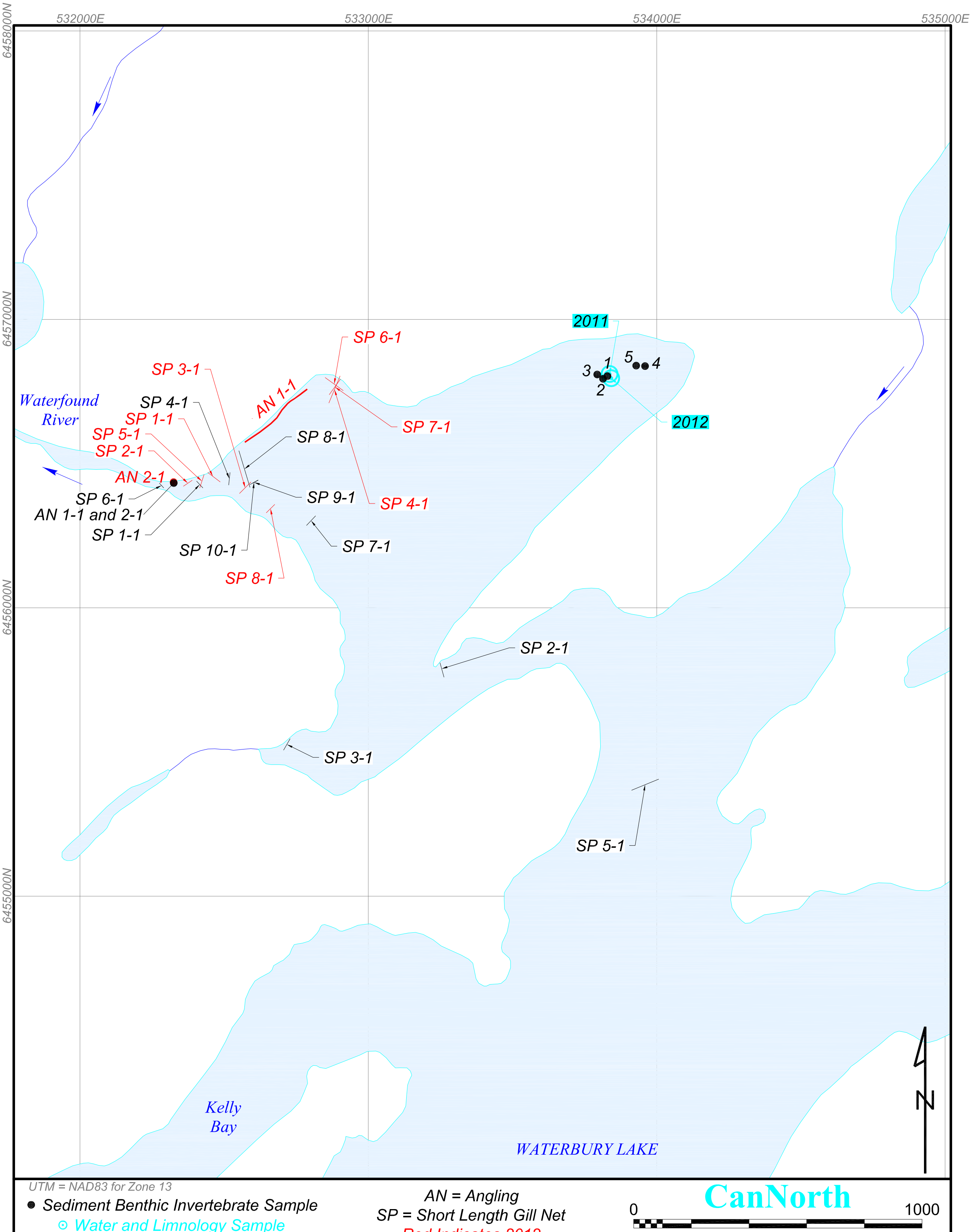
Red Indicates 2012

0 — 1500 metres

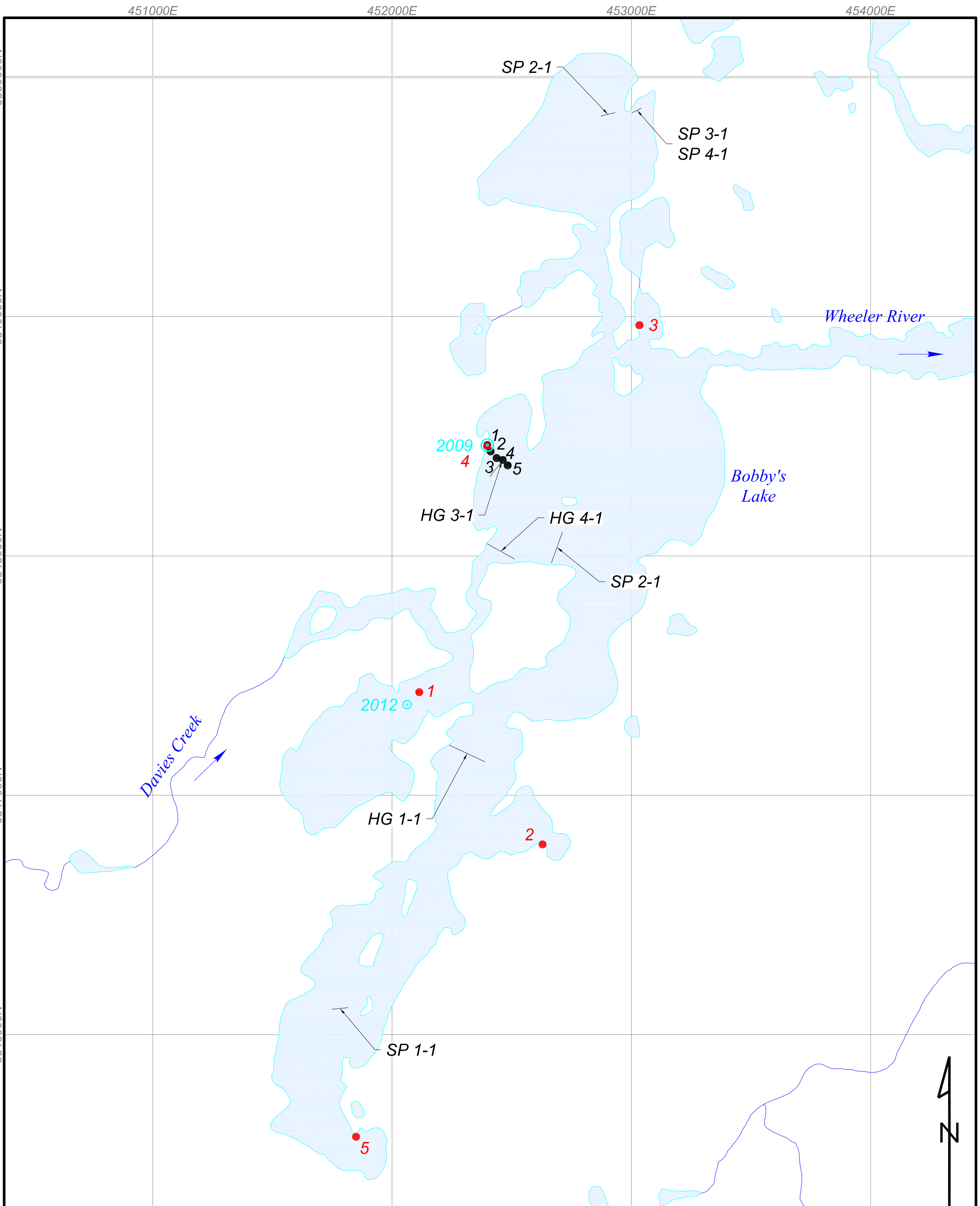
CanNorth

Appendix A, Figure 3

Detailed sampling locations in the Fond du Lac River for the EARMP technical program, 2011 and 2012.



Appendix A, Figure 4
Detailed sampling locations in Waterbury Lake for the EARMP technical program, 2011 and 2012.



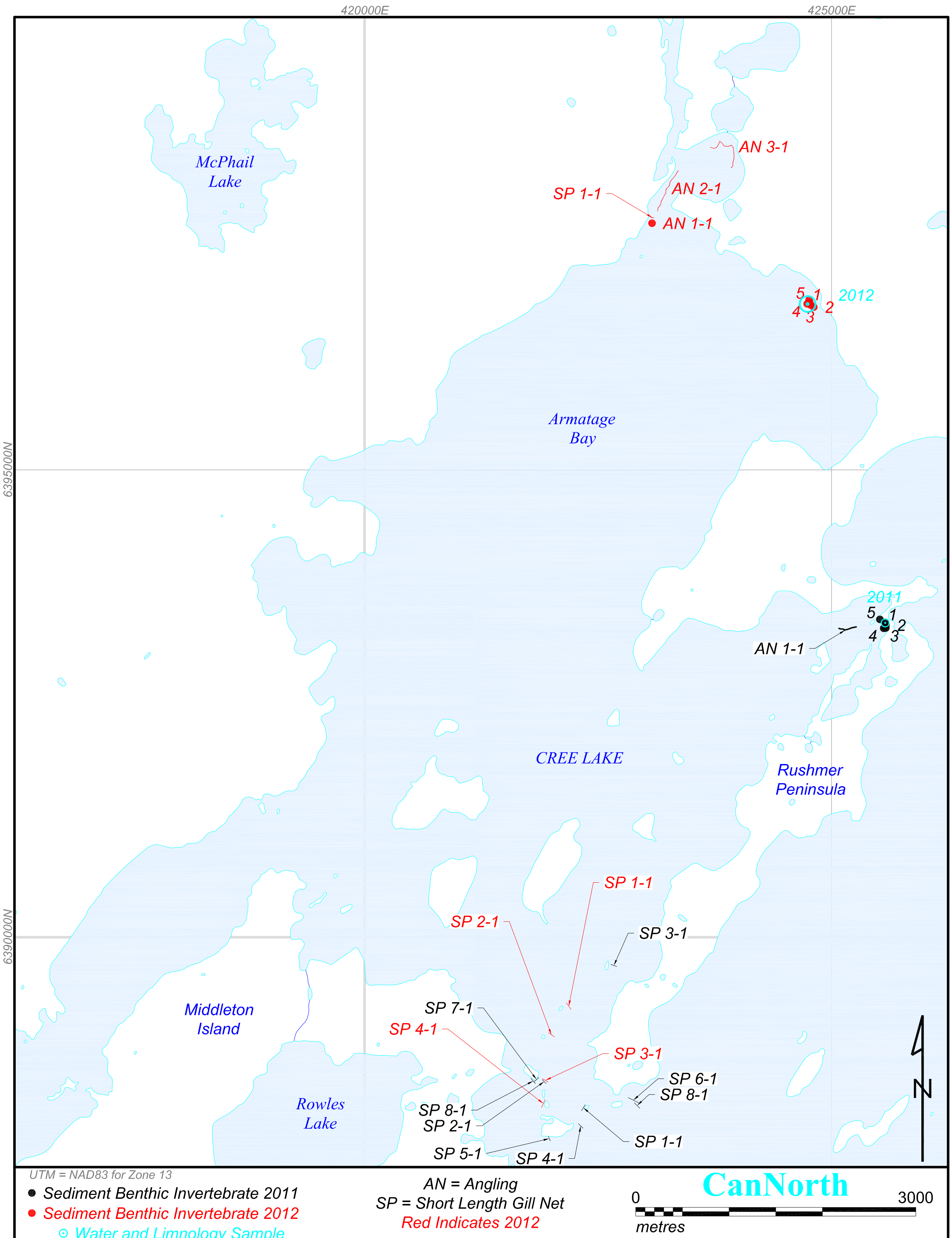
UTM = WGS84 for Zone 13
- Sediment Benthic Invertebrate 2009
- Sediment Benthic Invertebrate 2012
- Water and Limnology Sample

AN = Angling
HG = Half Standard Gang Gill Net
SP = Short Length Gill Net

CanNorth

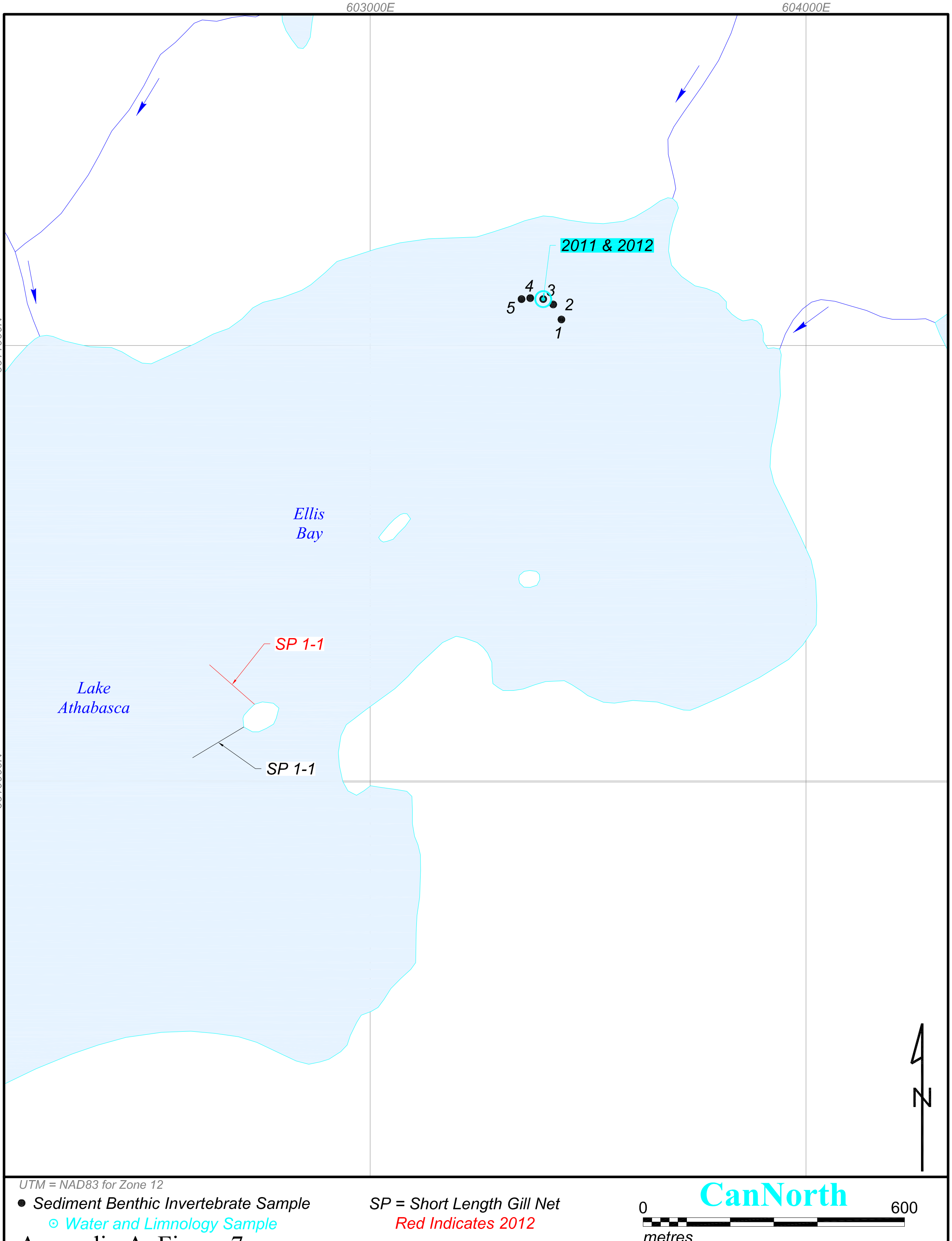
0 1000
metres

Appendix A, Figure 5
Additional reference areas sampled in Bobby's Lake, 2009 and 2012.

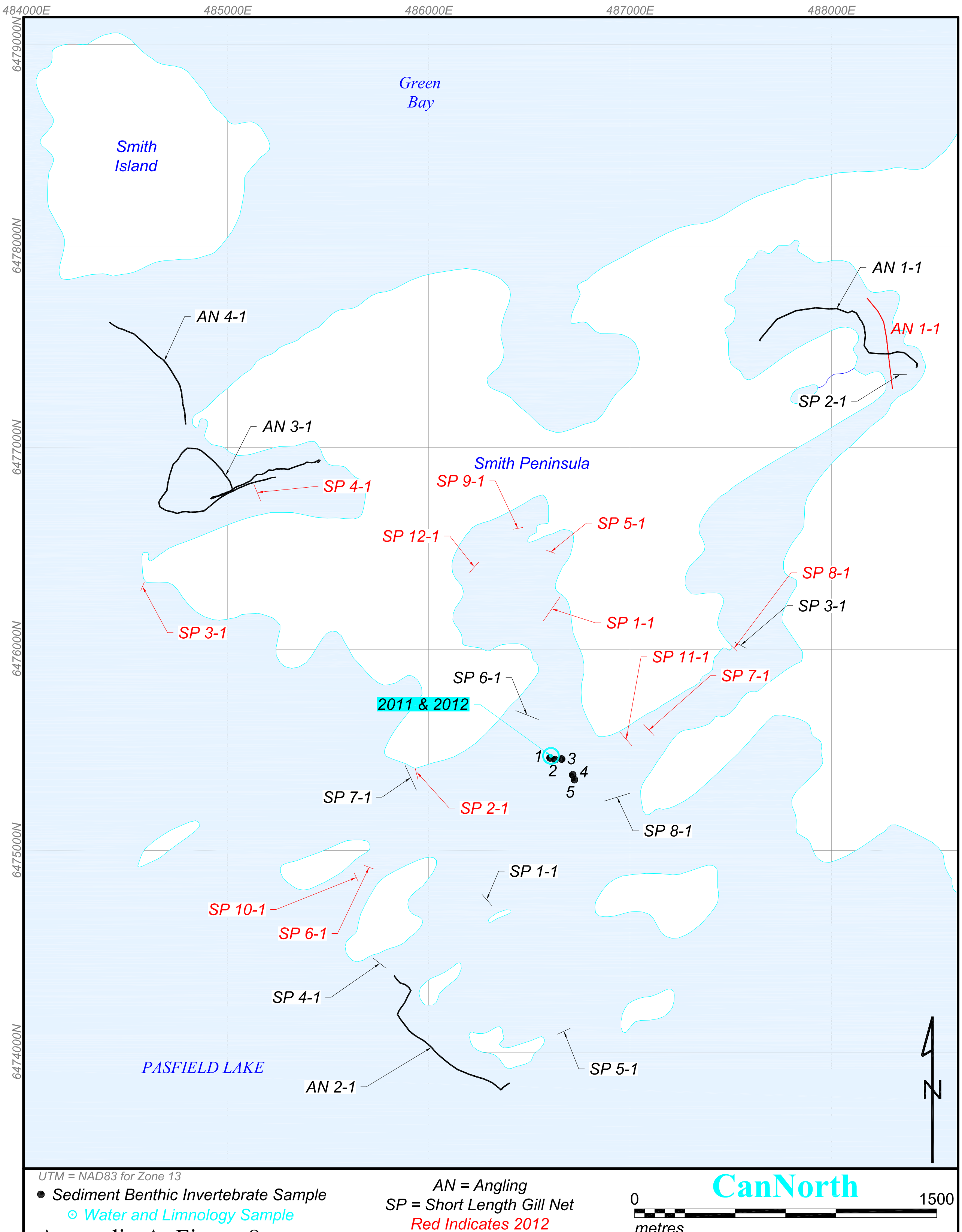


Appendix A, Figure 6

Detailed sampling locations in Cree Lake for the EARMP technical program, 2011 and 2012.

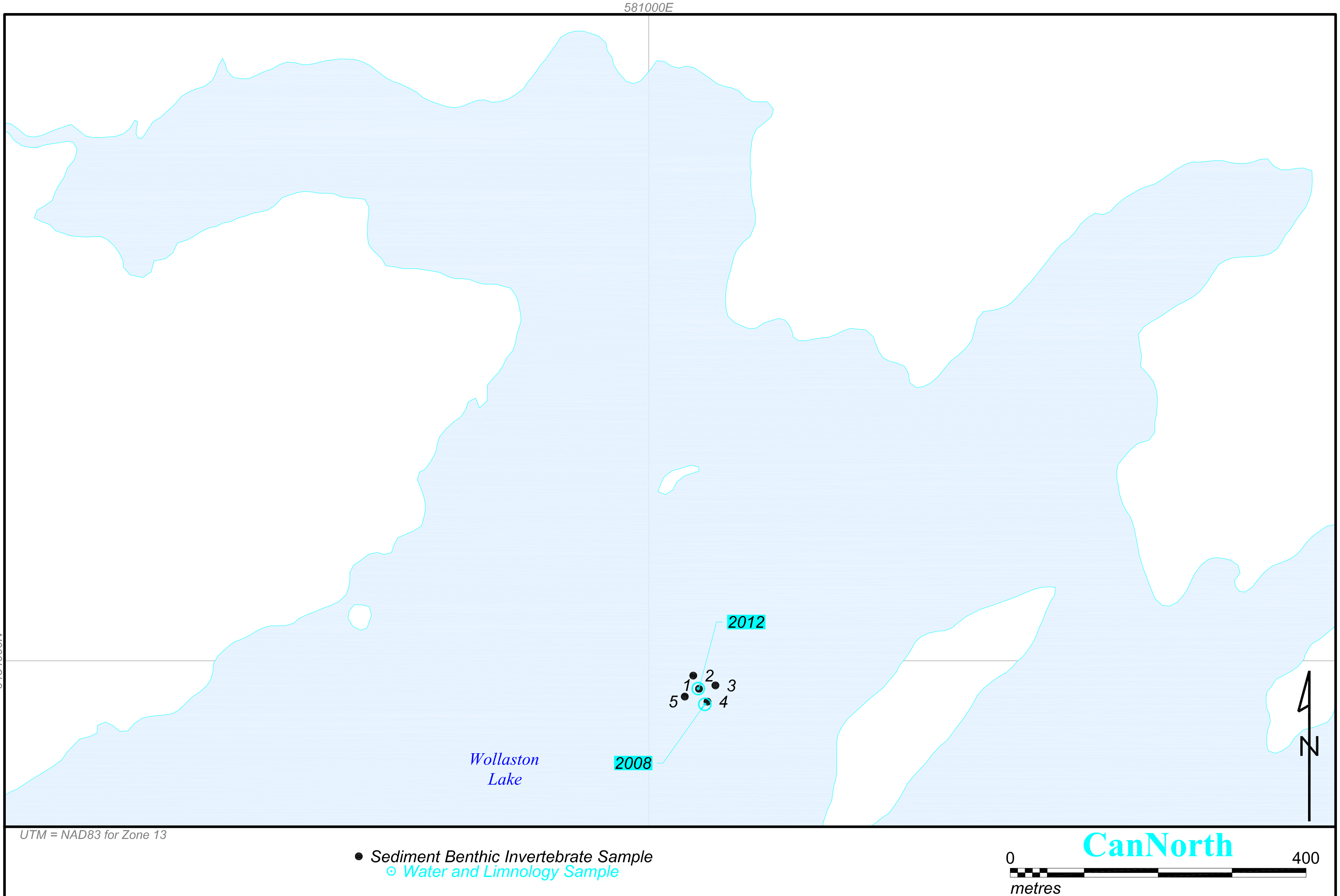


Appendix A, Figure 7
Detailed sampling locations in Ellis Bay of Lake Athabasca for the EARMP technical program, 2011 and 2012.

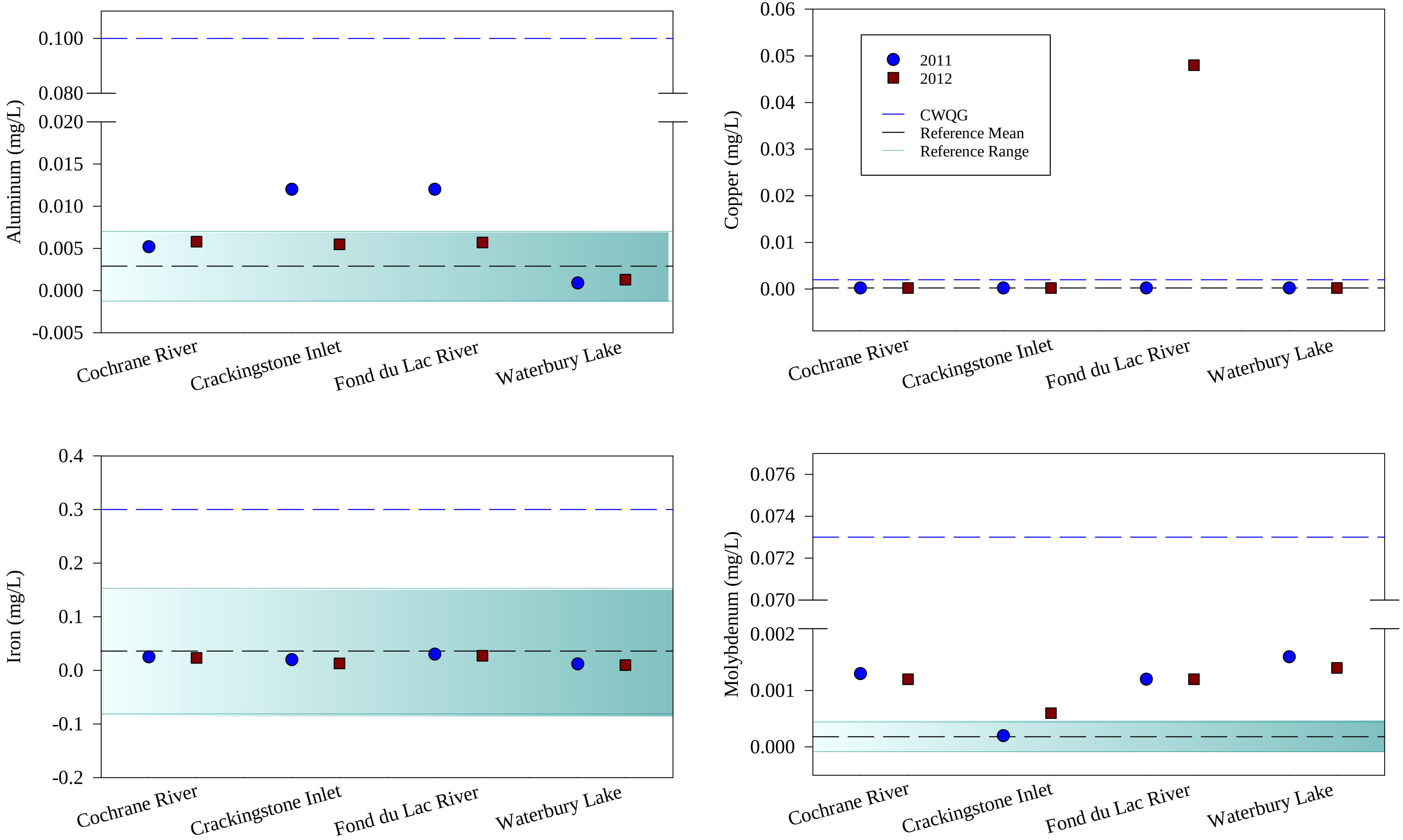


Appendix A, Figure 8

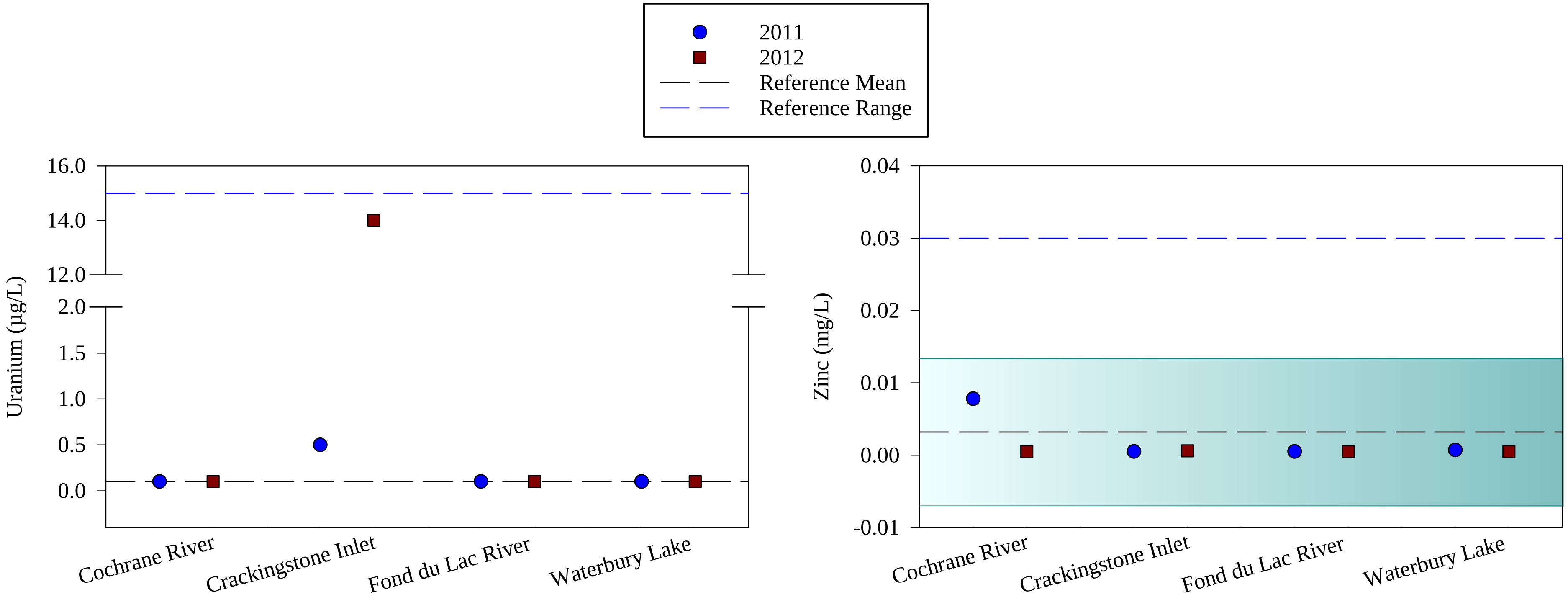
Detailed sampling locations in Pasfield Lake for the EARMP technical program, 2011 and 2012.



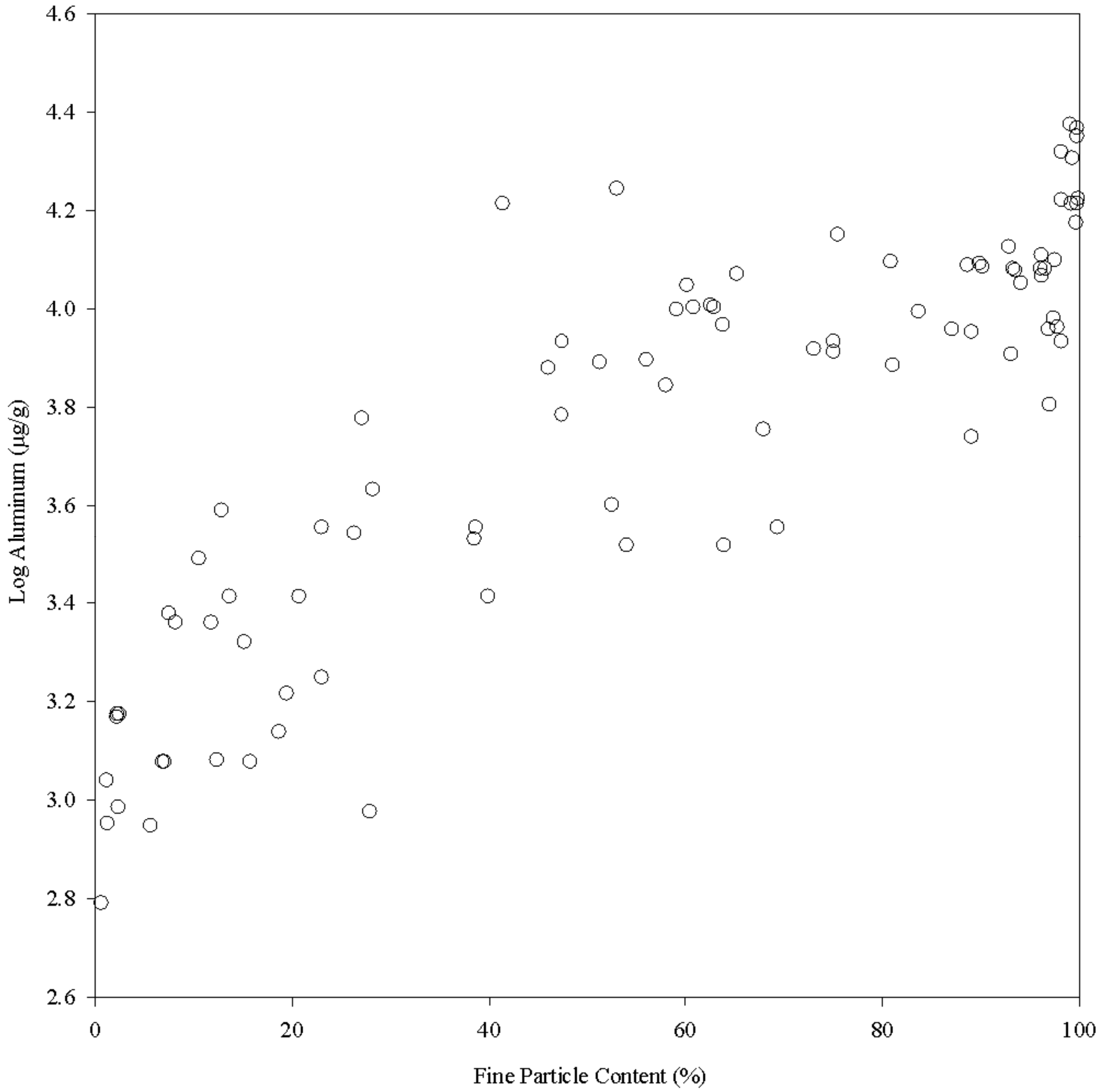
Appendix A, Figure 9
Additional reference area sampled at station RF-4 in Wollaston Lake, 2008 and 2012.



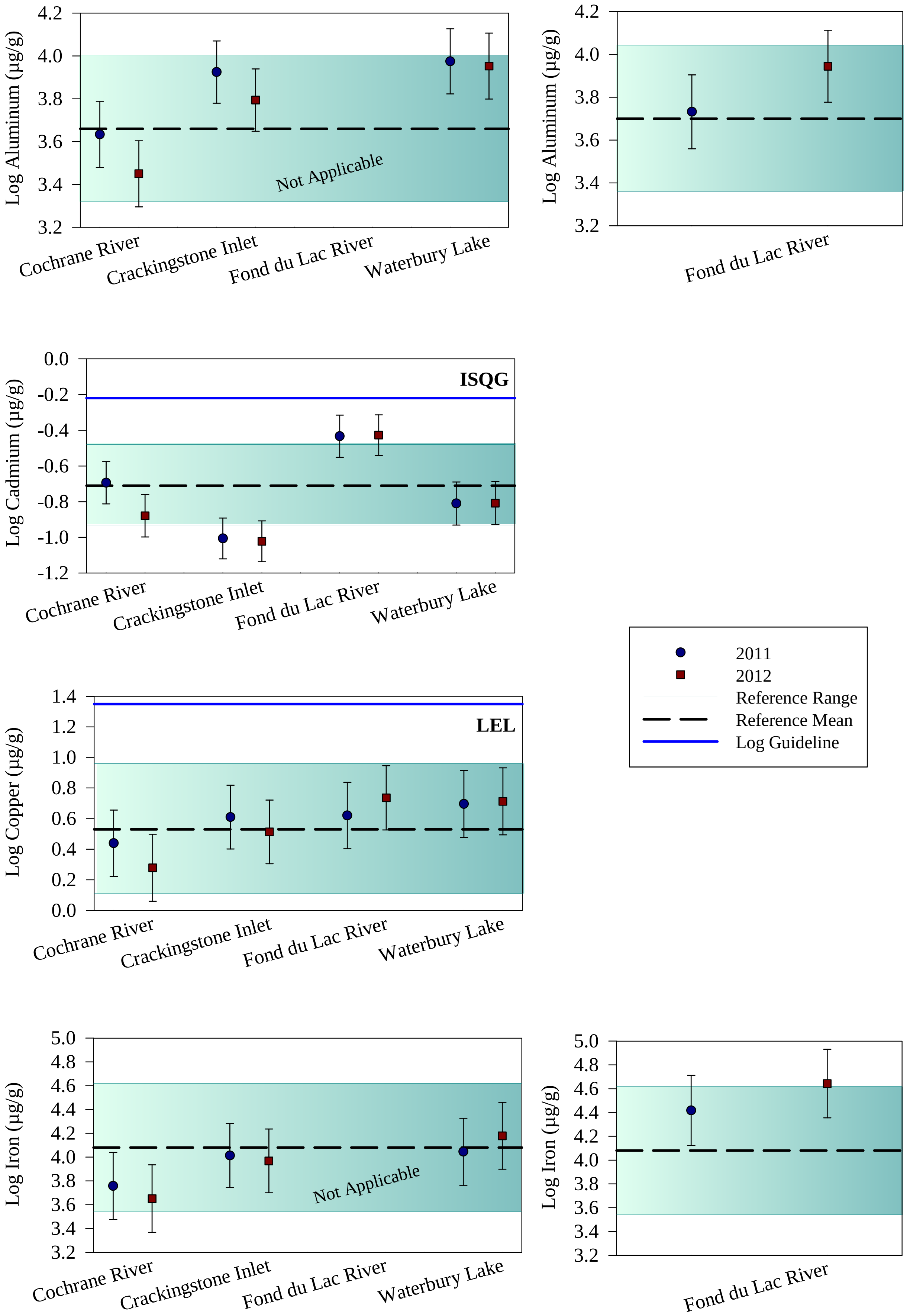
Appendix A, Figure 10
Select COPCs in the EARMP technical program study area, 2011 and 2012.



Appendix A, Figure 10
Select COPCs in the EARMP technical program study area, 2011 and 2012.

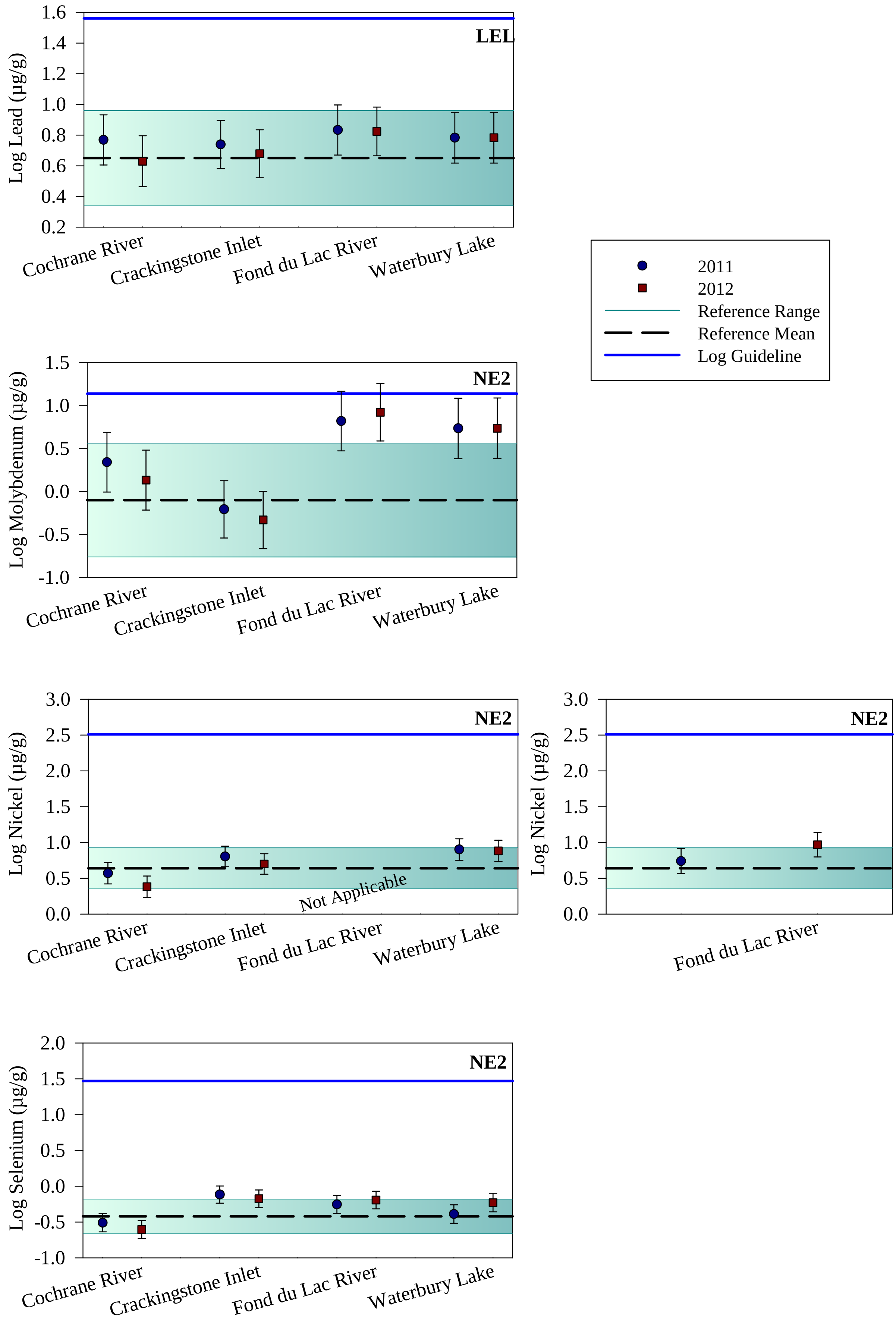


Appendix A, Figure 11
Typical relationship between COPC concentration and fine particle content in the EARMP technical program study area.



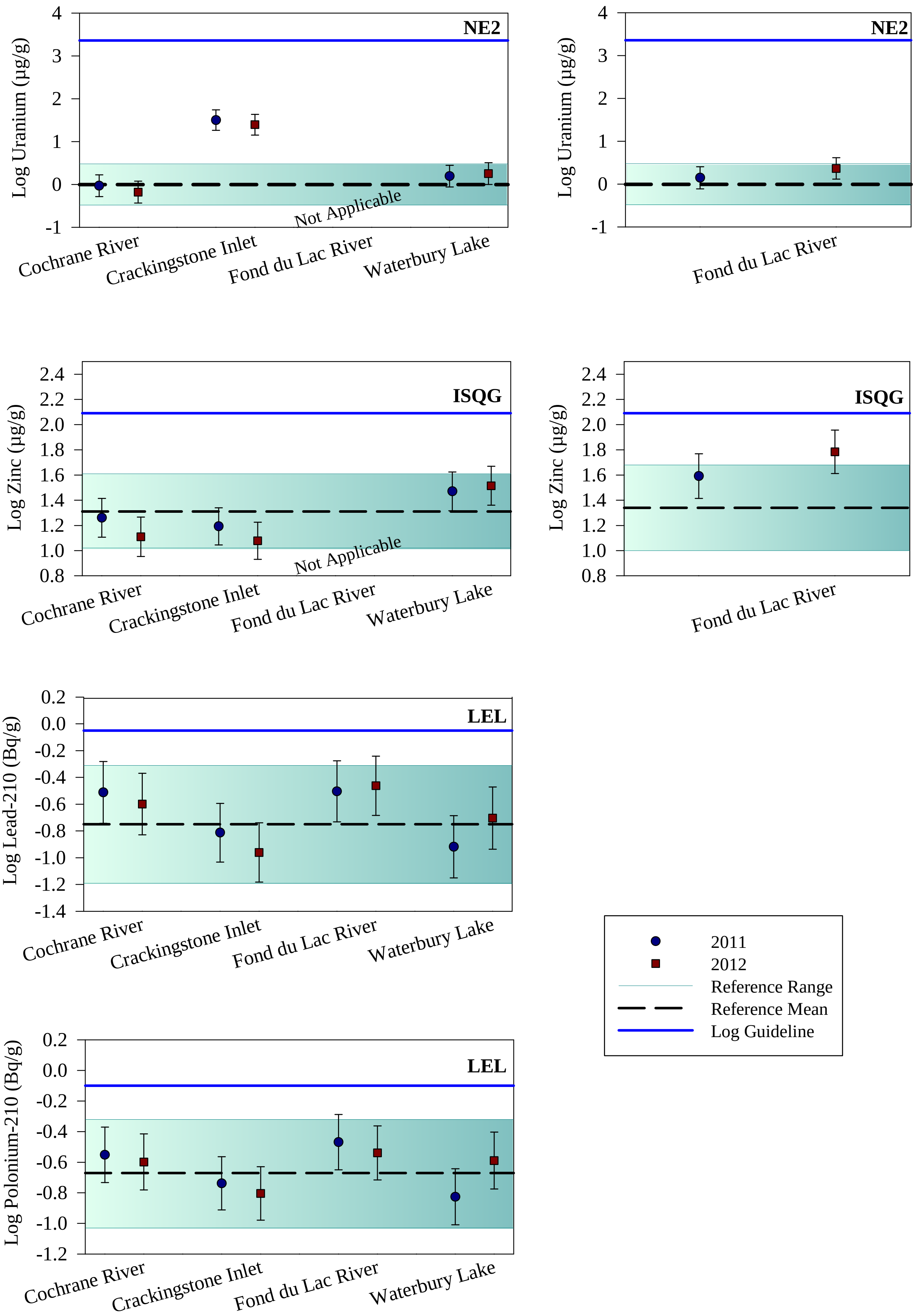
Appendix A, Figure 12
Sediment quality COPCs in the EARMP technical program study area, 2011 and 2012.

Note: Error bars are standard deviations.



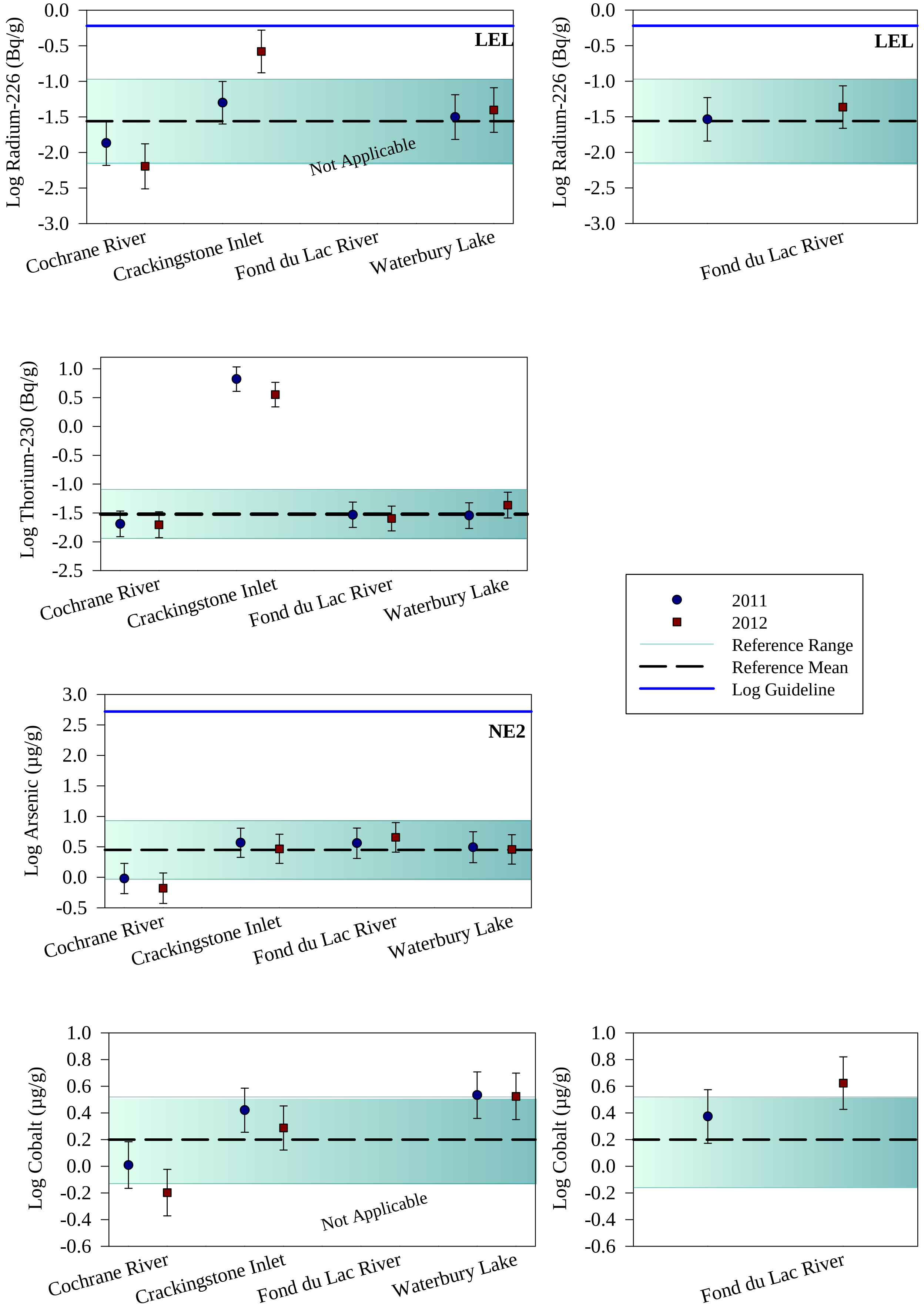
Appendix A, Figure 12
Sediment quality COPCs in the EARMP technical program study area, 2011 and 2012.

Note: Error bars are standard deviations.



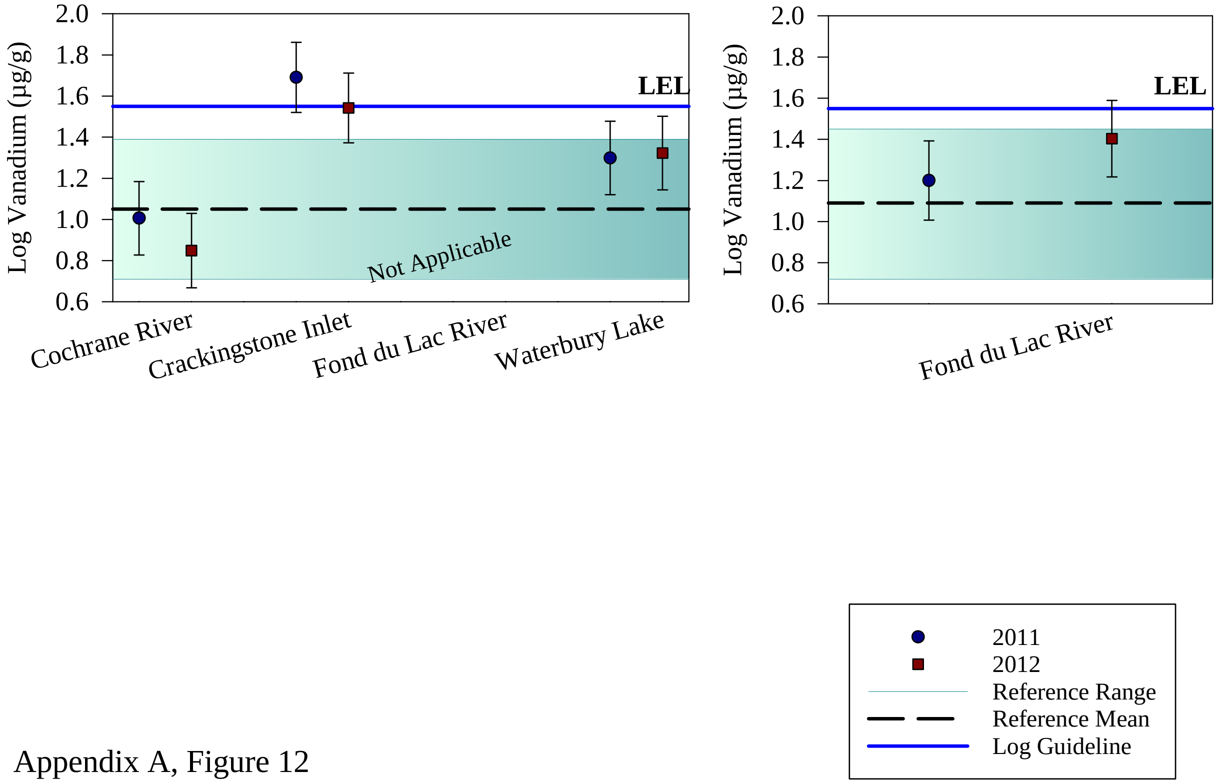
Appendix A, Figure 12
Sediment quality COPCs in the EARMP technical program study area, 2011 and 2012.

Note: Error bars are standard deviations.



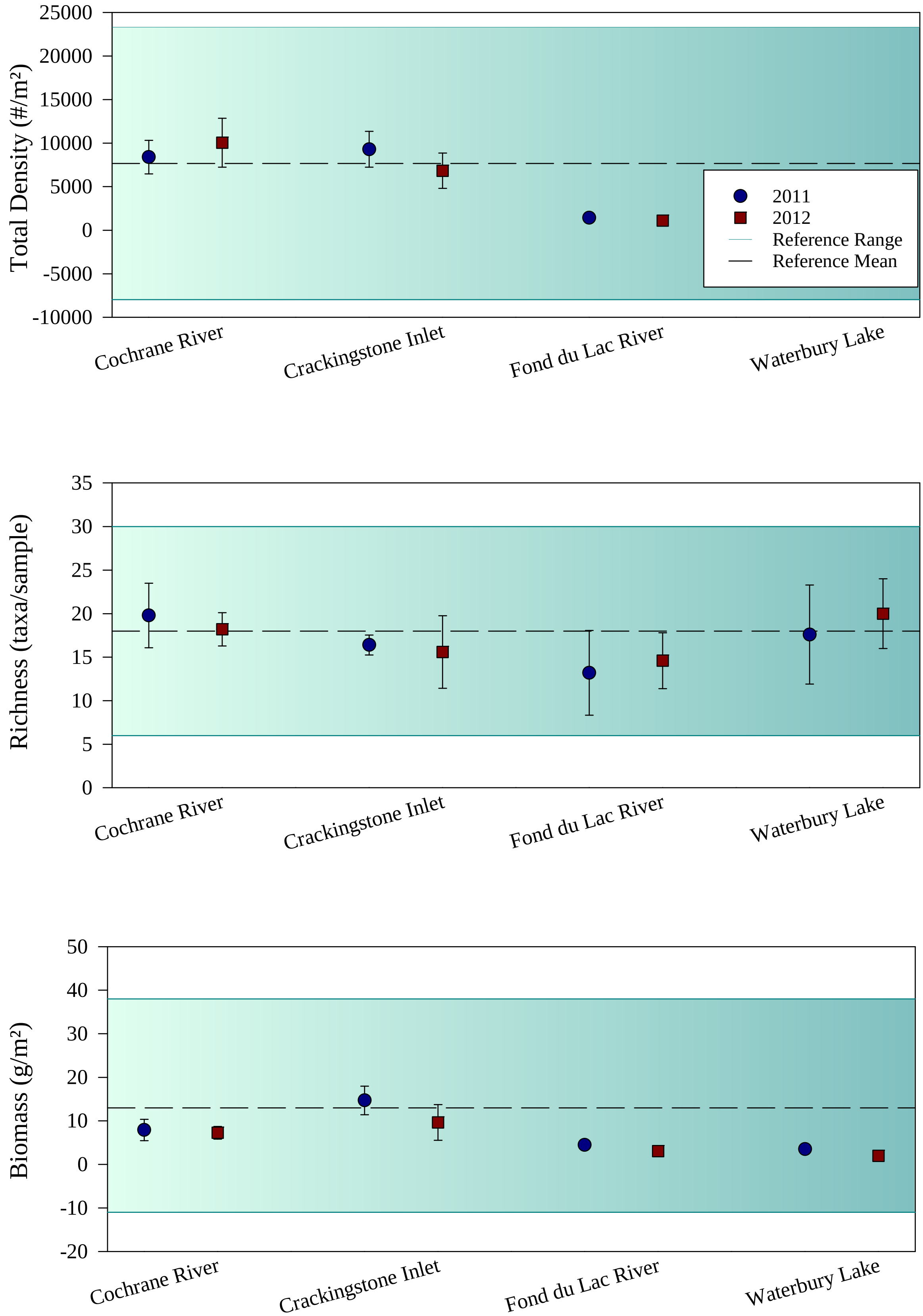
Appendix A, Figure 12
Sediment quality COPCs in the EARMP technical program study area, 2011 and 2012.

Note: Error bars are standard deviations.



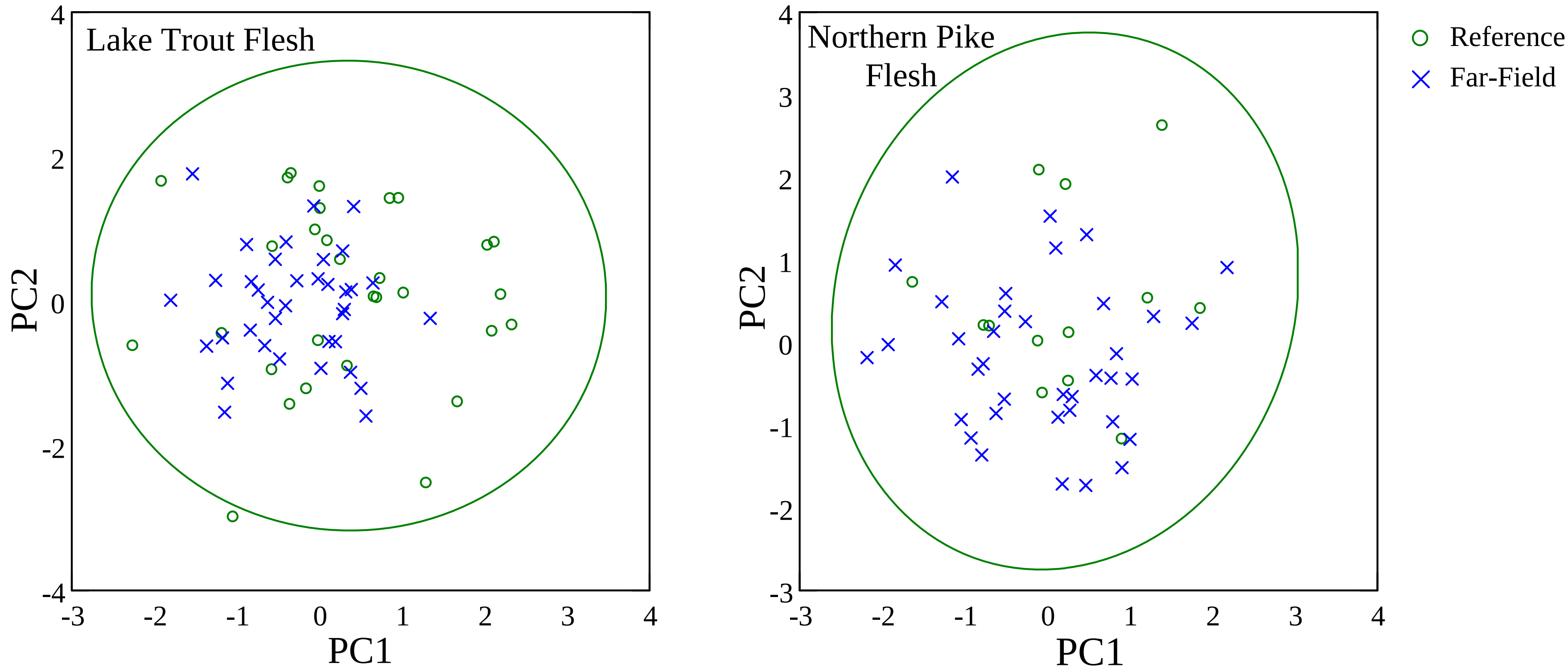
Appendix A, Figure 12
Sediment quality COPCs in the EARMP technical program study area, 2011 and 2012.

Note: Error bars are standard deviations.

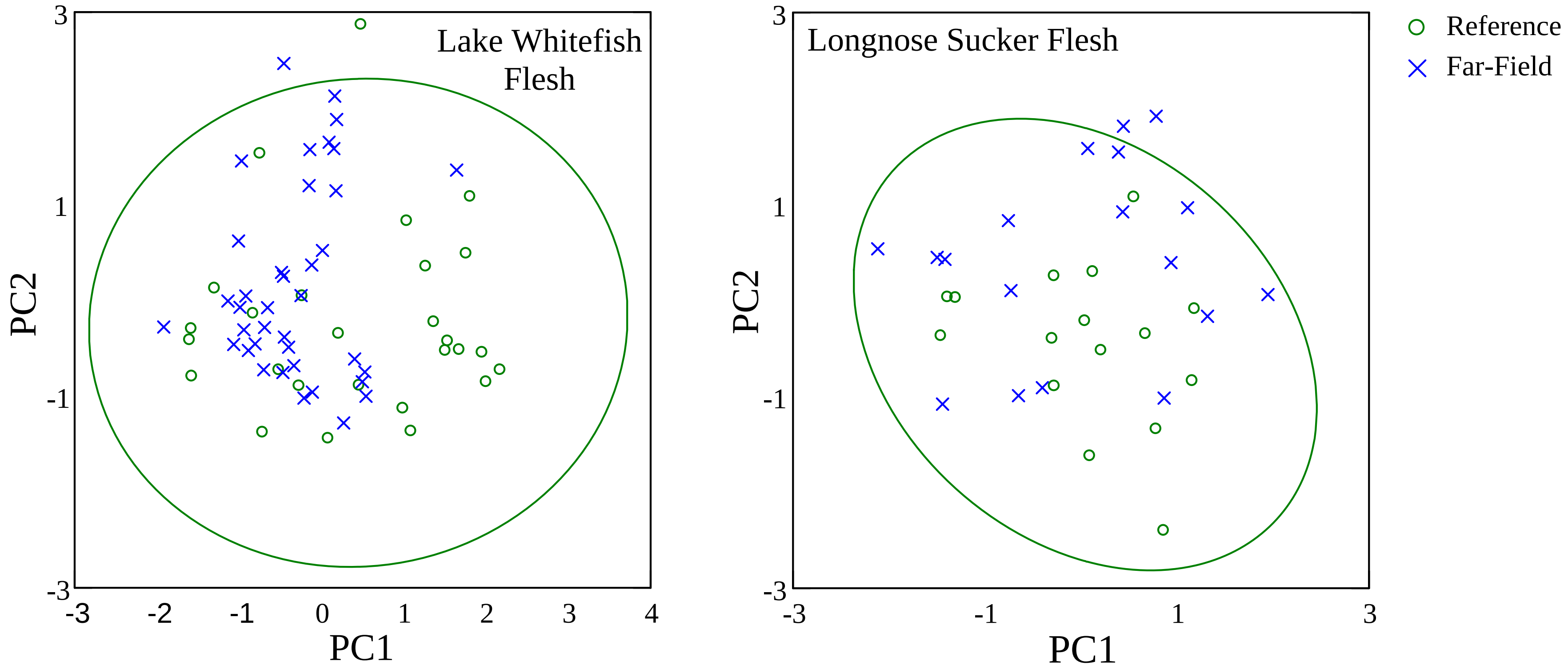


Appendix A, Figure 13
Benthic invertebrate community endpoints in the EARMP technical program study area, 2011 and 2012.

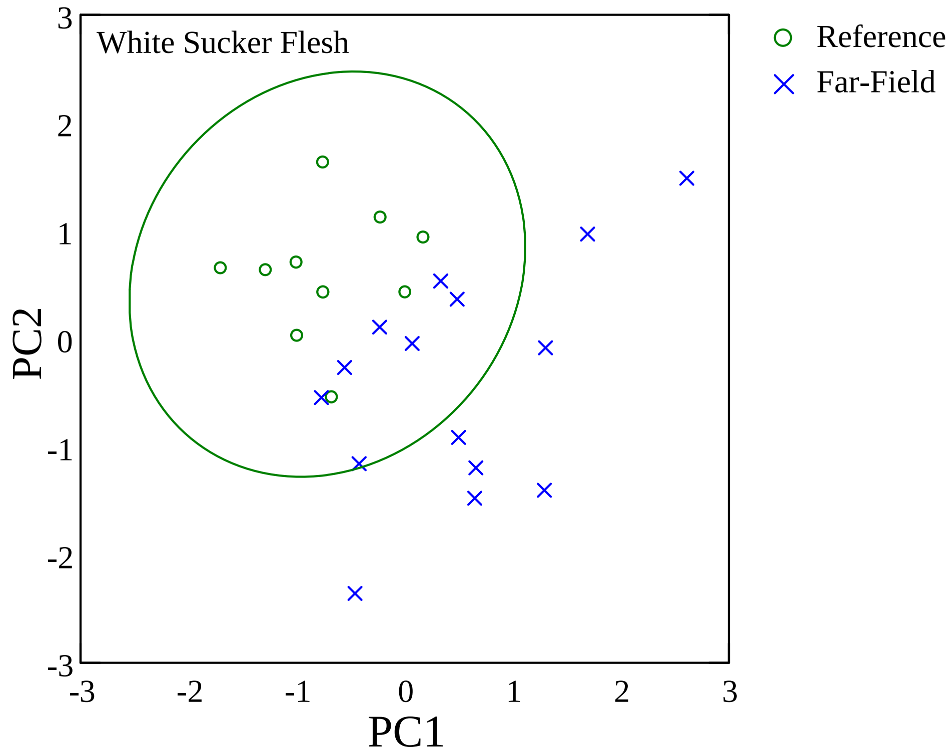
Note: Error bars are standard deviations.



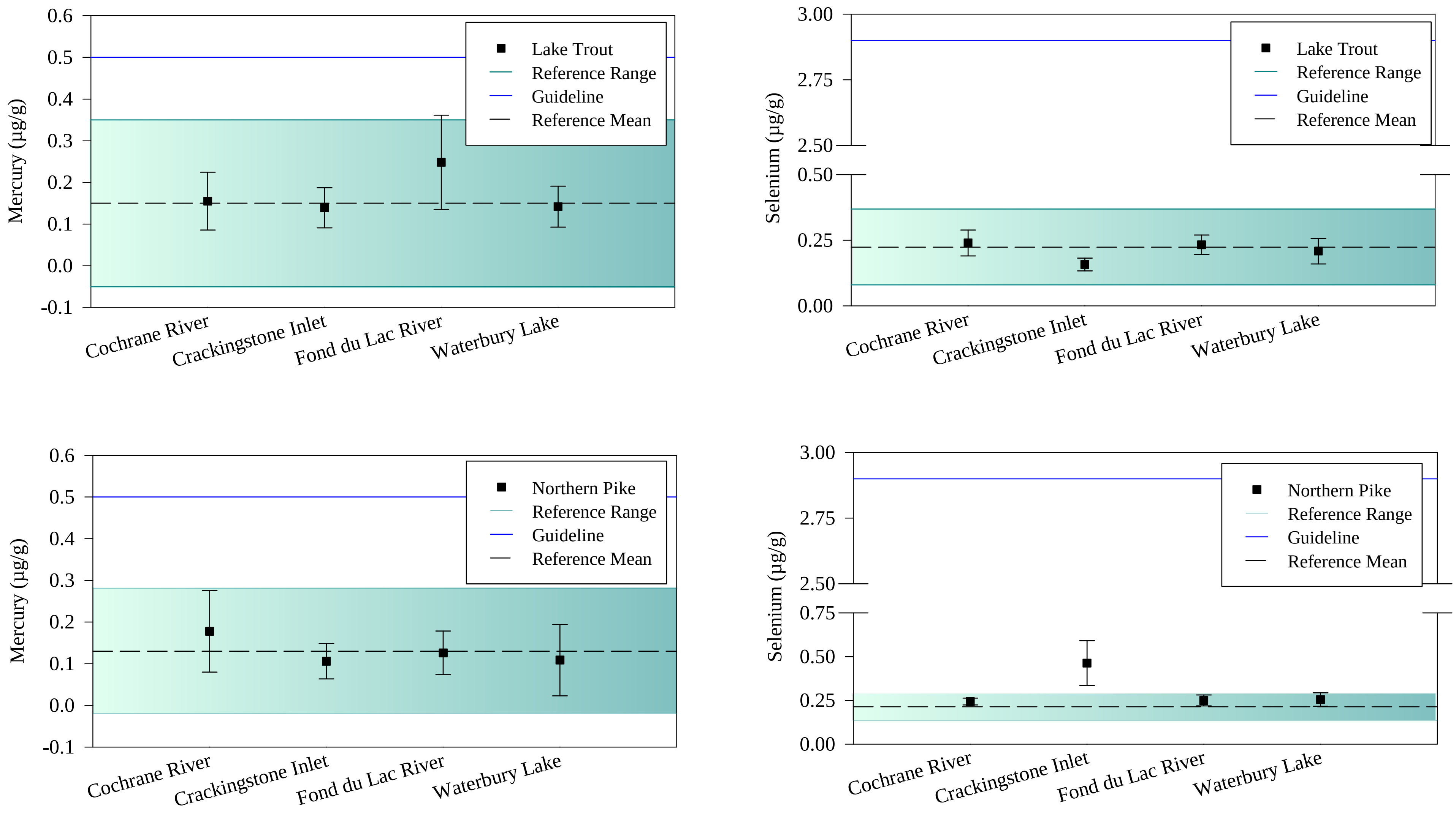
Appendix A, Figure 14
Fish flesh PCA results for axes 1 and 2 and 95% confidence ellipse of reference samples for the EARMP technical program study area, 2011 and 2012.



Appendix A, Figure 14
Fish flesh PCA results for axes 1 and 2 and 95% confidence ellipse of reference samples for the EARMP technical program study area, 2011 and 2012.

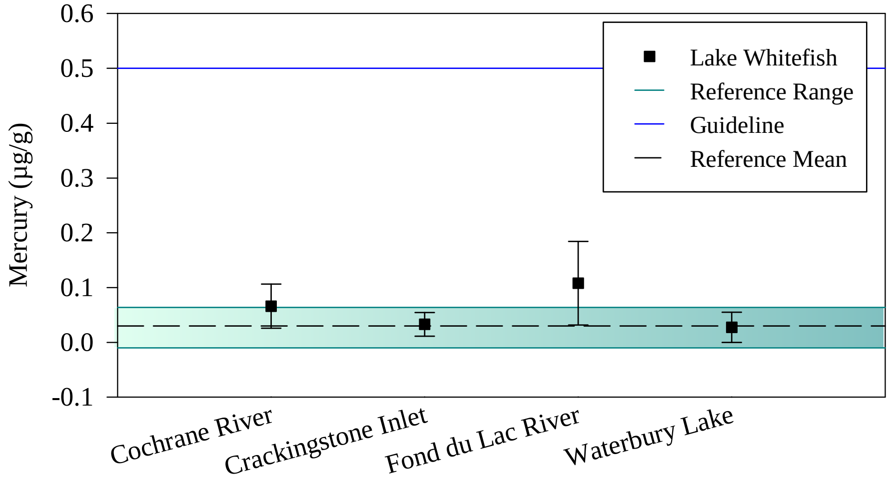


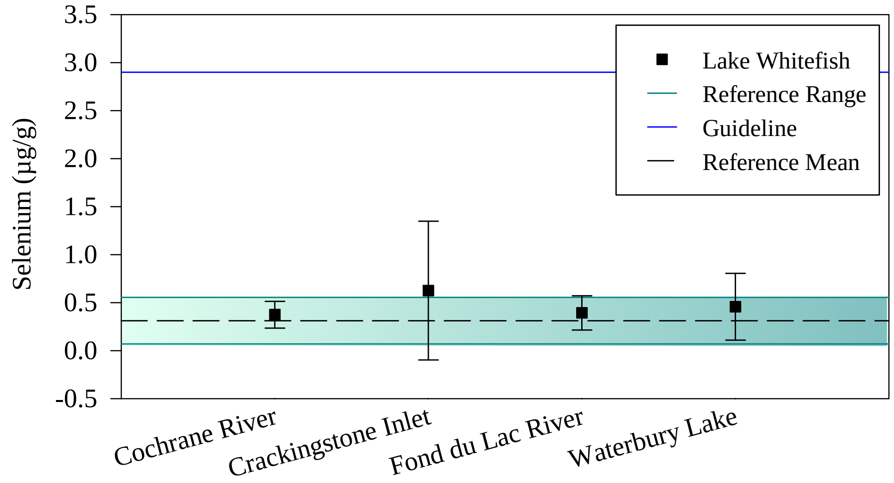
Appendix A, Figure 14
Fish flesh PCA results for axes 1 and 2 and 95% confidence ellipse of reference samples for the EARMP technical program study area, 2011 and 2012.

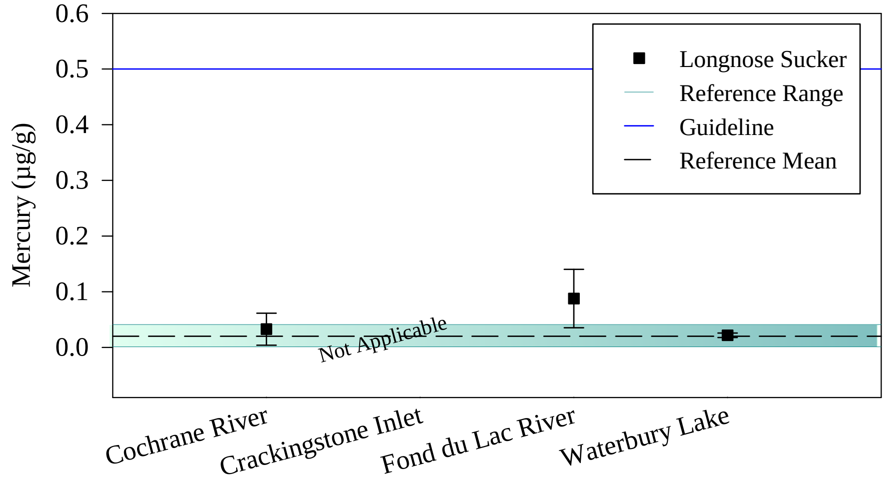


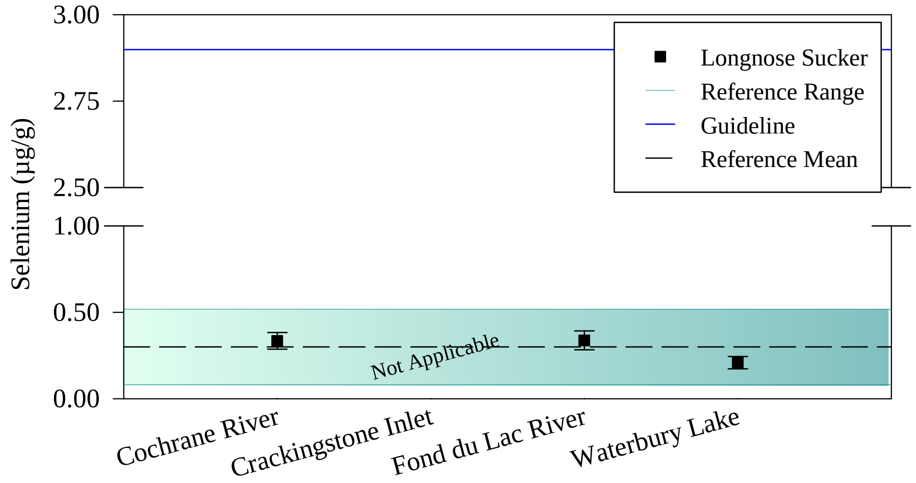
Appendix A, Figure 15.
Fish flesh concentrations of mercury, selenium, and of COPCs strongly correlated to the third PCA axis for the EARMP technical study program, 2011 and 2012.

Note: Error bars are standard deviations.



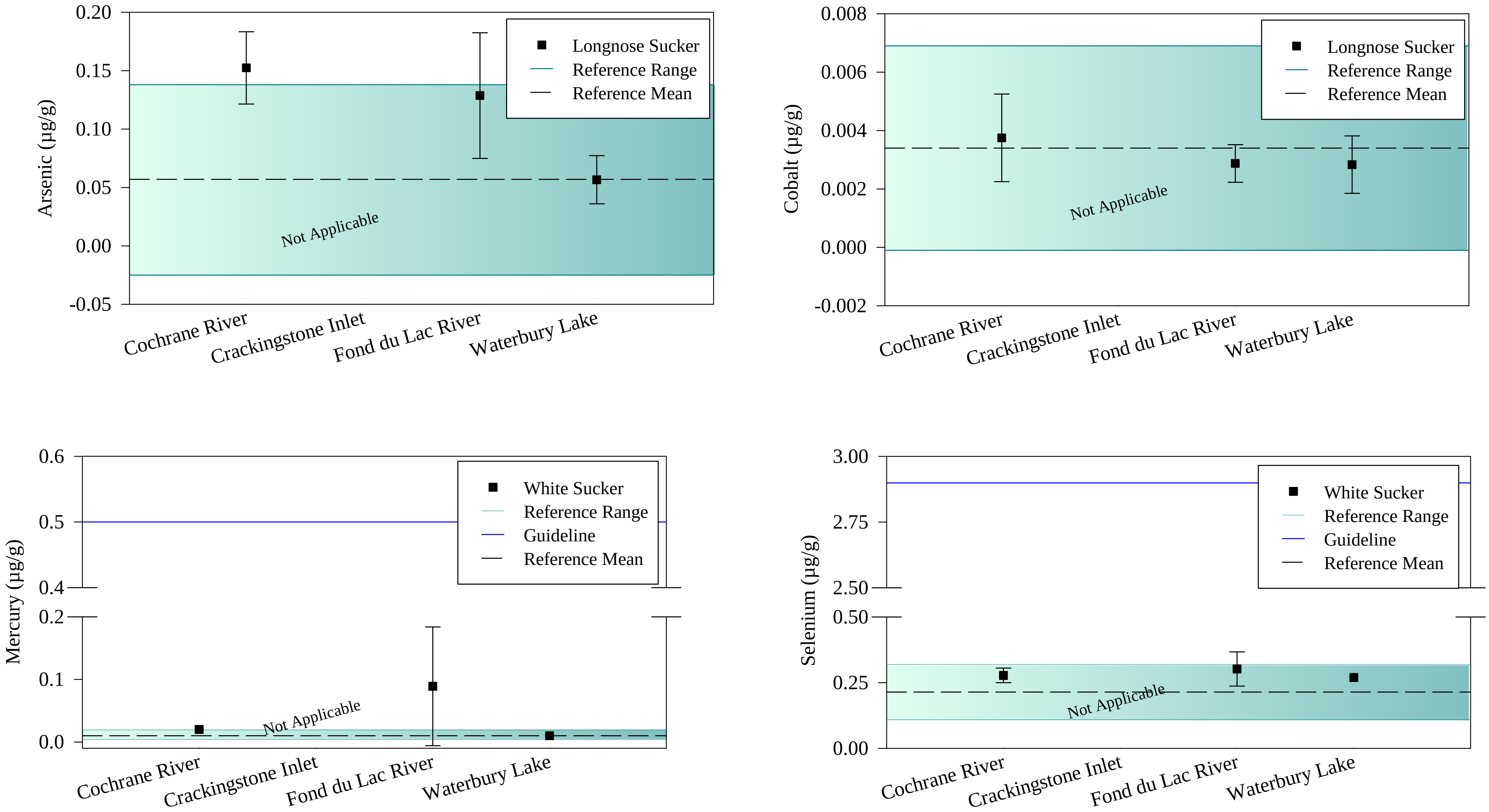






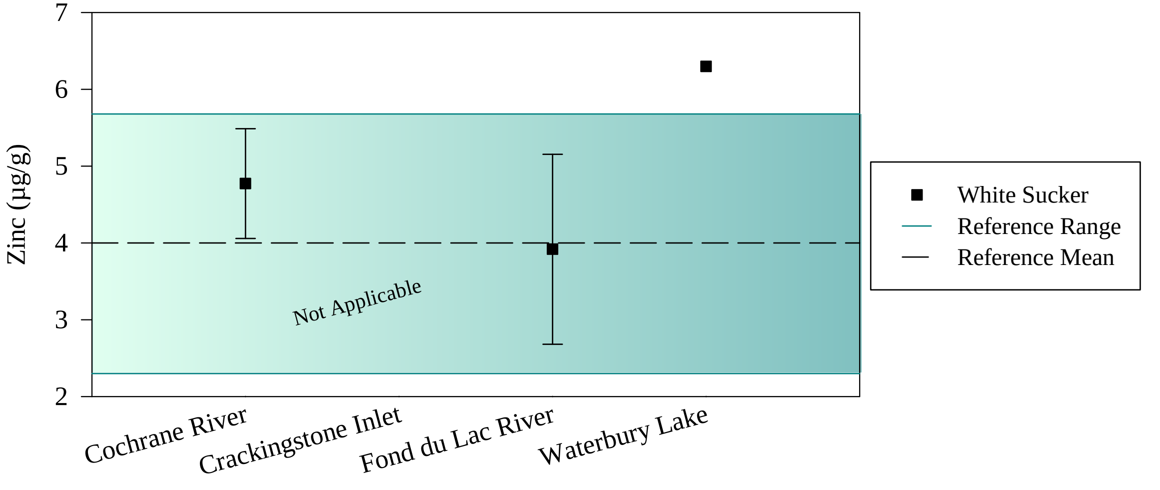
Appendix A, Figure 15.
Fish flesh concentrations of mercury, selenium, and of COPCs strongly correlated to the third PCA axis for the EARMP technical study program, 2011 and 2012.

Note: Error bars are standard deviations.



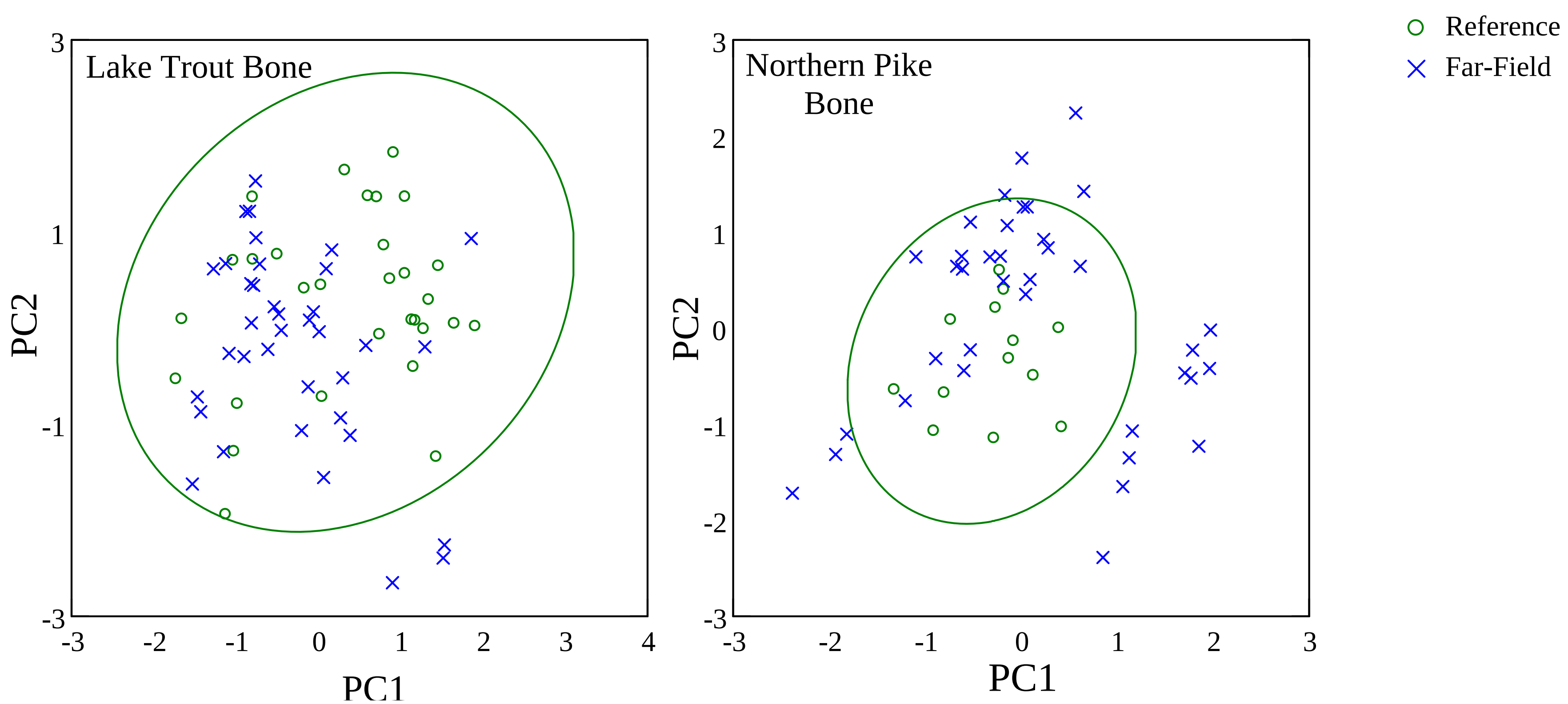
Appendix A, Figure 15.
Fish flesh concentrations of mercury, selenium, and of COPCs strongly correlated to the third PCA axis for the EARMP technical study program, 2011 and 2012.

Note: Error bars are standard deviations.

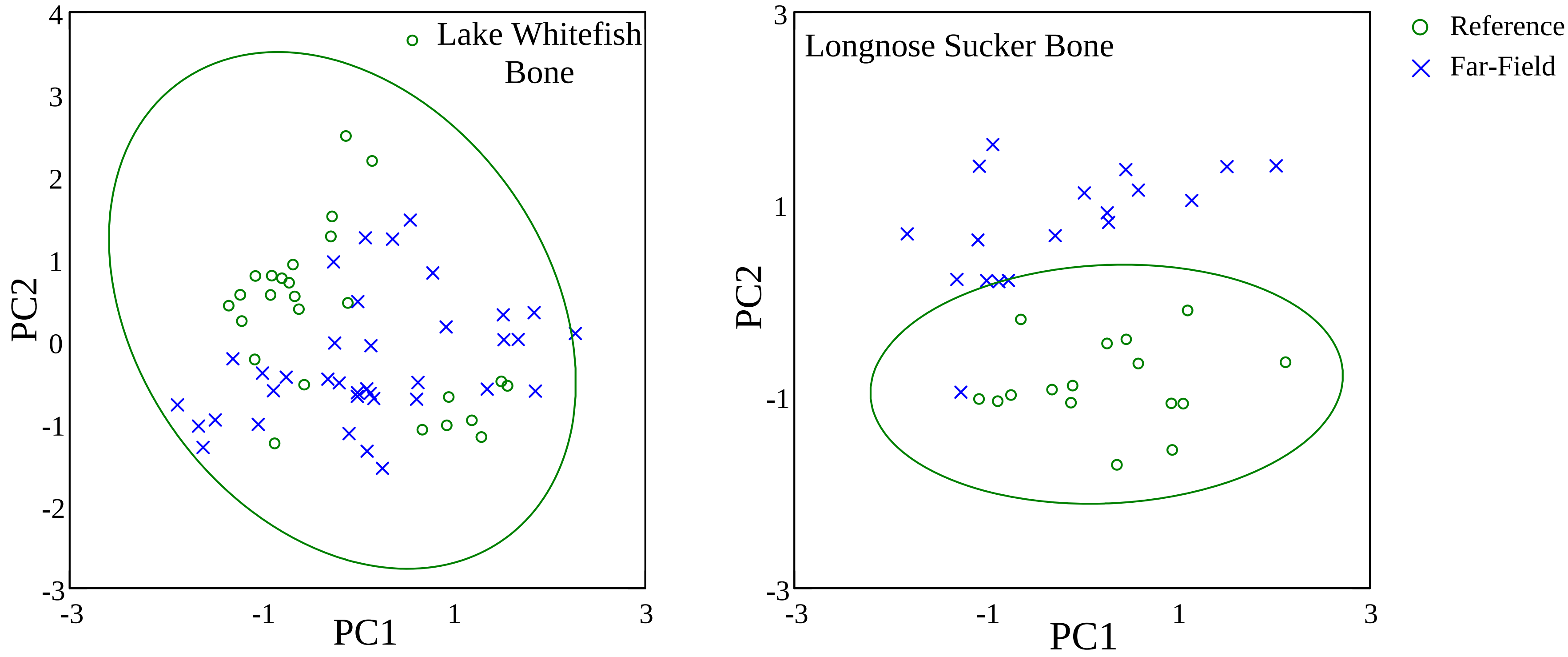


Appendix A, Figure 15.
Fish flesh concentrations of mercury, selenium, and of COPCs strongly correlated to the third PCA axis for the EARMP technical study program, 2011 and 2012.

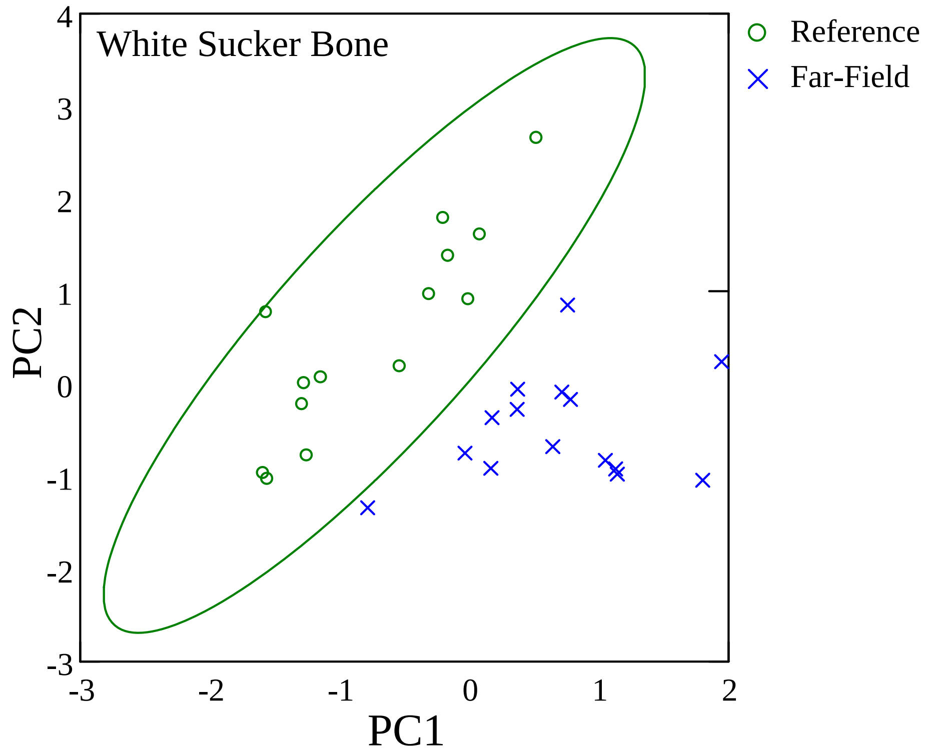
Note: Error bars are standard deviations.



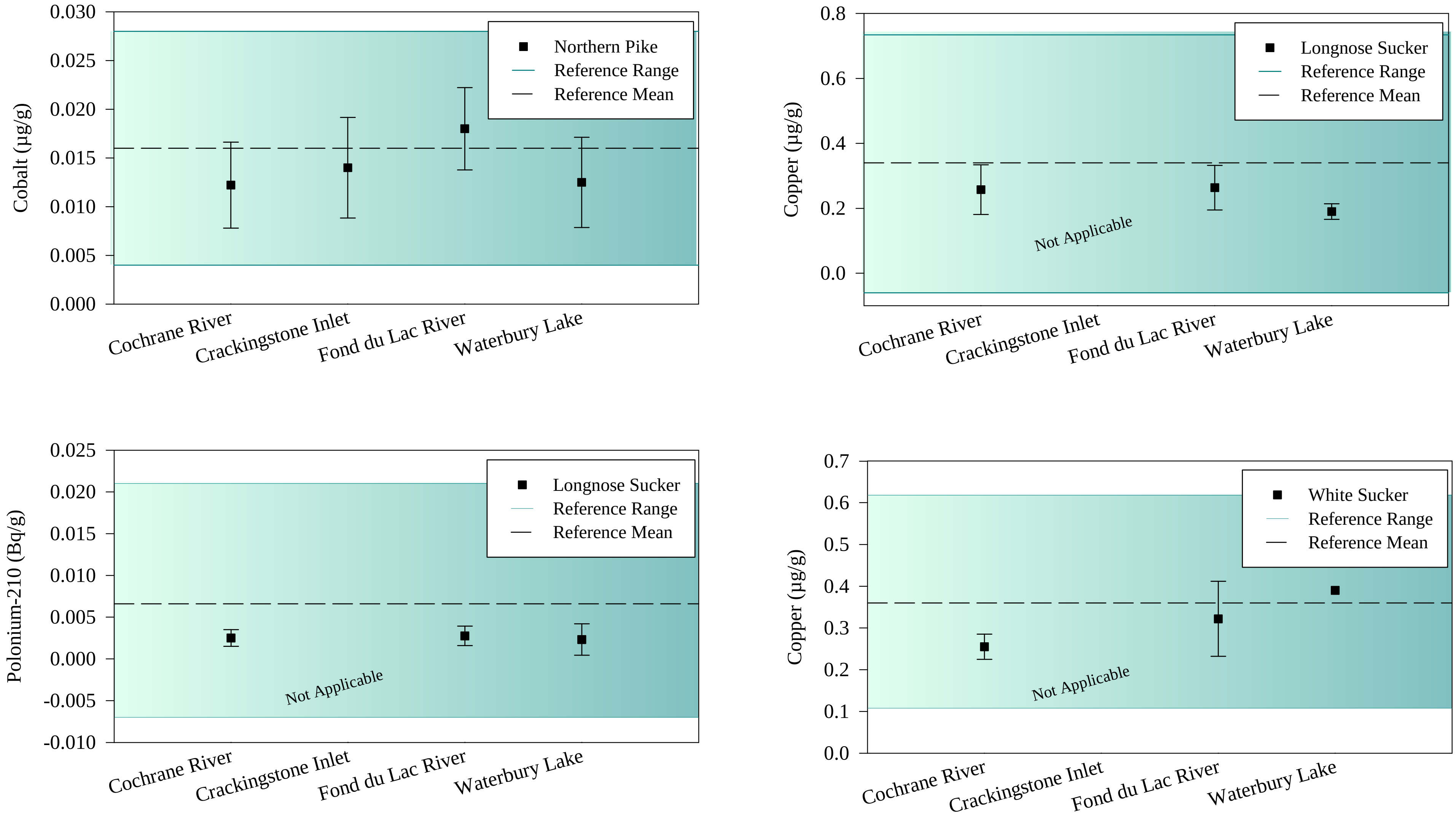
Appendix A, Figure 16
Fish bone PCA results for axes 1 and 2 and 95% confidence ellipse of reference samples for the EARMP technical program study area, 2011 and 2012.



Appendix A, Figure 16
Fish bone PCA results for axes 1 and 2 and 95% confidence ellipse of reference samples for the EARMP technical program study area, 2011 and 2012.



Appendix A, Figure 16
Fish bone PCA results for axes 1 and 2 and 95% confidence ellipse of reference samples for the EARMP technical program study area, 2011 and 2012.



Appendix A, Figure 17.
Concentrations of COPCs in fish bone strongly correlated to the third or fourth PCA axes, in the EARMP technical program study area, 2011 and 2012.

Note: Error bars are standard deviations.

LIST OF TABLES

Table 16. Bone chemistry of longnose sucker samples falling outside the reference 95% confidence ellipse, 2011 and 2012.

Table 17. Bone chemistry of white sucker samples falling outside the reference 95% confidence ellipse, 2011 and 2012.

APPENDIX A, TABLE 1

Limnology profiles from the EARMP technical program study area, 2011 and 2012.

Parameter	Depth (m)	Far-Field Exposures								References										Guidelines	
		Cochrane River		Crackingstone Inlet		Fond du Lac River		Waterbury Lake		Bobby's Lake		Cree Lake		Ellis Bay		Pasfield Lake[1]		RF-4		SSWQO[2]	CWQG[3]
		26-Sep-11	19-Sep-12	02-Oct-11	29-Sep-12	26-Oct-11	22-Sep-12	22-Sep-11	20-Sep-12	14-Oct-09	02-Oct-12	28-Sep-11	26-Sep-12	04-Oct-11	02-Oct-12	24-Sep-11	24-Sep-12	24-Mar-08	12-Apr-12		
Temperature (°C)	0	12.5	10.4	11.1	11.9	3.4	10.4	12.2	11.3	9.1	10.0	12.5	11.2	10.6	11.0	11.6	10.4	0.0	0.0	-	-
	1	12.5	10.4	11.1	11.8	3.4	10.3	12.2	11.3	9.1	10.0	12.5	11.2	10.6	11.0	11.6	10.4	0.0	0.0		
	2	12.4	10.4	11.1	11.8	3.4	10.3	12.2	11.3	9.1	9.9	12.5	11.1	10.6	11.0	11.5	10.3	0.4	0.5		
	3	12.5	10.4	11.1	11.8	3.4	10.2	12.2	11.3	9.1	9.8	12.5	11.1	10.6	10.9	11.5	10.3	0.6	0.8		
	4	12.3	10.4	11.1	11.8	3.4	-[5]	12.2	11.3	9.1	9.7	12.5	11.1	10.6	10.7	11.5	10.2	0.9	1.0		
	5	12.3	10.4	11.0	11.7	3.4	10.2	12.2	11.3	8.8	-	12.5	11.1	10.6	10.3	11.5	10.2	1.1	1.2		
	6	12.2	10.4	11.0	11.8	3.4	10.2	12.2	11.3	-	-	12.5	11.1	10.6	10.1	11.5	10.2	1.3	1.5		
	7	12.1	10.4	9.8	11.8	3.5	10.2	12.2	11.3	-	-	12.5	11.1	10.4	10.0	11.5	-	-	-		
Dissolved Oxygen (mg/L)	0	9.33	10.28	10.60	10.88	12.66	10.44	9.34	9.51	10.18	9.71	9.76	10.25	9.55	11.08	10.18	8.69	11.79	14.33	6.5-9.5[4]	6.5-9.5[4]
	1	9.23	10.10	10.31	10.93	12.58	10.15	9.68	9.31	10.04	9.66	9.55	10.18	9.18	11.79	9.89	7.93	11.94	14.55		
	2	9.01	10.17	10.45	10.91	12.48	10.01	9.62	9.16	9.97	9.77	9.56	10.18	9.22	10.90	9.82	7.65	13.22	13.56		
	3	8.91	10.09	10.53	10.92	11.25	10.01	10.54	9.14	9.95	9.90	9.77	10.16	9.41	10.83	9.92	7.80	13.29	12.83		
	4	8.90	10.14	10.25	10.90	11.01	-[5]	9.92	9.14	9.18	9.92	9.53	10.16	9.50	10.82	9.82	7.65	13.00	12.16		
	5	8.84	10.05	10.15	10.89	11.19	10.00	9.76	9.15	8.88	-	9.39	10.17	9.03	10.61	10.18	7.66	12.03	11.60		
	6	8.84	10.01	10.09	10.88	11.56	9.96	9.64	9.15	-	-	9.30	10.17	10.30	10.33	10.03	7.74	11.60	11.54		
	7	9.18	10.05	10.01	10.88	12.72	9.91	9.62	9.12	-	-	9.31	10.16	11.33	10.15	10.11	-	-	-		
Specific Conductance (µS/cm)	0	32	15	63	87	32	16	21	10	18	18	19	20	60	65	17	9	20	36	-	-
	1	32	14	63	88	32	15	21	10	18	18	19	20	60	65	17	8	20	35		
	2	32	14	63	91	32	15	21	10	18	18	19	20	60	65	17	8	19	34		
	3	32	14	63	88	32	15	21	10	18	18	19	20	60	65	17	8	18	35		
	4	32	14	63	100	32	-[5]	21	10	18	18	19	20	60	65	17	8	18	37		
	5	32	14	63	96	32	15	21	10	18	-	19	20	61	65	17	8	18	37		
	6	32	14	63	108	32	15	21	10	-	-	19	20	61	65	17	8	19	37		
	7	32	14	65	114	32	15	21	10	-	-	19	20	61	65	17	-	-	-		
pH	0	8.1	**6.3**	8.1	7.5	8.5	7.1	8.3	6.5	6.7	**5.4**	8.2	7.6	8.1	8.0	8.5	7.2	7.2	6.5	-	6.5-9.0
	1	7.9	**6.3**	8.2	7.5	8.3	6.9	8.1	6.5	6.6	**5.8**	8.2	7.6	8.1	8.0	8.3	7.2	7.1	6.6		
	2	7.8	**6.2**	8.2	7.6	8.2	6.8	8.0	6.6	6.6	**5.9**	8.1	7.6	8.1	7.9	8.0	6.9	7.1	6.7		
	3	7.7	**6.3**	8.1	7.6	8.1	6.7	7.9	6.6	6.6	**6.0**	8.2	7.6	8.0	7.9	7.9	**6.0**	7.1	6.7		
	4	7.6	**6.2**	8.1	7.6	8.0	-[5]	7.8	6.5	6.7	**6.0**	7.9	7.5	7.9	7.8	7.8	**6.0**	6.9	6.7		
	5	7.6	**6.3**	8.1	7.7	8.0	6.7	7.7	6.5	6.8	-	7.9	7.6	7.9	7.8	7.7	**5.9**	6.8	6.6		
	6	7.6	**6.3**	8.0	7.7	8.0	6.7	7.7	6.5	-	-	7.8	7.6	7.8	7.8	7.6	**5.8**	6.9	6.6		
	7	7.5	**6.3**	7.9	7.7	7.8	6.8	7.6	6.5	-	-	7.7	7.6	7.8	7.7	7.5	-	-	-		
Secchi Depth (m)		5.3	5.5	4.2	6.5	4.1	6.1	4.5	6.1	-[5]	2.7	4.8	4.6	5.8	6.5	6.7	6.4	-[5]	-[5]	-	-
Max. Depth (m)		7.3	7.5	7.8	7.7	7.6	7.8	7.1	7.8	5.5	4.0	7.4	8.0	7.2	7.0	6.7	6.4	6.4	6.4		

Bold values: values not meeting the guidelines.

[1]The deepest limnological measurements in Pasfield Lake were taken at 6.5 m rather than at 7.0 m depth.

[2]Saskatchewan surface water quality objectives for the protection of freshwater aquatic life (SE 2006).

[3]Canadian water quality guidelines for the protection of freshwater aquatic life (CCME 2013).

[4]9.5 mg/L for cold water biota in early life stages, 6.5 mg/L for cold water biota in other life stages.

[5]No data.

APPENDIX A, TABLE 2

Summary of the water chemistry results from the EARMP technical program study area, 2011.

Parameter[1]	Far-Field Exposure Areas				References					Pooled References and Years[4]		Guidelines	
	Cochrane River	Crackingstone Inlet	Fond du Lac River	Waterbury Lake	Bobby's Lake[2]	Cree Lake	Ellis Bay	Pasfield Lake	RF-4[3]	Average	Standard Deviation	SSWQO[5]	CWQG[6]
Metals													
Aluminum	0.0052	0.0120	0.0120	0.0009	**0.0056**	0.0024	0.0023	<0.0005	0.0033	0.003	0.002	0.005-0.1[7]	0.005-0.1[7]
Cadmium	<0.00001	<0.00001	0.00001	0.00001	<0.0001	<0.00001	0.00002	<0.00001	<0.0001	0.00003	0.00004		0.00004-0.00005[9]
Copper	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0[9]	0.002[9]	0.002[9]
Iron	0.025	0.020	0.030	0.012	0.079	0.025	0.007	0.003	0.015	0.036	0.059	-	0.3
Lead	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0	0.001[9]	0.001[9]
Mercury (µg/L)	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.05	0.01[10]	0[10]	0.026	0.026
Molybdenum	0.0013	0.0002	0.0012	0.0016	0.0001	<0.0001	0.0002	<0.0001	0.0005	0.00018	0.00013	-	0.073
Nickel	<0.0001	0.0002	<0.0001	0.0001	0.0001	<0.0001	0.0002	<0.0001	0.0001	0.00012	0.00004	0.025[9]	0.025-0.035[9]
Selenium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0	0.001	0.001
Uranium (µg/L)	<0.1	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0	15	15
Zinc	0.0078	<0.0005	<0.0005	0.0007	0.0043	0.0010	<0.0005	0.0170	0.0032	0.003	0.005	0.03	0.03
Nutrients													
Ammonia as nitrogen	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.14	0.024	0.041	0.7-32.4[11]	0.7-32.4[11]
Organic carbon	2.4	2.8	2.9	1.8	2.3	1.8	2.8	0.7	4.2	2.6	1.2		
Physical Properties													
pH (pH units)	7.12	7.46	7.18	6.97	**6.44**	6.96	7.44	6.87	7.37	7.0	0.3	-	6.5-9.0
Specific conductivity (µS/cm)	35	68	36	23	18	21	66	19	39	32.0	19.6		
Total hardness	13	27	12	7	6	7	26	5	14	11.4	8.2		
Radionuclides													
Lead-210 (Bq/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	0.02	0		
Polonium-210 (Bq/L)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	0.005	0		
Radium-226 (Bq/L)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	0.0051	0.0003		
Thorium-230 (Bq/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	0.01	0		
Trace Elements													
Arsenic (µg/L)	0.1	0.2	<0.1	0.1	<0.1	0.1	0.1	<0.1	0.1	0.1	0	5	5
Cobalt	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0		
Vanadium	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0		

Bolded values indicate exceedances of applicable guidelines; shaded cells indicate far-field exposure area values greater than 2 x the standard deviation around the pooled reference average.

For values measured at less than the method detection limit (MDL), all average and standard deviation computations were performed with values set at the MDL.

[1]All values are in mg/L, unless specified otherwise.

[2]Because no data were available for this lake for 2011, data from 2009 were used instead.

[3]Because no data were available for this lake for 2011, data from 2008 were used instead.

[4]Inclusive of both the 2011 and the 2012 reference area data.

[5]Saskatchewan surface water quality objectives for the protection of freshwater aquatic life (SE 2006).

[6]Canadian water quality guidelines for the protection of freshwater aquatic life (CCME 2013).

[7]Adjusted according to water pH of each waterbody.

[8]Standard deviations of 0 signify no variation, not a very small value.

[9]Adjusted according to water hardness of each waterbody.

[10]The Bobby's Lake and the RF-4 values for mercury from 2009 and 2008 had to be excluded from the average and standard deviation computations because of differing method detect limits from the 2011 and 2012 data.

[11]Adjusted according to water temperature and pH of each waterbody.

APPENDIX A, TABLE 3

Summary of the water chemistry results from the EARMP technical program study area, 2012.

Parameter[1]	Far-Field Exposure Areas				References					Pooled References[2]		Guidelines	
	Cochrane River	Crackingstone Inlet	Fond du Lac River	Waterbury Lake	Bobby's Lake	Cree Lake	Ellis Bay	Pasfield Lake	RF-4	Average	Standard Deviation	SSWQO[3]	CEQG[4]
Metals													
Aluminum	0.0058	0.0055	0.0057	0.0013	0.0072	0.0030	0.0017	0.0009	0.0021	0.003	0.002	0.1[5]	0.1[5]
Cadmium	<0.00001	<0.00001	0.00001	<0.00001	0.00002	<0.00001	<0.00001	0.00001	<0.00001	0.00003	0.00004		0.00004-0.00005[7]
Copper	<0.0002	0.0002	**0.0480**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0[6]	0.002[7]	0.002[7]
Iron	0.0230	0.0130	0.0270	0.0097	0.1900	0.0160	0.0058	0.0039	0.0140	0.036	0.059	0.3	0.3
Lead	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0	0.001[7]	0.001[7]
Mercury (µg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01[8]	0[8]	0.026	0.026
Molybdenum	0.0012	0.0006	0.0012	0.0014	<0.0001	<0.0001	0.0002	<0.0001	0.0003	0.00018	0.00013	-	0.073
Nickel	<0.0001	0.0002	0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	0.0001	0.00012	0.00004	0.025[7]	0.025[7]
Selenium	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0	0.001	0.001
Uranium (µg/L)	<0.1	14	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0	15	15
Zinc	<0.0005	0.0006	<0.0005	<0.0005	0.0039	<0.0005	<0.0005	<0.0005	<0.0005	0.003	0.005	0.03	0.03
Nutrients													
Ammonia as nitrogen	<0.01	0.07	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.024	0.041	3.26-10.30[9]	3.26-10.30[9]
Organic Carbon	2.8	4.0	2.8	2.0	3.6	2.0	3.4	0.8	3.9	2.6	1.2		
Physical Properties													
pH	7.05	7.58	7.26	6.94	6.94	6.95	7.38	6.88	6.93	7.0	0.3	-	6.5-9.0
Specific conductivity (µS/cm)	33	97	34	21	20	19	67	17	34	32.0	19.6	-	-
Total hardness	13	36	12	7	6	7	26	5	12	11.4	8.2	-	-
Radionuclides													
Lead-210 (Bq/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	0.02	0	-	-
Polonium-210 (Bq/L)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	0.005	0	-	-
Radium-226 (Bq/L)	<0.005	<0.005	0.006	<0.005	<0.005	0.005	<0.005	0.005	<0.005	0.0051	0.0003	-	-
Thorium-230 (Bq/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	0.01	0	-	-
Trace Elements													
Arsenic (µg/L)	<0.1	0.2	0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	0.1	0	5	5
Cobalt	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0	-	-
Vanadium	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0	-	-

Bolded values indicate exceedances of applicable guidelines.

Gray cells indicate far field exposure area values greater than 2 x the standard deviation around the pooled reference average.

For values measured at less than the method detection limit (MDL), all average and standard deviation computations were performed with values set at the MDL.

[1]All concentrations are in mg/L, except when specified otherwise.

[2]Inclusive of both the 2011 and the 2012 reference area data.

[3]SSWQO = Saskatchewan surface water quality objectives for the protection of aquatic life, interim edition (SE 2006).

[4]CEQG = Canadian environmental quality guidelines for the protection of freshwater life (CCME 2013); values differ between lakes when calculations are based on water hardness.

[5]Adjusted according to water pH of each waterbody.

[6]Standard deviations of 0 signify no variation, not a very small value.

[7]Adjusted according to water hardness of each waterbody.

[8]The Bobby's Lake and the RF-4 values for mercury from 2009 and 2008 had to be excluded from the average and standard deviation computations because of differing method detect limits from the 2011 and 2012 data.

[9]Adjusted according to water temperature and pH of each waterbody.

APPENDIX A, TABLE 4

Summary of the particle size and organic carbon content from the EARMP technical program study area, 2011 and 2012.

Area	Year	Data	Clay	Silt	Fine Particles	Fine Sand	Coarse Sand	Total Sand	Gravel	Moisture	Organic Carbon
Cochrane River	2011	Average	26.9	65.6	92.5	6.9	0.5	7.3	0.2	70.2	7.2
		S.D.	2.8	1.5	2.6	2.5	0.3	2.5	0.2	2.8	0.3
		Min	24.8	64.3	89.8	3.9	0.2	4.1	<0.1	66.4	6.8
		Max	31.3	68.2	96.0	9.5	1.0	9.9	0.5	73.1	7.6
		<MDL	0	0	0	0	0	0	3	0	0
		N	5	5	5	5	5	5	5	5	5
	2012	Average	13.9	82.6	96.6	3.2	0.3	3.4	0.1	87.2	6.9
		S.D.	2.3	2.9	2.1	2.0	0.1	2.0	-[1]	1.5	0.6
		Min	10.6	80.2	93.0	1.8	0.1	1.9	<0.1	85.7	6.2
		Max	16.6	87.5	98.1	6.8	0.5	7.0	<0.1	89.4	7.7
		<MDL	0	0	0	0	0	0	5	0	0
		N	5	5	5	5	5	5	5	5	5
Crackingstone Inlet	2011	Average	6.1	52.9	59.1	34.1	6.8	40.9	0.1	41.9	1.3
		S.D.	3.7	11.3	14.4	10.5	4.0	14.4	-	10.8	0.4
		Min	3.1	40.8	45.9	18.2	1.0	19.2	<0.1	30.9	0.9
		Max	12.3	68.5	80.8	42.8	11.3	54.1	<0.1	54.3	1.8
		<MDL	0	0	0	0	0	0	5	0	0
		N	5	5	5	5	5	5	5	5	5
	2012	Average	4.3	58.2	62.5	29.3	8.1	37.4	0.1	43.9	1.4
		S.D.	1.2	13.4	14.4	10.2	4.4	14.4	-	7.4	0.3
		Min	2.7	44.6	47.3	15.4	1.0	16.4	<0.1	36.3	1.2
		Max	5.3	78.3	83.6	41.2	11.5	52.6	<0.1	56.3	2.0
		<MDL	0	0	0	0	0	0	5	0	0
		N	5	5	5	5	5	5	5	5	5
Fond du Lac River	2011	Average	6.1	85.6	91.6	3.6	4.7	8.4	0.1	-	10.0
		S.D.	1.6	10.2	9.2	1.9	8.3	9.2	-	-	1.4
		Min	4.3	67.4	75.4	1.4	0.9	2.5	<0.1	-	7.7
		Max	8.0	91.2	97.5	6.0	19.5	24.5	<0.1	-	11.4
		<MDL	0	0	0	0	0	0	5	-	0
		N	5	5	5	5	5	5	5	-	5
	2012	Average	19.2	55.4	74.6	11.3	14.1	25.4	0.1	87.4	8.9
		S.D.	9.3	18.5	25.5	11.8	14.2	25.5	-	3.5	2.4
		Min	8.3	33.0	41.3	2.5	1.4	3.9	<0.1	82.8	5.6
		Max	33.1	73.8	96.1	29.2	29.5	58.6	<0.1	91.2	11.7
		<MDL	0	0	0	0	0	0	5	0	0
		N	5	5	5	5	5	5	5	5	5

APPENDIX A, TABLE 4

Summary of the particle size and organic carbon content from the EARMP technical program study area, 2011 and 2012.

Area	Year	Data	Clay	Silt	Fine Particles	Fine Sand	Coarse Sand	Total Sand	Gravel	Moisture	Organic Carbon
Waterbury Lake	2011	Average	4.4	12.7	17.1	28.5	54.3	82.8	0.2	54.6	3.0
		S.D.	3.1	7.1	9.7	7.1	13.4	9.7	0.1	7.6	1.2
		Min	1.5	6.7	8.1	20.4	39.0	71.9	<0.1	42.7	2.1
		Max	9.3	21.9	28.1	38.2	68.8	91.9	0.4	63.5	5.1
		<MDL	0	0	0	0	0	0	3	0	0
		N	5	5	5	5	5	5	5	5	5
	2012	Average	3.3	13.3	16.6	34.8	48.6	83.4	0.1	75.1	3.3
		S.D.	1.3	6.4	7.8	6.7	11.6	7.7	0[2]	13.5	1.9
		Min	1.9	5.5	7.5	26.6	37.8	73.8	<0.1	53.9	0.8
		Max	5.2	21.1	26.3	43.5	65.9	92.5	0.1	85.7	5.2
		<MDL	0	0	0	0	0	0	4	0	0
		N	5	5	5	5	5	5	5	5	5
Bobby's Lake	2009[3]	Average	25.2	51.4	76.6	18.6	4.6	23.2	1.0	84.5	7.6
		S.D.	6.9	12.4	18.9	15.3	4.6	19.6	-	8.7	1.9
		Min	17.0	37.0	54.0	5.0	1.0	6.0	<1	70.5	5.5
		Max	32.0	62.0	93.0	39.0	11.0	47.0	<1	94.1	9.3
		<MDL	0	0	0	0	0	0	5	0	0
		N	5	5	5	5	5	5	5	5	5
	2012	Average	11.3	46.0	57.3	32.5	10.3	42.8	0.1	-	7.3
		S.D.	6.7	21.1	27.0	20.0	8.8	27.0	-	-	4.2
		Min	3.1	24.7	27.8	2.7	0.4	3.1	<0.1	-	3.0
		Max	18.7	79.4	96.9	55.8	22.2	72.3	<0.1	-	11.6
		<MDL	0	0	0	0	0	0	5	-	0
		N	5	5	5	5	5	5	5	-	5
Cree Lake	2011	Average	2.8	28.2	30.9	27.1	41.8	68.9	0.2	58.1	4.0
		S.D.	2.4	22.1	24.3	7.6	23.8	24.4	0.2	15.7	3.3
		Min	0.2	6.2	6.8	17.1	18.5	35.6	<0.1	40.1	1.2
		Max	5.3	58.6	63.9	36.9	70.8	93.0	0.5	74.2	9.0
		<MDL	0	0	0	0	0	0	1	0	0
		N	5	5	5	5	5	5	5	5	5
	2012	Average	3.0	14.8	17.8	37.8	44.4	82.2	0.1	77.4	3.7
		S.D.	0.8	3.3	4.0	2.7	5.2	4.0	-	3.4	0.8
		Min	2.1	10.2	12.3	34.9	39.7	77.0	<0.1	71.7	2.6
		Max	4.1	18.9	23.0	40.9	52.8	87.7	<0.1	80.6	4.5
		<MDL	0	0	0	0	0	0	5	0	0
		N	5	5	5	5	5	5	5	5	5

APPENDIX A, TABLE 4

Summary of the particle size and organic carbon content from the EARMP technical program study area, 2011 and 2012.

Area	Year	Data	Clay	Silt	Fine Particles	Fine Sand	Coarse Sand	Total Sand	Gravel	Moisture	Organic Carbon
Ellis Bay	2011	Average	38.6	60.5	99.1	0.6	0.3	0.9	0.1	64.9	4.1
		S.D.	3.3	3.6	0.7	0.5	0.2	0.7	-	5.4	0.5
		Min	35.4	55.2	98.1	0.1	0.1	0.2	<0.1	60.7	3.5
		Max	43.8	64.3	99.7	1.2	0.7	1.9	<0.1	71.5	4.8
		<MDL	0	0	0	0	0	0	5	0	0
		N	5	5	5	5	5	5	5	5	5
	2012	Average	29.9	69.4	99.3	0.4	0.3	0.7	0.1	80.5	4.5
		S.D.	4.6	4.1	0.7	0.4	0.3	0.7	-	1.0	0.5
		Min	24.4	65.7	98.1	<0.1	0.1	0.2	<0.1	79.7	4.2
		Max	34.0	74.7	99.8	1.1	0.8	1.9	<0.1	82.1	5.3
		<MDL	0	0	0	1	0	0	5	0	0
		N	5	5	5	5	5	5	5	5	5
Pasfield Lake	2011	Average	1.1	4.3	5.4	15.3	79.3	94.5	0.2	43.7	2.1
		S.D.	2.2	6.3	8.6	5.4	13.7	8.5	0.1	14.5	2.1
		Min	<0.1	0.5	0.6	10.5	55.3	79.4	<0.1	26.6	0.6
		Max	5.1	15.5	20.6	24.1	88.3	99.3	0.3	66.4	5.8
		<MDL	1	0	0	0	0	0	1	0	0
		N	5	5	5	5	5	5	5	5	5
	2012	Average	1.2	4.1	5.3	12.5	82.1	94.7	0.1	58.2	2.5
		S.D.	1.0	4.8	5.7	4.9	10.4	5.7	0.03	17.3	2.3
		Min	0.4	0.7	1.2	8.2	65.4	84.9	<0.1	37.9	0.7
		Max	2.7	12.4	15.1	19.5	89.5	98.7	0.2	78.9	6.1
		<MDL	0	0	0	0	0	0	4	0	0
		N	5	5	5	5	5	5	5	5	5
RF-4	2008[4]	Average	35.2	43.0	78.2	19.8	1.8	21.6	1.0	-	9.6
		S.D.	5.8	2.4	5.8	5.5	1.3	5.5	-	-	5.4
		Min	30.0	39.0	73.0	11.0	1.0	13.0	<1	-	5.0
		Max	44.0	45.0	87.0	24.0	4.0	26.0	<1	-	16.5
		<MDL	0	0	0	0	0	0	5	-	0
		N	5	5	5	5	5	5	5	-	5
	2012	Average	7.1	54.2	61.3	29.4	9.3	38.7	0.1	-	7.6
		S.D.	1.9	2.6	1.9	3.3	2.1	2.0	0.03	-	2.2
		Min	4.4	51.1	59.1	24.5	7.2	36.2	<0.1	-	5.2
		Max	9.0	57.8	63.8	32.7	12.7	41.0	0.2	-	11.1
		<MDL	0	0	0	0	0	0	4	-	0
		N	5	5	5	5	5	5	5	-	5
Pooled References and Years		Average	16	38	53	19	27	47	0.3	66.7	5
		S.D.	14.9	24.6	36.8	14.6	32.3	36.8	0.4	17.1	3.5
		Min	<0.1	0.5	0.6	<0.1	0.1	0.2	<0.1	26.6	0.6
		Max	44.0	79.4	99.8	55.8	89.5	99.3	1.0	94.1	16.5
		<MDL	1	0	0	1	0	0	40	0.0	0
		N	50	50	50	50	50	50	50	35.0	50

All measures are in % dry weight.

S.D.: standard deviation; Min: minimum; Max: maximum; <MDL: number of samples with reading less than the method detection limit (MDL); N: sample size.

For values measured at less than the method detection limit (MDL), all average and standard deviation computations were performed with values set at the MDL.

[1]When all values were less than the method detection limit (MDL), standard deviations were not computed.

[2]Standard deviations of 0 signify no variation, not a very small value.

[3]No data were available for 2011 in Bobby's Lake, thus data from 2009 were used as a substitute.

[4]No data were available for 2011 in RF-4, thus data from 2008 were used as a substitute.

APPENDIX A, TABLE 5

Summary of the sediment chemistry results from the EARMP technical program study area, 2011 and 2012.

Parameter[1]	Far-Field Exposure Areas																References							
	Cochrane River				Crackingstone Inlet				Fond du Lac River				Waterbury Lake				Bobby 's Lake				Cree Lake			
	2011		2012		2011		2012		2011		2012		2011		2012		2009[2]		2012		2011		2012	
	Avr.	S.D.	Avr.	S.D.	Avr.	S.D.	Avr.	S.D.	Avr.	S.D.	Avr.	S.D.	Avr.	S.D.	Avr.	S.D.	Avr.	S.D.	Avr.	S.D.	Avr.	S.D.	Avr.	S.D.
Metals																								
Aluminum	12160	152	8920	581	9680	2297	7940	2084	13040	802	13860	2919	3600	1572	3200	660	6580	2251	3510	1999	2540	1228	1444	262
Cadmium	0.3	0.07	0.2	0[10]	0.1	0	0.1	-[11]	0.54	0.11	0.46	0.11	0.1	0	0.1	0	0.32	0.13	0.2	0.10	0.14	0.05	0.14	0.05
Copper	7.8	0.2	6.1	0.5	4.7	2.3	4.0	1.7	11.6	0.5	9.3	2.1	1.6	0.9	1.6	0.6	3.1	1.0	1.6	1.0	1.4	0.8	1.4	0.4
Iron	18780	1467	16740	2100	12080	2937	12160	2847	73000	20271	81360	44209	4140	2747	4780	1553	54280	17357	22000	12326	4780	2882	3108	530
Lead	9.8	0.7	7.6	0.6	6.1	3.0	6.2	5.0	11.4	2.1	8.6	1.0	3.5	1.1	3.5	1.2	6.5	1.7	3.8	2.2	2.6	1.3	2.6	0.5
Molybdenum	6.3	0.5	4.5	0.6	0.7	0.4	0.6	0.2	19.2	5.8	14.4	4.3	1.9	1.6	1.7	0.8	0.7	0.2	1.0	1.2	0.2	0.1	0.1	0.04
Nickel	11.6	0.5	8.5	0.7	7.5	2.2	6.5	1.8	14.4	0.5	15.4	4.6	2.9	1.4	2.5	0.7	6.5	2.5	4.3	2.4	2.5	1.6	1.7	0.4
Selenium	0.6	0.07	0.5	0.04	0.8	0.3	0.8	0.3	1.1	0.1	0.9	0.3	0.2	0.1	0.3	0.1	0.6	0.2	0.6	0.3	0.3	0.2	0.2	0
Uranium	4.4	0.1	3.7	0.3	41.4	18.9	36.4	12.7	5.3	0.3	4.5	0.7	0.4	0.2	0.4	0.1	1.4	0.4	0.9	0.5	0.2	0.1	0.2	0.0
Zinc	41.6	0.9	32.2	2.4	17.6	4.5	14.6	3.8	77.8	7.8	92.2	41.0	14.2	6.7	14.6	3.4	40.6	12.2	18.6	8.0	9.3	4.8	9.5	1.7
Radionuclides																								
Lead-210 (Bq/g)	0.39	0.03	0.33	0.06	0.18	0.13	0.12	0.06	0.40	0.08	0.40	0.11	0.11	0.09	0.18	0.11	0.27	0.10	0.28	0.21	0.14	0.07	0.19	0.07
Polonium-210 (Bq/g)	0.38	0.05	0.35	0.06	0.21	0.15	0.17	0.05	0.45	0.08	0.33	0.04	0.12	0.08	0.19	0.07	0.34	0.10	0.30	0.19	0.14	0.08	0.17	0.05
Radium-226 (Bq/g)	0.03	0.02	0.01	0.01	0.14	0.21	0.48	0.58	0.06	0.04	0.06	0.01	0.02	0.01	0.03	0.02	0.04	0.02	0.04	0.02	0.02	0.01	0.02	0.01
Thorium-230 (Bq/g)	0.03	0.01	0.03	0.004	9.26	9.52	5.50	5.11	0.04	0.01	0.03	0.02	0.02	-	0.04	0.03	0.03	0.01	0.02	0	0.02	-	0.02	0.004
Trace Elements																								
Arsenic	2.1	0.1	1.6	0.2	4.5	3.2	3.5	1.1	8.5	3.7	7.1	2.8	1.4	0.7	1.1	0.2	4.3	1.2	2.3	1.0	1.3	0.7	0.7	0.1
Cobalt	3.5	0.1	2.5	0.2	3.1	0.6	2.5	0.5	6.7	0.7	7.4	2.6	1.1	0.6	1.0	0.2	3.1	1.0	1.6	1.0	0.8	0.5	0.5	0.1
Vanadium	25.4	0.5	19.6	1.1	85.6	109.0	52.2	44.6	34.4	2.2	38.4	11.1	8.4	3.1	8.6	2.2	17.3	5.3	8.2	3.4	7.1	3.8	4.1	0.8

APPENDIX A, TABLE 5

Summary of the sediment chemistry results from the EARMP technical program study area, 2011 and 2012.

Parameter[1]	References														Guidelines/Sediment Quality Values				
	Ellis Bay				Pasfield Lake				RF-4				Pooled References and Years		CCME[4]		LEL[7]	NE2[8]	REF[9]
	2011		2012		2011		2012		2008[3]		2012								
	Avr.	S.D.	Avr.	S.D.	Avr.	S.D.	Avr.	S.D.	Avr.	S.D.	Avr.	S.D.	Avr.	S.D.	ISQG[5]	PEL[6]			
Metals																			
Aluminum	22180	1532	16260	727	1464	731	1268	525	8380	517	10140	680	7377	6890					
Cadmium	0.32	0.04	0.22	0.04	0.12	0.04	0.1	0	0.3	0.00	0.26	0.05	0.2	0.1	0.6	3.5			
Copper	21.0	0.7	18.8	0.8	0.8	0.5	0.8	0.4	6.4	0.6	6.3	1.1	6.2	7.3	35.7	197	22.2		
Iron	21880	4194	23160	3288	1752	1116	2258	840	39880	4738	50140	8808	22324	20406					
Lead	8.2	0.2	6.8	0.4	2.7	1.8	2.4	1.6	5.6	0.3	9.0	0.3	5	3	35	91.3	36.7		
Molybdenum	1.7	0.3	1.9	0.3	0.2	0.1	0.2	0.1	4.3	0.5	7.3	0.8	1.8	2.3			13.8	245	22.6
Nickel	21.2	0.8	18.6	0.9	1.0	0.5	1.0	0.6	8.3	0.5	8.4	1.0	7.4	7.0			23.4	326	21.4
Selenium	0.6	0.1	0.7	0.1	0.1	0.04	0.1	0.04	0.6	0.04	0.6	0.04	0.4	0.3			1.9	29.7	3.6
Uranium	7.7	0.8	7.9	0.8	0.1	0.04	0.1	0.1	2.5	0.1	4.9	0.2	2.6	3.0			104.4	2296	96.7
Zinc	46.0	0.7	39.6	3.7	8.3	4.4	7.1	3.8	49.2	7.4	46.6	6.9	27	18	123	315			
Radionuclides																			
Lead-210 (Bq/g)	0.17	0.07	0.18	0.03	0.20	0.12	0.16	0.12	0.25	0.02	0.15	0.02	0.20	0.10			0.9		
Polonium-210 (Bq/g)	0.19	0.06	0.23	0.04	0.16	0.11	0.19	0.12	0.31	0.02	0.29	0.02	0.23	0.11			0.8		
Radium-226 (Bq/g)	0.08	0.04	0.08	0.02	0.01	0	0.01	0.00	0.04	0.01	0.03	0.01	0.04	0.03			0.6		
Thorium-230 (Bq/g)	0.07	0.02	0.06	0.03	0.02	-	0.02	-	0.05	0.01	0.03	0.02	0.03	0.02					
Trace Elements																			
Arsenic	5.2	1.4	5.5	1.2	0.9	0.4	0.7	0.2	8.1	1.2	12.3	4.0	4.1	3.9	5.9	17	9.8	522	20.8
Cobalt	6.0	0.2	5.2	0.1	0.3	0.1	0.3	0.1	5.1	0.5	4.9	0.8	2.8	2.3					
Vanadium	37.4	1.7	31.4	0.9	4.2	2.1	3.2	1.0	22.4	2.3	25.2	1.5	16	12			35.2		

Avr.: average; S.D.: standard deviation.

For values measured at less than the method detection limit (MDL), all computations were performed with values set at the MDL.

Shaded guidelines or sediment quality values are those deemed most relevant and are those discussed in the report and shown in the figures, when applicable.

[1]All concentrations and activity levels are presented in µg/g on a dry weight basis, except when specified otherwise.

[2]No data were available for 2011 in Bobby's Lake, thus data from 2009 were used as a substitute.

[3]No data were available for 2011 in RF-4, thus data from 2008 were used as a substitute.

[4]Canadian Sediment Quality Guidelines for the protection of freshwater aquatic life (CCME 2013).

[5]ISQG: Interim freshwater sediment quality guideline (dry weight).

[6]PEL: Probable effects level (dry weight).

[7]LEL: Lowest effect level (dry weight) (Thompson et al. 2005).

[8]NE2: No effect sediment quality value (Burnett-Seidel and Liber 2013).

[9]REF: Reference sediment quality value (Burnett-Seidel and Liber 2013).

[10]Standard deviations of 0 signify no variation, not a very small value.

[11]When all values were less than the method detection limit (MDL), standard deviations were not computed.

APPENDIX A, TABLE 6

Summary of the benthic invertebrate community endpoints from the EARMP technical program study area, 2011 and 2012.

Area	Year	Sample	Total Density (per m²)	Taxon Richness (per sample)	Biomass (per m²)
Cochrane River	2011	1	10423	24	11.4
		2	8850	21	8.9
		3	5900	21	5.6
		4	6946	14	5.6
		5	9900	19	8.1
		Total[1]	-	30	-
		Mean	**8404**	**20**	**7.9**
		S.D.	**1931**	**4**	**2.4**
		Minimum	5900	14	5.6
		Maximum	10423	24	11.4
	2012	1	10415	18	6.3
		2	13308	17	9.7
		3	11954	21	6.2
		4	6331	16	7.2
		5	8262	19	6.9
		Total[1]	-	30	-
		Mean	**10054**	**18**	**7.3**
		S.D.	**2802**	**2**	**1.4**
		Minimum	6331	16	6.2
		Maximum	13308	21	9.7
Crackingstone Inlet	2011	1	11042	17	16.5
		2	8592	16	11.6
		3	11758	18	18.2
		4	8377	15	16.2
		5	6742	16	10.9
		Total[1]	-	32	-
		Mean	**9302**	**16**	**14.7**
		S.D.	**2060**	**1**	**3.3**
		Minimum	6742	15	10.9
		Maximum	11758	18	18.2
	2012	1	7538	12	10.7
		2	4615	15	6.4
		3	9942	22	12.8
		4	6154	12	4.4
		5	5904	17	13.9
		Total[1]	-	34	-
		Mean	**6831**	**16**	**9.6**
		S.D.	**2025**	**4**	**4.1**
		Minimum	4615	12	4.4
		Maximum	9942	22	13.9

APPENDIX A, TABLE 6

Summary of the benthic invertebrate community endpoints from the EARMP technical program study area, 2011 and 2012.

Area	Year	Sample	Total Density (per m^2)	Taxon Richness (per sample)	Biomass (per m^2)
Fond du Lac River	2011	1	1592	7	4.5
		2	1338	18	3.7
		3	1562	18	5.1
		4	1377	10	4.6
		5	1315	13	4.6
		Total[1]	-	24	-
		Mean	**1437**	**13**	**4.5**
		S.D.	**130**	**5**	**0.5**
		Minimum	1315	7	3.7
		Maximum	1592	18	5.1
	2012	1	1077	12	3.4
		2	1077	20	2.6
		3	1250	13	3.6
		4	1146	13	3.1
		5	1012	15	2.5
		Total[1]	-	25	-
		Mean	**1112**	**15**	**3.1**
		S.D.	**91**	**3**	**0.5**
		Minimum	1012	12	2.5
		Maximum	1250	20	3.6
Waterbury Lake	2011	1	2554	22	2.6
		2	1650	8	3.1
		3	3327	17	3.1
		4	5023	20	4.6
		5	4619	21	4.1
		Total[1]	-	34	-
		Mean	**3435**	**18**	**3.5**
		S.D.	**1405**	**6**	**0.8**
		Minimum	1650	8	2.6
		Maximum	5023	22	4.6
	2012	1	1962	15	2.5
		2	1646	19	2.0
		3	1642	19	2.3
		4	1704	21	1.6
		5	1696	26	1.6
		Total[1]	-	35	-
		Mean	**1730**	**20**	**2.0**
		S.D.	**132**	**4**	**0.4**
		Minimum	1642	15	1.6
		Maximum	1962	26	2.5

APPENDIX A, TABLE 6

Summary of the benthic invertebrate community endpoints from the EARMP technical program study area, 2011 and 2012.

Area	Year	Sample	Total Density (per m²)	Taxon Richness (per sample)	Biomass (per m²)
Bobby's Lake	2009	1	1346	23	2.4
		2	2417	19	2.8
		3	724	11	1.9
		4	571	7	1.9
		5	660	11	1.4
		Total[1]	-	30	-
		Mean	**1144**	**14**	**2.1**
		S.D.	**775**	**7**	**0.5**
		Minimum	571	7	1.4
		Maximum	2417	23	2.8
	2012	1	4246	29	6.3
		2	8981	20	27.8
		3	5960	22	6.2
		4	3154	28	1.5
		5	6517	16	14.3
		Total[1]	-	45	-
		Mean	**5772**	**23**	**11.2**
		S.D.	**2240**	**5**	**10.4**
		Minimum	3154	16	1.5
		Maximum	8981	29	27.8
Cree Lake	2011	1	3485	25	3.6
		2	3669	20	5.1
		3	3038	23	5.0
		4	3104	29	4.0
		5	4069	20	5.0
		Total[1]	-	40	-
		Mean	**3473**	**23**	**4.5**
		S.D.	**424**	**4**	**0.7**
		Minimum	3038	20	3.6
		Maximum	4069	29	5.1
	2012	1	12754	25	12.0
		2	6715	17	4.9
		3	10831	24	7.5
		4	10973	21	11.2
		5	14350	21	13.8
		Total[1]	-	31	-
		Mean	**11125**	**22**	**9.9**
		S.D.	**2855**	**3**	**3.6**
		Minimum	6715	17	4.9
		Maximum	14350	25	13.8

APPENDIX A, TABLE 6

Summary of the benthic invertebrate community endpoints from the EARMP technical program study area, 2011 and 2012.

Area	Year	Sample	Total Density (per m^2)	Taxon Richness (per sample)	Biomass (per m^2)
Ellis Bay	2011	1	10062	24	18.6
		2	14562	22	27.3
		3	10723	23	21.3
		4	8812	23	20.3
		5	8838	22	15.7
		Total[1]	-	35	-
		Mean	**10599**	**23**	**20.7**
		S.D.	**2361**	**1**	**4.3**
		Minimum	8812	22	15.7
		Maximum	14562	24	27.3
	2012	1	17138	28	35.7
		2	9338	22	20.8
		3	8969	20	17.2
		4	9492	20	20.9
		5	4338	18	10.7
		Total[1]	-	34	-
		Mean	**9855**	**22**	**21.0**
		S.D.	**4601**	**4**	**9.2**
		Minimum	4338	18	10.7
		Maximum	17138	28	35.7
Pasfield Lake	2011	1	27785	16	45.0
		2	29585	17	29.2
		3	15969	18	10.4
		4	40585	14	56.2
		5	13281	21	11.3
		Total[1]	-	29	-
		Mean	**25441**	**17**	**30.4**
		S.D.	**11063**	**3**	**20.3**
		Minimum	13281	14	10.4
		Maximum	40585	21	56.2
	2012	1	9077	19	7.7
		2	1931	20	2.3
		3	4804	18	6.7
		4	4269	16	7.2
		5	6304	20	8.2
		Total[1]	-	27	-
		Mean	**5277**	**19**	**6.4**
		S.D.	**2642**	**2**	**2.4**
		Minimum	1931	16	2.3
		Maximum	9077	20	8.2

APPENDIX A, TABLE 6

Summary of the benthic invertebrate community endpoints from the EARMP technical program study area, 2011 and 2012.

Area	Year	Sample	Total Density (per m^2)	Taxon Richness (per sample)	Biomass (per m^2)
RF-4	2008	1	1462	10	-[2]
		2	253	11	-
		3	596	8	-
		4	2427	13	-
		5	1813	13	-
		Total[1]	-	16	-
		Mean	**1310**	**11**	-
		S.D.	**887**	**2**	-
		Minimum	253	8	-
		Maximum	2427	13	-
	2012	1	5653	11	-
		2	3947	8	-
		3	3564	13	-
		4	3573	13	-
		5	4622	13	-
		Total[1]	-	19	-
		Mean	**4272**	**12**	-
		S.D.	**884**	**2**	-
		Minimum	3564	8	-
		Maximum	5653	13	-
Pooled References		Total[1]	-	80	-
		Mean	**7827**	**19**	**13**
		S.D.	**7823**	**6**	**12**
		Minimum	253	7	1
		Maximum	40585	29	56

S.D.: standard deviation.

[1]Total taxon richness is presented on a per five sample basis rather than on a per m^2 basis.

[2]Biomass was not measured in RF-4.

APPENDIX A, TABLE 7

COPCs in fish flesh with more than 50% of the values greater than the method detection limit.

COPC	Longnose Sucker					White Sucker					Lake Whitefish							Lake Trout							Northern Pike							
	Far-Field Exposure Areas			References		Far-Field Exposure Areas			References		Far-Field Exposure Areas				References			Far-Field Exposure Areas				References			Far-Field Exposure Areas				References			
	CR	FDL	WL	CL	PL	CR	FDL	WL	BL	CL	CR	CI	FDL	WL	CL	EB	PL	CR	CI	FDL	WL	CL	EB	PL	CR	CI	FDL	WL	BL	CL	EB	PL
Aluminum									✓																				✓			
Cadmium																																
Copper	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Iron	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lead								✓																					✓			
Mercury	✓	✓	✓	✓		✓	✓				✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓
Molybdenum																																
Nickel																																
Selenium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Uranium																																
Zinc	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lead-210																																
Polonium-210	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓								✓	✓	✓	✓	✓	✓	✓	✓
Radium-226																																
Thorium-230																																
Arsenic	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓			✓	✓
Cobalt	✓	✓		✓		✓	✓				✓																				✓	
Vanadium																																

CR: Cochrane River; FDL: Fond du Lac River; WL: Waterbury Lake; CL: Cree Lake; PL: Pasfield Lake; BL: Bobby's Lake; CI: Crackingstone Inlet; EB: Ellis Bay.
Shaded cells: Far-field exposure areas.
✓: indicates more than 50% of the samples have readings greater than the method detection limit (MDL) for a given area and species.
Refer to Appendix B, Table 18 for total sample sizes per area and species and for total number of readings less than the method detection limit. Refer to Appendix B, Tables 10 to 17 for detailed data.

APPENDIX A, TABLE 8

Correlations of individual COPCs with principal component axis scores for the 2011 and 2012 fish flesh and bone chemistry.

COPC	Lake Trout Flesh			
	PC1	**PC2**	**PC3**	**PC4**
Copper	**0.84**	-0.24	0.11	-
Iron	**0.87**	0.02	-0.24	-
Mercury	-0.29	0.23	**-0.87**	-
Selenium	0.51	**0.64**	0.29	-
Zinc	**0.68**	-0.40	-0.37	-
Arsenic	-0.23	**-0.85**	0.12	-
Eigenvalue	2.3	1.4	1.1	0.5
% of Variance	38.5	23.5	17.8	-

COPC	Lake Trout Bone			
	PC1	**PC2**	**PC3**	**PC4**
Copper	-0.36	**0.77**	-	-
Iron	**0.60**	0.38	-	-
Mercury	0.56	-0.49	-	-
Nickel	**0.66**	-0.13	-	-
Selenium	**0.82**	0.20	-	-
Zinc	0.36	**0.75**	-	-
Arsenic	**-0.74**	0.03	-	-
Eigenvalue	2.6	1.6	0.9	0.7
% of Variance	36.9	22.7	-	-

COPC	Northern Pike Flesh			
	PC1	**PC2**	**PC3**	**PC4**
Copper	**0.64**	0.59	-0.04	0.07
Iron	**0.71**	0.16	-0.14	0.55
Mercury	-0.42	0.31	**-0.68**	0.41
Selenium	-0.35	0.30	**0.61**	0.53
Zinc	**0.76**	0.29	0.08	-0.34
Polonium-210	0.38	**-0.60**	0.31	0.36
Arsenic	-0.36	**0.69**	0.35	-0.14
Eigenvalue	2.1	1.5	1.1	1.0
% of Variance	29.5	21.0	15.3	14.6

COPC	Northern Pike Bone			
	PC1	**PC2**	**PC3**	**PC4**
Copper	0.26	0.28	0.38	0.55
Iron	0.34	0.50	-0.17	-0.48
Mercury	0.13	**0.63**	-0.10	-0.15
Nickel	0.35	0.53	0.10	0.003
Selenium	**0.77**	0.04	-0.53	0.08
Uranium	**0.78**	-0.43	-0.33	-0.15
Zinc	0.55	0.38	0.24	0.46
Polonium-210	-0.27	**0.60**	-0.57	0.28
Arsenic	**0.69**	-0.53	0.21	0.08
Cobalt	0.30	0.40	**0.60**	-0.47
Eigenvalue	2.5	2.1	1.4	1.1
% of Variance	24.5	21.3	13.6	11.1

COPC	Lake Whitefish Flesh			
	PC1	**PC2**	**PC3**	**PC4**
Copper	**0.74**	0.20	-0.31	-
Iron	0.47	**0.64**	0.19	-
Mercury	**-0.72**	0.32	-0.05	-
Selenium	-0.14	-0.11	**0.86**	-
Zinc	**0.75**	-0.05	0.08	-
Polonium-210	**0.69**	-0.22	0.43	-
Arsenic	-0.45	0.29	0.31	-
Cobalt	0.12	**0.81**	0.08	-
Eigenvalue	2.6	1.4	1.2	0.9
% of Variance	32.2	17.0	14.7	-

COPC	Lake Whitefish Bone			
	PC1	**PC2**	**PC3**	**PC4**
Aluminum	**0.83**	-0.15	-0.15	-
Copper	-0.20	-0.48	-0.18	-
Iron	0.26	**0.73**	0.17	-
Lead	0.44	0.32	-0.44	-
Mercury	0.31	-0.17	0.37	-
Nickel	0.46	**0.60**	0.53	-
Selenium	0.50	0.17	-0.34	-
Uranium	**0.80**	-0.44	0.07	-
Zinc	-0.46	0.30	0.39	-
Polonium-210	-0.19	**0.62**	-0.55	-
Arsenic	0.51	-0.53	0.24	-
Cobalt	0.52	0.31	0.51	-
Vanadium	**0.66**	0.15	-0.48	-
Eigenvalue	3.4	2.4	1.8	1.3
% of Variance	26.1	18.2	13.9	9.8

APPENDIX A, TABLE 8

Correlations of individual COPCs with principal component axis scores for the 2011 and 2012 fish flesh and bone chemistry.

COPC	Longnose Sucker Flesh			
	PC1	PC2	PC3	PC4
Copper	**0.65**	-0.30	0.21	-
Iron	**0.86**	-0.20	0.04	-
Mercury	0.21	**0.70**	0.30	-
Selenium	0.51	0.55	-0.46	-
Zinc	0.35	**-0.74**	-0.13	-
Polonium-210	**0.66**	-0.03	0.15	-
Arsenic	0.36	0.28	**0.75**	-
Cobalt	0.45	0.26	**-0.72**	-
Eigenvalue	2.4	1.6	1.5	0.8
% of Variance	29.5	20.2	18.3	-

COPC	Longnose Sucker Bone			
	PC1	PC2	PC3	PC4
Copper	0.03	-0.43	-0.16	**0.78**
Iron	0.56	-0.27	-0.03	0.32
Molybdenum	-0.14	**0.86**	0.04	0.06
Nickel	**0.78**	0.36	0.23	-0.14
Selenium	0.35	0.53	-0.56	0.33
Zinc	**0.80**	-0.22	-0.26	-0.29
Polonium-210	0.16	-0.34	**0.85**	0.16
Arsenic	-0.004	**0.75**	0.44	0.32
Cobalt	**0.88**	0.06	0.13	0.01
Eigenvalue	2.5	2.1	1.4	1.1
% of Variance	27.9	23.8	15.4	11.7

COPC	White Sucker Flesh			
	PC1	PC2	PC3	PC4
Copper	**0.88**	0.07	-0.06	-
Iron	**0.60**	**0.61**	0.11	-
Mercury	0.59	-0.08	**-0.64**	-
Selenium	**0.78**	-0.30	-0.14	-
Zinc	0.42	0.38	**0.70**	-
Polonium-210	**0.63**	-0.48	0.19	-
Arsenic	0.34	**-0.68**	0.44	-
Cobalt	**0.87**	0.27	-0.10	-
Eigenvalue	3.5	1.4	1.2	0.6
% of Variance	44.0	17.3	14.6	-

COPC	White Sucker Bone			
	PC1	PC2	PC3	PC4
Copper	-0.38	0.02	0.48	**0.72**
Iron	0.07	**0.79**	-0.32	0.14
Molybdenum	**0.71**	-0.47	0.01	0.22
Nickel	0.38	**0.79**	0.26	-0.11
Selenium	0.47	-0.30	0.50	0.12
Uranium	**0.67**	-0.27	0.27	-0.51
Zinc	0.23	**0.83**	-0.08	0.08
Polonium-210	**0.73**	-0.16	-0.45	0.26
Arsenic	**0.82**	-0.11	-0.22	0.29
Cobalt	0.52	**0.60**	0.39	-0.04
Eigenvalue	3.0	2.7	1.1	1.0
% of Variance	29.9	27.1	11.2	10.4

Bolded values are COPCs with component loadings greater than 0.60 (disregarding positive or negative signs).
Principal Components (PC) with eigenvalues less than 1.0 or explaining less than 10% of the variance were not computed.

APPENDIX A, TABLE 9

Flesh chemistry of lake whitefish samples falling outside the reference 95% confidence ellipse, 2011 and 2012.

Parameter[1]	Lake Whitefish	
	Far-Field Exposure Areas	Pooled References
	Cochrane River	
	2011	2011-2012
	SP06-01	(Average ± 2 x S.D.)
	LW01	
Metals		
Copper	0.20	0.09[2]
		0.35[3]
Iron	3.3	-0.6[4]
		5.8
Mercury	0.070	-0.013
		0.064
Selenium	0.53	0.07
		0.56
Zinc	3.0	0.8
		8.7
Radionuclides		
Polonium-210 (Bq/g)	0.0006	-0.0029
		0.0075
Trace Elements		
Arsenic	0.14	-0.15
		0.35
Cobalt	0.0080	0.0001
		0.0049

Shaded cells indicate sample concentrations exceeding the pooled reference range (Average + 2 x S.D.).

S.D.: standard deviation.

For values measured at less than the method detection limit (MDL), all computations were performed with values set at the MDL.

[1]All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise.

[2]The first line within a given parameter is average - 2 x S.D.

[3]The second line within a given parameter is average + 2 x S.D.

[4]Ranges extend below zero when 2 x S.D. is larger than the average.

APPENDIX A, TABLE 10

Flesh chemistry of longnose sucker samples falling outside the reference 95% confidence ellipse, 2011 and 2012.

Parameter[1]	Longnose Sucker		
	Far-Field Exposure Areas		Pooled References
	Fond du Lac River		
	2011	2012	2011-2012
	SP06-02	SP07-01	(Average ± 2 x S.D.)
	LSU01	LSU08	
Metals			
Copper	0.27	0.22	0.14[2]
			0.37[3]
Iron	2.7	3.5	-1.45[4]
			7.71
Mercury	0.20	0.07	0.001
			0.041
Selenium	0.38	0.39	0.08
			0.52
Zinc	3.60	3.00	2.98
			6.90
Radionuclides			
Polonium-210 (Bq/g)	0.0023	0.0017	-0.0026
			0.0070
Trace Elements			
Arsenic	0.06	0.11	-0.02
			0.14
Cobalt	0.004	0.003	-0.0001
			0.0069

Shaded cells indicate sample concentrations exceeding the pooled reference range (Average + 2 x S.D.).

S.D.: standard deviation.

For values measured at less than the method detection limit (MDL), all computations were performed with values set at the MDL.

[1]All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise.
[2]The first line within a given parameter is average - 2 x S.D.
[3]The second line within a given parameter is average + 2 x S.D.
[4]Ranges extend below zero when 2 x S.D. is larger than the average.

APPENDIX A, TABLE 11

Flesh chemistry of white sucker samples falling outside the reference 95% confidence ellipse, 2011 and 2012.

Parameter[1]	White Sucker								
	Far-Field Exposure Areas								Pooled References
	Cochrane River		Fond du Lac River						
	2012		2011				2012		2011-2012
	SP1-2	SP4-1	SP05-01				SP3-2	SP6-1	(Average ± 2 x S.D.)
	WSU04	WSU12	WSU01	WSU02	WSU03	WSU04	WSU07	WSU03	
Metals									
Copper	0.34	0.34	0.43	0.65	0.33	0.34	0.25	0.36	0.12[2] 0.38[3]
Iron	4.6	2.5	5.7	8.0	2.8	2.9	1.3	2.9	0.52 5.94
Mercury	0.020	0.020	0.110	0.160	0.060	0.060	0.030	0.040	0.004 0.024
Selenium	0.310	0.290	0.320	0.440	0.370	0.270	0.290	0.320	0.109 0.319
Zinc	5.4	5.2	5.5	5.9	5.6	3.5	2.7	3.3	2.3 5.7
Radionuclides									
Polonium-210 (Bq/g)	0.0028	0.0032	0.0020	0.0012	0.0021	0.0025	0.0024	0.0020	-0.0005[4] 0.0019
Trace Elements									
Arsenic	0.11	0.13	0.05	0.05	0.20	0.08	0.09	0.13	-0.01 0.10
Cobalt	0.006	0.003	0.006	0.008	0.004	0.003	<0.002	0.003	0.0008 0.0042

Shaded cells indicate sample concentrations exceeding the pooled reference range (Average + 2 x S.D.).

S.D.: standard deviation.

For values measured at less than the method detection limit (MDL), all computations were performed with values set at the MDL.

[1]All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise

[2]The first line within a given parameter is average - 2 x S.D.

[3]The second line within a given parameter is average + 2 x S.D.

[4]Ranges extend below zero when 2 x S.D. is larger than the average.

APPENDIX A, TABLE 12

COPCs in fish bone with more than 50% of the values greater than the method detection limit.

	Longnose Sucker					White Sucker					Lake Whitefish							Lake Trout							Northern Pike							
	Far-Field Exposure Areas			References		Far-Field Exposure Areas			References		Far-Field Exposure Areas				References			Far-Field Exposure Areas				References			Far-Field Exposure Areas				References			
COPC	CR	FDL	WL	CL	PL	CR	FDL	WL	BL	CL	CR	CI	FDL	WL	CL	EB	PL	CR	CI	FDL	WL	CL	EB	PL	CR	CI	FDL	WL	BL	CL	EB	PL
Aluminum									✓		✓	✓	✓	✓	✓	✓	✓												✓			
Cadmium																																
Copper	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Iron	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lead											✓	✓			✓	✓	✓															
Mercury											✓		✓					✓	✓	✓	✓	✓	✓	✓	✓		✓				✓	
Molybdenum	✓	✓	✓			✓	✓	✓																								
Nickel	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Selenium	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Uranium		✓				✓	✓				✓	✓	✓			✓										✓						
Zinc	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lead-210																	✓															
Polonium-210	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓							✓	✓	✓	✓	✓	✓	✓		✓
Radium-226																	✓															
Thorium-230								✓																								
Arsenic	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				✓	✓
Cobalt		✓		✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	✓					✓		✓			✓			✓	✓	
Vanadium											✓	✓		✓		✓	✓															

CR: Cochrane River; FDL: Fond du Lac River; WL: Waterbury Lake; CL: Cree Lake; PL: Pasfield Lake; BL: Bobby's Lake; CI: Crackingstone Inlet; EB: Ellis Bay.

Shaded cells: Far-field exposure areas.

P: indicates more than 50% of the samples have readings greater than the method detection limit (MDL), for a given area and species.

Refer to Appendix B, Table 27 for total sample sizes per area and species and for total number of readings less than the method detection limit. Refer to Appendix B, Tables 19 to 26 for detailed data.

APPENDIX A, TABLE 13

Bone chemistry of lake trout samples falling outside the reference 95% confidence ellipse, 2011 and 2012.

Parameter[1]	Lake Trout			
	Far-Field Exposure Areas			Pooled References
	Cochrane River			
	2011			2011-2012
	AN01-01			(Average ± 2 x S.D.)
	LT01	LT04	LT05	
Metals				
Copper	**0.020**	**<0.02**	**<0.02**	0.021[2]
				0.278[3]
Iron	6.40	3.70	5.40	1.56
				7.44
Mercury	0.07	0.13	0.14	-0.04[4]
				0.14
Nickel	0.13	0.12	0.13	0.02
				0.15
Selenium	0.16	0.21	0.19	0.07
				0.33
Zinc	16	21	21	16
				35
Trace Elements				
Arsenic	0.09	0.04	0.06	-0.09
				0.33

Bolded values indicate sample concentrations below the pooled reference range (Average - 2 x S.D.).

S.D.: standard deviation.

For values measured at less than the method detection limit (MDL), all computations were performed with values set at the MDL.

[1]All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise.
[2]The first line within a given parameter is average - 2 x S.D.
[3]The second line within a given parameter is average + 2 x S.D.
[4]Ranges extend below zero when 2 x S.D. is larger than the average.

APPENDIX A, TABLE 14

Bone chemistry of northern pike samples falling outside the reference 95% confidence ellipse, 2011 and 2012.

Parameter[1]	Northern Pike																	
	Far-Field Exposure Areas																	Pooled References
	Cochrane River						Crackingstone Inlet										Waterbury Lake	
	2011			2012			2011					2012					2012	2011-2012
	AN01-01	AN02-01		SP1-2	SP4-1	SP6-1	SP01-01					AN01-01					SP7-1	(Average ± 2 x S.D.)
	NP06	NP02	NP03	NP01	NP02	NP01	NP01	NP02	NP03	NP04	NP05	NP01	NP02	NP03	NP04	NP05	NP02	
Metals																		
Copper	0.20	0.21	0.16	0.09	0.11	0.13	0.15	0.12	0.16	0.13	0.14	0.12	0.20	0.17	0.22	0.23	0.19	0.08[2] 0.33[3]
Iron	2.5	23.0	3.9	1.9	4.9	2.0	4.9	3.9	2.8	3.9	4.0	2.5	5.9	3.6	2.2	5.7	3.6	0.7 5.9
Mercury	0.07	0.03	0.04	<0.01	0.02	0.01	0.02	<0.01	0.01	0.02	0.02	<0.01	0.02	<0.01	<0.01	0.02	0.04	0.003 0.023
Nickel	0.09	0.07	0.09	**0.02**	0.04	**0.03**	0.09	0.09	0.07	0.12	0.11	0.05	0.08	0.06	0.05	0.05	0.08	0.032 0.128
Selenium	0.19	0.20	0.18	0.11	0.10	0.12	0.32	0.33	0.23	0.24	0.28	0.27	0.28	0.22	0.22	0.42	0.18	0.09 0.20
Uranium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.29	0.20	0.05	0.15	0.28	0.21	0.17	0.06	0.09	0.16	<0.01	<0.01 <0.01
Zinc	61	55	90	37	**24**	43	61	68	70	57	55	42	63	57	65	53	70	35.8 75.1
Radionuclides																		
Polonium-210 (Bq/g)	0.002	0.002	0.001	0.002	<0.0005	0.002	0.001	0.0008	<0.0005	<0.0005	0.0008	0.0006	0.001	<0.0005	<0.0005	0.001	0.002	-0.0001[4] 0.0017
Trace Elements																		
Arsenic	0.03	0.03	0.04	0.03	0.03	0.03	0.08	0.17	0.15	0.12	0.14	0.16	0.12	0.13	0.13	0.10	0.02	-0.077 0.195
Cobalt	0.01	0.02	0.02	<0.01	0.01	<0.01	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.02	0.01	0.01	0.02	0.004 0.028

Shaded cells indicate sample concentrations exceeding the pooled reference range (Average + 2 x S.D.).

Bolded values indicate sample concentrations below the pooled reference range (Average - 2 x S.D.).

S.D.: standard deviation.

For values measured at less than the method detection limit (MDL), all computations were performed with values set at the MDL.

When all values were less than the method detection limit (MDL), standard deviations were not computed.

[1]All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise.

[2]The first line within a given parameter is average - 2 x S.D.

[3]The second line within a given parameter is average + 2 x S.D.

[4]Ranges extend below zero when 2 x S.D. is larger than the average.

APPENDIX A, TABLE 15

Bone chemistry of lake whitefish samples falling outside the reference 95% confidence ellipse, 2011 and 2012.

Parameter[1]	Lake Whitefish	
	Far-Field Exposure Areas	Pooled References
	Crackingstone Inlet	
	2011	2011-2012
	SP01-01	(Average ± 2 x S.D.)
	LW09	
Metals		
Aluminum	1.9	-0.7[2, 3]
		3.6[4]
Copper	0.13	-0.03
		0.35
Iron	5.4	-12.7
		28.7
Lead	0.020	-0.004
		0.064
Mercury	<0.01	0.002
		0.022
Nickel	0.12	-0.01
		0.20
Selenium	1.8	0.08
		0.45
Uranium	1.8	-0.39
		0.71
Zinc	36	15
		65
Radionuclides		
Polonium-210 (Bq/g)	0.002	-0.005
		0.018
Trace Elements		
Arsenic	0.18	-0.13
		0.38
Cobalt	0.020	0.008
		0.028
Vanadium	2	-0.03
		0.28

Shaded cells indicate sample concentrations exceeding the pooled reference range (Average + 2 x S.D.).

S.D.: standard deviation.

For values measured at less than the method detection limit (MDL), all computations were performed with values set at the MDL.

When all values were less than the method detection limit (MDL), standard deviations were not computed.

[1]All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise.

[2]The first line within a given parameter is average - 2 x S.D.

[3]Ranges extend below zero when 2 x S.D. is larger than the average.

[4]The second line within a given parameter is average + 2 x S.D.

APPENDIX A, TABLE 16

Bone chemistry of longnose sucker samples falling outside the reference 95% confidence ellipse, 2011 and 2012.

Parameter[1]	Longnose Sucker																	
	Far-Field Exposure Areas																	Pooled References
	Cochrane River				Fond du Lac River								Waterbury Lake					
	2011		2012		2011					2012			2011					2011-2012
	SP06-01		SP3-1	SP3-1, SP5-1	SP05-01			SP06-02		SP7-1			SP08-01					(Average ± 2 x S.D.)
	LSU02	LSU03	LSU09, LSU10	LSU11, LSU02	LSU06	LSU07	LSU11	LSU01	LSU02	LSU05, LSU06	LSU07	LSU08	LSU11, LSU12	LSU13	LSU14	LSU15, LSU16	LSU17, LSU18	
Metals																		
Copper	0.20	0.19	0.29	0.35	0.24	0.19	0.20	0.24	0.21	0.33	0.34	0.36	0.20	0.16	0.21	0.22	0.17	-0.06[2, 3] 0.73[4]
Iron	18.0	5.1	4.5	5.2	3.5	6.6	5.9	4.0	3.4	3.8	6.1	4.3	3.3	3.6	4.5	4.1	2.8	-0.69 14.34
Molybdenum	0.32	0.23	0.27	0.16	0.23	0.31	0.33	0.16	0.23	0.36	0.28	0.34	0.19	0.15	0.43	0.22	0.25	<0.05 <0.05
Nickel	0.11	0.11	**0.02**	0.06	0.08	0.20	0.15	0.10	0.08	0.13	0.08	0.10	0.09	0.07	0.07	0.07	0.07	0.022 0.141
Selenium	0.330	0.310	0.280	0.220	0.320	0.360	0.320	0.340	0.280	0.250	0.230	0.310	0.350	0.250	0.190	0.190	0.200	0.147 0.327
Zinc	25	24	18	15	17	37	33	18	17	30	17	23	26	21	21	25	23	14.8 40.5
Radionuclides																		
Polonium-210 (Bq/g)	0.004	0.002	0.002	0.002	0.002	0.005	0.003	0.003	0.001	0.002	0.003	0.003	0.001	0.002	0.002	0.002	0.0009	-0.0073 0.0206
Trace Elements																		
Arsenic	0.10	0.11	0.14	0.08	0.18	0.09	0.10	0.09	0.11	0.12	0.10	0.06	0.04	0.03	0.03	0.06	0.05	0.00001 0.08749
Cobalt	0.02	0.02	<0.01	0.01	0.01	0.03	0.03	0.02	0.01	0.02	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.003 0.033

Shaded cells indicate samples concentrations exceeding the pooled reference range (Average + 2 x S.D.).

Bolded values indicate sample concentrations below the pooled reference range (Average - 2 x S.D.).

S.D.: standard deviation.

For values measured at less than the method detection limit (MDL), all computations were performed with values set at the MDL.

When all values were less than the method detection limit (MDL), standard deviations were not computed.

[1]All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise.

[2]The first line within a given parameter is average - 2 x S.D.

[3]Ranges extend below zero when 2 x S.D. is larger than the average.

[4]The second line within a given parameter is average + 2 x S.D.

APPENDIX A, TABLE 17

Bone chemistry of white sucker samples falling outside the reference 95% confidence ellipse, 2011 and 2012.

Parameter[1]	White Sucker															
	Far-Field Exposure Areas															Pooled References
	Cochrane River				Fond du Lac River										Waterbury Lake	
	2012				2011					2012					2012	2011-2012
	SP1-2			SP3-1	SP05-01					SP3-2			SP6-1	SP7-1	SP7-1	
	WSU02	WSU03	WSU04	WSU12	WSU01	WSU02	WSU03	WSU04	WSU05	WSU07	WSU08	WSU09	WSU03	WSU03	WSU09, WSU10, WSU11	(Average ± 2 x S.D.)
Metals																
Copper	0.22	0.24	0.28	0.28	0.26	0.40	0.28	0.19	0.27	0.32	0.38	0.51	0.33	0.28	0.39	0.11[2] 0.62[3]
Iron	3.1	3.9	4.7	3.2	5.5	3.8	5.4	2.4	6.6	9.4	4.9	5	3.5	5.1	5.3	-5.8[4] 24.1
Molybdenum	0.07	0.10	0.18	0.24	0.07	0.10	0.16	0.21	0.09	0.23	0.10	0.16	0.24	0.15	0.36	0.02 0.09
Nickel	0.04	0.06	0.05	0.05	0.08	0.08	0.13	0.09	0.12	0.07	0.07	0.08	0.07	0.08	0.06	0.007 0.169
Selenium	0.160	0.240	0.270	0.230	0.270	0.310	0.310	0.170	0.200	0.210	0.170	0.210	0.210	0.190	0.160	0.085 0.267
Uranium	0.01	0.02	0.02	0.02	0.02	0.03	0.02	0.08	0.06	0.01	0.02	0.01	0.02	0.02	<0.01	<0.01 0.01
Zinc	15	21	20	21	20	17	22	17	26	20	17	18	17	21	23	7.5 39.4
Radionuclides																
Polonium-210 (Bq/g)	0.00500	0.00300	0.00400	0.00500	0.00200	0.00300	0.00500	0.00700	0.00100	0.00400	0.00500	0.00300	0.00600	0.00400	0.00500	-0.00009 0.00399
Trace Elements																
Arsenic	0.030	0.050	0.080	0.080	0.050	0.050	0.120	0.070	0.040	0.070	0.040	0.080	0.080	0.060	0.040	0.006 0.064
Cobalt	0.010	0.010	0.020	0.020	0.020	0.020	0.030	0.020	0.030	0.020	0.020	0.010	0.020	0.020	0.020	0.008 0.029

Shaded cells indicate sample concentrations exceeding the pooled reference range (Average + 2 x S.D.).

S.D.: standard deviation.

For values measured at less than the method detection limit (MDL), all computations were performed with values set at the MDL.

[1]All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise.

[2]The first line within a given parameter is average - 2 x S.D.

[3]The second line within a given parameter is average + 2 x S.D.

[4]Ranges extend below zero when 2 x S.D. is larger than the average.

APPENDIX B

DETAILED DATA TABLES

LIST OF TABLES

APPENDIX B, TABLE 1

Detailed water chemistry results for the EARMP technical program, 2011 and 2012.

Parameter[1]	Far-Field Exposure Areas							
	Cochrane River		Crackingstone Inlet		Fond du Lac River		Waterbury Lake	
	2011	2012	2011	2012	2011	2012	2011	2012
Inorganic Ions								
Bicarbonate	20	17	30	44	21	18	7	18
Calcium	3.5	3.5	7.1	10	3.4	3.4	1.9	1.9
Carbonate	<1	<1	<1	<1	<1	<1	<1	<1
Chloride	0.3	0.3	3.2	3.9	0.3	0.3	0.6	0.6
Hydroxide	<1	<1	<1	<1	<1	<1	<1	<1
Magnesium	1	1	2.2	2.8	0.9	1	0.5	0.5
Potassium	0.6	0.6	0.9	0.9	0.6	0.6	0.5	0.4
Sodium	1.4	1.4	2.7	4.7	1.4	1.4	1.6	1.6
Sulfate	4.6	4	3.8	7.2	4.4	4	1.1	1.3
Metals								
Aluminum	0.0052	0.0058	0.012	0.0055	0.012	0.0057	0.0009	0.0013
Barium	0.0041	0.004	0.011	0.019	0.0046	0.0044	0.0027	0.0026
Boron	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	<0.00001	<0.00001	<0.00001	<0.00001	0.00001	0.00001	0.00001	<0.00001
Chromium	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper	<0.0002	<0.0002	0.0002	0.0002	<0.0002	0.048	<0.0002	<0.0002
Iron	0.025	0.023	0.020	0.013	0.030	0.027	0.012	0.0097
Lead	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Manganese	0.0055	0.0054	0.0012	0.002	0.0064	0.009	0.011	0.011
Mercury (µg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum	0.0013	0.0012	0.0002	0.0006	0.0012	0.0012	0.0016	0.0014
Nickel	<0.0001	<0.0001	0.0002	0.0002	<0.0001	0.0001	0.0001	<0.0001
Selenium	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Silver	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Thallium	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tin	<0.0001	0.0019	<0.0001	0.0017	<0.0001	0.0017	<0.0001	0.0009
Titanium	<0.0002	<0.0002	0.0005	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium (µg/L)	<0.1	<0.1	0.5	14	<0.1	<0.1	<0.1	<0.1
Zinc	0.0078	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	0.0007	<0.0005
Nutrients								
Ammonia as nitrogen	<0.01	<0.01	<0.01	0.07	0.01	<0.01	<0.01	<0.01
Nitrate	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Organic carbon	2.4	2.8	2.8	4	2.9	2.8	1.8	2
Organic carbon, dissolved	-	-	-	-	-	-	-	-
Phosphorus	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Kjeldahl nitrogen	0.26	0.19	0.32	0.26	0.15	0.21	0.25	0.21
Total nitrogen	0.26	0.19	0.32	0.26	0.15	0.21	0.25	0.21
Physical Properties								
P. alkalinity	<1	<1	<1	<1	<1	<1	<1	<1
pH (pH units)	7.12	7.05	7.46	7.58	7.18	7.26	6.97	6.94
Specific conductivity (µS/cm)	35	33	68	97	36	34	23	21
Sum of ions	31	28	50	74	32	29	13	24
Total alkalinity	16	14	25	36	17	15	6	15
Total dissolved solids	27	23	44	67	30	30	22	26
Total hardness	13	13	27	36	12	12	7	7
Total suspended solids	1	1	<1	<1	<1	1	<1	<1
Turbidity (NTU)	0.5	0.2	0.5	0.2	0.5	0.1	0.3	0.5
Radionuclides								
Lead-210 (Bq/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Polonium-210 (Bq/L)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Radium-226 (Bq/L)	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005
Thorium-230 (Bq/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Trace Elements								
Antimony	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Arsenic (µg/L)	0.1	<0.1	0.2	0.2	<0.1	0.1	0.1	<0.1
Beryllium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Fluoride	0.06	0.05	0.06	0.08	0.06	0.06	0.03	0.02
Strontium	0.012	0.012	0.054	0.067	0.012	0.012	0.015	0.015
Vanadium	<0.0001	<0.0001	0.0002	0.0002	<0.0001	<0.0001	<0.0001	<0.0001

APPENDIX B, TABLE 1

Detailed water chemistry results for the EARMP technical program, 2011 and 2012.

Parameter[1]	References									
	Bobby's Lake		Cree Lake		Ellis Bay		Pasfield Lake		RF-4	
	2009	2012	2011	2012	2011	2012	2011	2012	2008	2012
Inorganic Ions										
Bicarbonate	11	16	12	17	34	30	6	7	18	26
Calcium	1.5	1.6	1.8	1.8	7	7.1	1.6	1.6	3.7	3.4
Carbonate	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chloride	0.2	0.2	0.4	0.4	3	2.9	1.1	1	0.3	0.3
Hydroxide	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Magnesium	0.5	0.4	0.6	0.7	2	2	0.3	0.3	1.1	1
Potassium	0.4	0.4	0.4	0.4	0.9	0.8	0.4	0.4	0.8	0.6
Sodium	1.2	1.2	1.2	1.2	2.5	2.6	1.3	1.2	1.6	1.5
Sulfate	0.7	0.9	0.9	1.2	3.7	3.7	0.7	0.7	3.3	3
Metals										
Aluminum	0.0056	0.0072	0.0024	0.003	0.0023	0.0017	<0.0005	0.0009	0.0033	0.0021
Barium	0.0035	0.0031	0.0031	0.0032	0.01	0.01	0.0022	0.0022	0.0049	0.0043
Boron	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	<0.0001	0.00002	<0.00001	<0.00001	0.00002	<0.00001	<0.00001	0.00001	<0.0001	<0.00001
Chromium	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Iron	0.079	0.190	0.025	0.016	0.007	0.0058	0.003	0.0039	0.015	0.014
Lead	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Manganese	0.0093	0.022	0.0094	0.0098	0.0012	0.0009	0.0012	0.0015	0.0018	0.0018
Mercury (µg/L)	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01
Molybdenum	0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0002	<0.0001	<0.0001	0.0005	0.0003
Nickel	0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0002	<0.0001	<0.0001	0.0001	0.0001
Selenium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Silver	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0001	<0.00005
Thallium	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tin	<0.0001	<0.0001	<0.0001	0.0018	<0.0001	0.0012	<0.0001	0.0013	0.0004	<0.0001
Titanium	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Uranium (µg/L)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Zinc	0.0043	0.0039	0.001	<0.0005	<0.0005	<0.0005	0.017	<0.0005	0.0032	<0.0005
Nutrients										
Ammonia as nitrogen	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.14	<0.01
Nitrate	0.13	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	<0.04
Organic carbon	2.3	3.6	1.8	2	2.8	3.4	0.7	0.8	4.2	3.9
Organic carbon, dissolved	2.4	3.5	-	-	-	-	-	-	4.1	3.6
Phosphorus	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Total Kjeldahl nitrogen	0.12	0.20	0.36	0.26	0.2	0.22	0.2	0.12	0.22	0.25
Total nitrogen	-	-	0.36	0.26	0.2	0.22	0.2	0.12	-	-
Physical Properties										
P. alkalinity	-	<1	<1	<1	<1	<1	<1	<1	-	<1
pH (pH units)	6.44	6.94	6.96	6.95	7.44	7.38	6.87	6.88	7.37	6.93
Specific conductivity (µS/cm)	18	20	21	19	66	67	19	17	39	34
Sum of ions	16	21	17	23	53	49	11	12	29	36
Total alkalinity	9	13	10	14	28	25	5	6	15	21
Total dissolved solids	29	13	19	20	45	49	13	19	36	33
Total hardness	6	6	7	7	26	26	5	5	14	12
Total suspended solids	1	2	1	1	<1	<1	<1	<1	<1	<1
Turbidity (NTU)	0.8	1.0	0.4	0.4	0.4	0.3	0.3	0.4	0.2	0.3
Radionuclides										
Lead-210 (Bq/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-
Polonium-210 (Bq/L)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	-	-
Radium-226 (Bq/L)	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	0.005	0.006	<0.005
Thorium-230 (Bq/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	-	-
Trace Elements										
Antimony	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Arsenic (µg/L)	<0.1	<0.1	0.1	0.1	0.1	0.1	<0.1	<0.1	0.1	<0.1
Beryllium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Cobalt	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Fluoride	0.02	0.01	0.03	0.02	0.06	0.07	0.03	0.02	0.06	0.04
Strontium	0.012	0.013	0.015	0.015	0.051	0.054	0.017	0.017	0.016	0.013
Vanadium	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

[1]All values are in mg/L, unless specified otherwise.

APPENDIX B, TABLE 2

Detailed particle size and organic carbon content data for the EARMP technical program, 2011 and 2012.

Area	Year	Sample	Clay	Silt	Fine Particles	Fine Sand	Coarse Sand	Total Sand	Gravel	Moisture	Organic Carbon
Cochrane River	2011	1	28.1	65.3	93.4	5.1	1.0	6.1	0.4	69.3	6.9
		2	25.5	64.3	89.8	9.5	0.3	9.8	0.5	73.1	7.4
		3	24.8	65.3	90.1	9.4	0.5	9.9	<0.1	66.4	7.6
		4	31.3	64.7	96.0	3.9	0.2	4.1	<0.1	72.9	7.2
		5	25.0	68.2	93.2	6.5	0.4	6.9	<0.1	69.5	6.8
	2012	1	14.6	82.2	96.8	2.7	0.5	3.2	<0.1	87.3	7.3
		2	10.6	87.5	98.1	1.8	0.1	1.9	<0.1	89.4	7.7
		3	12.8	80.2	93.0	6.8	0.2	7.0	<0.1	86.0	6.2
		4	16.6	80.7	97.3	2.4	0.4	2.7	<0.1	85.7	6.3
		5	15.1	82.6	97.7	2.1	0.3	2.3	<0.1	87.7	7.0
Crackingstone Inlet	2011	1	3.7	43.7	47.4	42.7	10.0	52.7	<0.1	30.9	1.1
		2	3.1	52.9	56.0	37.8	6.2	44.0	<0.1	36.0	0.9
		3	5.1	40.8	45.9	42.8	11.3	54.1	<0.1	35.5	1.0
		4	6.5	58.7	65.2	29.1	5.7	34.8	<0.1	54.3	1.8
		5	12.3	68.5	80.8	18.2	1.0	19.2	<0.1	52.8	1.8
	2012	1	3.4	47.9	51.3	37.2	11.5	48.7	<0.1	42.3	1.5
		2	5.0	62.9	67.9	25.2	6.9	32.1	<0.1	43.1	1.2
		3	2.7	44.6	47.3	41.2	11.4	52.6	<0.1	36.3	1.2
		4	5.2	57.3	62.5	27.7	9.8	37.5	<0.1	41.7	1.4
		5	5.3	78.3	83.6	15.4	1.0	16.4	<0.1	56.3	2.0
Fond du Lac River	2011	1	8.0	67.4	75.4	5.0	19.5	24.5	<0.1	-	7.7
		2	7.3	90.2	97.5	1.4	1.1	2.5	<0.1	-	11.4
		3	6.0	90.5	96.5	2.7	0.9	3.6	<0.1	-	10.0
		4	4.9	91.2	96.1	3.0	1.0	4.0	<0.1	-	10.6
		5	4.3	88.5	92.8	6.0	1.2	7.2	<0.1	-	10.1
	2012	1	33.1	60.9	94.0	3.5	2.4	6.0	<0.1	90.2	10.6
		2	22.3	73.8	96.1	2.5	1.4	3.9	<0.1	91.2	11.7
		3	18.2	70.4	88.6	3.7	7.7	11.4	<0.1	87.6	9.2
		4	8.3	33.0	41.3	29.2	29.4	58.6	<0.1	82.8	5.6
		5	14.0	39.0	53.0	17.5	29.5	47.0	<0.1	85.0	7.6
Waterbury Lake	2011	1	5.1	21.9	27.0	27.1	45.7	72.8	0.1	57.0	2.8
		2	9.3	18.8	28.1	32.9	39.0	71.9	<0.1	63.5	5.1
		3	3.2	7.3	10.5	20.4	68.8	89.2	0.4	42.7	2.1
		4	2.9	8.9	11.7	38.2	50.1	88.3	<0.1	53.5	2.8
		5	1.5	6.7	8.1	24.0	67.9	91.9	<0.1	56.3	2.4
	2012	1	5.2	21.1	26.3	33.0	40.8	73.8	<0.1	84.9	5.0
		2	4.3	18.7	23.0	39.3	37.8	77.1	<0.1	85.7	5.2
		3	2.5	10.3	12.8	43.5	43.6	87.1	<0.1	53.9	0.8
		4	2.7	10.9	13.6	31.4	54.9	86.3	<0.1	81.4	3.5
		5	1.9	5.5	7.5	26.6	65.9	92.5	0.1	69.7	2.1

APPENDIX B, TABLE 2

Detailed particle size and organic carbon content data for the EARMP technical program, 2011 and 2012.

Area	Year	Sample	Clay	Silt	Fine Particles	Fine Sand	Coarse Sand	Total Sand	Gravel	Moisture	Organic Carbon
Bobby's Lake	2009[2]	1	17.0	37.0	54.0	39.0	8.0	47.0	<1	70.5	5.5
		2	19.0	39.0	58.0	31.0	11.0	42.0	<1	84.3	5.7
		3	27.0	62.0	89.0	8.0	2.0	10.0	<1	94.1	8.5
		4	32.0	57.0	89.0	10.0	1.0	11.0	<1	85.9	9.3
		5	31.0	62.0	93.0	5.0	1.0	6.0	<1	87.9	9.3
	2012	1	17.5	79.4	96.9	2.7	0.4	3.1	<0.1	-	11.3
		2	18.7	50.6	69.3	24.6	6.1	30.7	<0.1	-	11.6
		3	3.1	24.7	27.8	55.8	16.5	72.3	<0.1	-	3.2
		4	6.9	32.9	39.8	38.0	22.2	60.2	<0.1	-	3.0
		5	10.1	42.4	52.5	41.4	6.2	47.6	<0.1	-	7.2
Cree Lake	2011	1	5.0	33.6	38.6	30.1	31.2	61.3	0.1	65.1	3.2
		2	2.8	35.6	38.4	36.9	24.7	61.6	<0.1	68.5	5.2
		3	0.2	6.8	7.0	29.2	63.8	93.0	0.1	42.6	1.2
		4	0.6	6.2	6.8	22.2	70.8	93.0	0.2	40.1	1.2
		5	5.3	58.6	63.9	17.1	18.5	35.6	0.5	74.2	9.0
	2012	1	3.2	16.2	19.4	35.6	45.0	80.6	<0.1	78.0	4.0
		2	2.1	10.2	12.3	34.9	52.8	87.7	<0.1	71.7	2.6
		3	3.3	15.3	18.6	40.9	40.5	81.4	<0.1	78.8	4.1
		4	4.1	18.9	23.0	37.3	39.7	77.0	<0.1	80.6	4.5
		5	2.4	13.3	15.7	40.1	44.1	84.2	<0.1	77.7	3.3
Ellis Bay	2011	1	37.8	60.3	98.1	1.2	0.7	1.9	<0.1	60.7	3.8
		2	43.8	55.2	99.0	0.8	0.2	1.1	<0.1	60.8	3.5
		3	39.7	59.5	99.2	0.5	0.3	0.8	<0.1	71.5	4.8
		4	35.4	64.3	99.7	0.1	0.2	0.3	<0.1	61.4	4.5
		5	36.3	63.4	99.7	0.1	0.1	0.2	<0.1	69.9	4.0
	2012	1	25.4	72.7	98.1	1.1	0.8	1.9	<0.1	80.0	4.3
		2	24.4	74.7	99.1	0.6	0.3	0.9	<0.1	80.6	4.2
		3	34.0	65.7	99.7	0.2	0.1	0.3	<0.1	82.1	5.3
		4	32.5	67.1	99.6	0.3	0.2	0.4	<0.1	79.7	4.4
		5	33.2	66.6	99.8	<0.1	0.1	0.2	<0.1	79.9	4.2
Pasfield Lake	2011	1	0.1	2.3	2.4	15.8	81.7	97.5	0.1	44.6	1.4
		2	0.2	2.0	2.2	14.7	82.9	97.6	0.3	38.8	1.4
		3	<0.1	1.0	1.1	10.5	88.3	98.8	0.2	41.9	1.4
		4	5.1	15.5	20.6	24.1	55.3	79.4	<0.1	66.4	5.8
		5	0.1	0.5	0.6	11.2	88.1	99.3	0.1	26.6	0.6
	2012	1	1.8	3.8	5.6	15.8	78.5	94.3	<0.1	73.3	3.5
		2	0.7	1.6	2.3	8.2	89.5	97.7	<0.1	50.1	1.0
		3	0.4	1.7	2.2	9.6	88.1	97.7	0.2	50.7	1.5
		4	2.7	12.4	15.1	19.5	65.4	84.9	<0.1	78.9	6.1
		5	0.5	0.7	1.2	9.6	89.1	98.7	<0.1	37.9	0.7
RF-4	2008[3]	1	36.0	45.0	81.0	18.0	1.0	19.0	<1	-	14.4
		2	30.0	45.0	75.0	24.0	1.0	25.0	<1	-	5.0
		3	44.0	43.0	87.0	11.0	2.0	13.0	<1	-	16.5
		4	30.0	43.0	73.0	22.0	4.0	26.0	<1	-	5.9
		5	36.0	39.0	75.0	24.0	1.0	25.0	<1	-	6.3
	2012	1	6.0	57.8	63.8	27.6	8.6	36.2	<0.1	-	7.4
		2	4.4	54.7	59.1	31.6	9.4	41.0	<0.1	-	7.8
		3	7.8	55.1	62.9	24.5	12.7	37.2	0.2	-	11.1
		4	8.5	52.3	60.8	30.5	8.7	39.2	<0.1	-	6.6
		5	9.0	51.1	60.1	32.7	7.2	39.9	<0.1	-	5.2

[1]All concentrations are in % dry weight.

[2]No data were available for 2011 in Bobby's Lake, thus data from 2009 were used as a substitute.

[3]No data were available for 2011 in RF-4, thus data from 2008 were used as a substitute.

APPENDIX B, TABLE 3

Detailed sediment chemistry results for the EARMP technical program, 2011 and 2012.

Parameter[1]	Far-Field Exposure Areas																			
	Cochrane River										Crackingstone Inlet									
	2011					2012					2011					2012				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Metals																				
Aluminum	12000	12400	12200	12100	12100	9100	8600	8100	9600	9200	8600	7900	7600	11800	12500	7800	5700	6100	10200	9900
Barium	80	80	77	80	82	70	60	58	65	58	55	47	50	65	74	56	38	44	58	64
Boron	6	6	6	6	6	2	1	1	1	<1	8	7	6	11	13	6	4	4	8	10
Cadmium	0.3	0.4	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium	23	22	22	22	23	17	16	15	18	17	17	14	15	32	23	16	11	13	26	20
Copper	7.9	7.8	7.6	8.1	7.8	6.7	5.8	5.5	6.5	6.2	3.6	2.7	2.7	7.7	6.6	3.7	2.4	2.5	6.1	5.5
Iron	16800	18200	18800	19300	20800	20200	15200	17000	16300	15000	10600	9200	10100	15300	15200	12700	8400	10300	13800	15600
Lead	11	10	9.2	9.6	9.3	7.8	7.4	6.8	8.4	7.5	4.4	4	4	11	7	4.3	3.1	3.2	15	5.5
Manganese	240	230	250	250	280	240	160	190	170	150	220	180	210	220	370	260	140	200	250	300
Molybdenum	6.2	6.8	6.4	6.6	5.6	4.9	5.2	3.7	4.4	4.1	0.5	0.4	0.5	1.4	0.8	0.7	0.3	0.6	0.6	0.6
Nickel	12	12	11	12	11	9	8.2	7.6	9.3	8.4	6.6	5.7	5.5	9.7	10	6.6	4.5	5	8.2	8.3
Selenium	0.6	0.6	0.6	0.7	0.5	0.6	0.5	0.5	0.5	0.5	0.8	0.6	0.5	1.1	1.1	0.8	0.6	0.6	0.6	1.2
Silver	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Thallium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Tin	1	0.8	0.8	0.7	0.8	0.6	0.6	0.5	0.6	0.6	0.4	0.4	0.3	0.6	0.6	0.4	0.3	0.3	0.5	0.5
Titanium	870	900	890	850	920	720	680	690	740	740	720	780	640	880	990	690	530	510	660	780
Uranium	4.6	4.4	4.2	4.4	4.3	3.8	3.4	3.3	4	3.9	38	23	25	67	54	46	19	27	42	48
Zinc	43	42	41	41	41	33	33	28	34	33	15	14	14	22	23	14	10	12	18	19
Physical Properties																				
Loss on ignition (%)	16.28	16.18	14.79	17.3	16.41	18.3	16.83	15.75	17.19	16.04	2.46	1.86	1.83	3.73	4.15	3.46	2.17	2.57	3.83	4.67
Moisture (%)	90.61	91.54	91.15	92.45	92.14	93.16	91.84	90.73	91.25	88.53	43.06	38.59	34.9	57.78	64.65	46.78	46.68	47.04	59.06	63.74
Radionuclides																				
Lead-210 (Bq/g)	0.41	0.42	0.37	0.38	0.35	0.35	0.35	0.28	0.4	0.26	0.17	0.07	0.11	0.4	0.17	0.13	0.05	0.1	0.2	0.14
Polonium-210 (Bq/g)	0.43	0.42	0.31	0.35	0.37	0.42	0.38	0.34	0.37	0.25	0.14	0.12	0.13	0.47	0.21	0.16	0.12	0.14	0.24	0.18
Radium-226 (Bq/g)	0.04	0.05	0.06	<0.01	<0.01	0.02	<0.01	<0.01	0.02	<0.01	0.09	<0.01	0.01	0.51	0.1	0.18	0.1	0.28	1.5	0.33
Thorium-230 (Bq/g)	0.02	0.04	0.02	0.05	<0.02	0.02	0.03	0.03	0.03	0.03	5	2.8	7.7	26	4.8	4.7	2.4	5.6	14	0.8
Trace Elements																				
Antimony	<0.2	<0.2	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic	2.2	2.2	2	2	2.1	1.6	1.5	1.4	1.7	1.8	2.6	1.7	4.9	9.8	3.7	3.5	1.6	4.5	4	3.7
Beryllium	0.6	0.6	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.5	0.4	0.3	0.2	0.2	0.3	0.3
Cobalt	3.7	3.6	3.4	3.5	3.4	2.5	2.4	2.3	2.7	2.6	2.7	2.6	2.6	3.8	3.7	2.6	1.9	2.2	3	3
Strontium	20	20	20	19	20	17	16	16	17	16	30	32	28	39	47	32	24	24	34	40
Vanadium	26	25	25	25	26	20	18	19	21	20	36	31	31	280	50	34	24	29	131	43

APPENDIX B, TABLE 3

Detailed sediment chemistry results for the EARMP technical program, 2011 and 2012.

Parameter[1]	Far-Field Exposure Areas																			
	Fond du Lac River										Waterbury Lake									
	2011					2012					2011					2012				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Metals																				
Aluminum	14200	12600	12100	12900	13400	11300	11700	12300	16400	17600	6000	4300	3100	2300	2300	3500	3600	3900	2600	2400
Barium	170	170	240	190	150	110	120	210	140	140	59	66	41	24	42	48	53	55	32	32
Boron	1	1	<1	1	<1	4	3	3	<1	<1	4	3	3	2	2	<1	<1	<1	<1	<1
Cadmium	0.4	0.5	0.7	0.5	0.6	0.4	0.5	0.5	0.3	0.6	<0.1	0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.1
Chromium	24	21	21	23	23	19	19	20	76	28	10	8.2	6.7	3.5	4.1	6.7	6.7	7.4	4.4	4.2
Copper	12	12	11	12	11	9.7	10	11	5.6	10	2.8	2.3	1.4	0.7	1	1.9	1.9	2.2	1	0.9
Iron	54300	49500	96900	80900	83400	42400	39500	86700	148000	90200	5400	8200	3600	2200	1300	4900	6400	6200	3200	3200
Lead	7.9	13	11	13	12	7.4	9.2	10	7.8	8.5	3.4	5.3	3.6	2.4	2.6	4.0	4.5	4.5	2.2	2.2
Manganese	2440	2190	4510	3090	2840	1710	1200	3710	1930	1900	290	1200	340	200	310	360	520	470	210	280
Molybdenum	14	14	28	21	19	13	12	22	12	13	1.3	4.7	1.5	0.8	1.3	1.5	2.8	2.4	0.9	1.0
Nickel	15	14	14	15	14	12	12	14	23	16	4.6	3.9	2.8	1.3	1.7	2.9	3.0	3.1	1.8	1.7
Selenium	0.9	1.2	1.1	1.1	1	1.2	1.1	1	0.5	0.8	0.2	0.3	0.2	0.2	0.1	0.3	0.4	0.3	0.2	0.2
Silver	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Thallium	0.3	0.2	0.2	0.2	0.2	0.3	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Tin	0.7	0.6	0.6	0.7	0.7	0.9	0.6	0.6	0.8	0.7	0.5	0.3	0.6	0.3	0.1	0.2	0.3	0.3	0.2	0.2
Titanium	810	630	640	760	760	590	590	690	1560	1240	440	290	230	140	150	290	280	310	200	170
Uranium	5	5.2	5.5	5.8	5.1	4.5	4.6	4.7	3.5	5.4	0.6	0.6	0.3	0.2	0.2	0.4	0.5	0.5	0.4	0.2
Zinc	88	68	75	75	83	59	58	74	150	120	24	18	12	7.9	9	17	16	18	12	10
Physical Properties																				
Loss on ignition (%)	21.45	25.12	23.88	24.04	22.19	24.51	25.13	23.67	11.27	18.66	6.44	13.26	4.62	3.12	4.96	11.33	12.86	12.76	6.94	6.43
Moisture (%)	89.5	91.38	90.8	90.97	89.64	92.57	92.43	91.89	75.22	88.94	79.05	87.81	81.96	75.58	78.69	86.35	89.9	87.07	79.64	79.26
Radionuclides																				
Lead-210 (Bq/g)	0.26	0.43	0.44	0.44	0.42	0.43	0.37	0.5	0.22	0.48	0.06	0.27	0.07	0.06	0.1	0.16	0.33	0.23	0.13	0.05
Polonium-210 (Bq/g)	0.35	0.44	0.57	0.45	0.46	0.36	0.36	0.36	0.27	0.32	0.11	0.26	0.09	0.06	0.09	0.2	0.27	0.24	0.16	0.1
Radium-226 (Bq/g)	0.12	0.06	0.06	0.02	0.04	0.07	0.05	0.07	0.05	0.05	0.01	0.02	<0.01	0.02	0.03	0.06	0.03	0.02	<0.01	<0.01
Thorium-230 (Bq/g)	0.04	0.06	0.04	<0.02	0.05	<0.02	0.06	0.03	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	0.04	<0.02
Trace Elements																				
Antimony	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arsenic	4.6	4.9	13	11	9.1	4.4	4.3	10	10	6.7	2.4	1.9	1	0.7	0.9	1.2	1.4	1.3	0.9	0.9
Beryllium	0.9	0.7	0.8	0.8	0.9	0.6	0.5	0.8	1.4	1.2	0.2	0.2	0.1	<0.1	0.1	0.1	0.1	0.1	<0.1	<0.1
Cobalt	6.9	5.5	7.4	6.7	7.2	5.3	4.5	8.2	11	8.1	2	1.3	0.9	0.6	0.7	1.1	1.1	1.2	0.8	0.7
Strontium	27	24	26	25	25	20	20	23	18	22	25	22	18	17	16	21	20	23	16	17
Vanadium	35	31	34	35	37	28	28	36	50	50	12	11	8.2	5.2	5.7	9.7	9.6	11	6.4	6.1

APPENDIX B, TABLE 3

Detailed sediment chemistry results for the EARMP technical program, 2011 and 2012.

Parameter[1]	References																								
	Bobby's Lake										Cree Lake										Ellis Bay				
	2009					2012					2011					2012					2011				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Metals																									
Aluminum	3300	7000	9000	5500	8100	6400	3600	950	2600	4000	3600	3400	1200	1200	3300	1650	1210	1380	1780	1200	20900	23800	20300	22500	23400
Barium	43	86	110	91	110	65	56	23	37	60	29	30	11	15	43	24	16	17	24	17	200	180	270	190	200
Boron	65	41	<1	93	29	7	4	1	2	4	3	3	2	1	3	<1	<1	<1	<1	<1	32	33	34	32	33
Cadmium	0.1	0.3	0.4	0.4	0.4	0.3	0.2	0.1	0.1	0.3	0.1	0.2	<0.1	<0.1	0.2	0.2	<0.1	0.1	0.2	0.1	0.3	0.3	0.4	0.3	0.3
Chromium	2.1	3.9	6.1	12	6.6	11	8.8	1.8	4.6	13	7.4	5.7	1.8	2.5	6	2.9	2.2	2.4	3.5	2.1	32	34	30	32	33
Copper	1.5	2.9	3.9	3.4	3.8	2.5	2.4	0.5	0.6	2.2	1.7	1.9	<0.5	0.7	2.3	1.3	1.1	1.8	1.8	0.9	21	21	21	20	22
Iron	24500	55900	68900	58800	63300	40500	13400	8700	25800	21600	7600	6000	1300	2100	6900	3700	2440	2700	3500	3200	20800	20300	29300	19100	19900
Lead	4.1	5.4	8.1	6.8	7.9	5.2	5.1	0.9	2	5.8	2.8	3.7	1.2	1.5	4	3.1	1.9	2.6	3.2	2.3	8.2	8.3	7.8	8.4	8.1
Manganese	570	1200	1770	1240	1520	330	360	400	590	310	260	280	83	140	290	200	170	160	170	220	1000	530	1600	620	450
Molybdenum	0.3	0.6	0.7	0.9	0.9	3.1	0.7	0.3	0.4	0.5	0.4	0.3	<0.1	0.1	0.3	0.1	<0.1	0.1	0.2	<0.1	1.9	1.9	2	1.2	1.7
Nickel	3.2	5.8	10	6.2	7.5	6.6	5.5	1.1	2.6	5.8	2.5	4.6	0.7	1.3	3.4	2	1.3	1.6	2.2	1.3	21	22	22	20	21
Selenium	0.2	0.5	0.7	0.7	0.8	0.6	1	0.2	0.4	0.8	0.5	0.3	<0.1	0.1	0.6	0.2	0.2	0.2	0.2	0.2	0.7	0.7	0.6	0.6	0.6
Silver	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	0.1	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Thallium	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	0.2	0.2	0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	0.2	<0.2	<0.2	0.2
Tin	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.1	0.1	0.2	0.2	0.2	<0.1	<0.1	0.2	0.1	<0.1	<0.1	0.1	<0.1	0.9	1.0	0.8	0.8	0.9
Titanium	140	230	310	180	310	220	99	46	94	120	230	230	80	91	200	140	100	120	170	130	1200	1400	1200	1200	1300
Uranium	0.8	1.4	1.7	1.4	1.7	1.4	1.1	0.3	0.6	1.2	0.3	0.3	<0.1	0.1	0.3	0.2	0.2	0.2	0.3	0.2	8.1	6.8	8.7	8.1	7.0
Zinc	20	42	51	42	48	31	18	8.8	16	19	9.7	13	3.7	5.3	15	9.8	7.7	9.7	12	8.2	45	47	46	46	46
Physical Properties																									
Loss on ignition (%)	15.4	12.7	19.2	19.2	20.3	22	24	5	7	15	7.33	10.23	1.93	4.6	13.82	8.74	5.91	7.78	12.07	7.32	12.46	8.68	16.84	13.13	11
Moisture (%)	70.91	84.18	88.43	87.79	88.69	87.98	93.51	77.25	76.4	93.4	84.98	88.22	50.44	75.27	90.9	84.41	75.13	80.89	87.81	79.69	85.71	80.68	87.53	85.69	81.89
Radionuclides																									
Lead-210 (Bq/g)	0.13	0.22	0.33	0.31	0.37	0.3	0.55	0.04	0.09	0.41	0.22	0.13	0.05	0.09	0.21	0.16	0.08	0.25	0.26	0.21	0.12	0.16	0.26	0.24	0.09
Polonium-210 (Bq/g)	0.22	0.25	0.38	0.43	0.42	0.34	0.52	0.08	0.14	0.42	0.14	0.16	0.04	0.1	0.27	0.17	0.13	0.13	0.25	0.16	0.16	0.12	0.26	0.25	0.14
Radium-226 (Bq/g)	0.04	0.06	0.06	<0.01	0.03	0.03	0.07	0.04	0.03	0.03	<0.01	0.01	0.04	0.01	0.02	0.02	<0.01	0.02	<0.01	0.02	0.08	0.14	0.09	0.05	0.05
Thorium-230 (Bq/g)	0.03	0.03	<0.02	<0.02	0.03	0.02	0.02	0.02	0.02	0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	0.03	<0.02	0.1	0.06	0.05	0.06	0.09
Trace Elements																									
Antimony	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	0.2	0.2	0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.6	0.3	0.3	0.2	0.3
Arsenic	2.4	4.2	5.3	4.2	5.3	3.8	2.4	0.9	2	2.4	2	1.5	0.5	0.7	1.8	0.8	0.7	0.7	0.9	0.6	5.3	4.5	7.5	3.9	4.7
Beryllium	0.2	0.4	0.5	0.3	0.4	0.3	0.2	0.1	0.1	0.2	0.2	0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	0.1	0.7	0.8	0.7	0.7	0.7
Cobalt	1.4	3.2	4	3.1	3.7	3.3	1.5	0.5	1.3	1.2	1.2	1.1	0.2	0.3	1.2	0.5	0.4	0.4	0.6	0.4	5.9	6.4	6.0	5.8	6.1
Strontium	34	62	77	43	79	55	46	13	24	44	20	22	16	16	24	18	16	15	18	15	79	84	82	84	85
Vanadium	8.5	17	21	18	22	13	8.6	3.5	6.9	8.8	11	8.7	2.7	3.5	9.8	4.5	3.3	4	5.1	3.4	37	39	35	37	39

APPENDIX B, TABLE 3

Detailed sediment chemistry results for the EARMP technical program, 2011 and 2012.

Parameter[1]	References																								
	Ellis Bay					Pasfield Lake										RF-4									
	2012					2011					2012					2008					2012				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Metals																									
Aluminum	16700	16400	16400	15000	16800	1500	1500	1100	2600	620	890	970	1480	2100	900	7700	8600	9100	8300	8200	9300	10000	10100	10100	11200
Barium	160	220	170	190	170	16	16	12	25	8.2	13	14	18	21	12	62	63	68	64	63	70	71	74	77	79
Boron	26	26	23	23	23	2	2	1	3	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	3	43	15	18	12
Cadmium	0.2	0.2	0.3	0.2	0.2	0.2	0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3
Chromium	27	26	26	25	28	2.2	2.1	2	4	1	1.6	1.6	2.6	3.5	0.8	13	14	14	14	13	16	17	16	17	18
Copper	19	18	19	20	18	0.7	0.7	0.5	1.7	<0.5	<0.5	<0.5	1	1.5	<0.5	5.8	6.6	6	6.5	7.3	5.8	5.4	6.4	8.2	5.6
Iron	19000	28100	22200	23800	22700	1800	1500	1200	3600	660	1530	2240	2570	3500	1450	37300	37500	48300	37600	38700	41400	52300	64300	46500	46200
Lead	7.1	6.5	6.4	7.0	7.2	2.5	2.3	1.9	5.7	1.1	1.4	1.4	3.1	4.8	1.2	5.4	5.7	6	5.6	5.2	8.7	9.1	9.4	8.6	9.1
Manganese	420	1730	1170	1130	750	71	56	55	110	47	43	96	47	76	31	1800	1600	1900	1800	1700	1770	1600	2340	2030	1490
Molybdenum	1.6	2.0	2.2	2.1	1.7	0.2	0.2	0.1	0.3	0.1	<0.1	0.1	0.2	0.3	<0.1	4.2	3.9	5.1	4	4.4	6.8	6.8	8.4	8.1	6.6
Nickel	18	18	18	20	19	0.8	0.9	0.8	2	0.7	0.6	0.8	1.4	1.9	0.4	7.6	8.3	8.4	8.4	9	7.8	7.6	8.7	10	8.1
Selenium	0.8	0.6	0.6	0.7	0.6	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	0.1	0.2	<0.1	0.6	0.6	0.6	0.7	0.6	0.6	0.5	0.6	0.6	0.6
Silver	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	0.1	0.1	0.1
Thallium	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	0.2	0.2	0.2	0.2
Tin	1.1	0.8	0.8	0.7	0.8	0.2	0.1	<0.1	0.2	<0.1	<0.1	<0.1	0.1	0.2	<0.1	0.6	0.6	0.7	0.5	0.6	0.7	0.7	0.3	0.7	0.8
Titanium	1110	1060	1080	1040	1100	98	110	67	200	40	54	89	120	160	53	540	630	680	610	620	640	570	470	630	660
Uranium	7.9	8	6.6	8.7	8.4	0.1	0.1	<0.1	0.2	<0.1	0.1	0.1	0.2	0.2	<0.1	2.4	2.5	2.7	2.4	2.4	4.7	4.9	4.9	5.2	5
Zinc	39	37	37	39	46	7.8	10	5.3	15	3.6	4.2	6	8.7	13	3.6	41	46	58	45	56	40	44	54	54	41
Physical Properties																									
Loss on ignition (%)	14.13	18.4	14.1	15.45	14.05	4.8	4.67	3.29	12.38	3.18	4.13	3.68	9.38	3.08	3.5	-	-	-	-	-	-	-	-	-	-
Moisture (%)	86.52	88.83	87.68	87.91	87.64	63.38	64.27	58.57	81.96	72.86	60.32	61.51	74.18	84.47	52.28	84.02	83.2	83.77	85.6	84.72	84.38	82.51	85.13	89.25	80.02
Radionuclides																									
Lead-210 (Bq/g)	0.16	0.22	0.14	0.17	0.2	0.14	0.3	0.08	0.35	0.11	0.12	0.06	0.26	0.32	0.05	0.26	0.24	0.27	0.27	0.23	0.14	0.17	0.16	0.12	0.15
Polonium-210 (Bq/g)	0.21	0.23	0.17	0.25	0.27	0.16	0.11	0.1	0.35	0.1	0.12	0.08	0.25	0.38	0.12	0.34	0.28	0.3	0.32	0.29	0.27	0.3	0.3	0.26	0.32
Radium-226 (Bq/g)	0.05	0.07	0.09	0.08	0.11	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.02	<0.01	0.01	0.01	0.03	0.04	0.04	0.05	0.04	0.02	0.01	0.04	0.03	0.04
Thorium-230 (Bq/g)	0.08	0.03	<0.02	0.08	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	0.04	0.05	0.05	0.06	0.05	0.02	0.05	0.02	0.03
Trace Elements																									
Antimony	0.3	0.3	0.3	0.3	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	0.2	0.2	0.2	0.2
Arsenic	3.6	6.8	5.6	6.2	5.2	0.7	0.7	1.4	1.2	0.5	0.5	0.6	0.8	1	0.6	7.5	7.1	10	7.3	8.4	19	12	12	9.7	9
Beryllium	0.7	0.5	0.5	0.5	0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.3	0.3	0.2	0.2	0.6	0.8	0.9	0.7	0.7
Cobalt	5.0	5.2	5.2	5.3	5.1	0.2	0.3	<0.2	0.5	<0.2	<0.2	0.2	0.3	0.5	<0.2	4.4	5.3	5.7	5	5.1	4.3	4.4	5.5	5.9	4.3
Strontium	68	73	69	67	68	20	20	22	28	13	16	15	21	24	15	11	11	11	11	11	20	19	20	22	22
Vanadium	31	31	31	31	33	4.1	4.1	3.2	7.5	1.9	2.5	3.1	4.9	3.3	2.4	20	23	26	22	21	23	26	27	25	25

[1]All concentrations and activity levels are presented in µg/g on a dry weight basis, except when specified otherwise.

APPENDIX B, TABLE 4

Sediment chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Far-Field Exposure Areas																							
	Cochrane River												Crackingstone Inlet											
	2011						2012						2011						2012					
	Avr	S.D.	Min	Max	<MDL	N	Avr	S.D.	Min	Max	<MDL	N	Avr	S.D.	Min	Max	<MDL	N	Avr	S.D.	Min	Max	<MDL	N
Metals																								
Aluminum	12160	152	12000	12400	0	5	8920	581	8100	9600	0	5	9680	2297	7600	12500	0	5	7940	2084	5700	10200	0	5
Barium	80	2	77	82	0	5	62	5	58	70	0	5	58	11	47	74	0	5	52	11	38	64	0	5
Boron	6.0	0[4]	6.0	6.0	0	5	1.2	0.4	<1	2.0	1	5	9.0	2.9	6.0	13.0	0	5	6.4	2.6	4.0	10.0	0	5
Cadmium	0.3	0.1	0.2	0.4	0	5	0.2	0	0.2	0.2	0	5	0.1	0	<0.1	0.1	3	5	0.1	-	<0.1	<0.1	5	5
Chromium	22.4	0.5	22.0	23.0	0	5	16.6	1.1	15.0	18.0	0	5	20.2	7.5	14.0	32.0	0	5	17.2	6.0	11.0	26.0	0	5
Copper	7.8	0.2	7.6	8.1	0	5	6.1	0.5	5.5	6.7	0	5	4.7	2.3	2.7	7.7	0	5	4.0	1.7	2.4	6.1	0	5
Iron	18780	1467	16800	20800	0	5	16740	2100	15000	20200	0	5	12080	2937	9200	15300	0	5	12160	2847	8400	15600	0	5
Lead	9.8	0.7	9.2	11.0	0	5	7.6	0.6	6.8	8.4	0	5	6.1	3.0	4.0	11.0	0	5	6.2	5.0	3.1	15.0	0	5
Manganese	250	19	230	280	0	5	182	36	150	240	0	5	240	74	180	370	0	5	230	62	140	300	0	5
Molybdenum	6.3	0.5	5.6	6.8	0	5	4.5	0.6	3.7	5.2	0	5	0.7	0.4	0.4	1.4	0	5	0.6	0.2	0.3	0.7	0	5
Nickel	11.6	0.5	11.0	12.0	0	5	8.5	0.7	7.6	9.3	0	5	7.5	2.2	5.5	10.0	0	5	6.5	1.8	4.5	8.3	0	5
Selenium	0.6	0.07	0.5	0.7	0	5	0.5	0.04	0.5	0.6	0	5	0.8	0.3	0.5	1.1	0	5	0.8	0.3	0.6	1.2	0	5
Silver	0.1	-[5]	<0.1	<0.1	5	5	0.1	-	<0.1	<0.1	5	5	0.1	-	<0.1	<0.1	5	5	0.1	-	<0.1	<0.1	5	5
Thallium	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5
Tin	0.82	0.11	0.70	1.00	0	5	0.58	0.04	0.50	0.60	0	5	0.46	0.13	0.30	0.60	0	5	0.40	0.10	0.30	0.50	0	5
Titanium	886	27	850	920	0	5	714	28	680	740	0	5	802	137	640	990	0	5	634	113	510	780	0	5
Uranium	4.4	0.1	4.2	4.6	0	5	3.7	0.3	3.3	4.0	0	5	41.4	18.9	23.0	67.0	0	5	36.4	12.7	19.0	48.0	0	5
Zinc	42	1	41	43	0	5	32	2	28	34	0	5	18	5	14	23	0	5	15	4	10	19	0	5
Physical Properties																								
Loss on ignition (%)	16.2	0.9	14.8	17.3	0	5	16.8	1.0	15.8	18.3	0	5	2.8	1.1	1.8	4.2	0	5	3.3	1.0	2.2	4.7	0	5
Moisture (%)	92	1	91	92	0	5	91	2	89	93	0	5	48	13	35	65	0	5	53	8	47	64	0	5
Radionuclides																								
Lead-210 (Bq/g)	0.39	0.03	0.35	0.42	0	5	0.33	0.06	0.26	0.4	0	5	0.18	0.13	0.07	0.40	0	5	0.12	0.06	0.05	0.20	0	5
Polonium-210 (Bq/g)	0.38	0.05	0.31	0.43	0	5	0.35	0.06	0.25	0.42	0	5	0.21	0.15	0.12	0.47	0	5	0.17	0.05	0.12	0.24	0	5
Radium-226 (Bq/g)	0.03	0.02	<0.01	0.06	2	5	0.01	0.01	<0.01	0.02	3	5	0.14	0.21	<0.01	0.51	1	5	0.48	0.58	0.10	1.5	0	5
Thorium-230 (Bq/g)	0.03	0.01	<0.02	0.05	1	5	0.03	0.004	0.02	0.03	0	5	9.26	9.52	2.80	26.00	0	5	5.50	5.11	0.80	14.00	0	5
Trace Elements																								
Antimony	0.2	0.1	<0.2	0.4	4	5	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5
Arsenic	2.1	0.1	2.0	2.2	0	5	1.6	0.2	1.4	1.8	0	5	4.5	3.2	1.7	9.8	0	5	3.5	1.1	1.6	4.5	0	5
Beryllium	0.6	0	0.6	0.6	0	5	0.4	0	0.4	0.4	0	5	0.4	0.1	0.3	0.5	0	5	0.3	0.1	0.2	0.3	0	5
Cobalt	3.5	0.1	3.4	3.7	0	5	2.5	0.2	2.3	2.7	0	5	3.1	0.6	2.6	3.8	0	5	2.5	0.5	1.9	3.0	0	5
Strontium	19.8	0.4	19.0	20.0	0	5	16.4	0.5	16.0	17.0	0	5	35.2	7.8	28.0	47.0	0	5	30.8	6.9	24.0	40.0	0	5
Vanadium	25.4	0.5	25.0	26.0	0	5	19.6	1.1	18.0	21.0	0	5	85.6	109.0	31.0	280.0	0	5	52.2	44.6	24.0	131.0	0	5

APPENDIX B, TABLE 4

Sediment chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Far-Field Exposure Areas																							
	Fond du Lac River												Waterbury Lake											
	2011						2012						2011						2012					
	Avr	S.D.	Min	Max	<MDL	N	Avr	S.D.	Min	Max	<MDL	N	Avr	S.D.	Min	Max	<MDL	N	Avr	S.D.	Min	Max	<MDL	N
Metals																								
Aluminum	13040	802	12100	14200	0	5	13860	2919	11300	17600	0	5	3600	1572	2300	6000	0	5	3200	660	2400	3900	0	5
Barium	184	34	150	240	0	5	144	39	110	210	0	5	46	17	24	66	0	5	44	11	32	55	0	5
Boron	1.0	0	<1	1.0	2	5	2.4	1.3	<1	4.0	2	5	2.8	0.8	2.0	4.0	0	5	1.0	-	<1	<1	5	5
Cadmium	0.5	0.1	0.4	0.7	0	5	0.5	0.1	0.3	0.6	0	5	0.1	0	<0.1	0.1	4	5	0.1	0	<0.1	0.1	3	5
Chromium	22.4	1.3	21.0	24.0	0	5	32.4	24.7	19.0	76.0	0	5	6.5	2.7	3.5	10.0	0	5	5.9	1.5	4.2	7.4	0	5
Copper	11.6	0.5	11.0	12.0	0	5	9.3	2.1	5.6	11.0	0	5	1.6	0.9	0.7	2.8	0	5	1.6	0.6	0.9	2.2	0	5
Iron	73000	20271	49500	96900	0	5	81360	44209	39500	148000	0	5	4140	2747	1300	8200	0	5	4780	1553	3200	6400	0	5
Lead	11.4	2.1	7.9	13.0	0	5	8.6	1.0	7.4	10.0	0	5	3.5	1.1	2.4	5.3	0	5	3.5	1.2	2.2	4.5	0	5
Manganese	3014	906	2190	4510	0	5	2090	952	1200	3710	0	5	468	413	200	1200	0	5	368	129	210	520	0	5
Molybdenum	19.2	5.8	14.0	28.0	0	5	14.4	4.3	12.0	22.0	0	5	1.9	1.6	0.8	4.7	0	5	1.7	0.8	0.9	2.8	0	5
Nickel	14.4	0.5	14.0	15.0	0	5	15.4	4.6	12.0	23.0	0	5	2.9	1.4	1.3	4.6	0	5	2.5	0.7	1.7	3.1	0	5
Selenium	1.1	0.1	0.9	1.2	0	5	0.9	0.3	0.5	1.2	0	5	0.2	0.1	0.1	0.3	0	5	0.3	0.1	0.2	0.4	0	5
Silver	0.1	-	<0.1	<0.1	5	5	0.1	-	<0.1	<0.1	5	5	0.1	-	<0.1	<0.1	5	5	0.1	-	<0.1	<0.1	5	5
Thallium	0.2	0.04	0.2	0.3	0	5	0.2	0.04	<0.2	0.3	3	5	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5
Tin	0.66	0.05	0.60	0.70	0	5	0.72	0.13	0.60	0.90	0	5	0.36	0.19	0.10	0.60	0	5	0.24	0.05	0.20	0.30	0	5
Titanium	720	80	630	810	0	5	934	442	590	1560	0	5	250	123	140	440	0	5	250	61	170	310	0	5
Uranium	5.3	0.3	5.0	5.8	0	5	4.5	0.7	3.5	5.4	0	5	0.4	0.2	0.2	0.6	0	5	0.4	0.1	0.2	0.5	0	5
Zinc	78	8	68	88	0	5	92	41	58	150	0	5	14	7	8	24	0	5	15	3	10	18	0	5
Physical Properties																								
Loss on ignition (%)	23.3	1.5	21.5	25.1	0	5	20.6	5.8	11.3	25.1	0	5	6.5	4.0	3.1	13.3	0	5	10.1	3.1	6.4	12.9	0	5
Moisture (%)	90	1	90	91	0	5	88	7	75	93	0	5	81	5	76	88	0	5	84	5	79	90	0	5
Radionuclides																								
Lead-210 (Bq/g)	0.40	0.08	0.26	0.44	0	5	0.40	0.11	0.22	0.50	0	5	0.11	0.09	0.06	0.27	0	5	0.18	0.11	0.05	0.33	0	5
Polonium-210 (Bq/g)	0.45	0.08	0.35	0.57	0	5	0.33	0.04	0.27	0.36	0	5	0.12	0.08	0.06	0.26	0	5	0.19	0.07	0.10	0.27	0	5
Radium-226 (Bq/g)	0.06	0.04	0.02	0.12	0	5	0.06	0.01	0.05	0.07	0	5	0.02	0.01	<0.01	0.03	1	5	0.03	0.02	<0.01	0.06	2	5
Thorium-230 (Bq/g)	0.04	0.01	<0.02	0.06	1	5	0.03	0.02	<0.02	0.06	2	5	0.02	-	<0.02	<0.02	5	5	0.04	0.03	<0.02	0.08	3	5
Trace Elements																								
Antimony	0.2	-	<0.2	<0.2	5	5	0.2	0.04	<0.2	0.3	4	5	0.2	0.1	<0.2	0.4	4	5	0.2	-	<0.2	<0.2	5	5
Arsenic	8.5	3.7	4.6	13	0	5	7.1	2.8	4.3	10	0	5	1.4	0.7	0.7	2.4	0	5	1.1	0.2	0.9	1.4	0	5
Beryllium	0.8	0.1	0.7	0.9	0	5	0.9	0.4	0.5	1.4	0	5	0.1	0.1	<0.1	0.2	1	5	0.1	0	<0.1	0.1	2	5
Cobalt	6.7	0.7	5.5	7.4	0	5	7.4	2.6	4.5	11.0	0	5	1.1	0.6	0.6	2.0	0	5	1.0	0.2	0.7	1.2	0	5
Strontium	25.4	1.1	24.0	27.0	0	5	20.6	1.9	18.0	23.0	0	5	19.6	3.8	16.0	25.0	0	5	19.4	2.9	16.0	23.0	0	5
Vanadium	34.4	2.2	31.0	37.0	0	5	38.4	11.1	28.0	50.0	0	5	8.4	3.1	5.2	12.0	0	5	8.6	2.2	6.1	11.0	0	5

APPENDIX B, TABLE 4

Sediment chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	References																							
	Bobby's Lake												Cree Lake											
	2009[2]						2012						2011						2012					
	Avr	S.D.	Min	Max	<MDL	N	Avr	S.D.	Min	Max	<MDL	N	Avr	S.D.	Min	Max	<MDL	N	Avr	S.D.	Min	Max	<MDL	N
Metals																								
Aluminum	6580	2251	3300	9000	0	5	3510	1999	950	6400	0	5	2540	1228	1200	3600	0	5	1444	262	1200	1780	0	5
Barium	88	27	43	110	0	5	48	18	23	65	0	5	26	13	11	43	0	5	20	4	16	24	0	5
Boron	45.8	35.0	<1	93.0	1	5	3.6	2.3	<1	7.0	1	5	2.4	0.9	1.0	3.0	0	5	1.0	-	<1	<1	5	5
Cadmium	0.3	0.1	0.1	0.4	0	5	0.2	0.1	<0.1	0.3	2	5	0.1	0.05	<0.1	0.2	2	5	0.1	0.05	<0.1	0.2	1	5
Chromium	6.1	3.7	2.1	12.0	0	5	7.8	4.6	1.8	13.0	0	5	4.7	2.4	1.8	7.4	0	5	2.6	0.6	2.1	3.5	0	5
Copper	3.1	1.0	1.5	3.9	0	5	1.6	1.0	<0.5	2.5	1	5	1.4	0.8	<0.5	2.3	1	5	1.4	0.4	0.9	1.8	0	5
Iron	54280	17357	24500	68900	0	5	22000	12326	8700	40500	0	5	4780	2882	1300	7600	0	5	3108	530	2440	3700	0	5
Lead	6.5	1.7	4.1	8.1	0	5	3.8	2.2	0.9	5.8	0	5	2.6	1.3	1.2	4.0	0	5	2.6	0.5	1.9	3.2	0	5
Manganese	1260	449	570	1770	0	5	398	113	310	590	0	5	211	93	83	290	0	5	184	25	160	220	0	5
Molybdenum	0.7	0.2	0.3	0.9	0	5	1.0	1.2	0.3	3.1	0	5	0.2	0.1	<0.1	0.4	1	5	0.1	0.04	<0.1	0.2	2	5
Nickel	6.5	2.5	3.2	10.0	0	5	4.3	2.4	1.1	6.6	0	5	2.5	1.6	0.7	4.6	0	5	1.7	0.4	1.3	2.2	0	5
Selenium	0.6	0.2	0.2	0.8	0	5	0.6	0.3	0.2	1.0	0	5	0.3	0.2	<0.1	0.6	1	5	0.2	0	0.2	0.2	0	5
Silver	0.1	-	<0.1	<0.1	5	5	0.1	-	<0.1	<0.1	5	5	0.1	-	<0.1	<0.1	5	5	0.1	-	<0.1	<0.1	5	5
Thallium	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5
Tin	0.22	0.08	0.10	0.30	0	5	0.18	0.08	<0.1	0.30	1	5	0.16	0.05	<0.1	0.20	2	5	0.10	0	<0.1	0.10	3	5
Titanium	234	76	140	310	0	5	116	64	46	220	0	5	166	75	80	230	0	5	132	26	100	170	0	5
Uranium	1.4	0.4	0.8	1.7	0	5	0.9	0.5	0.3	1.4	0	5	0.2	0.1	<0.1	0.3	1	5	0.2	0.04	0.2	0.3	0	5
Zinc	41	12	20	51	0	5	19	8	9	31	0	5	9	5	4	15	0	5	9	2	8	12	0	5
Physical Properties																								
Loss on ignition (%)	17.4	3.2	12.7	20.3	0	5	14.6	8.6	5.0	24.0	0	5	7.6	4.7	1.9	13.8	0	5	8.4	2.3	5.9	12.1	0	5
Moisture (%)	84	8	71	89	0	5	86	8	76	94	0	5	78	16	50	91	0	5	82	5	75	88	0	5
Radionuclides																								
Lead-210 (Bq/g)	0.27	0.10	0.13	0.37	0	5	0.28	0.21	0.04	0.55	0	5	0.14	0.07	0.05	0.22	0	5	0.19	0.07	0.08	0.26	0	5
Polonium-210 (Bq/g)	0.34	0.10	0.22	0.43	0	5	0.30	0.19	0.08	0.52	0	5	0.14	0.08	0.04	0.27	0	5	0.17	0.05	0.13	0.25	0	5
Radium-226 (Bq/g)	0.04	0.02	<0.01	0.06	1	5	0.04	0.02	0.03	0.07	0	5	0.02	0.01	<0.01	0.04	1	5	0.02	0.01	<0.01	0.02	2	5
Thorium-230 (Bq/g)	0.03	0.01	<0.02	0.03	2	5	0.02	-	<0.02	<0.02	5	5	0.02	0	<0.02	0.02	4	5	0.02	0.004	<0.02	0.03	4	5
Trace Elements																								
Antimony	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5
Arsenic	4.3	1.2	2.4	5.3	0	5	2.3	1.0	0.9	3.8	0	5	1.3	0.7	0.5	2.0	0	5	0.7	0.1	0.6	0.9	0	5
Beryllium	0.4	0.1	0.2	0.5	0	5	0.2	0.1	<0.1	0.3	1	5	0.1	0.1	<0.1	0.2	2	5	0.1	0	<0.1	0.1	4	5
Cobalt	3.1	1.0	1.4	4.0	0	5	1.6	1.0	0.5	3.3	0	5	0.8	0.5	0.2	1.2	0	5	0.5	0.1	0.4	0.6	0	5
Strontium	59.0	20.1	34.0	79.0	0	5	36.4	17.3	13.0	55.0	0	5	19.6	3.6	16.0	24.0	0	5	16.4	1.5	15.0	18.0	0	5
Vanadium	17.3	5.3	8.5	22.0	0	5	8.2	3.4	3.5	13.0	0	5	7.1	3.8	2.7	11.0	0	5	4.1	0.8	3.3	5.1	0	5

APPENDIX B, TABLE 4

Sediment chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	References																							
	Ellis Bay												Pasfield Lake											
	2011						2012						2011						2012					
	Avr	S.D.	Min	Max	<MDL	N	Avr	S.D.	Min	Max	<MDL	N	Avr	S.D.	Min	Max	<MDL	N	Avr	S.D.	Min	Max	<MDL	N
Metals																								
Aluminum	22180	1532	20300	23800	0	5	16260	727	15000	16800	0	5	1464	731	620	2600	0	5	1268	525	890	2100	0	5
Barium	208	36	180	270	0	5	182	24	160	220	0	5	15	6	8	25	0	5	16	4	12	21	0	5
Boron	32.8	0.8	32.0	34.0	0	5	24.2	1.6	23.0	26.0	0	5	1.8	0.8	1.0	3.0	0	5	1.0	-	<1	<1	5	5
Cadmium	0.3	0.04	0.3	0.4	0	5	0.2	0.04	0.2	0.3	0	5	0.1	0.04	<0.1	0.2	2	5	0.1	0	<0.1	0.1	4	5
Chromium	32.2	1.5	30.0	34.0	0	5	26.4	1.1	25.0	28.0	0	5	2.3	1.1	1.0	4.0	0	5	2.0	1.0	0.8	3.5	0	5
Copper	21.0	0.7	20.0	22.0	0	5	18.8	0.8	18.0	20.0	0	5	0.8	0.5	<0.5	1.7	1	5	0.8	0.4	<0.5	1.5	3	5
Iron	21880	4194	19100	29300	0	5	23160	3288	19000	28100	0	5	1752	1116	660	3600	0	5	2258	840	1450	3500	0	5
Lead	8.2	0.2	7.8	8.4	0	5	6.8	0.4	6.4	7.2	0	5	2.7	1.8	1.1	5.7	0	5	2.4	1.6	1.2	4.8	0	5
Manganese	840	474	450	1600	0	5	1040	492	420	1730	0	5	68	25	47	110	0	5	59	27	31	96	0	5
Molybdenum	1.7	0.3	1.2	2.0	0	5	1.9	0.3	1.6	2.2	0	5	0.2	0.1	0.1	0.3	0	5	0.2	0.1	<0.1	0.3	2	5
Nickel	21.2	0.8	20.0	22.0	0	5	18.6	0.9	18.0	20.0	0	5	1.0	0.5	0.7	2.0	0	5	1.0	0.6	0.4	1.9	0	5
Selenium	0.6	0.1	0.6	0.7	0	5	0.7	0.1	0.6	0.8	0	5	0.1	0.04	<0.1	0.2	4	5	0.1	0.04	<0.1	0.2	3	5
Silver	0.1	-	<0.1	<0.1	5	5	0.1	-	<0.1	<0.1	5	5	0.1	-	<0.1	<0.1	5	5	0.1	-	<0.1	<0.1	5	5
Thallium	0.2	0	<0.2	0.2	2	5	0.2	0.04	<0.2	0.3	4	5	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5
Tin	0.88	0.08	0.80	1.00	0	5	0.84	0.15	0.70	1.10	0	5	0.14	0.05	<0.1	0.20	2	5	0.12	0.04	<0.1	0.20	3	5
Titanium	1260	89	1200	1400	0	5	1078	29	1040	1110	0	5	103	61	40	200	0	5	95	46	53	160	0	5
Uranium	7.7	0.8	6.8	8.7	0	5	7.9	0.8	6.6	8.7	0	5	0.1	0.04	<0.1	0.2	2	5	0.1	0.1	<0.1	0.2	1	5
Zinc	46	1	45	47	0	5	40	4	37	46	0	5	8	4	4	15	0	5	7	4	4	13	0	5
Physical Properties																								
Loss on ignition (%)	12.4	3.0	8.7	16.8	0	5	15.2	1.9	14.1	18.4	0	5	5.7	3.8	3.2	12.4	0	5	4.8	2.6	3.1	9.4	0	5
Moisture (%)	84	3	81	88	0	5	88	1	87	89	0	5	68	9	59	82	0	5	67	13	52	84	0	5
Radionuclides																								
Lead-210 (Bq/g)	0.17	0.07	0.09	0.26	0	5	0.18	0.03	0.14	0.22	0	5	0.20	0.12	0.08	0.35	0	5	0.16	0.12	0.05	0.32	0	5
Polonium-210 (Bq/g)	0.19	0.06	0.12	0.26	0	5	0.23	0.04	0.17	0.27	0	5	0.16	0.11	0.10	0.35	0	5	0.19	0.12	0.08	0.38	0	5
Radium-226 (Bq/g)	0.08	0.04	0.05	0.14	0	5	0.08	0.02	0.05	0.11	0	5	0.01	0	<0.01	0.01	4	5	0.01	0.004	<0.01	0.02	2	5
Thorium-230 (Bq/g)	0.07	0.02	0.05	0.10	0	5	0.06	0.03	<0.02	0.08	1	5	0.02	-	<0.02	<0.02	5	5	0.02	-	<0.02	<0.02	5	5
Trace Elements																								
Antimony	0.3	0.2	0.2	0.6	0	5	0.3	0.0	0.2	0.3	0	5	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5
Arsenic	5.2	1.4	3.9	7.5	0	5	5.5	1.2	3.6	6.8	0	5	0.9	0.4	0.5	1.4	0	5	0.7	0.2	0.5	1.0	0	5
Beryllium	0.7	0.04	0.7	0.8	0	5	0.5	0.1	0.5	0.7	0	5	0.1	-	<0.1	<0.1	5	5	0.1	-	<0.1	<0.1	5	5
Cobalt	6.0	0.2	5.8	6.4	0	5	5.2	0.1	5.0	5.3	0	5	0.3	0.1	<0.2	0.5	2	5	0.3	0.1	<0.2	0.5	2	5
Strontium	82.8	2.4	79.0	85.0	0	5	69.0	2.3	67.0	73.0	0	5	20.6	5.4	13.0	28.0	0	5	18.2	4.1	15.0	24.0	0	5
Vanadium	37.4	1.7	35.0	39.0	0	5	31.4	0.9	31.0	33.0	0	5	4.2	2.1	1.9	7.5	0	5	3.2	1.0	2.4	4.9	0	5

APPENDIX B, TABLE 4

Sediment chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	References																	
	RF-4												Pooled References and Years					
	2008[3]						2012											
	Avr	S.D.	Min	Max	<MDL	N	Avr	S.D.	Min	Max	<MDL	N	Avr	S.D.	Min	Max	<MDL	N
Metals																		
Aluminum	8380	517	7700	9100	0	5	10140	680	9300	11200	0	5	7377	6890	620	23800	0	50
Barium	64	2	62	68	0	5	74	4	70	79	0	5	74	68	8	270	0	50
Boron	1.0	-	<1	<1	5	5	18.2	15.0	3.0	43.0	0	5	13.2	19.0	<1	93.0	17	50
Cadmium	0.3	0	0.3	0.3	0	5	0.3	0.05	0.2	0.3	0	5	0.2	0.1	<0.1	0.4	11	50
Chromium	13.6	0.5	13.0	14.0	0	5	16.8	0.8	16.0	18.0	0	5	11.5	10.4	0.8	34.0	0	50
Copper	6.4	0.6	5.8	7.3	0	5	6.3	1.1	5.4	8.2	0	5	6.2	7.3	<0.5	22.0	6	50
Iron	39880	4738	37300	48300	0	5	50140	8808	41400	64300	0	5	22324	20406	660	68900	0	50
Lead	5.6	0.3	5.2	6.0	0	5	9.0	0.3	8.6	9.4	0	5	5.0	2.7	0.9	9.4	0	50
Manganese	1760	114	1600	1900	0	5	1846	343	1490	2340	0	5	767	708	31	2340	0	50
Molybdenum	4.3	0.5	3.9	5.1	0	5	7.3	0.8	6.6	8.4	0	5	1.8	2.3	<0.1	8.4	5	50
Nickel	8.3	0.5	7.6	9.0	0	5	8.4	1.0	7.6	10.0	0	5	7.4	7.0	0.4	22.0	0	50
Selenium	0.6	0.04	0.6	0.7	0	5	0.6	0.04	0.5	0.6	0	5	0.4	0.3	<0.1	1	8	50
Silver	0.1	-	<0.1	<0.1	5	5	0.1	-	<0.1	<0.1	5	5	0.1	0	<0.1	<0.1	50	50
Thallium	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5	0.2	0.01	<0.2	0.3	46	50
Tin	0.60	0.07	0.50	0.70	0	5	0.64	0.19	0.30	0.80	0	5	0.39	0.31	<0.1	1.10	11	50
Titanium	616	50	540	680	0	5	594	77	470	660	0	5	439	418	40	1400	0	50
Uranium	2.5	0.1	2.4	2.7	0	5	4.9	0.2	4.7	5.2	0	5	2.6	3.0	<0.1	8.7	4	50
Zinc	49	7	41	58	0	5	47	7	40	54	0	5	27	18	4	58	0	50
Physical Properties																		
Loss on ignition (%)	-	-	-	-	-	-	-	-	-	-	-	-	11	6	1.9	24.0	0	40
Moisture (%)	84	1	83	86	0	5	84	3	80	89	0	5	80	10	50	94	0	50
Radionuclides																		
Lead-210 (Bq/g)	0.25	0.02	0.23	0.27	0	5	0.15	0.02	0.12	0.17	0	5	0.20	0.10	0.04	0.55	0	50
Polonium-210 (Bq/g)	0.31	0.02	0.28	0.34	0	5	0.29	0.02	0.26	0.32	0	5	0.23	0.11	0.04	0.52	0	50
Radium-226 (Bq/g)	0.04	0.01	0.03	0.05	0	5	0.03	0.01	<0.01	0.04	1	5	0.04	0.03	<0.01	0.14	11	50
Thorium-230 (Bq/g)	0.05	0.01	0.04	0.06	0	5	0.03	0.02	<0.02	0.05	1	5	0.03	0.02	<0.02	0.10	27	50
Trace Elements																		
Antimony	0.2	-	<0.2	<0.2	5	5	0.2	-	<0.2	<0.2	5	5	0.2	0.06	<0.2	0.6	40	50
Arsenic	8.1	1.2	7.1	10.0	0	5	12.3	4.0	9.0	19.0	0	5	4.1	3.9	0.5	19.0	0	50
Beryllium	0.2	0.1	0.2	0.3	0	5	0.7	0.1	0.6	0.9	0	5	0.3	0.3	<0.1	0.9	17	50
Cobalt	5.1	0.5	4.4	5.7	0	5	4.9	0.8	4.3	5.9	0	5	2.8	2.3	<0.2	6.4	4	50
Strontium	11.0	0	11.0	11.0	0	5	20.6	1.3	19.0	22.0	0	5	35.4	25.7	11.0	85.0	0	50
Vanadium	22.4	2.3	20.0	26.0	0	5	25.2	1.5	23.0	27.0	0	5	16.0	12.2	1.9	39.0	0	50

S.D.: standard deviation; Min: minimum; Max: maximum; <MDL: number of samples with reading less than the method detection limit (MDL); N: sample size.

For values measured at less than the method detection limit (MDL), all average and standard deviation computations were performed with values set at the MDL.

[1]All concentrations and activity levels are presented in µg/g on a dry weight basis, except when specified otherwise.

[2]No data were available for 2011 in Bobby's Lake, thus data from 2009 were used as a substitute.

[3]No data were available for 2011 in RF-4, thus data from 2008 were used as a substitute.

[4]Standard deviations of 0 signify no variation, not a very small value.

[5]When all values were less than the method detection limit (MDL), standard deviations were not computed.

APPENDIX B, TABLE 5

Detailed benthic invertebrate taxonomy and densities for the EARMP technical program, 2011.

Taxonomy	Far-Field Exposure Areas																												References						
	Cochrane River							Crackingstone Inlet							Fond du Lac River							Waterbury Lake							Bobby's Lake[2]						
	1[1]	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%
Phylum: Annelida (segmented worms)																																			
Class: Hirudinea (leeches)																																			
Order: Arhynchobdellida																																			
Family: Erpobdellidae																																			
Erpobdella punctata	4					**1**	**0.01**				8		**2**	**0.02**																					
Order: Rhynchobdellida																																			
Family: Glossiphoniidae																																			
Helobdella stagnalis	38					**8**	**0.1**																												
Family: Piscicolidae																																			
Pisicola milneri										31			**6**	**0.1**																					
Class: Oligochaeta (aquatic earthworms)																																			
Oligochaeta - cocoon[4]																																			
Family: Lumbriculidae										31			**6**	**0.1**												8	**2**	**0.04**							
Family: Naididae																																			
Subfamily: Naidinae	231					**46**	**0.5**																		31	31	**12**	**0.3**							
Subfamily: Tubificidae	19	92	77	38	92	**64**	**0.7**	69	38	31	31	123	**58**	**0.6**		15			4	**4**	**0.3**	19	19	35	58	108	**48**	**1.3**					38	**8**	**0.6**
Phylum: Arthropoda																																			
Subphylum: Chelicerata																																			
Class: Arachnida																																			
Order: Hydracarina (water mites)[5]	1019	446	123	246	138	**395**	**4.4**	131	177	169		31	**102**	**1.1**	15	12	27	8	15	**15**	**1.1**	123	81	92	188	31	**103**	**2.9**	64	77				**28**	**2.4**
Subphylum: Crustacea																																			
Class: Branchiopoda																																			
Order: Cladocera (water fleas)																																			
Family: Chydoridae																																			
Unidentified Chydoridae[4]																								31			**6**	**0.2**							
Eurycercus (*Bullatifrons*) sp.	654	338	323	92	231	**328**	**3.7**															792	635	1446	1523	1762	**1232**	**34.6**							
Family: Macrothricidae	538	692	400	192	492	**463**	**5.2**										4	12		**3**	**0.2**	62	154	215	554	154	**228**	**6.4**	13	51	13			**15**	**1.3**
Family: Sididae																																			
Latona sp.[5]																															13			**3**	**0.2**
Class: Copepoda																																			
Order: Cyclopoida[5]	154	115	62		62	**78**	**0.9**									4				**1**	**0.1**	31	15	62			**22**	**0.6**	13		13	13		**8**	**0.6**
Class: Malacostraca																																			
Order: Amphipoda (scuds)																																			
Family: Gammaridae																																			
Gammarus lacustris																																			
Family: Haustoriidae																																			
Diporeia hoyi	615	323	354	108	615	**403**	**4.5**	3600	2977	4331	3631	3231	**3554**	**37.8**	1062	727	1085	1004	869	**949**	**65.3**														
Family: Hyalellidae																																			
Hyalella azteca								646	62	862	215	62	**369**	**3.9**								50	12	358	873	831	**425**	**11.9**							
Order: Mysidacea																																			
Family: Mysidae																																			
Mysis relicta																	4			**1**	**0.1**														
Class: Ostracoda (seed shrimp)	77		46		62	**37**	**0.4**								200	123	96	108	73	**120**	**8.3**	77	31	62	154	62	**77**	**2.2**							
Subphylum: Hexapoda																																			
Class: Insecta																																			
Order: Diptera (flies)																																			
Family: Ceratopogonidae																																			
Subfamily: Ceratopogoninae																																			
Bezzia sp.																						15	4	8	88	15	**26**	**0.7**							
Palpomyia sp.																																			
Probezzia sp.		38			31	**14**	**0.2**	1077	1808	1500	585	615	**1117**	**11.9**	4	8	12	4	15	**8**	**0.6**	8				4	**2**	**0.1**	51	51				**21**	**1.7**
Family: Chaoboridae																																			
Chaoborus sp.																													6					**1**	**0.1**

APPENDIX B, TABLE 5

Detailed benthic invertebrate taxonomy and densities for the EARMP technical program, 2011.

Taxonomy	Far-Field Exposure Areas																												References						
	Cochrane River							Crackingstone Inlet							Fond du Lac River							Waterbury Lake							Bobby's Lake[2]						
	1[1]	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%
Family: Chironomidae																																			
Subfamily: Chironominae																																			
Chironomus sp.	19	31	15			**13**	**0.1**									4	19	4		**5**	**0.4**				4		**1**	**0.02**	6	6				**3**	**0.2**
Cladopelma sp.	77	192		54	15	**68**	**0.8**		38				**8**	**0.1**			8			**2**	**0.1**														
Cladotanytarsus sp.		31	62		31	**25**	**0.3**															54		69	331	223	**135**	**3.8**		282				**56**	**4.8**
Corynocera sp.	1154	254		423	800	**526**	**5.9**															77					**15**	**0.4**							
Cryptochironomus sp.	19	177	46	46	31	**64**	**0.7**					31	**6**	**0.1**	31	8	4	4	4	**10**	**0.7**	8			19	35	**12**	**0.3**	26	6	51	13	19	**23**	**1.9**
Demicryptochironomus sp.																																			
Dicrotendipes sp.			31		46	**15**	**0.2**			38			**8**	**0.1**															6		32			**8**	**0.6**
Endochironomus sp.									38				**8**	**0.1**		4				**1**	**0.1**								6		32			**8**	**0.6**
Lauterborniella sp.																													6					**1**	**0.1**
Micropsectra sp																						15		62			**15**	**0.4**							
Microtendipes sp.																																			
Nilothauma sp.																																			
Pagastiella sp.		15	46			**12**	**0.1**									8	85		8	**20**	**1.4**			31			**6**	**0.2**			13		6	**4**	**0.3**
Parachironomus sp.																																			
Paratanytarsus sp.									38			62	**20**	**0.2**																					
Polypedilum sp.	96	54	46	38	46	**56**	**0.6**	115	192	69	31	62	**94**	**1.0**		4				**1**	**0.1**														
Pseudochironomus sp.								38					**8**	**0.1**								12			12	8	**6**	**0.2**							
Sergentia sp.	115	54				**34**	**0.4**																		31	31	**12**	**0.3**							
Stempellina sp.																	4			**1**	**0.1**								77	385				**92**	**7.8**
Stictochironomus sp.																						258		250	81	115	**141**	**4.0**				6	6	**3**	**0.2**
Tanytarsus sp.	846	662	492	362	1446	**762**	**8.6**	231	231	223	92	431	**242**	**2.6**		4	4			**2**	**0.1**	77			62		**28**	**0.8**	109	58	26		19	**42**	**3.6**
Tribelos sp.																														6				**1**	**0.1**
Tribe: Tanytarsini																																			
Unidentified Tanytarsini[4]																4				**1**	**0.1**														
Subfamily: Diamesinae																																			
Potthastia longimana			31			**6**	**0.1**		31	38	31	31	**26**	**0.3**		4			4	**2**	**0.1**	12					**2**	**0.1**	6					**1**	**0.1**
Protanypus sp.																8	4			**2**	**0.2**	4					**1**	**0.02**							
Subfamily: Orthocladiinae																																			
Cricotopus/Orthocladius Group																																			
Epoicocladius sp.																													13					**3**	**0.2**
Heterotanytarsus sp.																8	4	4	19	**7**	**0.5**					31	**6**	**0.2**	6	26				**6**	**0.5**
Heterotrissocladius sp.								38					**8**	**0.1**																					
Parakiefferiella sp.																8	12		8	**5**	**0.4**								6	154				**32**	**2.7**
Psectrocladius sp.																									62		**12**	**0.3**		51				**10**	**0.9**
Zalutschia sp.	3288	4038	2600	3392	3108	**3285**	**37.0**															27		4			**6**	**0.2**	71	45	263	288	282	**190**	**16.0**
Subfamily: Prodiamesinae																																			
Monodiamesa sp.																						19		4			**5**	**0.1**							
Subfamily: Tanypodinae																																			
Unidentified Tanypodinae[4]																																			
Ablabesmyia sp.										38			**8**	**0.1**																					
Clinotanypus sp.																													6					**1**	**0.1**
Larsia sp.								308	31	31	123	31	**105**	**1.1**	15	19	15	19	31	**20**	**1.4**								6	26			6	**8**	**0.6**
Procladius sp.	269	154	385	269	231	**262**	**2.9**		69		62	92	**45**	**0.5**	19	142	158	200	246	**153**	**10.5**	315		335	423	335	**282**	**7.9**	314	526	115	147	96	**240**	**20.2**
Thienemannimyia Group											31		**6**	**0.1**																					
Order: Ephemeroptera (mayflies)																																			
Family: Baetidae																																			
Callibaetis sp.																																			
Family: Caenidae																																			
Caenis sp.									31	100			**26**	**0.3**										4			**1**	**0.02**							
Family: Ephemerellidae																																			
Eurylophella sp.																																			
Family: Ephemeridae																																			
Hexagenia limbata																			4	**1**	**0.1**								71	32	19	26	19	**33**	**2.8**
Order: Hemiptera																																			
Family: Corixidae[5]																													13	6				**4**	**0.3**

APPENDIX B, TABLE 5

Detailed benthic invertebrate taxonomy and densities for the EARMP technical program, 2011.

Taxonomy	Far-Field Exposure Areas																												References						
	Cochrane River							Crackingstone Inlet							Fond du Lac River							Waterbury Lake							Bobby's Lake[2]						
	1[1]	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%
Order: Megaloptera (fishflies)																																			
Family: Sialidae																																			
Sialis sp.																													13	6				**4**	**0.3**
Order: Odonata (dragon & damselflies)																																			
Family: Coenagrionidae																																			
Enallagma sp.								92				4	**19**	**0.2**																					
Family: Corduliidae																																			
Somatochlora sp.																																			
Order: Trichoptera (caddisflies)																																			
Family: Hydroptilidae																																			
Oxyethira sp.	308	38	108		15	**94**	**1.1**																												
Family: Leptoceridae																																			
Mystacides sp.											31	31	**12**	**0.1**																					
Oecetis sp.								31					**6**	**0.1**																					
Triaenodes sp.																																			
Family: Molannidae																																			
Molanna sp.		77	15			**18**	**0.2**																			8	**2**	**0.04**							
Family: Phryganeidae																																			
Unidentified Phryganeidae[4]																						4					**1**	**0.02**							
Agrypnia sp.	8	4	8	4		**5**	**0.1**																												
Phryganea sp.																																			
Phylum: Mollusca																																			
Class: Bivalvia (clams)																																			
Family: Sphaeridae																																			
Unidentified Sphaeriidae[4]	1385	1254	523	1415	2046	**1325**	**14.9**	4254	2277	3785	2800	1200	**2863**	**30.4**	262	231	38	19	31	**116**	**8.0**	504	596	319	550	738	**542**	**15.2**	288	462	103	38	90	**196**	**16.5**
Pisidium sp.	4	138	169	342	392	**209**	**2.4**	62		158	185	92	**99**	**1.1**								42	135	31	15	31	**51**	**1.4**	154	199	45		51	**90**	**7.6**
Sphaerium sp.	42				15	**12**	**0.1**		31				**6**	**0.1**										4	4		**2**	**0.04**	6					**1**	**0.1**
Class: Gastropoda (snails)																																			
Subclass: Prosobranchia																																			
Family: Valvatidae																																			
Valvata sincera	385	192	92	169	123	**192**	**2.2**	335	315	338	492	615	**419**	**4.5**		12				**2**	**0.2**	100	65	27	77	77	**69**	**1.9**	13	45				**12**	**1.0**
Subclass: Pulmonata																																			
Family: Lymnaeidae																																			
Unidentified Lymnaeidae[4]	173					**35**	**0.4**	38		31			**14**	**0.1**																					
Lymnaea sp.										8			**2**	**0.0**																					
Family: Physidae																																			
Physa sp.								31					**6**	**0.1**																					
Family: Planorbidae																																			
Gyraulus sp.	38					**8**	**0.1**	38		38	31		**22**	**0.2**											12	4	**3**	**0.1**							
Phylum: Nematoda (roundworms)	19		31		31	**16**	**0.2**	38	385	77		31	**106**	**1.1**			8			**2**	**0.1**	4		35	62	12	**22**	**0.6**	64	0	13	51	26	**31**	**2.6**
Total	11596	9412	6085	7192	10100	**8877**	**100.0**	11173	8769	11927	8377	6773	**9404**	**100.0**	1608	1354	1588	1385	1331	**1453**	**100.0**	2708	1746	3481	5212	4650	**3559**	**100.0**	1436	2500	750	583	660	**1186**	**100.0**

APPENDIX B, TABLE 5

Detailed benthic invertebrate taxonomy and densities for the EARMP technical program, 2011.

Taxonomy	References																											
	Cree Lake							Ellis Bay							Pasfield Lake							RF-4[3]						
	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%
Phylum: Annelida (segmented worms)																												
Class: Hirudinea (leeches)																												
Order: Arhynchobdellida																												
Family: Erpobdellidae																												
Erpobdella punctata			4			**1**	**0.02**	8		8	23		**8**	**0.1**														
Order: Rhynchobdellida																												
Family: Glossiphoniidae																												
Helobdella stagnalis		15			15	**6**	**0.2**		31		31		**12**	**0.1**					15	**3**	**0.01**							
Family: Piscicolidae																												
Pisicola milneri																												
Class: Oligochaeta (aquatic earthworms)																												
Oligochaeta - cocoon[4]			646	231		**175**	**4.5**																					
Family: Lumbriculidae								215	154	200	62	96	**145**	**1.2**	31	215	31		31	**62**	**0.2**							
Family: Naididae																												
Subfamily: Naidinae									369	615	492	96	**315**	**2.6**														
Subfamily: Tubificidae	142	92	200	212	77	**145**	**3.7**	62	400	62	15	19	**112**	**0.9**	154	62	15	31	173	**87**	**0.3**	107	9	4	58	116	**59**	**4.4**
Phylum: Arthropoda																												
Subphylum: Chelicerata																												
Class: Arachnida																												
Order: Hydracarina (water mites)[5]	58	138	77	96	215	**117**	**3.0**	31	154		231	77	**98**	**0.8**	123	77	108	138	92	**108**	**0.4**			4	53	27	**17**	**1.3**
Subphylum: Crustacea																												
Class: Branchiopoda																												
Order: Cladocera (water fleas)																												
Family: Chydoridae																												
Unidentified Chydoridae[4]																												
Eurycercus (*Bullatifrons*) sp.	154	338	77	127	92	**158**	**4.1**				77	19	**19**	**0.2**	31	15	15		31	**18**	**0.1**							
Family: Macrothricidae	308	585	400	338	631	**452**	**11.6**																					
Family: Sididae																												
Latona sp.[5]																												
Class: Copepoda																												
Order: Cyclopoida[5]	173	185	31	185	62	**127**	**3.3**	985	2338	862	1231	846	**1252**	**10.5**		123		123		**49**	**0.2**	18					**4**	**0.3**
Class: Malacostraca																												
Order: Amphipoda (scuds)																												
Family: Gammaridae																												
Gammarus lacustris								142	492	215	185	146	**236**	**2.0**			15	15	69	**20**	**0.1**							
Family: Haustoriidae																												
Diporeia hoyi																						467	102	267	827	604	**453**	**34.1**
Family: Hyalellidae																												
Hyalella azteca								4646	6154	4446	3292	3173	**4342**	**36.3**														
Order: Mysidacea																												
Family: Mysidae																												
Mysis relicta																												
Class: Ostracoda (seed shrimp)	96	108	62	138	292	**139**	**3.6**									246	185		77	**102**	**0.4**	36			36		**14**	**1.1**
Subphylum: Hexapoda																												
Class: Insecta																												
Order: Diptera (flies)																												
Family: Ceratopogonidae																												
Subfamily: Ceratopogoninae																												
Bezzia sp.	35	31	31	23	92	**42**	**1.1**		62		15		**15**	**0.1**	31					**6**	**0.02**							
Palpomyia sp.																						18			9	4	**6**	**0.5**
Probezzia sp.	96		169	65	62	**78**	**2.0**	92					**18**	**0.2**								18			22	4	**9**	**0.7**
Family: Chaoboridae																												
Chaoborus sp.																												

APPENDIX B, TABLE 5

Detailed benthic invertebrate taxonomy and densities for the EARMP technical program, 2011.

Taxonomy	References																											
	Cree Lake							Ellis Bay							Pasfield Lake							RF-4[3]						
	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%
Family: Chironomidae																												
Subfamily: Chironominae																												
Chironomus sp.	58	115	8	23	92	**59**	**1.5**	523	1231	477	369	712	**662**	**5.5**			15	46		**12**	**0.05**		9	13	22	9	**11**	**0.8**
Cladopelma sp.	81	31			77	**38**	**1.0**									15	62			**15**	**0.1**	89	4		18	18	**26**	**1.9**
Cladotanytarsus sp.	38		15		62	**23**	**0.6**			62			**12**	**0.1**														
Corynocera sp.	38	31	31	4		**21**	**0.5**								25015	26323	13554	37123	8892	**22182**	**86.7**							
Cryptochironomus sp.	69	46		46	62	**45**	**1.1**								215	154	15	62	31	**95**	**0.4**	44	27	36	40	36	**36**	**2.7**
Demicryptochironomus sp.	8		46	12		**13**	**0.3**																					
Dicrotendipes sp.	12		31		15	**12**	**0.3**	831	1569	954	1138	538	**1006**	**8.4**			92	15		**22**	**0.1**					4	**1**	**0.1**
Endochironomus sp.			15	4		**4**	**0.1**																					
Lauterborniella sp.				4		**1**	**0.02**																					
Micropsectra sp																							4	4	53	18	**16**	**1.2**
Microtendipes sp.				19		**4**	**0.1**	31					**6**	**0.1**														
Nilothauma sp.				46		**9**	**0.2**																					
Pagastiella sp.	154	31	92	46		**65**	**1.7**																					
Parachironomus sp.										62			**12**	**0.1**														
Paratanytarsus sp.								338	492	308	169	462	**354**	**3.0**														
Polypedilum sp.	119	77	200	35	262	**138**	**3.6**	62	31	62	31	58	**48**	**0.4**	31	15				**9**	**0.04**		4				**1**	**0.1**
Pseudochironomus sp.	4					**1**	**0.02**								31					**6**	**0.02**							
Sergentia sp.			31			**6**	**0.2**				15	58	**15**	**0.1**	31		15		31	**15**	**0.1**							
Stempellina sp.	19			15		**7**	**0.2**																					
Stictochironomus sp.				8	15	**5**	**0.1**	185	462	169	31	192	**208**	**1.7**	185	15	46	185	200	**126**	**0.5**		4				**1**	**0.1**
Tanytarsus sp.	565	569	400	677	708	**584**	**15.0**	185	185	262	185	77	**178**	**1.5**		123			31	**31**	**0.1**							
Tribelos sp.				23		**5**	**0.1**												15	**3**	**0.01**							
Tribe: Tanytarsini																												
Unidentified Tanytarsini[4]																												
Subfamily: Diamesinae																												
Potthastia longimana																												
Protanypus sp.																						22	4	22	44	44	**28**	**2.1**
Subfamily: Orthocladiinae																												
Cricotopus/Orthocladius Group															123	138	754	246	77	**268**	**1.0**							
Epoicocladius sp.				4		**1**	**0.02**																					
Heterotanytarsus sp.	19	31		15		**13**	**0.3**																					
Heterotrissocladius sp.																												
Parakiefferiella sp.																												
Psectrocladius sp.												19	**4**	**0.03**					108	**22**	**0.1**							
Zalutschia sp.																												
Subfamily: Prodiamesinae																												
Monodiamesa sp.																												
Subfamily: Tanypodinae																												
Unidentified Tanypodinae[4]	4					**1**	**0.02**																		9		**2**	**0.1**
Ablabesmyia sp.	19					**4**	**0.1**					19	**4**	**0.03**			15		92	**22**	**0.1**							
Clinotanypus sp.																												
Larsia sp.				8		**2**	**0.04**																					
Procladius sp.	623	665	662	542	677	**634**	**16.3**	31	92	131		38	**58**	**0.5**	154	200	123	154	215	**169**	**0.7**	93	4	31	191	160	**96**	**7.2**
Thienemannimyia Group								1723	1815	1446	1308	1481	**1555**	**13.0**											9	18	**5**	**0.4**
Order: Ephemeroptera (mayflies)																												
Family: Baetidae																												
Callibaetis sp.								62	31	15	92	19	**44**	**0.4**														
Family: Caenidae																												
Caenis sp.								62		15		19	**19**	**0.2**														
Family: Ephemerellidae																												
Eurylophella sp.								31					**6**	**0.1**														
Family: Ephemeridae																												
Hexagenia limbata	35	65	4	38	8	**30**	**0.8**																					
Order: Hemiptera																												
Family: Corixidae[5]																												

APPENDIX B, TABLE 5

Detailed benthic invertebrate taxonomy and densities for the EARMP technical program, 2011.

Taxonomy	References																											
	Cree Lake							Ellis Bay							Pasfield Lake							RF-4[3]						
	1	**2**	**3**	**4**	**5**	**Avr.**	**%**	**1**	**2**	**3**	**4**	**5**	**Avr.**	**%**	**1**	**2**	**3**	**4**	**5**	**Avr.**	**%**	**1**	**2**	**3**	**4**	**5**	**Avr.**	**%**
Order: Megaloptera (fishflies)																												
Family: Sialidae																												
Sialis sp.			85	23		**22**	**0.6**																					
Order: Odonata (dragon & damselflies)																												
Family: Coenagrionidae																												
Enallagma sp.																												
Family: Corduliidae																												
Somatochlora sp.		4				**1**	**0.02**																					
Order: Trichoptera (caddisflies)																												
Family: Hydroptilidae																												
Oxyethira sp.																												
Family: Leptoceridae																												
Mystacides sp.															62					**12**	**0.05**							
Oecetis sp.																												
Triaenodes sp.																15				**3**	**0.01**							
Family: Molannidae																												
Molanna sp.								31					**6**	**0.1**				4	19	**5**	**0.02**							
Family: Phryganeidae																												
Unidentified Phryganeidae[4]																												
Agrypnia sp.								4	4				**2**	**0.01**		15	31	54	4	**21**	**0.1**							
Phryganea sp.		4				**1**	**0.02**		4	15	4		**5**	**0.04**														
Phylum: Mollusca																												
Class: Bivalvia (clams)																												
Family: Sphaeridae																												
Unidentified Sphaeriidae[4]	612	677	415	531	662	**579**	**14.9**	123	185	123	277	731	**288**	**2.4**	1354	1123	631	1200	446	**951**	**3.7**	498	80	218	1031	760	**517**	**38.9**
Pisidium sp.	62	123	15	19	108	**65**	**1.7**	31	31	46			**22**	**0.2**	277	277	62	650	62	**265**	**1.0**	71			58	18	**29**	**2.2**
Sphaerium sp.				4		**1**	**0.02**			31	15		**9**	**0.1**														
Class: Gastropoda (snails)																												
Subclass: Prosobranchia																												
Family: Valvatidae																												
Valvata sincera	23		15	46	15	**20**	**0.5**	462	246	738	677	731	**571**	**4.8**	31	15		15	31	**18**	**0.1**							
Subclass: Pulmonata																												
Family: Lymnaeidae																												
Unidentified Lymnaeidae[4]																												
Lymnaea sp.																												
Family: Physidae																												
Physa sp.																												
Family: Planorbidae																												
Gyraulus sp.								62	246	108	231	135	**156**	**1.3**														
Phylum: Nematoda (roundworms)	92	31	31	8	46	**42**	**1.1**	123	277	154	77		**126**	**1.1**	31	615	292	785	2631	**871**	**3.4**							
Total	3715	3992	3792	3615	4346	**3892**	**100.0**	11077	17054	11585	10273	9762	**11950**	**100.0**	27908	29785	16077	40846	13373	**25598**	**100.0**	1480	253	600	2480	1840	**1331**	**100.0**

Avr. = average; % = percent composition.

[1]Numbers are per m^2.

[2]In Bobby's Lake, no data were available for 2011, thus data from 2009 were used as a substitute.

[3]In RF-4, no data were available for 2011, thus data from 2008 were used as a substitute.

[4]These taxa were included in total benthic invertebrate density and biomass analyses but not in taxon richness analyses if conspecifics identified with higher taxonomic resolution were present. This was to avoid artificially inflating taxon diversity.

[5]Non-benthic invertebrates not included in community indices computations.

APPENDIX B, TABLE 6

Detailed benthic invertebrate taxonomy and densities for the EARMP technical program, 2012.

Taxon	Far-Field Exposure Areas																												References						
	Cochrane River							Crackingstone Inlet							Fond du Lac River							Waterbury Lake							Bobby's Lake						
	1[1]	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%
Phylum: Annelida (segmented worms)																																			
Class: Hirudinea (leeches)																																			
Order: Arhynchobdellida																																			
Family: Erpobdellidae																																			
Erpobdella punctata												4	**1**	**0.01**																					
Nephelopsis obscura																															2			**0.4**	**0.0**
Order: Rhynchobdellida																																			
Family: Glossiphoniidae																																			
Helobdella stagnalis	46				15	**12**	**0.1**																												
Class: Oligochaeta (aquatic earthworms)																																			
Family: Enchytraeidae																																			
Family: Lumbriculidae										19			**4**	**0.1**												4	**1**	**0.0**							
Family: Naididae																																			
Subfamily: Naidinae	723	1262	1785	785	385	**988**	**9.5**		38				**8**	**0.1**															46				77	**24.6**	**0.4**
Subfamily: Tubificinae	185	231	246	169	231	**212**	**2.1**	415	208	77	54	177	**186**	**2.7**	12	46	4		23	**17**	**1.5**	8	4	35		35	**16**	**0.9**	19	77		2	38	**27.3**	**0.5**
Oligochaeta (cocoon)[2]																																			
Phylum: Arthropoda																																			
Subphylum: Chelicerata																																			
Class: Arachnida																																			
Order: Hydracarina (water mites)[3]	477	62	262	215	231	**249**	**2.4**	4	18	35		10	**13**	**0.2**	12	27	15	8	15	**15**	**1.3**	96	69	50	88	35	**68**	**3.6**	8	77	38	87		**41.9**	**0.7**
Subphylum: Crustacea																																			
Class: Branchiopoda																																			
Order: Cladocera (water fleas)																																			
Family: Chydoridae																																			
Unidentified Chydoridae[2]																						58	31	31		15	**27**	**1.4**		154	38			**38.5**	**0.6**
Eurycercus (*Bullatifrons*) sp.	15	15	46		15	**18**	**0.2**															615	300	542	281	292	**406**	**21.7**	2					**0.4**	**0.0**
Family: Daphnidae																																			
Simocephalus sp.[3]	154					**31**	**0.3**								31	19	15	12	15	**18**	**1.6**	58					**12**	**0.6**							
Family: Macrothricidae	231	462	77	231	385	**277**	**2.7**								4	31		4	4	**8**	**0.7**	19	46	15	15	31	**25**	**1.4**	92	77	115	38	38	**72.3**	**1.2**
Family: Sididae[3]																								4		31	**7**	**0.4**							
Class: Copepoda																																			
Order: Calanoida[3]		77				**15**	**0.1**			77	38		**23**	**0.3**		4	8			**2**	**0.2**	19	46	62	31	108	**53**	**2.8**							
Order: Cyclopoida[3]																													77	462		77	385	**200.0**	**3.3**
Class: Malacostraca																																			
Order: Amphipoda (scuds)																																			
Family: Gammaridae																																			
Gammarus lacustris																																			
Family: Haustoriidae																																			
Diporeia hoyi	46	92	123	31	246	**108**	**1.0**	2200	1023	1673	1908	2154	**1792**	**26.1**																					
Family: Hyalellidae																																			
Hyalella azteca	31					**6**	**0.1**	31	215	346	138		**146**	**2.1**	692	565	954	750	646	**722**	**62.8**	4		19	342	227	**118**	**6.3**		38	660	4		**140.4**	**2.3**
Order: Mysidacea																																			
Family: Mysidae																																			
Mysis relicta	15					**3**	**0.0**			19			**4**	**0.1**																					
Class: Ostracoda (seed shrimp)	77	77	154	154	77	**108**	**1.0**			154		38	**38**	**0.6**	8	73	69	42	42	**47**	**4.1**		19	92	46	62	**44**	**2.3**	100	308	192		269	**173.8**	**2.9**
Subphylum: Hexapoda																																			
Class: Insecta																																			
Order: Diptera (flies)																																			
Family: Ceratopogonidae																																			
Subfamily: Ceratopogoninae																																			
Bezzia sp.																									15	8	**5**	**0.2**							
Probezzia sp.			31			**6**	**0.1**	292	254	192	77	446	**252**	**3.7**		8	27	27	23	**17**	**1.5**					31	**6**	**0.3**	38		2	87		**25.4**	**0.4**
Family: Chaoboridae																																			
Chaoborus sp.	15				15	**6**	**0.1**																						54	1108		2		**232.7**	**3.9**

APPENDIX B, TABLE 6

Detailed benthic invertebrate taxonomy and densities for the EARMP technical program, 2012.

Taxon	Far-Field Exposure Areas																												References						
	Cochrane River							Crackingstone Inlet							Fond du Lac River							Waterbury Lake							Bobby's Lake						
	1[1]	2	3	4	5	**Avr.**	**%**	1	2	3	4	5	**Avr.**	**%**	1	2	3	4	5	**Avr.**	**%**	1	2	3	4	5	**Avr.**	**%**	1	2	3	4	5	**Avr.**	**%**
Family: Chironomidae																																			
Subfamily: Chironominae																																			
Chironomus sp.																4				**1**	**0.1**								2	1404	4		1429	**567.7**	**9.4**
Cladopelma sp.			77		77	**31**	**0.3**									4		4	4	**2**	**0.2**			4	15		**4**	**0.2**		77				**15.4**	**0.3**
Cladotanytarsus sp.		77	231			**62**	**0.6**															77	15	35	154	92	**75**	**4.0**	123		385	313	192	**202.7**	**3.4**
Corynocera sp.	1046	862	738	938	538	**825**	**8.0**															19	15	15	35	4	**18**	**0.9**							
Cryptochironomus sp.		31	31	31	31	**25**	**0.2**				38		**8**	**0.1**	4	8	8		4	**5**	**0.4**	54	12	35	27	12	**28**	**1.5**	163	269	160	71		**132.7**	**2.2**
Cryptotendipes sp.																4		8		**2**	**0.2**								190			231	1231	**330.4**	**5.5**
Demicryptochironomus sp.												15	**3**	**0.0**		4				**1**	**0.1**											2		**0.4**	**0.0**
Dicrotendipes sp.			92			**18**	**0.2**		31	385	31	77	**105**	**1.5**															37			260	115	**82.3**	**1.4**
Endochironomus sp.																														79		2		**16.2**	**0.3**
Glyptotendipes sp.																																			
Lauterborniella sp.																																			
Microtendipes sp.											15		**3**	**0.0**																					
Neostempellina sp.																													31					**6.2**	**0.1**
Nilothauma sp.																																115		**23.1**	**0.4**
Pagastiella sp.																4		19	4	**5**	**0.5**				15	15	**6**	**0.3**	215		269	38	38	**112.3**	**1.9**
Parachironomus sp.																																			
Paratanytarsus sp.									77				**15**	**0.2**																					
Polypedilum sp.	123	15	77	15	15	**49**	**0.5**	31	15	58	15	92	**42**	**0.6**	4	4				**2**	**0.1**								248			44		**58.5**	**1.0**
Pseudochironomus sp.								15				54	**14**	**0.2**								4	8	8			**4**	**0.2**				2		**0.4**	**0.0**
Sergentia sp.	15	46		31		**18**	**0.2**																												
Stempellina sp.					77	**15**	**0.1**																												
Stictochironomus sp.																						412	369	162	85	54	**216**	**11.6**		38	2	763	38	**168.5**	**2.8**
Tanytarsus sp.	1015	1523	1908	877	554	**1175**	**11.4**	477	1200	423	131	377	**522**	**7.6**	12	38	4	23	38	**23**	**2.0**	19		15	4	15	**11**	**0.6**	1154	885	1000	425	1462	**985.0**	**16.4**
Tribelos sp.																														42				**8.5**	**0.1**
Xenochironomus sp.			77			**15**	**0.1**																												
Tribe: Chironomini																																			
Unidentified Chironomini[2]																																			
Tribe: Tanytarsini																																			
Unidentified Tanytarsini[2]																																			
Subfamily: Diamesinae																																			
Potthastia longimana			15	15	15	**9**	**0.1**					31	**6**	**0.1**												4	**1**	**0.0**							
Protanypus sp.																								4			**1**	**0.0**							
Subfamily: Orthocladiinae																																			
Crictopus/Orthocladius Group																																			
Heterotanytarsus sp.																			4	**1**	**0.1**	19					**4**	**0.2**	31		38			**13.8**	**0.2**
Heterotrissocladius sp.																																79		**15.8**	**0.3**
Nanocladius sp.																														38				**7.7**	**0.1**
Parakiefferiella sp.															8	8	15	4	4	**8**	**0.7**					15	**3**	**0.2**	125		462		38	**125.0**	**2.1**
Psectrocladius sp.										38			**8**	**0.1**									15		4		**4**	**0.2**	31	38	154	4		**45.4**	**0.8**
Zalutschia sp.	4569	5831	4477	469	3631	**3795**	**36.7**															42	31	58	15	8	**31**	**1.6**	17				38	**11.2**	**0.2**
Subfamily: Prodiamesinae																																			
Monodiamesa sp.																							35	4		15	**11**	**0.6**				6		**1.2**	**0.0**
Subfamily: Tanypodinae																																			
Unidentified Tanypodinae[2]																																2		**0.4**	**0.0**
Ablabesmyia sp.		77		77		**31**	**0.3**		38	77			**23**	**0.3**									15				**3**	**0.2**	25					**5.0**	**0.1**
Clinotanypus sp.																													6					**1.2**	**0.0**
Larsia sp.															4	4	8			**3**	**0.3**														
Procladius sp.	615	769	508	738		**526**	**5.1**	138	131	58	246	169	**148**	**2.2**	81	69	77	65	54	**69**	**6.0**	219	304	154	242	315	**247**	**13.2**	873	1954	1248	138	1148	**1072.3**	**17.8**
Tanypus sp.																														1698			50	**349.6**	**5.8**
Thienemannimyia Group																															38			**7.7**	**0.1**
Family: Empididae																																			
Chelifera sp.												31	**6**	**0.1**																					
Order: Ephemeroptera (mayflies)																																			
Family: Baetidae																																			
Callibaetis sp.										19			**4**	**0.1**																					

APPENDIX B, TABLE 6

Detailed benthic invertebrate taxonomy and densities for the EARMP technical program, 2012.

Taxon	Far-Field Exposure Areas																												References						
	Cochrane River							Crackingstone Inlet							Fond du Lac River							Waterbury Lake							Bobby's Lake						
	1[1]	2	3	4	5	**Avr.**	**%**	1	2	3	4	5	**Avr.**	**%**	1	2	3	4	5	**Avr.**	**%**	1	2	3	4	5	**Avr.**	**%**	1	2	3	4	5	**Avr.**	**%**
Family: Caenidae																																			
Caenis sp.									38	192			**46**	**0.7**											35	4	**8**	**0.4**	94		435	69		**119.6**	**2.0**
Family: Ephemeridae																																			
Hexagenia limbata																		4		**1**	**0.1**								88	40	4	225		**71.5**	**1.2**
Family: Leptophlebiidae																																			
Leptophlebia sp.																4				**1**	**0.1**														
Order: Megaloptera (fishflies)																																			
Family: Sialidae																																			
Sialis sp.																													2	2	19	2		**5.0**	**0.1**
Order: Trichoptera (caddisflies)																																			
Family: Hydroptilidae																																			
Agraylea sp.																																			
Oxyethira sp.			15			**3**	**0.0**																												
Family: Lepidostomatidae																																			
Lepidostoma sp.																																			
Family: Leptoceridae																																			
Mystacides sp.										77			**15**	**0.2**			4			**1**	**0.1**		4				**1**	**0.0**				4		**0.8**	**0.0**
Oecetis sp.												15	**3**	**0.0**			4	8	4	**3**	**0.3**		4		4	8	**3**	**0.2**			38	83		**24.2**	**0.4**
Family: Molannidae																																			
Unidentified Mollanidae[2]																									4	4	**2**	**0.1**							
Molanna sp.								15					**3**	**0.0**												4	**1**	**0.0**							
Family: Phryganeidae																																			
Unidentified Phryganeidae[2]																										4	**1**	**0.0**							
Agrypnia sp.																																			
Family: Polycentropodidae																																			
Polycentropus sp.																																			
Phylum: Mollusca																																			
Class: Bivalvia (clams)																																			
Family: Sphaeriidae																																			
Unidentified Sphaeriidae[2]	1415	1508	938	1585	1538	**1397**	**13.5**	3523	800	4750	2923	1362	**2672**	**38.9**	242	185	73	188	154	**168**	**14.7**	296	350	315	273	338	**315**	**16.8**	381	462	308	17	269	**287.3**	**4.8**
Pisidium sp.	46	262	77	92	154	**126**	**1.2**	62	108	250	15	108	**108**	**1.6**		8				**2**	**0.1**	38	15	15	4	4	**15**	**0.8**	46	154	77	4	44	**65.0**	**1.1**
Sphaerium sp.	15	46	46			**22**	**0.2**	15	15	19			**10**	**0.1**	4					**1**	**0.1**	8	4	12	8		**6**	**0.3**							
Class: Gastropoda (snails)																																			
Subclass: Prosobranchia																																			
Family: Valvatidae																																			
Valvata sincera	169	123	185	92	246	**163**	**1.6**	231	231	865	562	531	**484**	**7.0**	4	4				**2**	**0.1**	50	35	58	38	50	**46**	**2.5**	2					**0.4**	**0.0**
Subclass: Pulmonata																																			
Family: Lymnaeidae										19			**4**	**0.1**																					
Family: Physidae																																			
Physa sp.										38			**8**	**0.1**																					
Family: Planorbidae																																			
Gyraulus sp.										38			**8**	**0.1**											4	4	**2**	**0.1**							
Phylum: Nematoda (roundworms)					15	**3**	**0.0**	92	192	154		223	**132**	**1.9**		4	4		4	**2**	**0.2**		15	15	38	23	**18**	**1.0**	10	38	310	121		**95.8**	**1.6**
Total	11046	13446	12215	6546	8492	**10349**	**100.0**	7542	4633	10054	6192	5914	**6867**	**100.0**	1119	1127	1288	1165	1042	**1148**	**100.0**	2135	1762	1758	1823	1869	**1869**	**100.0**	4331	9519	5998	3317	6902	**6013**	**100.0**

APPENDIX B, TABLE 6

Detailed benthic invertebrate taxonomy and densities for the EARMP technical program, 2012.

Taxon	References																											
	Cree Lake							Ellis Bay							Pasfield Lake							RF-4						
	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%
Phylum: Annelida (segmented worms)																												
Class: Hirudinea (leeches)																												
Order: Arhynchobdellida																												
Family: Erpobdellidae																												
Erpobdella punctata																												
Nephelopsis obscura																												
Order: Rhynchobdellida																												
Family: Glossiphoniidae																												
Helobdella stagnalis								31		77			**22**	**0.2**														
Class: Oligochaeta (aquatic earthworms)																												
Family: Enchytraeidae								31				31	**12**	**0.1**														
Family: Lumbriculidae								708	77	138	292	31	**249**	**2.3**	46	19	88	77	46	**55**	**1.0**							
Family: Naididae																												
Subfamily: Naidinae								308		108	154	62	**126**	**1.1**														
Subfamily: Tubificinae	12	158	4	177	162	**102**	**0.8**	31	31				**12**	**0.1**	77		88	8	215	**78**	**1.4**	36	249	196	213	142	**167.1**	**3.9**
Oligochaeta (cocoon)[2]		77			4	**16**	**0.1**																					
Phylum: Arthropoda																												
Subphylum: Chelicerata																												
Class: Arachnida																												
Order: Hydracarina (water mites)[3]	77			77	77	**46**	**0.4**		338	123	77		**108**	**1.0**		12	27	15		**11**	**0.2**		18	44	18	80	**32.0**	**0.7**
Subphylum: Crustacea																												
Class: Branchiopoda																												
Order: Cladocera (water fleas)																												
Family: Chydoridae																												
Unidentified Chydoridae[2]																												
Eurycercus (*Bullatifrons*) sp.	692	385	77	312	385	**370**	**3.0**								523	138	96	231	58	**209**	**3.9**							
Family: Daphnidae																												
Simocephalus sp.[3]	2462	538	462	923	538	**985**	**7.9**																					
Family: Macrothricidae								154					**31**	**0.3**														
Family: Sididae[3]	385	77	77			**108**	**0.9**										31			**6**	**0.1**							
Class: Copepoda																												
Order: Calanoida[3]	154	77	385	538	77	**246**	**2.0**	923	1692	846	1154	523	**1028**	**9.3**	77	31	62	77	215	**92**	**1.7**				9		**1.8**	**0.0**
Order: Cyclopoida[3]								154					**31**	**0.3**									36	18			**10.7**	**0.2**
Class: Malacostraca																												
Order: Amphipoda (scuds)																												
Family: Gammaridae																												
Gammarus lacustris								462	185	123	431	185	**277**	**2.5**		38	112	31	246	**85**	**1.6**							
Family: Haustoriidae																												
Diporeia hoyi								62	31				**18**	**0.2**								3733	2044	1573	1644	2613	**2321.8**	**53.8**
Family: Hyalellidae																												
Hyalella azteca								4646	4077	4785	3954	1754	**3843**	**34.9**														
Order: Mysidacea																												
Family: Mysidae																												
Mysis relicta																												
Class: Ostracoda (seed shrimp)	154		231	77		**92**	**0.7**								231	31	246	77	123	**142**	**2.6**		36				**7.1**	**0.2**
Subphylum: Hexapoda																												
Class: Insecta																												
Order: Diptera (flies)																												
Family: Ceratopogonidae																												
Subfamily: Ceratopogoninae																												
Bezzia sp.								31	62	77	31	31	**46**	**0.4**														
Probezzia sp.	81				158	**48**	**0.4**		31				**6**	**0.1**										133	9	36	**35.6**	**0.8**
Family: Chaoboridae																												
Chaoborus sp.																												

APPENDIX B, TABLE 6

Detailed benthic invertebrate taxonomy and densities for the EARMP technical program, 2012.

Taxon	References																											
	Cree Lake							**Ellis Bay**							**Pasfield Lake**							**RF-4**						
	1	**2**	**3**	**4**	**5**	**Avr.**	**%**	**1**	**2**	**3**	**4**	**5**	**Avr.**	**%**	**1**	**2**	**3**	**4**	**5**	**Avr.**	**%**	**1**	**2**	**3**	**4**	**5**	**Avr.**	**%**
Family: Chironomidae																												
Subfamily: Chironominae																												
Chironomus sp.	146	38	77	119	181	**112**	**0.9**	800	862	400	554	492	**622**	**5.6**	15		69		31	**23**	**0.4**	71	142	71	98	133	**103.1**	**2.4**
Cladopelma sp.																			31	**6**	**0.1**			36	53		**17.8**	**0.4**
Cladotanytarsus sp.	627	469	1242	831	319	**698**	**5.6**								77				62	**28**	**0.5**	36					**7.1**	**0.2**
Corynocera sp.	5327	2181	3935	5069	7885	**4879**	**39.0**								3662	362	2238	1092	2446	**1960**	**36.4**							
Cryptochironomus sp.	269	162	162	269	346	**242**	**1.9**								62	42	35	46	31	**43**	**0.8**	53		9	44	36	**28.4**	**0.7**
Cryptotendipes sp.																												
Demicryptochironomus sp.	85	4	4			**18**	**0.1**															18					**3.6**	**0.1**
Dicrotendipes sp.	735	723	627	1085	696	**773**	**6.2**	3631	1077	1077	1046	338	**1434**	**13.0**	92	31			62	**37**	**0.7**							
Endochironomus sp.		8	4			**2**	**0.0**																					
Glyptotendipes sp.					4	**1**	**0.0**																					
Lauterborniella sp.	77				77	**31**	**0.2**																					
Microtendipes sp.																												
Neostempellina sp.																												
Nilothauma sp.	4					**1**	**0.0**																					
Pagastiella sp.			231	4	4	**48**	**0.4**																		18		**3.6**	**0.1**
Parachironomus sp.								31					**6**	**0.1**														
Paratanytarsus sp.								1415	108	231	215	62	**406**	**3.7**														
Polypedilum sp.	77	4	8	81	158	**65**	**0.5**	523	138	108	31		**160**	**1.5**					31	**6**	**0.1**							
Pseudochironomus sp.	165	81	173	77	50	**109**	**0.9**								46	15	27	138	31	**52**	**1.0**							
Sergentia sp.								31	62	31	31	123	**55**	**0.5**	15					**3**	**0.1**							
Stempellina sp.																												
Stictochironomus sp.	77	154	77			**62**	**0.5**		62	31	62	92	**49**	**0.4**	92	69	88	200	108	**112**	**2.1**							
Tanytarsus sp.	1000	462	400	615	619	**619**	**4.9**	215	262	31	77		**117**	**1.1**		31	123	77		**46**	**0.9**	196	213	98	142	80	**145.8**	**3.4**
Tribelos sp.																												
Xenochironomus sp.																												
Tribe: Chironomini																												
Unidentified Chironomini[2]		4				**1**	**0.0**																					
Tribe: Tanytarsini																												
Unidentified Tanytarsini[2]				15	4	**4**	**0.0**																					
Subfamily: Diamesinae																												
Potthastia longimana																								44		9	**10.7**	**0.2**
Protanypus sp.																						124	36	89	80	116	**88.9**	**2.1**
Subfamily: Orthocladiinae																												
Crictopus/Orthocladius Group								492					**98**	**0.9**	169	35	58			**52**	**1.0**							
Heterotanytarsus sp.																												
Heterotrissocladius sp.																								18	18	9	**8.9**	**0.2**
Nanocladius sp.																												
Parakiefferiella sp.																								36			**7.1**	**0.2**
Psectrocladius sp.								462					**92**	**0.8**	15	8	58	15	15	**22**	**0.4**							
Zalutschia sp.																												
Subfamily: Prodiamesinae																												
Monodiamesa sp.																										9	**1.8**	**0.0**
Subfamily: Tanypodinae																												
Unidentified Tanypodinae[2]										77			**15**	**0.1**											9		**1.8**	**0.0**
Ablabesmyia sp.			238	81		**64**	**0.5**	31					**6**	**0.1**	77	31		31		**28**	**0.5**							
Clinotanypus sp.																												
Larsia sp.	77			8		**17**	**0.1**																					
Procladius sp.	631	396	992	296	465	**556**	**4.4**	615	92		62		**154**	**1.4**	385	92	254	446	508	**337**	**6.3**	551	196	284	382	249	**332.4**	**7.7**
Tanypus sp.																												
Thienemannimyia Group								585	1015	923	1508	554	**917**	**8.3**														
Family: Empididae																												
Chelifera sp.																												
Order: Ephemeroptera (mayflies)																												
Family: Baetidae																												
Callibaetis sp.			77			**15**	**0.1**																					

APPENDIX B, TABLE 6

Detailed benthic invertebrate taxonomy and densities for the EARMP technical program, 2012.

Taxon	References																											
	Cree Lake							Ellis Bay							Pasfield Lake							RF-4						
	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%	1	2	3	4	5	Avr.	%
Family: Caenidae																												
Caenis sp.				8	4	**2**	**0.0**	215	77		31		**65**	**0.6**														
Family: Ephemeridae																												
Hexagenia limbata	4		4	4		**2**	**0.0**																					
Family: Leptophlebiidae																												
Leptophlebia sp.																	31			**6**	**0.1**							
Order: Megaloptera (fishflies)																												
Family: Sialidae																												
Sialis sp.																												
Order: Trichoptera (caddisflies)																												
Family: Hydroptilidae																												
Agraylea sp.								62	31	12	62	92	**52**	**0.5**														
Oxyethira sp.																												
Family: Lepidostomatidae																												
Lepidostoma sp.												31	**6**	**0.1**														
Family: Leptoceridae																												
Mystacides sp.	77		231		77	**77**	**0.6**									35			15	**10**	**0.2**							
Oecetis sp.	77					**15**	**0.1**																					
Family: Molannidae																												
Unidentified Mollanidae[2]																												
Molanna sp.	19		12	15	15	**12**	**0.1**									19				**4**	**0.1**							
Family: Phryganeidae																												
Unidentified Phryganeidae[2]																												
Agrypnia sp.																4				**1**	**0.0**							
Family: Polycentropodidae																												
Polycentropus sp.										4			**1**	**0.0**														
Phylum: Mollusca																												
Class: Bivalvia (clams)																												
Family: Sphaeriidae																												
Unidentified Sphaeriidae[2]	2004	1238	1846	1542	2238	**1774**	**14.2**	215	138		138	92	**117**	**1.1**	1292	673	808	1369	1000	**1028**	**19.1**	764	1013	942	818	1120	**931.6**	**21.6**
Pisidium sp.				12		**2**	**0.0**	92	123	62	92	92	**92**	**0.8**	200	42	73	123	46	**97**	**1.8**	36	18	36	36		**24.9**	**0.6**
Sphaerium sp.									31				**6**	**0.1**														
Class: Gastropoda (snails)																												
Subclass: Prosobranchia																												
Family: Valvatidae																												
Valvata sincera	254	173	100	104	488	**224**	**1.8**	646	369	338	508	154	**403**	**3.7**	138	38	19	31	15	**48**	**0.9**							
Subclass: Pulmonata																												
Family: Lymnaeidae																												
Family: Physidae																												
Physa sp.								31					**6**	**0.1**														
Family: Planorbidae																												
Gyraulus sp.									77	77	108	62	**65**	**0.6**														
Phylum: Nematoda (roundworms)	85	77	81	173	15	**86**	**0.7**	585	323	262	108	62	**268**	**2.4**	1862	177	292	277	1185	**758**	**14.1**	36			9	71	**23.1**	**0.5**
Total	15831	7485	11754	12512	15046	**12525**	**100.0**	18215	11369	9938	10723	4862	**11022**	**100.0**	9154	1973	4923	4362	6519	**5386**	**100.0**	5653	4000	3627	3600	4702	**4316**	**100.0**

Avr. = average; % = percent composition.

[1]Numbers are per m^2.

[2]These taxa were included in total benthic invertebrate density and biomass analyses but not in taxon richness analyses if conspecifics identified with higher taxonomic resolution were present. This was to avoid artificially inflating taxon diversity.

[3]Non-benthic invertebrates not included in community indices computations.

APPENDIX B, TABLE 7

Detailed benthic invertebrate community biomass data collected for the EARMP technical program, 2011 and 2012.

Taxonomic Group	Far-Field Exposure Areas																			
	Cochrane River										Crackingstone Inlet									
	2011					2012					2011					2012				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Amphipoda	**3.348**	1.826	1.517	0.562	**3.131**	0.269	0.383	0.722	0.135	1.162	**11.714**	**8.202**	**12.765**	**10.895**	**8.797**	**7.292**	**3.635**	**6.088**	1.738	0.712
Chironomidae	2.844	**3.930**	**1.906**	**2.292**	2.248	**2.198**	3.775	**2.897**	2.838	**3.672**	0.119	0.143	0.097	0.283	0.111	0.269	0.254	0.267	0.301	0.267
Ephemeroptera	0[1]	0	0	0	0	0	0	0	0	0	0	0.009	0.034	0	0	0	0.008	0.073	0	0
Gastropoda/Pelecypoda	2.884	1.862	1.028	2.131	1.927	2.185	**4.731**	1.242	**3.049**	1.215	3.912	2.664	4.428	2.935	1.538	2.146	1.525	5.763	**2.115**	2.276
Hirudinea	0.412	0	0	0	0	0.517	0	0	0	0.063	0	0	0.151	1.576	0	0	0	0	0	2.442
Malacostraca	0	0	0	0	0	0.072	0	0	0	0	0	0	0	0	0	0	0	0.162	0	0
Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odonata	0	0	0	0	0	0	0	0	0	0	0.249	0	0	0	0.036	0	0	0	0	0
Oligochaeta	0.106	0.297	0.123	0.050	0.292	0.569	0.594	0.958	0.994	0.460	0.191	0.073	0.311	0.052	0.089	0.765	0.884	0.192	0.159	**7.965**
Other Diptera	0	0.015	0	0	0.022	0.020	0	0.023	0	0.074	0.208	0.300	0.258	0.206	0.178	0.108	0.045	0.073	0.032	0.135
Other taxa	0.808	0.612	0.360	0.265	0.452	0.429	0.243	0.342	0.218	0.291	0.118	0.163	0.168	0	0.031	0.028	0.045	0.121	0.008	0.031
Trichoptera	0.995	0.363	0.663	0.316	0.009	0	0	0.011	0	0	0.028	0	0	0.295	0.095	0.111	0	0.015	0	0.034
Total	11.4	8.9	5.6	5.6	8.1	6.3	9.7	6.2	7.2	6.9	16.5	11.6	18.2	16.2	10.9	10.7	6.4	12.8	4.4	13.9

Taxonomic Group	Far-Field Exposure Areas																			
	Fond du Lac River										Waterbury Lake									
	2011					2012					2011					2012				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Amphipoda	**4.054**	**2.960**	**4.512**	**4.147**	**4.210**	**2.978**	**2.181**	**3.431**	**2.917**	**2.366**	0.045	0.020	0.438	**1.328**	**1.155**	0.004	0	0.035	0.469	0.373
Chironomidae	0.111	0.413	0.428	0.353	0.315	0.130	0.182	0.100	0.068	0.040	**1.251**	1.152	**1.145**	1.223	1.019	**1.267**	**1.331**	0.825	**0.625**	**0.496**
Ephemeroptera	0	0	0	0	0.005	0	0.002	0	0.023	0	0	0	0.003	0	0	0	0	0	0.007	0.001
Gastropoda/Pelecypoda	0.235	0.253	0.012	0.005	0.045	0.260	0.185	0.036	0.063	0.082	0.812	**1.553**	0.682	0.707	0.704	0.829	0.419	**0.929**	0.305	0.245
Hirudinea	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Malacostraca	0	0	0.085	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oligochaeta	0	0.008	0	0	0.017	0.015	0.056	0.002	0	0.032	0.049	0.028	0.065	0.231	0.397	0.027	0.007	0.165	0	0.076
Other Diptera	0.011	0.002	0.005	0.001	0.002	0.002	0.0004	0.008	0.009	0.004	0.016	0.003	0.002	0.057	0.017	0	0	0	0.009	0.007
Other taxa	0.052	0.040	0.042	0.048	0.022	0.017	0.036	0.018	0.013	0.012	0.455	0.385	0.736	1.030	0.772	0.361	0.193	0.300	0.149	0.175
Trichoptera	0	0	0	0	0	0	0	0.006	0.015	0.005	0.007	0	0	0	0.035	0	0.007	0	0.009	0.192
Total	4.5	3.7	5.1	4.6	4.6	3.4	2.6	3.6	3.1	2.5	2.6	3.1	3.1	4.6	4.1	2.5	2.0	2.3	1.6	1.6

APPENDIX B, TABLE 7

Detailed benthic invertebrate community biomass data collected for the EARMP technical program, 2011 and 2012.

Taxonomic Group	**References[2]**																			
	Bobby's Lake										**Cree Lake**									
	2009[3]					**2012**					**2011**					**2012**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Amphipoda	0	0	0	0	0	0	0.073	1.050	0.003	0	0	0	0	0	0	0	0	0	0	0
Chironomidae	0.287	0.485	0.317	0.212	0.249	0.515	**23.421**	**2.384**	0.654	**13.914**	**2.099**	**2.215**	**1.263**	**1.281**	**3.568**	**10.262**	**3.469**	**6.069**	**8.836**	**10.818**
Ephemeroptera	**1.656**	**1.495**	**1.438**	**1.660**	**0.933**	**5.240**	0.877	0.920	**0.697**	0	0.149	0.279	0.066	1.146	0.098	0.021	0	0.261	0.047	0.0004
Gastropoda/Pelecypoda	0.362	0.764	0.121	0.066	0.176	0.276	0.546	0.327	0.021	0.163	0.724	0.714	0.471	0.398	0.678	0.857	0.890	0.717	1.082	1.110
Hirudinea	0	0	0	0	0	0	0	0.878	0	0	0	0.046	2.001	0	0.042	0	0	0	0	0
Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Megaloptera	0.008	0.007	0	0	0	0.018	0.031	0.337	0.028	0	0	0	0.511	0.377	0	0	0	0	0	0
Odonata	0	0	0	0	0	0	0	0	0	0	0	0.966	0	0	0	0	0	0	0	0
Oligochaeta	0	0	0	0	0.017	0.020	0.088	0	0.002	0.019	0.262	0.118	0.431	0.421	0.037	0.051	0.223	0.002	0.370	0.326
Other Diptera	0.022	0.026	0	0	0	0.120	2.540	0.002	0.023	0	0.047	0.023	0.068	0.023	0.040	0.010	0	0	0	0.093
Other taxa	0.036	0.033	0.005	0.006	0.003	0.075	0.246	0.131	0.037	0.169	0.305	0.478	0.178	0.353	0.500	0.585	0.277	0.251	0.558	0.392
Trichoptera	0	0	0	0	0	0	0	0.185	0.026	0	0	0.261	0	0	0	0.222	0	0.182	0.268	1.047
Total	2.4	2.8	1.9	1.9	1.4	6.3	27.8	6.2	1.5	14.3	3.6	5.1	5.0	4.0	5.0	12.0	4.9	7.5	11.2	13.8

Taxonomic Group	**References[2]**																			
	Ellis Bay										**Pasfield Lake**									
	2011					**2012**					**2011**					**2012**				
	1	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**	**1**	**2**	**3**	**4**	**5**
Amphipoda	**11.218**	**16.047**	**10.303**	**8.595**	**7.160**	**16.354**	**9.349**	**10.625**	**11.888**	**4.898**	0	0	0.045	0.028	0.392	0	0.209	0.648	0.235	1.642
Chironomidae	3.234	7.258	3.963	3.109	4.517	8.215	7.129	2.478	4.745	3.812	**24.372**	**23.069**	**8.909**	**49.800**	**6.971**	**4.900**	0.742	**3.205**	**3.329**	**4.138**
Ephemeroptera	0.345	0.083	0.118	0.151	0.135	0.040	0.008	0	0.012	0	0	0	0	0	0	0	0	0.003	0	0
Gastropoda/Pelecypoda	1.825	1.034	2.429	2.089	3.152	9.698	2.652	2.522	2.892	1.400	18.338	2.066	0.574	4.126	1.440	1.395	**0.882**	1.155	2.471	0.692
Hirudinea	0	0.080	0.691	4.652	0	0.089	0	0.038	0	0	0	0	0	0	0.017	0	0	0	0	0
Malacostraca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Megaloptera	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Odonata	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oligochaeta	1.157	1.378	1.157	0.432	0.483	0.834	0.511	0.618	0.854	0.148	1.471	3.069	0.518	1.042	1.323	0.938	0.184	1.445	1.008	1.257
Other Diptera	0.025	0.028	0	0.008	0	0.015	0.049	0.038	0.022	0.022	0.003	0	0	0	0	0	0	0	0	0
Other taxa	0.228	0.631	0.231	0.469	0.290	0.200	0.960	0.548	0.234	0.080	0.160	0.286	0.271	0.160	0.363	0.495	0.122	0.254	0.163	0.411
Trichoptera	0.591	0.777	2.385	0.838	0	0.228	0.117	0.317	0.228	0.363	0.609	0.662	0.046	1.024	0.818	0	0.154	0	0	0.058
Total	18.6	27.3	21.3	20.3	15.7	35.7	20.8	17.2	20.9	10.7	45.0	29.2	10.4	56.2	11.3	7.7	2.3	6.7	7.2	8.2

All values are in g/m^2.

Bolded values are taxonomic groups with the highest biomass at a given sampling station.

[1]Values of 0 signify zero, not a very small value.

[2]Benthic invertebrate community biomass was not measured in RF-4 in either survey years, and therefore, biomass data for RF-4 is not included here.

[3]No samples were collected in Bobby's Lake in 2011; samples from 2009 were used instead.

APPENDIX B, TABLE 8

Detailed fish capture data for the EARMP technical program, 2011 and 2012.

Waterbody	Method	Site	Set Date	Catch Date	Species	Fish Number	Length (cm)	Weight (g)	Sex	Released	Maturity	Spawning Condition	Age Structure Collected	Age (years)	Stomach Contents	Comments
Bobby's Lake	HG	HG01-01	02/10/2009 10:30	02/10/2009 13:30	NP	1	66.2	1660	F	N	A	U	CL	9		Healthy; kept for chemistry
Bobby's Lake	HG	HG01-01	02/10/2009 10:30	02/10/2009 13:30	NP	2	59.2	1055	F	N	A	U	CL	8	Empty	Healthy; kept for chemistry
Bobby's Lake	HG	HG01-01	02/10/2009 10:30	02/10/2009 13:30	LSU	3	46.1	1220	F	N	A	U	FR	-	Empty	Healthy; kept for chemistry but not submitted
Bobby's Lake	HG	HG01-01	02/10/2009 10:30	02/10/2009 13:30	LW	4	35.5	340	M	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG01-01	02/10/2009 10:30	02/10/2009 13:30	LW	5	38.1	460	M	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG01-01	02/10/2009 10:30	02/10/2009 13:30	LW	6	26.6	220	F	Y	J	NS	-	-	-	-
Bobby's Lake	HG	HG01-01	02/10/2009 10:30	02/10/2009 13:30	LW	7	34	505	M	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG01-01	02/10/2009 10:30	02/10/2009 13:30	LW	8	21.2	110	U	Y	J	NS	-	-	-	-
Bobby's Lake	HG	HG01-01	02/10/2009 10:30	02/10/2009 13:30	WE	9	46.8	940	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG01-01	02/10/2009 10:30	02/10/2009 13:30	WE	10	43.7	680	U	Y	U	U	-	-	-	-
Bobby's Lake	GN	GN01-01	02/10/2009 11:00	02/10/2009 14:30	LW	1	33.1	390	U	Y	U	U	-	-	-	-
Bobby's Lake	MT	MT01-01	02/10/2009 11:05	03/10/2009 12:30	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	MT	MT02-01	02/10/2009 11:10	03/10/2009 12:35	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	MT	MT03-01	02/10/2009 11:15	03/10/2009 12:40	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	MT	MT04-01	02/10/2009 11:20	03/10/2009 12:45	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	MT	MT05-01	02/10/2009 11:25	03/10/2009 12:50	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	MT	MT06-01	02/10/2009 11:30	03/10/2009 13:00	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	MT	MT07-01	02/10/2009 11:35	03/10/2009 13:10	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	MT	MT08-01	02/10/2009 11:40	03/10/2009 13:20	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	MT	MT09-01	02/10/2009 11:45	03/10/2009 13:30	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	MT	MT10-01	02/10/2009 11:50	03/10/2009 13:35	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	GN	GN02-01	02/10/2009 12:00	02/10/2009 15:00	WSU	1	42	705	M	N	U	U	FR	12	Empty	Healthy; kept for chemistry
Bobby's Lake	BN	BN01-01	02/10/2009 13:00	03/10/2009 13:00	-	-	-	-	-	N	-	-	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	NP	1	69.6	2460	F	N	U	U	CL	9	70% LW	Healthy; kept for chemistry
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	NP	2	43	550	M	N	U	U	CL		Empty	Healthy; kept for chemistry; not analyzed
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WSU	3	45.8	1080	M	N	U	U	FR	14	5% Unidentified BI	Large lesion; kept for chemistry
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WSU	4	47.2	1140	F	N	U	U	FR	12	25% Unidentified BI	Healthy; kept for chemistry
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WSU	5	44.8	1005	F	N	U	U	FR	11	Empty	Healthy; kept for chemistry
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WSU	6	40.9	700	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WSU	7	44	780	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WSU	8	47.2	1280	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	9	29	300	U	Y	J	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WSU	10	24.6	180	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	11	40.5	780	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	12	51.2	1140	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	13	46.5	880	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	14	46.4	780	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	15	52.2	1160	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	16	479.3	1040	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	17	49.8	1060	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	18	48	1000	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	19	43.1	660	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	20	49.6	980	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	21	51.3	1120	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	22	52	1160	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	23	49.3	980	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	24	50.2	1060	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	25	52.7	1220	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	26	42.4	560	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	WE	27	47.7	1000	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	28	45.8	1200	U	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	29	41.6	760	U	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	30	42.4	1000	U	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	31	43.1	820	U	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	32	42.8	1010	U	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	33	42.1	805	U	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	34	40.8	760	U	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	35	45.5	1000	U	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	36	42.1	720	U	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	37	37.3	650	U	Y	U	U	-	-	-	-

APPENDIX B, TABLE 8

Detailed fish capture data for the EARMP technical program, 2011 and 2012.

Waterbody	Method	Site	Set Date	Catch Date	Species	Fish Number	Length (cm)	Weight (g)	Sex	Released	Maturity	Spawning Condition	Age Structure Collected	Age (years)	Stomach Contents	Comments
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	38	41.2	760	U	Y	U	U	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	39	40.7	740	U	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	40	39.6	560	U	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	41	38.8	680	U	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	42	36.5	380	U	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	43	39.1	580	U	Y	A	MT	-	-	-	-
Bobby's Lake	HG	HG02-01	02/10/2009 16:00	03/10/2009 9:00	LW	44	28.2	280	U	Y	J	NS	-	-	-	-
Bobby's Lake	BE	BE01-01	03/10/2009 14:00	03/10/2009 14:15	NP	1	17.1	-	U	Y	U	U	-	-	-	-
Bobby's Lake	BE	BE02-01	03/10/2009 14:30	03/10/2009 14:45	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	BE	BE03-01	03/10/2009 15:00	03/10/2009 15:15	YP	1	8.5	-	U	Y	U	U	-	-	-	-
Bobby's Lake	AN	AN01-01	03/10/2009 15:10	03/10/2009 15:15	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	AN	AN02-01	03/10/2009 15:15	03/10/2009 15:25	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	BE	BE04-01	03/10/2009 15:15	03/10/2009 15:30	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	BE	BE05-01	03/10/2009 15:50	03/10/2009 16:10	NF	-	-	-	-	N	-	-	-	-	-	No fish captured; observed small perch
Bobby's Lake	BE	BE06-01	03/10/2009 16:15	03/10/2009 16:30	NP	1	8.7	-	U	Y	U	U	-	-	-	-
Bobby's Lake	BE	BE07-01	03/10/2009 16:45	03/10/2009 17:00	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	BE	BE08-01	03/10/2009 17:00	03/10/2009 17:15	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	HG	HG03-1	04/10/2009 9:30	04/10/2009 13:00	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	HG	HG04-1	04/10/2009 13:30	04/10/2009 15:15	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	GN	GN03-01	04/10/2009 14:30	04/10/2009 16:00	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Bobby's Lake	GN	GN04-01	04/10/2009 14:40	04/10/2009 17:00	NP	1	53.1	715	F	N	U	U	CL	6	Empty	Kept for chemistry
Bobby's Lake	GN	GN04-01	04/10/2009 14:40	04/10/2009 17:00	NP	2	67.5	1720	F	N	U	U	CL	9	Empty	Kept for chemistry
Bobby's Lake	AN	AN01-1	04/10/2009 15:50	04/10/2009 16:50	NF	-	-	-	-	-	-	-	-	-	-	-
Waterbury Lake	SP	SP01-01	22/09/2011 11:10	22/09/2011 12:35	LT	2	47	1120	M	Y	A	SP	-	-	-	-
Waterbury Lake	SP	SP01-01	22/09/2011 11:10	22/09/2011 12:35	NP	3	78.5	3540	M	N	A	ST	CL	9	Empty	Kept for chemistry
Waterbury Lake	SP	SP02-01	22/09/2011 11:25	22/09/2011 13:55	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Waterbury Lake	SP	SP03-01	22/09/2011 11:45	22/09/2011 14:00	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Waterbury Lake	AN	AN01-01	22/09/2011 12:00	22/09/2011 12:10	LT	1	-	-	-	Y	-	-	-	-	-	-
Waterbury Lake	AN	AN01-01	22/09/2011 12:00	22/09/2011 12:10	LT	2	-	-	-	Y	-	-	-	-	-	-
Waterbury Lake	AN	AN02-01	22/09/2011 12:00	22/09/2011 12:20	NF	-	-	-	-	-	-	-	-	-	-	One LT got away; no fish captured
Waterbury Lake	SP	SP04-01	22/09/2011 12:45	22/09/2011 14:45	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Waterbury Lake	SP	SP05-01	22/09/2011 14:25	22/09/2011 17:25	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Waterbury Lake	SP	SP06-01	22/09/2011 14:55	22/09/2011 15:25	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Waterbury Lake	SP	SP07-01	22/09/2011 15:30	22/09/2011 17:35	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	NP	1	85.9	4750	F	N	A	U	CL	8	Empty	Kept for chemistry
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	NP	2	67	2250	F	N	A	U	CL	4	Empty	Kept for chemistry
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LT	3	66.2	2680	F	N	A	NS	OT	17	Empty	Kept for chemistry
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LT	4	52.9	1920	M	N	A	M	OT	11	Empty	Kept for chemistry
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LT	5	51.5	1440	F	N	A	ST	OT	16	Empty	Kept for chemistry
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LT	6	50.6	1380	M	N	A	M	OT	12	Empty	Kept for chemistry
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LT	7	53.5	3310	F	N	A	SP	OT	20	Empty	Kept for chemistry
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LW	8	37.5	680	F	N	A	MT	OT	16	20% Unidentified BI	Kept for chemistry
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LW	9	37.5	750	F	N	A	MT	OT	19	30% Unidentified BI	Kept for chemistry
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LW	10	35.5	560	F	N	A	NS	OT	12	Empty	Kept for chemistry
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LSU	11	37.2	750	M	N	A	U	FR	11	Empty	Composite with SP08-01 LSU12
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LSU	12	33.5	480	F	N	A	U	FR	8	44% unknown	Composite with SP08-01 LSU11
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LSU	13	38.6	800	M	N	A	U	FR	13	Empty	Kept for chemistry
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LSU	14	39.5	920	M	N	A	U	FR	15	30% unknown	Kept for chemistry
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LSU	15	37.5	720	M	N	A	U	FR	11	Empty	Composite with SP08-01 LSU16
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LSU	16	33.5	550	F	N	A	U	FR	14	30% unknown	Composite with SP08-01 LSU15
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LSU	17	33.5	5560	M	N	A	U	FR	13	20% unknown	Composite with SP08-01 LSU18
Waterbury Lake	SP	SP08-01	22/09/2011 17:45	23/09/2011 9:00	LSU	18	32.2	450	M	N	A	U	FR	10	Empty	Composite with SP08-01 LSU17
Waterbury Lake	SP	SP09-01	23/09/2011 10:00	23/09/2011 13:45	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Waterbury Lake	SP	SP10-01	23/09/2011 10:30	23/09/2011 14:00	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Pasfield Lake	SP	SP01-01	24/09/2011 9:30	24/09/2011 11:45	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Pasfield Lake	SP	SP02-01	24/09/2011 9:45	24/09/2011 10:20	LW	1	34	500	M	N	A	SP	OT	-	Empty	Kept for chemistry; not analyzed
Pasfield Lake	SP	SP02-01	24/09/2011 9:45	24/09/2011 10:20	NP	2	84.4	3750	F	N	A	U	CL	8	40% unknown	Kept for chemistry

APPENDIX B, TABLE 8

Detailed fish capture data for the EARMP technical program, 2011 and 2012.

Waterbody	Method	Site	Set Date	Catch Date	Species	Fish Number	Length (cm)	Weight (g)	Sex	Released	Maturity	Spawning Condition	Age Structure Collected	Age (years)	Stomach Contents	Comments
Pasfield Lake	SP	SP03-01	24/09/2011 10:30	24/09/2011 12:45	LT	1	58.6	1980	F	N	A	NS	OT	23	Empty	Kept for chemistry
Pasfield Lake	AN	AN01-01	24/09/2011 12:00	24/09/2011 12:30	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Pasfield Lake	AN	AN02-01	24/09/2011 12:00	24/09/2011 12:30	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Pasfield Lake	AN	AN03-01	24/09/2011 12:00	24/09/2011 13:00	LT	1	58.6	2010	F	N	A	ST	OT	18	10% small minnows	Kept for chemistry
Pasfield Lake	AN	AN03-01	24/09/2011 12:00	24/09/2011 13:00	LT	2	58.4	2015	M	N	A	ST	OT	19	Empty	Kept for chemistry
Pasfield Lake	AN	AN04-01	24/09/2011 12:00	24/09/2011 12:30	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Pasfield Lake	SP	SP04-01	24/09/2011 12:00	24/09/2011 15:30	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Pasfield Lake	SP	SP05-01	24/09/2011 13:20	24/09/2011 15:10	LT	1	53.1	1620	M	N	A	NS	OT	n/a	Empty	Kept for chemistry
Pasfield Lake	SP	SP05-01	24/09/2011 13:20	24/09/2011 15:10	LT	2	58.2	1630	M	N	A	ST	OT	21	Empty	Kept for chemistry
Pasfield Lake	SP	SP06-01	24/09/2011 15:45	24/09/2011 17:45	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Pasfield Lake	SP	SP07-01	24/09/2011 18:00	25/09/2011 9:00	LW	1	35.9	580	F	N	A	MT	OT	5	Empty	Composite with LW02
Pasfield Lake	SP	SP07-01	24/09/2011 18:00	25/09/2011 9:00	LW	2	32.3	410	M	N	A	NS	OT	5	Empty	Composite with LW01
Pasfield Lake	SP	SP07-01	24/09/2011 18:00	25/09/2011 9:00	LW	3	35.5	540	M	N	A	MT	OT	6	15% Unidentified BI	Composite with LW04
Pasfield Lake	SP	SP07-01	24/09/2011 18:00	25/09/2011 9:00	LW	4	33.5	475	F	N	A	M	OT	5	Empty	Composite with LW03
Pasfield Lake	SP	SP07-01	24/09/2011 18:00	25/09/2011 9:00	LW	5	36.1	528	F	N	A	NS	OT	5	Empty	Composite with LW06
Pasfield Lake	SP	SP07-01	24/09/2011 18:00	25/09/2011 9:00	LW	6	32.6	420	F	N	A	NS	OT	5	20% unknown	Composite with LW05
Pasfield Lake	SP	SP07-01	24/09/2011 18:00	25/09/2011 9:00	LW	7	33.4	460	F	N	J	NS	OT	5	Empty	Composite with LW08
Pasfield Lake	SP	SP07-01	24/09/2011 18:00	25/09/2011 9:00	LW	8	33.1	460	M	N	A	NS	OT	5	Empty	Composite with LW07
Pasfield Lake	SP	SP07-01	24/09/2011 18:00	25/09/2011 9:00	LW	9	34.3	510	F	N	A	MT	OT	5	Empty	Composite with LW10
Pasfield Lake	SP	SP07-01	24/09/2011 18:00	25/09/2011 9:00	LW	10	30.7	350	M	N	A	NS	OT	4	Empty	Composite with LW09
Pasfield Lake	SP	SP07-01	24/09/2011 18:00	25/09/2011 9:00	LSU	11	33.3	420	M	N	J	U	FR	10	25% Unidentified BI	Kept for chemistry
Pasfield Lake	SP	SP07-01	24/09/2011 18:00	25/09/2011 9:00	LSU	12	38.4	800	M	N	A	U	FR	13	40% unknown	Kept for chemistry
Pasfield Lake	SP	SP07-01	24/09/2011 18:00	25/09/2011 9:00	LSU	13	45.8	1690	F	N	A	U	FR	23	40% Unidentified BI	Kept for chemistry
Pasfield Lake	SP	SP08-01	25/09/2011 9:30	25/09/2011 12:30	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Cochrane River	SP	SP01-01	26/09/2011 9:15	26/09/2011 12:00	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Cochrane River	AN	AN01-01	26/09/2011 9:45	26/09/2011 10:45	LT	1	58.3	2440	F	N	A	ST	OT	18	60% stickleback	Kept for chemistry
Cochrane River	AN	AN01-01	26/09/2011 9:45	26/09/2011 10:45	LT	2	59.4	2280	F	N	A	ST	OT	10	50% stickleback	Kept for chemistry
Cochrane River	AN	AN01-01	26/09/2011 9:45	26/09/2011 10:45	LT	3	67.7	3460	F	N	A	ST	OT	23	60% stickleback	Kept for chemistry
Cochrane River	AN	AN01-01	26/09/2011 9:45	26/09/2011 10:45	LT	4	63.2	3320	F	N	A	ST	OT	23	35% stickleback	Kept for chemistry; green liver
Cochrane River	AN	AN01-01	26/09/2011 9:45	26/09/2011 10:45	LT	5	57.5	2380	F	N	A	ST	OT	19	90% white suckers	Kept for chemistry
Cochrane River	AN	AN01-01	26/09/2011 9:45	26/09/2011 10:45	NP	6	57.7	1420	M	N	A	U	CL	9	Empty	Kept for chemistry; green liver
Cochrane River	AN	AN01-01	26/09/2011 9:45	26/09/2011 10:45	NP	7	59.4	1700	M	N	A	U	CL	6	Empty	Kept for chemistry
Cochrane River	AN	AN02-01	26/09/2011 9:45	26/09/2011 10:45	NP	1	51.1	1110	M	N	A	U	CL	4	Empty	Kept for chemistry
Cochrane River	AN	AN02-01	26/09/2011 9:45	26/09/2011 10:45	NP	2	48.9	840	F	N	A	U	CL	4	Empty	Kept for chemistry
Cochrane River	AN	AN02-01	26/09/2011 9:45	26/09/2011 10:45	NP	3	52.1	1180	M	N	A	U	CL	6	Empty	Kept for chemistry
Cochrane River	SP	SP02-01	26/09/2011 9:45	26/09/2011 10:45	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Cochrane River	SP	SP03-01	26/09/2011 11:00	26/09/2011 15:30	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Cochrane River	SP	SP04-01	26/09/2011 12:30	26/09/2011 15:10	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Cochrane River	SP	SP05-01	26/09/2011 15:40	26/09/2011 17:00	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Cochrane River	SP	SP06-01	26/09/2011 17:00	27/09/2011 7:30	LW	1	42.5	960	F	N	A	MT	OT	32	Empty	Kept for chemistry
Cochrane River	SP	SP06-01	26/09/2011 17:00	27/09/2011 7:30	LW	2	49.4	1210	F	N	A	NS	OT	34	10% Unidentified BI	Kept for chemistry
Cochrane River	SP	SP06-01	26/09/2011 17:00	27/09/2011 7:30	LW	3	43.2	990	M	N	A	U	OT	10	40% BI	Kept for chemistry
Cochrane River	SP	SP06-01	26/09/2011 17:00	27/09/2011 7:30	LSU	4	37.9	930	M	N	A	U	FR	19	Empty	-
Cochrane River	SP	SP06-01	26/09/2011 17:00	27/09/2011 7:30	LSU	5	39.7	970	M	N	A	U	FR	16	10% unknown	Kept for chemistry
Cochrane River	SP	SP06-01	26/09/2011 17:00	27/09/2011 7:30	LSU	6	42.7	1210	M	N	A	U	FR	12	Empty	Kept for chemistry
Cochrane River	SP	SP07-01	27/09/2011 7:50	27/09/2011 11:50	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Cochrane River	SP	SP08-01	27/09/2011 12:00	27/09/2011 15:30	LW	1	46.5	1310	F	N	A	NS	OT	17	30% Unidentified BI	Kept for chemistry
Cochrane River	SP	SP08-01	27/09/2011 12:00	27/09/2011 15:30	LW	2	46.5	1380	F	N	A	M	OT	15	70% BI	Kept for chemistry
Cochrane River	SP	SP08-01	27/09/2011 12:00	27/09/2011 15:30	LW	3	43.8	1180	U	Y	A	U	-	-	-	-
Cree Lake	SP	SP01-01	28/09/2011 10:00	28/09/2011 13:10	LT	1	44.5	950	F	N	J	NS	OT	6	Empty	Kept for chemistry
Cree Lake	SP	SP01-01	28/09/2011 10:00	28/09/2011 13:10	LW	2	33.5	460	F	N	J	NS	OT	4	Empty	Composited with SP03-01 LW02
Cree Lake	SP	SP02-01	28/09/2011 10:15	28/09/2011 12:55	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Cree Lake	SP	SP03-01	28/09/2011 10:30	28/09/2011 12:45	LT	1	67.7	3240	M	N	A	M	OT	n/a	Empty	Dead
Cree Lake	SP	SP03-01	28/09/2011 10:30	28/09/2011 12:45	LW	2	36.3	550	M	N	J	NS	OT	6	15% BI	Composited with SP01-01 LW02
Cree Lake	AN	AN01-01	28/09/2011 12:00	28/09/2011 13:00	LT	1	47.4	1170	M	N	A	SP	OT	9	Empty	Kept for chemistry
Cree Lake	AN	AN01-01	28/09/2011 12:00	28/09/2011 13:00	LT	2	57.9	1920	M	N	A	SP	OT	18	Empty	Kept for chemistry
Cree Lake	AN	AN01-01	28/09/2011 12:00	28/09/2011 13:00	LT	3	48.1	1180	F	N	A	NS	OT	7	Empty	Kept for chemistry
Cree Lake	AN	AN01-01	28/09/2011 12:00	28/09/2011 13:00	LT	4	54.9	1620	F	N	A	NS	OT	10	Empty	Kept for chemistry
Cree Lake	SP	SP04-01	28/09/2011 13:15	28/09/2011 15:30	NF	-	-	-	-	-	-	-	-	-	-	No fish captured

APPENDIX B, TABLE 8

Detailed fish capture data for the EARMP technical program, 2011 and 2012.

Waterbody	Method	Site	Set Date	Catch Date	Species	Fish Number	Length (cm)	Weight (g)	Sex	Released	Maturity	Spawning Condition	Age Structure Collected	Age (years)	Stomach Contents	Comments
Cree Lake	SP	SP05-01	28/09/2011 13:25	28/09/2011 15:25	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Cree Lake	SP	SP06-01	28/09/2011 15:45	28/09/2011 17:45	LT	1	60.6	2220	U	Y	A	U	-	-	-	-
Cree Lake	SP	SP06-01	28/09/2011 15:45	28/09/2011 17:45	LW	2	49.6	1530	M	N	A	MT	OT	9	Empty	Kept for chemistry
Cree Lake	SP	SP07-01	28/09/2011 15:55	28/09/2011 17:55	LT	1	58.3	1740	M	Y	A	ST	-	-	-	-
Cree Lake	SP	SP07-01	28/09/2011 15:55	28/09/2011 17:55	LW	2	37.1	620	M	N	A	MT	OT	18	Empty	Composited with SP09-01 LW01
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	WSU	1	38.4	900	U	Y	A	U	-	-	-	-
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	LT	2	46.4	1180	F	N	A	SP	-	-	-	Dead
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	WSU	3	44.1	1360	U	Y	A	U	-	-	-	-
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	LT	4	54.1	1330	M	N	A	ST	-	-	-	Dead
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	LT	5	44	980	M	N	A	NS	-	-	-	Dead
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	LW	6	37.5	630	M	N	A	MT	-	-	Empty	Dead
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	LW	7	35.4	510	M	N	A	MT	-	-	Empty	Dead
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	LW	8	35.7	515	F	N	A	NS	-	-	Empty	Dead
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	LW	9	36.1	550	F	N	A	M	-	-	Empty	Dead
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	LW	10	34.9	520	M	N	A	NS	-	-	Empty	Dead
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	LW	11	35.7	550	U	Y	A	G	-	-	-	-
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	LW	12	35.7	480	U	Y	A	G	-	-	-	-
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	LW	13	33.7	475	F	N	A	M	-	-	Empty	Dead
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	LSU	14	34.5	580	U	Y	A	U	-	-	-	-
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	WSU	15	33.1	600	U	Y	A	MT	-	-	-	-
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	WSU	16	33.5	520	F	N	A	MT	-	-	-	Dead
Cree Lake	SP	SP08-01	28/09/2011 18:15	29/09/2011 9:00	BB	17	56.1	1140	U	Y	A	MT	-	-	-	-
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LW	1	33.4	420	M	N	J	NS	OT	8	Empty	Composited with SP07-01 LW02
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	WSU	2	37.7	810	U	N	A	MT	FR	9	25% Unidentified BI	Kept for chemistry, lesion on tail
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	WSU	3	36.7	790	U	N	A	MT	FR	7	Empty	Kept for chemistry
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	WSU	4	38.4	900	U	N	A	MT	FR	9	Empty	Kept for chemistry
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	WSU	5	37.8	855	U	N	A	MT	FR	8	30% Unidentified BI	Kept for chemistry
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	WSU	6	41.7	1165	U	N	A	MT	FR	9	Empty	Kept for chemistry
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LSU	7	45.6	1510	U	N	A	MT	FR	23	Empty	Kept for chemistry
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LSU	8	36.4	610	U	N	A	MT	FR	14	Empty	Composited with LSU09
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LSU	9	33.2	510	U	N	A	MT	FR	14	20% Unidentified BI	Composited with LSU08
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LSU	10	35.1	600	U	N	A	MT	FR	10	Empty	Composited with LSU11
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LSU	11	34.3	520	U	N	A	MT	FR	8	Empty	Composited with LSU10
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LSU	12	34.6	540	U	N	A	MT	FR	9	10% Unidentified BI	Composited with LSU13
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LSU	13	35	560	U	N	A	MT	FR	14	10% Unidentified BI	Composited with LSU12
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LSU	14	36.7	715	U	N	A	MT	FR	13	10% Unidentified BI	Composited with LSU15
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LSU	15	36.5	670	U	N	A	MT	FR	10	Empty	Composited with LSU14
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LT	16	46.3	1180	U	Y	A	ST	-	-	-	-
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LT	17	55.9	2050	M	Y	A	SP	-	-	-	-
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	NP	18	74.6	3150	U	Y	A	MT	-	-	-	-
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LW	19	44.4	950	M	N	A	NS	OT	8	Empty	Kept for chemistry
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LW	20	39.4	705	M	N	A	MT	OT	12	Empty	composited with SP09-01 LW21
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LW	21	34.7	520	M	N	A	MT	OT	9	Empty	composited with SP09-01 LW20
Cree Lake	SP	SP09-01	28/09/2011 18:30	29/09/2011 9:30	LT	22	38.1	920	U	Y	A	MT	-	-	-	-
Crackingstone Inlet	SP	SP01-01	04/10/2011 12:00	05/10/2011 10:00	LT	1	55.1	2280	M	N	A	SP	OT	14	10% Stickleback	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	04/10/2011 12:00	05/10/2011 10:00	LT	2	55.7	2160	F	N	A	SP	OT	19	Empty	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	04/10/2011 12:00	05/10/2011 10:00	LT	3	54.1	1780	F	N	A	SP	OT	14	Empty	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	04/10/2011 12:00	05/10/2011 10:00	LT	4	53.3	1950	M	N	A	SP	OT	14	70% Stickleback	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	04/10/2011 12:00	05/10/2011 10:00	LT	5	52.6	1680	M	N	A	SP	OT	n/a	Empty	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	04/10/2011 12:00	05/10/2011 10:00	LW	6	40.1	1090	F	N	A	M	OT	14	20% UIR	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	04/10/2011 12:00	05/10/2011 10:00	LW	7	41.4	1220	M	N	A	M	OT	8	Empty	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	04/10/2011 12:00	05/10/2011 10:00	LW	8	43.4	1260	M	N	A	NS	OT	13	35% UIR	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	04/10/2011 12:00	05/10/2011 10:00	LW	9	40.4	1060	F	N	A	NS	OT	14	40% UIR	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	04/10/2011 12:00	05/10/2011 10:00	LW	10	41.3	1150	F	N	A	M	OT	19	Empty	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	04/10/2011 12:00	05/10/2011 10:00	NP	1	55.2	1320	M	N	A	MT	CL	5	10% Lake whitefish	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	04/10/2011 12:00	05/10/2011 10:00	NP	2	55.9	1410	F	N	A	MT	CL	5	30% Lake whitefish	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	04/10/2011 12:00	05/10/2011 10:00	NP	3	59.9	1720	F	N	A	MT	CL	5	Empty	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	04/10/2011 12:00	05/10/2011 10:00	NP	4	61.7	1960	F	N	A	MT	CL	7	10% UIR	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	04/10/2011 12:00	05/10/2011 10:00	NP	5	71.5	2560	F	N	A	MT	CL	9	Empty	Kept for chemistry
Ellis Bay	SP	SP01-01	04/10/2011 18:00	05/10/2011 10:00	LT	1	49.8	1490	M	N	A	NS	OT	12	30% Stickleback	Kept for chemistry
Ellis Bay	SP	SP01-01	04/10/2011 18:00	05/10/2011 10:00	LT	2	48.6	1480	M	N	A	NS	OT	8	50% Sucker	Kept for chemistry
Ellis Bay	SP	SP01-01	04/10/2011 18:00	05/10/2011 10:00	LT	3	53.9	1920	F	N	A	NS	OT	23	60% Stickleback	Kept for chemistry
Ellis Bay	SP	SP01-01	04/10/2011 18:00	05/10/2011 10:00	LT	4	48.5	1420	F	N	J	NS	OT	8	50% Stickleback	Kept for chemistry
Ellis Bay	SP	SP01-01	04/10/2011 18:00	05/10/2011 10:00	LT	5	55.6	2480	F	N	A	NS	OT	11	25% Stickleback	Kept for chemistry
Ellis Bay	SP	SP01-01	04/10/2011 18:00	05/10/2011 10:00	LW	6	32	1250	M	N	A	M	OT	31	Empty	Kept for chemistry

APPENDIX B, TABLE 8

Detailed fish capture data for the EARMP technical program, 2011 and 2012.

Waterbody	Method	Site	Set Date	Catch Date	Species	Fish Number	Length (cm)	Weight (g)	Sex	Released	Maturity	Spawning Condition	Age Structure Collected	Age (years)	Stomach Contents	Comments
Ellis Bay	SP	SP01-01	04/10/2011 18:00	05/10/2011 10:00	LW	7	43.2	1260	M	N	A	M	OT	27	Empty	Kept for chemistry
Ellis Bay	SP	SP01-01	04/10/2011 18:00	05/10/2011 10:00	LW	8	40	1380	F	N	A	M	OT	22	Empty	Kept for chemistry
Ellis Bay	SP	SP01-01	04/10/2011 18:00	05/10/2011 10:00	LW	9	39.5	1120	F	N	A	M	OT	18	Empty	Kept for chemistry
Ellis Bay	SP	SP01-01	04/10/2011 18:00	05/10/2011 10:00	LW	10	38.6	880	F	N	A	M	OT	11	Empty	Kept for chemistry
Fond du Lac River	SP	SP01-01	25/10/2011 10:26	25/10/2011 15:55	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Fond du Lac River	SP	SP02-01	25/10/2011 10:38	25/10/2011 15:43	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Fond du Lac River	SP	SP03-01	25/10/2011 10:45	25/10/2011 15:37	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	LW	1	40.1	1060	M	N	A	NS	OT	16	25% Unidentified BI	Kept for chemistry
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	LW	2	41.5	1040	F	N	A	ST	OT	16	Empty	Kept for chemistry
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	LW	3	45.8	1690	M	N	A	SP	OT	26	Empty	Kept for chemistry
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	LW	4	53.1	2550	M	N	A	SP	OT	32	20% Unidentified BI	Kept for chemistry
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	LW	5	44.3	1050	M	N	A	SP	OT	10	Empty	Kept for chemistry
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	NP	6	46.3	910	M	N	A	ST	CL	3	Empty	Kept for chemistry
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	NP	7	54.3	4060	M	N	A	ST	CL	5	Empty	Kept for chemistry
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	NP	8	63.4	2550	M	N	A	ST	CL	9	40% Sucker	Kept for chemistry
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	NP	9	55.8	1380	F	N	A	ST	CL	5	Empty	Kept for chemistry
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	NP	10	48.9	980	M	N	A	ST	CL	3	Empty	Kept for chemistry
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	LW	11	37.5	680	F	Y	A	SP	-	-	-	-
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	LSU	11	37.5	980	F	N	A	MT	FR	16	35% Unidentified BI	Kept for chemistry
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	NP	12	50.8	950	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	WSU	13	37.9	800	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	NP	14	72.5	2920	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP04-01	25/10/2011 16:05	26/10/2011 10:15	NP	15	68.3	2440	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	WSU	1	43.2	1350	M	N	A	MT	FR	14	Empty	Kept for chemistry
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	WSU	2	44.5	1390	M	N	A	MT	FR	20	Empty	Kept for chemistry
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	WSU	3	40.8	1130	F	N	A	MT	FR	13	25% Unidentified BI	Kept for chemistry
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	WSU	4	40.5	1290	F	N	A	MT	FR	14	-	Kept for chemistry
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	WSU	5	49.6	1920	M	N	A	MT	FR	26	50% Unidentified BI	Kept for chemistry
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	LSU	6	36.2	840	M	N	A	MT	FR	13	-	Kept for chemistry
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	LSU	7	42.2	1450	F	N	A	MT	FR	19	30% Unidentified BI	Kept for chemistry
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	LT	8	56.2	2610	F	N	A	ST	OT	21	-	Kept for chemistry
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	NP	9	69.9	2750	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	LW	10	40.3	945	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	WSU	11	38.7	1050	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	WSU	12	41.5	1180	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	WSU	13	38.8	920	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	WSU	14	51.2	1820	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	WSU	15	37.5	880	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	WSU	16	44.6	1520	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	WSU	17	36.3	710	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	WSU	18	39.4	1005	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	WSU	19	45.2	1340	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	WSU	20	37.2	840	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	LW	21	47.2	1130	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	LW	22	37.5	610	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP05-01	25/10/2011 16:20	26/10/2011 9:15	LW	23	40.8	880	M	Y	A	SP	-	-	-	-
Fond du Lac River	SP	SP06-01	26/10/2011 10:35	26/10/2011 16:15	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Fond du Lac River	SP	SP07-01	26/10/2011 10:45	26/10/2011 16:24	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Fond du Lac River	SP	SP06-02	26/10/2011 16:20	28/10/2011 9:50	LSU	1	52.8	2020	F	N	A	MT	FR	27	Empty	Kept for chemistry
Fond du Lac River	SP	SP06-02	26/10/2011 16:20	28/10/2011 9:50	LSU	2	43.5	1250	M	N	A	MT	FR	19	Empty	Kept for chemistry
Fond du Lac River	SP	SP06-02	26/10/2011 16:20	28/10/2011 9:50	LW	3	38.8	670	M	Y	A	SP	-	-	-	-
Fond du Lac River	SP	SP06-02	26/10/2011 16:20	28/10/2011 9:50	LW	4	39.5	880	U	Y	A	MT	-	-	-	-
Fond du Lac River	SP	SP06-02	26/10/2011 16:20	28/10/2011 9:50	BB	5	44.6	550	U	Y	U	U	-	-	-	-
Fond du Lac River	SP	SP06-02	26/10/2011 16:20	28/10/2011 9:50	LW	6	-	-	U	Y	U	U	-	-	-	-
Fond du Lac River	SP	SP06-02	26/10/2011 16:20	28/10/2011 9:50	LW	7	-	-	U	Y	U	U	-	-	-	-
Fond du Lac River	SP	SP06-02	26/10/2011 16:20	28/10/2011 9:50	LW	8	-	-	U	Y	U	U	-	-	-	-
Fond du Lac River	SP	SP06-02	26/10/2011 16:20	28/10/2011 9:50	LW	9	-	-	U	Y	U	U	-	-	-	-

APPENDIX B, TABLE 8

Detailed fish capture data for the EARMP technical program, 2011 and 2012.

Waterbody	Method	Site	Set Date	Catch Date	Species	Fish Number	Length (cm)	Weight (g)	Sex	Released	Maturity	Spawning Condition	Age Structure Collected	Age (years)	Stomach Contents	Comments
Fond du Lac River	SP	SP06-02	26/10/2011 16:20	28/10/2011 9:50	LW	10	-	-	U	Y	U	U	-	-	-	-
Fond du Lac River	SP	SP06-02	26/10/2011 16:20	28/10/2011 9:50	LW	11	-	-	U	Y	U	U	-	-	-	-
Fond du Lac River	SP	SP06-02	26/10/2011 16:20	28/10/2011 9:50	NP	12	-	-	U	Y	U	U	-	-	-	-
Fond du Lac River	SP	SP06-02	26/10/2011 16:20	28/10/2011 9:50	LSU	13	-	-	U	Y	U	U	-	-	-	-
Fond du Lac River	SP	SP06-02	26/10/2011 16:20	28/10/2011 9:50	BB	14	-	-	U	Y	U	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	1	47.4	1310	F	Y	A	SP	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	2	45.1	1180	F	Y	A	SP	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	3	39.2	720	F	Y	A	SP	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	4	43.5	1175	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	5	33.1	380	U	Y	J	NS	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	6	33.8	410	U	Y	J	NS	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	7	45.1	1150	M	Y	A	SP	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	8	35.4	490	U	Y	J	NS	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	9	40.2	830	M	Y	A	SP	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	10	39.6	690	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	11	36.4	560	U	Y	J	NS	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	12	35.5	560	U	Y	J	NS	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	13	34.2	495	U	Y	J	NS	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	14	34.3	430	U	Y	J	NS	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LT	15	57.2	1850	F	N	A	ST	OT	21	Empty	Kept for chemistry
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	NP	16	56.4	1280	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	NP	17	72.9	3930	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	NP	18	74.9	3960	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	NP	19	65.2	2230	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	NP	20	61.5	1880	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	21	-	-	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	22	-	-	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	23	-	-	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	24	-	-	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	25	-	-	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	26	-	-	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	27	-	-	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	28	-	-	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	LW	29	-	-	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	NP	30	-	-	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	NP	31	-	-	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	NP	32	-	-	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	NP	33	-	-	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	WSU	34	-	-	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP07-02	26/10/2011 16:30	28/10/2011 9:15	WSU	35	-	-	U	Y	A	U	-	-	-	-
Fond du Lac River	SP	SP08-01	28/10/2011 11:05	28/10/2011 15:30	NF	-	-	-	-	-	-	-	-	-	-	No fish captured
Ellis Bay	AN	AN01-01	28/06/2012 12:00	28/06/2012 12:00	NP	1	76	2800	F	FALSE	A	MT	CL	6	100% digested fish	Kept for chemistry
Ellis Bay	AN	AN01-01	28/06/2012 12:00	28/06/2012 12:00	NP	2	67.7	2760	M	FALSE	A	MT	CL	9	25% digested fish	Kept for chemistry
Ellis Bay	AN	AN01-01	28/06/2012 12:00	28/06/2012 12:00	NP	3	67.8	1660	F	FALSE	A	M	CL	5	Empty	Kept for chemistry
Ellis Bay	AN	AN01-01	28/06/2012 12:00	28/06/2012 12:00	NP	4	72.3	2760	F	FALSE	A	M	CL	7	25% digested fish	Kept for chemistry
Ellis Bay	AN	AN01-01	28/06/2012 12:00	28/06/2012 12:00	NP	5	89.5	4860	F	FALSE	A	MT	CL	16	100% Whole LW	Kept for chemistry
Cree Lake	AN	AN01-01	05/07/2012 3:10	05/07/2012 3:30	NF	-	-	-	-	N	-	-	-	-	-	No fish captured; observed ~20 fish LSU, WSU, and LW
Cree Lake	SP	SP01-01	05/07/2012 3:47	05/07/2012 5:07	WSU	1	44.6	1000	F	N	A	U	FR	13	-	Kept for chemistry; submitted
Cree Lake	AN	AN02-01	05/07/2012 3:52	05/07/2012 4:03	NF	-	-	-	-	N	-	-	-	-	-	No fish captured; 1 NP got away
Cree Lake	AN	AN03-01	05/07/2012 4:15	05/07/2012 4:25	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Cree Lake	AN	AN02-02	05/07/2012 4:43	05/07/2012 5:06	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Cree Lake	SP	SP01-02	05/07/2012 6:19	05/07/2012 7:33	WSU	1	38.8	730	M	N	A	U	FR	8	-	Kept for chemistry; submitted
Cree Lake	SP	SP01-02	05/07/2012 6:19	05/07/2012 7:33	WSU	2	38.6	710	F	N	A	U	FR	7	-	Kept for chemistry; submitted
Cree Lake	SP	SP01-02	05/07/2012 6:19	05/07/2012 7:33	WSU	3	38.6	710	U	Y	A	U	-	-	-	Healthy
Cree Lake	SP	SP01-02	05/07/2012 6:19	05/07/2012 7:33	WSU	4	34.9	620	U	Y	A	U	-	-	-	Healthy
Cree Lake	SP	SP01-02	05/07/2012 6:19	05/07/2012 7:33	WSU	5	35.8	640	U	Y	A	U	-	-	-	Healthy
Cree Lake	SP	SP01-02	05/07/2012 6:19	05/07/2012 7:33	WSU	6	34.7	560	U	Y	A	U	-	-	-	Healthy

APPENDIX B, TABLE 8

Detailed fish capture data for the EARMP technical program, 2011 and 2012.

Waterbody	Method	Site	Set Date	Catch Date	Species	Fish Number	Length (cm)	Weight (g)	Sex	Released	Maturity	Spawning Condition	Age Structure Collected	Age (years)	Stomach Contents	Comments
Cree Lake	SP	SP01-02	05/07/2012 6:19	05/07/2012 7:33	NP	7	106	7900	F	N	A	U	CL	16	-	Kept for chemistry
Cree Lake	SP	SP01-02	05/07/2012 6:19	05/07/2012 7:33	NP	8	98.7	7600	F	N	A	U	CL	11	-	Kept for chemistry
Cree Lake	SP	SP01-02	05/07/2012 6:19	05/07/2012 7:33	LSU	9	36.9	660	F	N	A	U	FR	13	-	Kept for chemistry
Cree Lake	SP	SP01-03	05/07/2012 8:05	05/07/2012 9:15	NP	1	47.7	840	M	N	A	U	CL	3	-	Kept for chemistry; photo 18 & 19 green liver
Cree Lake	SP	SP01-03	05/07/2012 8:05	05/07/2012 9:15	NP	2	68.7	2600	M	N	A	U	CL	9	-	Kept for chemistry
Cree Lake	SP	SP01-03	05/07/2012 8:05	05/07/2012 9:15	LSU	3	39.7	780	F	N	A	U	FR	17	-	Kept for chemistry
Cree Lake	SP	SP01-01	05/07/2012 12:00	05/07/2012 5:07	WSU	2	41.5	870	M	N	A	U	FR	14	-	Kept for chemistry; submitted
Cree Lake	SP	SP01-01	05/07/2012 12:00	05/07/2012 5:07	WSU	3	38.7	760	F	N	A	U	FR	9	-	Kept for chemistry; submitted
Cree Lake	SP	SP01-01	05/07/2012 12:00	05/07/2012 5:07	WSU	4	35.9	630	M	N	A	U	-	-	-	Kept for chemistry; did not submit
Cree Lake	SP	SP01-01	05/07/2012 12:00	05/07/2012 5:07	WSU	5	36.2	640	M	N	A	U	-	-	-	Kept for chemistry; did not submit
Cree Lake	SP	SP01-01	05/07/2012 12:00	05/07/2012 5:07	WSU	6	33.8	540	U	N	A	U	-	-	-	Kept for chemistry; did not submit
Cree Lake	SP	SP01-01	05/07/2012 12:00	05/07/2012 5:07	NP	7	65.7	1980	M	N	A	U	CL	8	-	Kept for chemistry
Cree Lake	SP	SP01-01	05/07/2012 12:00	05/07/2012 5:07	LSU	8	38.3	600	F	N	A	U	FR	15	-	Kept for chemistry; composited with SP01-01 LSU10
Cree Lake	SP	SP01-01	05/07/2012 12:00	05/07/2012 5:07	LSU	9	39.5	710	F	N	A	U	FR	14	-	Kept for chemistry
Cree Lake	SP	SP01-01	05/07/2012 12:00	05/07/2012 5:07	LSU	10	35.2	530	M	N	A	U	FR	14	-	Kept for chemistry; composited with SP01-01 LS08
Cree Lake	SP	SP01-01	05/07/2012 12:00	05/07/2012 5:07	LSU	11	34.8	540	M	N	A	U	FR	15	-	Kept for chemistry; composited with SP01-01 LSU12
Cree Lake	SP	SP01-01	05/07/2012 12:00	05/07/2012 5:07	LSU	12	34	460	M	N	A	U	FR	14	-	Kept for chemistry; composited with SP01-01 LSU11
Cochrane River	SP	SP01-01	18/09/2012 1:15	18/09/2012 6:15	LW	1	48.5	1240	F	N	A	MT	OT	18	-	Kept for chemistry
Cochrane River	SP	SP01-01	18/09/2012 1:15	18/09/2012 6:15	LW	2	42	560	M	N	A	MT	-	-	Empty	Did not keep
Cochrane River	SP	SP02-01	18/09/2012 2:30	18/09/2012 6:30	LW	1	48.5	1050	F	N	A	MT	OT	19	Empty	Kept for chemistry
Cochrane River	SP	SP02-01	18/09/2012 2:30	18/09/2012 6:30	LW	2	45.8	890	F	N	A	MT	OT	8	40% Unidentified Invert Remains	Kept for chemistry
Cochrane River	SP	SP03-01	18/09/2012 5:15	19/09/2012 9:00	LW	1	48.9	890	F	N	A	MT	OT	22	30%	Kept for chemistry
Cochrane River	SP	SP03-01	18/09/2012 5:15	19/09/2012 9:00	LW	2	46.7	710	F	N	A	MT	OT	25	Empty	Kept for chemistry
Cochrane River	SP	SP03-01	18/09/2012 5:15	19/09/2012 9:00	LW	3	44.8	550	M	N	A	MT	-	-	-	Did not keep
Cochrane River	SP	SP03-01	18/09/2012 5:15	19/09/2012 9:00	LW	4	35.1	160	M	N	A	MT	-	-	-	Did not keep
Cochrane River	SP	SP03-01	18/09/2012 5:15	19/09/2012 9:00	LT	5	51.7	1310	F	N	A	SP	OT	8	Empty	Kept for chemistry
Cochrane River	SP	SP03-01	18/09/2012 5:15	19/09/2012 9:00	LT	6	58.8	2120	F	N	A	SP	OT	15	Empty	Kept for chemistry
Cochrane River	SP	SP03-01	18/09/2012 5:15	19/09/2012 9:00	LT	7	61.2	2110	F	N	A	SP	OT	18	Empty	Kept for chemistry
Cochrane River	SP	SP03-01	18/09/2012 5:15	19/09/2012 9:00	LT	8	53.1	1350	M	N	A	SP	OT	16	Empty	Kept for chemistry
Cochrane River	SP	SP03-01	18/09/2012 5:15	19/09/2012 9:00	LSU	9	39	420	F	N	A	MT	FR	12	20% Unidentified Invert Remains	Kept for chemistry; composite with SP03-01 LSU10
Cochrane River	SP	SP03-01	18/09/2012 5:15	19/09/2012 9:00	LSU	10	38.5	435	F	N	A	MT	FR	16	10% Unidentified Invert Remains	Kept for chemistry SP03-01 LSU09
Cochrane River	SP	SP03-01	18/09/2012 5:15	19/09/2012 9:00	LSU	11	44.2	650	F	N	A	MT	FR	17		Composite with LSU02 SP05-01
Cochrane River	SP	SP03-01	18/09/2012 5:15	19/09/2012 9:00	WSU	12	50.5	1720	U	N	A	U	FR	16		Kept for chemistry
Cochrane River	SP	SP04-01	18/09/2012 5:45	19/09/2012 10:00	LT	1	47.8	920	F	N	A	ST	OT	7	Empty	Kept for chemistry
Cochrane River	SP	SP04-01	18/09/2012 5:45	19/09/2012 10:00	NP	2	95.7	6250	F	N	A	MT	CL	14	30% WSU	Kept for chemistry; green liver
Cochrane River	SP	SP04-01	18/09/2012 5:45	19/09/2012 10:00	NP	3	65	1820	M	N	A	MT	CL	11	Empty	Kept for chemistry
Cochrane River	SP	SP04-01	18/09/2012 5:45	19/09/2012 10:00	LW	4	-	-	U	N	U	U	-	-	-	Did not keep for chemistry
Cochrane River	SP	SP04-01	18/09/2012 5:45	19/09/2012 10:00	LW	5	-	-	U	N	U	U	-	-	-	Did not keep for chemistry
Cochrane River	SP	SP04-01	18/09/2012 5:45	19/09/2012 10:00	LW	6	-	-	U	N	U	U	-	-	-	Did not keep for chemistry
Cochrane River	SP	SP04-01	18/09/2012 5:45	19/09/2012 10:00	LW	7	-	-	U	N	U	U	-	-	-	Did not keep for chemistry
Cochrane River	SP	SP01-02	18/09/2012 6:20	19/09/2012 10:30	NP	1	65.1	1430	F	N	A	MT	CL	8	Empty	Kept for chemistry
Cochrane River	SP	SP01-02	18/09/2012 6:20	19/09/2012 10:30	WSU	2	47.5	1320	F	N	A	MT	FR	13	20% Unidentified Invert Remains	Kept for chemistry
Cochrane River	SP	SP01-02	18/09/2012 6:20	19/09/2012 10:30	WSU	3	50.1	1670	F	N	A	MT	FR	16	Empty	Kept for chemistry
Cochrane River	SP	SP01-02	18/09/2012 6:20	19/09/2012 10:30	WSU	4	47.2	1160	U	N	A	MT	FR	16	40% Unidentified Invert Remains	Kept for chemistry
Cochrane River	SP	SP05-01	18/09/2012 6:45	19/09/2012 11:00	LT	1	42.4	520	F	N	A	ST	-	-	-	Did not keep; dead
Cochrane River	SP	SP05-01	18/09/2012 6:45	19/09/2012 11:00	LSU	2	32.5	140	M	N	J	NS	FR	9	Empty	Kept for chemistry; composite with SP03-01 LSU11
Cochrane River	SP	SP06-01	19/09/2012 11:20	19/09/2012 3:30	NP	1	68.5	2100	U	N	A	MT	CL	8	-	Kept for chemistry
Waterbury Lake	SP	SP05-01	20/09/2012 2:00	20/09/2012 4:40	LT	1	-	-	U	Y	U	U	-	-	-	Captured and released alive
Waterbury Lake	SP	SP05-01	20/09/2012 2:00	20/09/2012 4:40	LT	2	-	-	U	Y	U	U	-	-	-	Captured and released alive
Waterbury Lake	SP	SP06-01	20/09/2012 2:20	20/09/2012 4:50	LT	1	-	-	U	Y	U	U	-	-	-	Captured and released alive
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	NP	1	57	1280	M	N	A	MT	CL	3	Empty	Kept for chemistry
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	NP	2	71.4	2080	M	N	A	MT	CL	9	Empty	Kept for chemistry
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	NP	3	51	680	F	N	A	MT	CL	2	Empty	Kept for chemistry
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	NP	4	46.9	540	F	N	A	MT	CL	2	Empty	Kept for chemistry; composited with SP07-01 NP05
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	NP	5	48.5	580	F	N	A	MT	CL	2	15% 2 minnows (suckers)	Kept for chemistry; composited with SP07-01 NP04; green liver
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	LW	6	44.7	900	M	N	A	NS	OT	8	40% Unidentified Invert Remains	Kept for chemistry
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	LW	7	50.5	1640	M	N	A	MT	OT	10	30% Unidentified Invert Remains	Kept for chemistry

APPENDIX B, TABLE 8

Detailed fish capture data for the EARMP technical program, 2011 and 2012.

Waterbody	Method	Site	Set Date	Catch Date	Species	Fish Number	Length (cm)	Weight (g)	Sex	Released	Maturity	Spawning Condition	Age Structure Collected	Age (years)	Stomach Contents	Comments
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	LW	8	45	805	M	N	A	MT	OT	8	Empty	Kept for chemistry
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	WSU	9	33.5	280	M	N	A	MT	FR	6	Empty	Kept for chemistry; composited with SP007-01 WSU10 + WSU11
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	WSU	10	33.7	180	F	N	A	MT	FR	6	Empty	Kept for chemistry; composited with SP007-01 WSU09 + WSU11
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	WSU	11	33.4	280	M	N	A	MT	FR	6	Empty	Kept for chemistry; composited with SP007-01 WSU09 + WSU10
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	WSU	12	34.9	210	M	N	A	MT	FR	6	Empty	Kept for chemistry; composited with SP07-01 LSU13 + LSU23
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	LSU	13	39.8	375	F	N	A	MT	FR	8	Empty	Kept for chemistry: composited with SP07-01 WSU12 + LSU23
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	LT	14	48.4	1080	M	Y	A	M	-	10	-	Healthy
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	LT	15	61.5	1920	F	Y	A	SP	-	12	-	Healthy
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	LT	16	65.7	2520	F	Y	A	ST	-	14	-	Healthy
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	LT	17	63.5	2260	F	Y	A	M	-	16	-	Healthy
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	NP	18	45.5	360	U	Y	A	MT	-	18	-	Healthy
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	NP	19	40.8	220	U	Y	A	MT	-	-	-	Healthy
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	NP	20	45.6	420	U	Y	A	MT	-	-	-	Healthy
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	NP	21	25.8	450	U	Y	A	MT	-	-	-	Healthy
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	LW	22	35.3	180	U	Y	A	MT	-	-	-	Healthy
Waterbury Lake	SP	SP07-01	20/09/2012 5:45	21/09/2012 9:30	LSU	23	29.4	75	M	N	A	MT	FR	6	Empty	Kept for chemistry; composited with SP07-01 WSU12 + LSU13
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LT	1	54.5	1720	M	Y	A	M	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LT	2	54.1	1680	F	Y	A	M	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LT	3	54.7	1540	M	Y	A	M	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LT	4	57.8	1950	F	Y	A	M	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LT	5	52.1	1460	M	Y	A	M	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LT	6	52.3	1120	M	Y	A	M	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LT	7	55.6	1580	F	Y	A	M	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LT	8	59.1	1960	F	Y	A	M	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LT	9	52.8	1280	F	Y	A	SP	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LT	10	60.5	2180	F	Y	A	SP	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LT	11	54	1650	F	Y	A	M	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LW	12	56.5	2350	U	Y	A	MT	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LW	13	61.5	2780	U	Y	A	MT	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LW	14	49.6	1320	U	Y	A	MT	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LW	15	49.9	1320	U	Y	A	MT	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LW	16	33.5	240	U	Y	A	MT	-	-	-	Healthy
Waterbury Lake	SP	SP08-01	20/09/2012 6:00	21/09/2012 10:00	LW	17	32.7	120	U	Y	A	MT	-	-	-	Healthy
Waterbury Lake	SP	SP01-01	20/09/2012 10:00	20/09/2012 1:40	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Waterbury Lake	SP	SP02-01	20/09/2012 10:20	20/09/2012 1:50	NP	1	89.3	5250	M	N	A	MT	CL	9	30% WSU	Kept for chemistry
Waterbury Lake	SP	SP02-01	20/09/2012 10:20	20/09/2012 1:50	LW	2	40.1	405	M	N	A	M	OT	-	Empty	Did not keep for chemistry
Waterbury Lake	SP	SP02-01	20/09/2012 10:20	20/09/2012 1:50	LT	3	-	-	U	N	U	U	-	-	-	Did not keep for chemistry
Waterbury Lake	SP	SP03-01	20/09/2012 10:30	20/09/2012 2:10	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Waterbury Lake	SP	SP04-01	20/09/2012 10:45	20/09/2012 2:15	LW	1	53.9	1910	F	N	A	M	OT	18	Empty	Kept for chemistry
Waterbury Lake	SP	SP04-01	20/09/2012 10:45	20/09/2012 2:15	LT	2	49.3	820	M	N	A	SP			Empty	Dead
Waterbury Lake	SP	SP04-01	20/09/2012 10:45	20/09/2012 2:15	LW	3	51.2	2580	M	N	A	M	OT	19	10% Unidentified Invert Remains	Kept for chemistry
Waterbury Lake	AN	AN01-01	20/09/2012 12:00	20/09/2012 12:20	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Waterbury Lake	AN	AN02-01	20/09/2012 12:00	20/09/2012 12:40	LT	1	66.5	2320	F	N	A	SP	OT	26	Empty	Kept for chemistry
Waterbury Lake	AN	AN02-01	20/09/2012 12:00	20/09/2012 12:40	LT	2	61.5	1810	M	N	A	SP	OT	12	30% Unknown Fish Remains	Kept for chemistry
Waterbury Lake	AN	AN02-01	20/09/2012 12:00	20/09/2012 12:40	LT	3	52.4	1410	M	N	A	SP	OT	12	Empty	Kept for chemistry
Waterbury Lake	AN	AN02-01	20/09/2012 12:00	20/09/2012 12:40	LT	4	52.2	1320	M	N	A	SP	OT	-	10% WSU	Kept for chemistry; unable to age
Waterbury Lake	AN	AN02-01	20/09/2012 12:00	20/09/2012 12:40	LT	5	52.3	1340	U	N	A	SP	OT	9	-	Kept for chemistry
Fond du Lac River	SP	SP01-02	22/09/2012 2:25	22/09/2012 4:25	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Fond du Lac River	SP	SP03-02	22/09/2012 3:00	23/09/2012 10:00	NP	1	71.4	2320	M	N	A	MT	CL	8	Empty	Kept for chemistry
Fond du Lac River	SP	SP03-02	22/09/2012 3:00	23/09/2012 10:00	NP	2	64.4	1850	F	N	A	MT	CL	6	Empty	Kept for chemistry
Fond du Lac River	SP	SP03-02	22/09/2012 3:00	23/09/2012 10:00	NP	3	51.5	650	U	Y	A	MT	-	-	-	Released
Fond du Lac River	SP	SP03-02	22/09/2012 3:00	23/09/2012 10:00	LW	4	49.4	1050	F	N	A	MT	OT	25	Empty	Kept for chemistry
Fond du Lac River	SP	SP03-02	22/09/2012 3:00	23/09/2012 10:00	LW	5	43.5	590	U	Y	A	MT	-	-	-	Released
Fond du Lac River	SP	SP03-02	22/09/2012 3:00	23/09/2012 10:00	LW	6	37.5	410	U	N	A	NS	-	-	Empty	Dead
Fond du Lac River	SP	SP03-02	22/09/2012 3:00	23/09/2012 10:00	WSU	7	41.4	1220	F	N	A	MT	FR	12	Empty	Kept for chemistry
Fond du Lac River	SP	SP03-02	22/09/2012 3:00	23/09/2012 10:00	WSU	8	42.8	1120	F	N	A	MT	FR	10	Empty	Kept for chemistry
Fond du Lac River	SP	SP03-02	22/09/2012 3:00	23/09/2012 10:00	WSU	9	42.9	930	M	N	A	MT	FR	9	Empty	Kept for chemistry

APPENDIX B, TABLE 8

Detailed fish capture data for the EARMP technical program, 2011 and 2012.

Waterbody	Method	Site	Set Date	Catch Date	Species	Fish Number	Length (cm)	Weight (g)	Sex	Released	Maturity	Spawning Condition	Age Structure Collected	Age (years)	Stomach Contents	Comments
Fond du Lac River	SP	SP03-02	22/09/2012 3:00	23/09/2012 10:00	WSU	10	45.1	910	U	Y	A	MT	-	-	-	Released
Fond du Lac River	SP	SP03-02	22/09/2012 3:00	23/09/2012 10:00	WSU	11	34.1	290	M	N	A	MT	-	-	Empty	Dead
Fond du Lac River	SP	SP05-01	22/09/2012 3:10	23/09/2012 10:15	NP	1	64.5	1710	F	N	A	MT	CL	6	Empty	Kept for chemistry
Fond du Lac River	SP	SP05-01	22/09/2012 3:10	23/09/2012 10:15	NP	2	45	350	U	Y	A	U	-	-	-	Released
Fond du Lac River	SP	SP05-01	22/09/2012 3:10	23/09/2012 10:15	NP	3	44.2	320	U	Y	A	U	-	-	-	Released
Fond du Lac River	SP	SP05-01	22/09/2012 3:10	23/09/2012 10:15	WSU	4	33.3	200	U	Y	A	U	-	-	-	Released
Fond du Lac River	SP	SP06-01	22/09/2012 4:00	23/09/2012 9:30	LT	1	51	1120	F	N	A	NS	OT	8	50% 7 NSB	Kept for chemistry
Fond du Lac River	SP	SP06-01	22/09/2012 4:00	23/09/2012 9:30	LW	2	43.6	650	F	N	A	MT	OT	-	Empty	Kept for chemistry for another program (not included in earmp data)
Fond du Lac River	SP	SP06-01	22/09/2012 4:00	23/09/2012 9:30	WSU	3	43.8	810	M	N	A	MT	FR	10	Empty	Kept for chemistry
Fond du Lac River	SP	SP06-01	22/09/2012 4:00	23/09/2012 9:30	WSU	4	41	720	M	N	A	MT	FR	-	Empty	Dead
Fond du Lac River	SP	SP06-01	22/09/2012 4:00	23/09/2012 9:30	NP	5	52.7	800	F	N	A	MT	CL	3	Empty	Kept for chemistry
Fond du Lac River	SP	SP06-01	22/09/2012 4:00	23/09/2012 9:30	NP	6	40.2	200	U	Y	A	U	-	-	-	Released
Fond du Lac River	SP	SP07-01	22/09/2012 4:30	23/09/2012 9:45	LT	1	58.1	1760	F	N	A	NS	OT	10	Empty	Kept for chemistry
Fond du Lac River	SP	SP07-01	22/09/2012 4:30	23/09/2012 9:45	LW	2	46.8	980	F	N	A	MT	OT	21	Empty	Kept for chemistry
Fond du Lac River	SP	SP07-01	22/09/2012 4:30	23/09/2012 9:45	WSU	3	46.7	1300	F	N	A	MT	FR		Empty	Kept for chemistry; no sample sent for ageing
Fond du Lac River	SP	SP07-01	22/09/2012 4:30	23/09/2012 9:45	WSU	4	41.2	720	U	Y	A	U	-	-	-	Released
Fond du Lac River	SP	SP07-01	22/09/2012 4:30	23/09/2012 9:45	LSU	5	38.3	520	M	N	A	MT	FR	14	Empty	Kept for chemistry; composited with SP07-01 LSU06
Fond du Lac River	SP	SP07-01	22/09/2012 4:30	23/09/2012 9:45	LSU	6	38.6	525	M	N	A	MT	FR	16	Empty	Kept for chemistry; composited with SP07-01 LSU05
Fond du Lac River	SP	SP07-01	22/09/2012 4:30	23/09/2012 9:45	LSU	7	51.4	1620	F	N	A	MT	FR	26	Empty	Kept for chemistry
Fond du Lac River	SP	SP07-01	22/09/2012 4:30	23/09/2012 9:45	LSU	8	62.5	1650	M	N	A	MT	FR	23	Empty	Kept for chemistry
Fond du Lac River	SP	SP07-01	22/09/2012 4:30	23/09/2012 9:45	LT	9	51.5	1540	M	N	A	SP	-	-	-	Dead
Fond du Lac River	SP	SP07-01	22/09/2012 4:30	23/09/2012 9:45	LT	10	57.5	1980	F	Y	A	SP	-	-	-	Released
Fond du Lac River	SP	SP07-01	22/09/2012 4:30	23/09/2012 9:45	LT	11	69.4	1820	U	Y	A	NS	-	-	-	Released
Fond du Lac River	SP	SP01-01	22/09/2012 10:45	22/09/2012 2:15	LT	1	62.3	2420	F	N	A	M	OT	16	Empty	Kept for chemistry
Fond du Lac River	SP	SP01-01	22/09/2012 10:45	22/09/2012 2:15	LT	2	63.8	1620	M	N	A	NS	OT	9	10% 1 Minnow	Kept for chemistry
Fond du Lac River	SP	SP01-01	22/09/2012 10:45	22/09/2012 2:15	LW	3	45.4	910	F	N	A	MT	OT	12	30% Unidentified Invert Remains	Kept for chemistry
Fond du Lac River	SP	SP02-01	22/09/2012 11:00	22/09/2012 2:30	NF					N						No fish captured
Fond du Lac River	SP	SP03-01	22/09/2012 11:15	22/09/2012 2:45	LW	1	43.9	720	M	N	A	MT	OT	9	Empty	Kept for chemistry
Fond du Lac River	SP	SP03-01	22/09/2012 11:15	22/09/2012 2:45	LW	2	41.5	620	M	N	A	MT	OT	7	Empty	Kept for chemistry; composited with SP03-01 LW03
Fond du Lac River	SP	SP03-01	22/09/2012 11:15	22/09/2012 2:45	LW	3	38.2	390	F	N	A	MT	OT	9	Empty	Kept for chemistry; composited with SP03-01 LW02
Fond du Lac River	SP	SP04-01	22/09/2012 11:30	22/09/2012 3:15	NP	1	62.4	1350	M	N	A	MT	CL	8	Empty	Kept for chemistry
Fond du Lac River	SP	SP04-01	22/09/2012 11:30	22/09/2012 3:15	LT	2	49.8	1010	M	N	A	MT	CL	7	50% 8 Minnows	Kept for chemistry
Fond du Lac River	AN	AN01-01	22/09/2012 12:00	22/09/2012 12:20	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Fond du Lac River	AN	AN02-01	22/09/2012 12:00	22/09/2012 12:15	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Pasfield Lake	SP	SP05-01	24/09/2012 1:45	24/09/2012 4:15	LT	1	65.4	2360	M	N	A	M	OT	19	Empty	Kept for chemistry
Pasfield Lake	SP	SP06-01	24/09/2012 2:15	24/09/2012 4:45	LT	1	-	-	U	Y	U	U	-	-	-	Released alive
Pasfield Lake	SP	SP07-01	24/09/2012 2:45	24/09/2012 5:00	LT	1	-	-	U	Y	U	U	-	-	-	Released alive
Pasfield Lake	SP	SP08-01	24/09/2012 3:00	24/09/2012 5:20	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Pasfield Lake	AN	AN01-01	24/09/2012 3:30	24/09/2012 4:00	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Pasfield Lake	SP	SP09-01	24/09/2012 4:20	25/09/2012 9:45	LT	1	64.5	2620	M	Y	A	SP	-	-	-	Released
Pasfield Lake	SP	SP09-01	24/09/2012 4:20	25/09/2012 9:45	LT	2	59.9	2150	F	N	A	ST	-	-	Empty	Dead
Pasfield Lake	SP	SP09-01	24/09/2012 4:20	25/09/2012 9:45	LW	3	33.1	290	U	N	J	NS	OT	5	Empty	Kept for chemistry; composited with SP11-01 LW04 + LW07, SP09-01 LW04
Pasfield Lake	SP	SP09-01	24/09/2012 4:20	25/09/2012 9:45	LW	4	30.5	170	U	N	J	NS	OT	4	Empty	Kept for chemistry; composited with SP11-01 LW04 + LW07, SP09-01 LW03
Pasfield Lake	SP	SP10-01	24/09/2012 4:50	25/09/2012 10:10	LW	1	45	860	M	N	A	NS	OT	6	30% Unidentified invert remains	Kept for chemistry
Pasfield Lake	SP	SP10-01	24/09/2012 4:50	25/09/2012 10:10	LSU	2	32.3	395	U	N	J	NS	FR	7	Empty	Kept for chemistry; composited with SP10-01 LSU03
Pasfield Lake	SP	SP10-01	24/09/2012 4:50	25/09/2012 10:10	LSU	3	32.1	390	U	N	J	NS	FR	10	Empty	Kept for chemistry; composited with SP10-01 LSU02
Pasfield Lake	SP	SP10-01	24/09/2012 4:50	25/09/2012 10:10	LSU	4	30.8	335	U	N	J	NS	FR	7	Empty	Kept for chemistry; composited with SP10-01 LSU05 + WSU06
Pasfield Lake	SP	SP10-01	24/09/2012 4:50	25/09/2012 10:10	LSU	5	29.1	275	U	N	J	NS	FR	6	Empty	Kept for chemistry; composited with SP10-01 LSU04 + WSU06
Pasfield Lake	SP	SP10-01	24/09/2012 4:50	25/09/2012 10:10	WSU	6	28.5	265	U	N	J	NS	FR	3	Empty	Kept for chemistry; composited with SP10-01 LSU04 + LSU05
Pasfield Lake	SP	SP10-01	24/09/2012 4:50	25/09/2012 10:10	LT	7	62.5	2350	F	N	A	NS	-	-	Empty	Dead
Pasfield Lake	SP	SP10-01	24/09/2012 4:50	25/09/2012 10:10	LT	8	62.9	2780	M	N	A	SP	-	-	Empty	Dead
Pasfield Lake	SP	SP11-01	24/09/2012 5:10	25/09/2012 10:30	NP	1	63.1	1720	M	N	A	MT	CL	3	Empty	Kept for chemistry
Pasfield Lake	SP	SP11-01	24/09/2012 5:10	25/09/2012 10:30	LSU	2	49.6	1630	F	N	A	MT	FR	22	Empty	Kept for chemistry
Pasfield Lake	SP	SP11-01	24/09/2012 5:10	25/09/2012 10:30	LT	3	62.7	2450	M	N	A	SP			25% minnows	Dead
Pasfield Lake	SP	SP11-01	24/09/2012 5:10	25/09/2012 10:30	LW	4	32.4	295	U	N	J	NS	OT	5	Empty	Kept with chemistry; composited with SP 11-01 LW07 + SP09-01 LW03 + LW04
Pasfield Lake	SP	SP11-01	24/09/2012 5:10	25/09/2012 10:30	LW	5	31.5	280	U	N	J	NS	OT	3	Empty	Kept for chemistry; composited with SP11-01 LW06 + SP08-02 LW03
Pasfield Lake	SP	SP11-01	24/09/2012 5:10	25/09/2012 10:30	LW	6	62.9	280	U	N	J	NS	OT	3	Empty	Kept for chemistry; composited with SP11-01 LW05 + SP08-02 LW03

APPENDIX B, TABLE 8

Detailed fish capture data for the EARMP technical program, 2011 and 2012.

Waterbody	Method	Site	Set Date	Catch Date	Species	Fish Number	Length (cm)	Weight (g)	Sex	Released	Maturity	Spawning Condition	Age Structure Collected	Age (years)	Stomach Contents	Comments
Pasfield Lake	SP	SP11-01	24/09/2012 5:10	25/09/2012 10:30	LW	7	32	285	U	N	J	NS	OT	4	Empty	Kept for chemistry; composited with SP11-01 LW04 + SP09-01 LW03 + LW04
Pasfield Lake	SP	SP11-01	24/09/2012 5:10	25/09/2012 10:30	LW	8	30.9	280	U	N	J	NS	OT	5	Empty	Kept for chemistry; composited with SP11-01 LW10 + LW12 + LW13
Pasfield Lake	SP	SP11-01	24/09/2012 5:10	25/09/2012 10:30	LW	9	30.8	255	U	N	J	NS	OT	4	Empty	Kept for chemistry; composited with SP11-01 LW11 + LW14 + LW15
Pasfield Lake	SP	SP11-01	24/09/2012 5:10	25/09/2012 10:30	LW	10	30.8	310	U	N	J	NS	OT	5	Empty	Kept for chemistry; composited with SP11-01 LW8 + LW12 + LW13
Pasfield Lake	SP	SP11-01	24/09/2012 5:10	25/09/2012 10:30	LW	11	29.5	270	U	N	J	NS	OT	3	Empty	Kept for chemistry; composited with SP11-01 LW09 + LW14 + LW15
Pasfield Lake	SP	SP11-01	24/09/2012 5:10	25/09/2012 10:30	LW	12	29.9	305	U	N	J	NS	OT	3	Empty	Kept for chemistry; composited with SP11-01 LW08 + LW10 + LW13
Pasfield Lake	SP	SP11-01	24/09/2012 5:10	25/09/2012 10:30	LW	13	27.7	240	U	N	J	NS	OT	2	Empty	Kept for chemistry; composited with SP11-01 LW08 + LW10 + LW12
Pasfield Lake	SP	SP11-01	24/09/2012 5:10	25/09/2012 10:30	LW	14	28.4	250	U	N	J	NS	OT	3	Empty	Kept for chemistry; composited with SP11-01 LW09 + LW11 + LW15
Pasfield Lake	SP	SP11-01	24/09/2012 5:10	25/09/2012 10:30	LW	15	29.4	255	U	N	J	NS	OT	3	Empty	Kept for chemistry; composited with SP11-01 LW09 + LW11 + LW14
Pasfield Lake	SP	SP08-02	24/09/2012 5:30	25/09/2012 10:45	NP	1	93.8	5850	F	N	A	MT	CL	12	Empty	Kept for chemistry; heavy fish; Ryan photos #85-86
Pasfield Lake	SP	SP08-02	24/09/2012 5:30	25/09/2012 10:45	LT	2	55.4	1760	F	Y	A	ST	-	-	-	Released
Pasfield Lake	SP	SP08-02	24/09/2012 5:30	25/09/2012 10:45	LW	3	35.3	380	F	N	A	NS	OT	5	Empty	Kept for chemistry; composited with SP11-1 LW05 +LW06
Pasfield Lake	SP	SP01-01	24/09/2012 10:15	24/09/2012 1:30	NF	-	-	-		N	-	-	-	-	-	No fish captured
Pasfield Lake	SP	SP02-01	24/09/2012 10:30	24/09/2012 2:00	NF	-	-	-		N	-	-	-	-	-	No fish captured
Pasfield Lake	SP	SP03-01	24/09/2012 10:45	24/09/2012 2:20	NF		-	-		N	-	-	-	-	-	No fish captured
Pasfield Lake	SP	SP04-01	24/09/2012 11:00	24/09/2012 2:30	LT	1	65.8	3260	F	N	A	NS	OT	18	Empty	Kept for chemistry
Pasfield Lake	SP	SP04-01	24/09/2012 11:00	24/09/2012 2:30	LT	2	59.9	2130	M	N	A	M	OT	20	50% minnows	Kept for chemistry
Pasfield Lake	SP	SP04-01	24/09/2012 11:00	24/09/2012 2:30	LT	3	61.5	1880	F	N	A	NS	OT	17	Empty	Kept for chemistry
Pasfield Lake	SP	SP04-01	24/09/2012 11:00	24/09/2012 2:30	LT	4	58.4	1850	M	N	A	SP	OT	18	100% Suckers	Kept for chemistry
Pasfield Lake	SP	SP12-01	25/09/2012 11:30	25/09/2012 3:30	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Pasfield Lake	SP	SP13-01	25/09/2012 11:45	25/09/2012 3:45	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Pasfield Lake	SP	SP14-01	25/09/2012 12:00	25/09/2012 4:00	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Cree Lake	SP	SP01-01	26/09/2012 11:00	26/09/2012 4:15	LW	1	37.6	350	U	Y	A	U	-	-	-	Released alive
Cree Lake	SP	SP01-01	26/09/2012 11:00	26/09/2012 4:15	LW	2	36.2	240	M	N	A	MT	-	-	Empty	Dead
Cree Lake	SP	SP01-01	26/09/2012 11:00	26/09/2012 4:15	LW	3	38.7	390	U	Y	A	U	-	-	-	Released, healthy
Cree Lake	SP	SP01-01	26/09/2012 11:00	26/09/2012 4:15	LW	4	37.5	330	M	N	A	MT	-	-	Empty	Dead, but otherwise healthy
Cree Lake	SP	SP02-01	26/09/2012 11:15	26/09/2012 4:30	LW	1	38.2	360	F	N	A	MT	OT	11	Empty	Kept for chemistry; composited with SP02-01 LW02
Cree Lake	SP	SP02-01	26/09/2012 11:15	26/09/2012 4:30	LW	2	38.7	380	M	N	A	MT	OT	23	Empty	Kept for chemistry; composited with SP02-01 LW01
Cree Lake	SP	SP03-01	26/09/2012 11:30	26/09/2012 4:45	LT	1	55.2	1080	M	N	A	SP	OT	19	Empty	Kept for chemistry; only 1 otolith
Cree Lake	SP	SP03-01	26/09/2012 11:30	26/09/2012 4:45	LT	2	56.4	1520	M	N	A	SP	OT	15	Empty	Kept for chemistry
Cree Lake	SP	SP03-01	26/09/2012 11:30	26/09/2012 4:45	LW	3	33.3	420	M	N	A	NS			Empty	Dead but released
Cree Lake	SP	SP04-01	26/09/2012 11:45	26/09/2012 5:00	LW	1	45	790	M	N	A	MT	OT	8	Empty	Kept for chemistry
Cree Lake	SP	SP04-01	26/09/2012 11:45	26/09/2012 5:00	LW	2	44.5	750	F	N	A	MT	OT	11	Empty	Kept for chemistry
Cree Lake	SP	SP04-01	26/09/2012 11:45	26/09/2012 5:00	LW	3	41.2	450	F	N	A	MT	OT	21	Empty	Kept for chemistry; composited with SP04-01 LW04
Cree Lake	SP	SP04-01	26/09/2012 11:45	26/09/2012 5:00	LW	4	41.2	460	F	N	A	MT	OT	7	Empty	Kept for chemistry; composited with SP04-01 LW03
Cree Lake	SP	SP04-01	26/09/2012 11:45	26/09/2012 5:00	LW	5	39.6	420	F	N	A	MT	OT	22	Empty	Kept for chemistry; composited with SP04-01 LW06
Cree Lake	SP	SP04-01	26/09/2012 11:45	26/09/2012 5:00	LW	6	39.7	395	M	N	A	MT	OT	18	Empty	Kept for chemistry; composited with SP04-01 LW05
Cree Lake	SP	SP04-01	26/09/2012 11:45	26/09/2012 5:00	LT	7	60.5	1520	M	N	A	SP	OT	23	Empty	Kept for chemistry
Cree Lake	SP	SP04-01	26/09/2012 11:45	26/09/2012 5:00	LT	8	73.3	3120	F	N	A	ST	OT	17	30% minnows (LW)	Kept for chemistry
Cree Lake	SP	SP04-01	26/09/2012 11:45	26/09/2012 5:00	LT	9	64.9	1910	F	N	A	ST	OT	-	Empty	Kept for chemistry; unable to age >20 yrs
Crackingstone Inlet	AN	AN01-01	28/09/2012 3:00	28/09/2012 4:00	NP	1	83.1	4100	F	N	A	MT	CL	8	Empty	Kept for chemistry
Crackingstone Inlet	AN	AN01-01	28/09/2012 3:00	28/09/2012 4:00	NP	2	64.5	1630	F	N	A	MT	CL	6	Empty	Kept for chemistry
Crackingstone Inlet	AN	AN01-01	28/09/2012 3:00	28/09/2012 4:00	NP	3	63.8	1390	F	N	A	MT	CL	6	Empty	Kept for chemistry
Crackingstone Inlet	AN	AN01-01	28/09/2012 3:00	28/09/2012 4:00	NP	4	65.6	1610	F	N	A	MT	CL	5	20% WSU	Kept for chemistry
Crackingstone Inlet	AN	AN01-01	28/09/2012 3:00	28/09/2012 4:00	NP	5	60.8	1320	M	N	A	MT	CL	7	40% Unknown	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	28/09/2012 4:00	29/09/2012 10:30	LW	1	44.8	905	M	N	A	MT	OT	12	Empty	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	28/09/2012 4:00	29/09/2012 10:30	LW	2	43.5	820	F	N	A	MT	OT	12	Empty	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	28/09/2012 4:00	29/09/2012 10:30	LW	3	39.1	740	F	N	A	NS	OT	6	Empty	Kept for chemistry
Crackingstone Inlet	SP	SP01-01	28/09/2012 4:00	29/09/2012 10:30	LSU	4	33.1	460	M	N	A	MT	FR	11	Empty	Kept for chemistry; need to composite possibly - not submitted
Crackingstone Inlet	SP	SP01-01	28/09/2012 4:00	29/09/2012 10:30	LT	5	49.7	1290	F	N	A	SP	-	-	Empty	Dead
Crackingstone Inlet	SP	SP01-01	28/09/2012 4:00	29/09/2012 10:30	LT	6	52.4	1090	M	N	A	SP	-	-	Empty	Dead
Crackingstone Inlet	SP	SP02-01	28/09/2012 6:00	29/09/2012 9:30	LT	1	63.4	2290	F	N	A	SP	OT	13	Empty	Kept for chemistry
Crackingstone Inlet	SP	SP02-01	28/09/2012 6:00	29/09/2012 9:30	LT	2	55.4	1720	M	N	A	SP	OT	16	Empty	Kept for chemistry
Crackingstone Inlet	SP	SP02-01	28/09/2012 6:00	29/09/2012 9:30	LT	3	58.9	1850	F	N	A	SP	OT	23	10% minnow	Kept for chemistry
Crackingstone Inlet	SP	SP02-01	28/09/2012 6:00	29/09/2012 9:30	LT	4	52.2	1310	F	N	A	SP	OT	13	30% unknown minnow	Kept for chemistry
Crackingstone Inlet	SP	SP02-01	28/09/2012 6:00	29/09/2012 9:30	LT	5	56.3	1590	M	N	A	SP	-	-	Empty	-
Crackingstone Inlet	SP	SP02-01	28/09/2012 6:00	29/09/2012 9:30	LT	6	50.1	1150	M	N	A	SP	OT	9	Empty	Kept for chemistry

APPENDIX B, TABLE 8

Detailed fish capture data for the EARMP technical program, 2011 and 2012.

Waterbody	Method	Site	Set Date	Catch Date	Species	Fish Number	Length (cm)	Weight (g)	Sex	Released	Maturity	Spawning Condition	Age Structure Collected	Age (years)	Stomach Contents	Comments
Crackingstone Inlet	SP	SP02-01	28/09/2012 6:00	29/09/2012 9:30	LT	7	52.6	1090	M	N	A	SP	-	-	Empty	-
Crackingstone Inlet	SP	SP02-01	28/09/2012 6:00	29/09/2012 9:30	LT	8	51.1	1060	M	N	A	SP	-	-	Empty	-
Crackingstone Inlet	SP	SP02-01	28/09/2012 6:00	29/09/2012 9:30	NP	9	67.5	2140	F	N	A	MT	-	-	50% WSU	-
Crackingstone Inlet	SP	SP02-01	28/09/2012 6:00	29/09/2012 9:30	NP	10	77.2	2980	F	N	A	MT	-	-	25% WSU	-
Crackingstone Inlet	SP	SP02-01	28/09/2012 6:00	29/09/2012 9:30	NP	11	64.5	1520	F	N	A	MT	-	-	Empty	-
Crackingstone Inlet	SP	SP02-01	28/09/2012 6:00	29/09/2012 9:30	NP	12	65.5	1670	M	N	A	MT	-	-	Empty	-
Crackingstone Inlet	SP	SP01-03	29/09/2012 3:00	30/09/2012 10:00	LW	1	43.1	780	F	N	A	NS	OT	16	15% Unidentified Invert Remains	Kept for chemistry
Crackingstone Inlet	SP	SP01-03	29/09/2012 3:00	30/09/2012 10:00	LW	2	41.2	750	M	N	A	MT	OT	13	Empty	Kept for chemistry
Crackingstone Inlet	SP	SP01-02	29/09/2012 11:00	29/09/2012 2:30	NF	-	-	-	-	N	-	-	-	-	-	No fish captured
Ellis Bay	SP	SP01-01	01/10/2012 12:00	01/10/2012 12:00	LT	1	62.2	3640	F	FALSE	A	SP	OT	19	Empty	Kept for chemistry
Ellis Bay	SP	SP01-01	01/10/2012 12:00	01/10/2012 12:00	LT	2	69.1	2920	M	FALSE	A	SP	OT	13	Empty	Kept for chemistry
Ellis Bay	SP	SP01-01	01/10/2012 12:00	01/10/2012 12:00	LT	3	53	1420	M	FALSE	A	SP	OT	9	Empty	Kept for chemistry
Ellis Bay	SP	SP01-01	01/10/2012 12:00	01/10/2012 12:00	LT	4	60.3	1760	M	FALSE	A	SP	OT	20	Empty	Kept for chemistry
Ellis Bay	SP	SP01-01	01/10/2012 12:00	01/10/2012 12:00	LT	5	63.5	2560	F	FALSE	A	SP	OT	18	Empty	Kept for chemistry
Ellis Bay	SP	SP01-01	01/10/2012 12:00	01/10/2012 12:00	LW	6	49.1	1180	M	FALSE	A	U	OT	30	Empty	Kept for chemistry
Ellis Bay	SP	SP01-01	01/10/2012 12:00	01/10/2012 12:00	LW	7	48.5	1120	M	FALSE	A	U	OT	33	25% Unidentified invert remains	Kept for chemistry

Method: AN = angling, HG = half tandard gang gill net, SP = spawning net.
Species: NP = northern pike, BB = burbot, WSU = white sucker, LSU = longnose sucker, LT = lake trout, LW = lake whitefish, WE = walleye, YP = yellow perch, NF = no fish.
Sex: M = male, F = female, U = unknown.
Maturity: U = unknown, A = adult, J = juvenile.
Spawning condition: MT = green, M = ripe, SP = ripe+/running ripe, ST = spent, U = unknown, NS = non-spawner.
Ageing: CL = cleithra, FR = fin rays, OT = otolith.
Stomach contents: BI = Benthic invertebrate remains.

APPENDIX B, TABLE 9

Descriptive statistics of fish collected for chemistry for the EARMP technical program, 2011 and 2012.

Waterbody	Statistic	Longnose Sucker			Lake Trout			Lake Whitefish			Northern Pike			White Sucker			All Species	
		Length (cm)	Weight (g)	Age (years)	Length (cm)	Weight (g)	Age (years)	Length (cm)	Weight (g)	Age (years)	Length (cm)	Weight (g)	Age (years)	Length (cm)	Weight (g)	Age (years)	Length (cm)	Weight (g)
Cochrane River	N	6	6	6	11	11	10	14	14	10	9	9	9	4	4	4	45	45
	Average	39.4	638	13.7	56.5	2019	15.7	45.2	934	20.0	62.6	1983	7.8	48.825	1468	15.3	50.8	1417
	S.D.	4.1	394	3.1	7.2	926	5.7	3.8	343	8.5	14.2	1646	3.3	1.7	271	1.5	11.1	1031
	Minimum	32.5	140	9	42.4	520	7	35.1	160	8	48.9	840	4	47.2	1160	13	32.5	140
	Maximum	44.2	1210	17	67.7	3460	23	49.4	1380	34	95.7	6250	14	50.5	1720	16	95.7	6250
Crackingstone Inlet	N	-	-	-	15	15	9	10	10	10	9	9	10	-	-	-	35	35
	Average	-	-	-	54.2	1619	15.0	41.8	978	12.7	68.1	2040	6.3	-	-	-	53.6	1511
	S.D.	-	-	-	3.5	437	4.0	1.8	201	3.7	7.2	925	1.4	-	-	-	11.3	697
	Minimum	-	-	-	49.7	1060	9	39.1	740	6	60.8	1320	5	-	-	-	33.1	460
	Maximum	-	-	-	63.4	2290	23	44.8	1260	19	83.1	4100	9	-	-	-	83.1	4100
Fond du Lac River	N	4	4	9	18	18	7	19	19	11	9	9	10	10	10	10	60	60
	Average	47.7	1079	19.2	56.4	1664	13.1	42.5	844	16.6	55.1	1061	5.6	41.2	822	14.2	48.7	1135
	S.D.	11.6	642	5.1	6.7	384	6.1	3.7	262	8.3	10.9	770	2.2	4.4	363	5.5	9.5	561
	Minimum	38.3	520	13	46.4	1010	7	36.4	390	7	40.2	200	3	33.3	200	9	33.3	200
	Maximum	62.5	1650	27	69.4	2420	21	49.4	1340	32	71.4	2320	9	46.7	1300	26	71.4	2420
Waterbury Lake	N	10	10	10	28	28	10	16	16	8	13	13	10	4	4	4	71	71
	Average	35.5	1068	11.9	55.8	1752	15.0	44.7	1159	13.8	57.9	1723	6.6	33.9	238	6.0	49.6	1431
	S.D.	3.5	1597	2.3	5.5	554	5.4	8.9	868	4.8	19.0	1750	5.1	0.7	51	0.0	13.0	1143
	Minimum	29.4	75	8	47.0	820	9	32.7	120	8	25.8	220	2	33.4	180	6	25.8	75
	Maximum	39.8	5560	15	66.5	3310	26	61.5	2780	19	89.3	5250	18	34.9	280	6	89.3	5560
Bobby's Lake	N	-	-	-	-	-	-	-	-	-	5	5	5	4	4	4	9	9
	Average	-	-	-	-	-	-	-	-	-	63.1	1522	8.2	45.0	983	12.3	55.0	1282
	S.D.	-	-	-	-	-	-	-	-	-	6.8	672	1.3	2.2	193	1.3	10.8	566
	Minimum	-	-	-	-	-	-	-	-	-	53.1	715	6	42.0	705	11	42.0	705
	Maximum	-	-	-	-	-	-	-	-	-	69.6	2460	9	47.2	1140	14	69.6	2460
Cree Lake	N	17	17	16	19	19	9	29	29	16	6	6	5	21	21	10	93	93
	Average	36.5	653	13.6	54.4	1623	13.8	38.1	542	12.2	76.9	4012	9.4	37.8	777	9.3	43.8	1066
	S.D.	3.0	237	3.5	9.0	672	6.0	3.9	242	6.1	21.8	2997	4.7	3.2	210	2.4	13.2	1175
	Minimum	33.2	460	8	38.1	920	6	33.3	240	4	47.7	840	3	33.1	520	7	33.1	240
	Maximum	45.6	1510	23	73.3	3240	23	49.6	1530	23	106	7900	16	44.6	1360	14	106.0	7900
Ellis Bay	N	-	-	-	10	10	10	7	7	7	5	5	5	-	-	-	22	22
	Average	-	-	-	56.5	2109	14.1	41.6	1170	24.6	74.7	2968	8.6	-	-	-	55.9	2005
	S.D.	-	-	-	7.0	762	5.5	6.0	157	8.0	9.0	1162	4.4	-	-	-	14.1	986
	Minimum	-	-	-	48.5	1420	8	32.0	880	11	67.7	1660	5.0	-	-	-	32.0	880
	Maximum	-	-	-	69.1	3640	23	49.1	1380	33	89.5	4860	16	-	-	-	89.5	4860
Pasfield Lake	N	8	8	8	16	16	9	27.0	27	16	3	3	3	1	1	1	55	55
	Average	36.4	742	12.3	60.4	2178	19.2	33.8	379	3.9	80.4	3773	7.7	28.5[1]	265[1]	3[1]	44.3	1138
	S.D.	7.5	588	6.7	3.5	443	1.9	6.7	147	1.1	15.7	2065	4.5	-	-	-	16.1	1140
	Minimum	29.1	275	6	53.1	1620	17	27.7	170	2	63.1	1720	3	-	-	3	27.7	170
	Maximum	49.6	1690	23	65.8	3260	23	62.9	860	6	93.8	5850	12	-	-	3	93.8	5850

S.D. = standard deviation.

[1]Since only one specimen was captured, descriptive statistics could not be compiled.

APPENDIX B, TABLE 10

Detailed fish flesh chemistry data collected from the Cochrane River for the EARMP technical program, 2011 and 2012.

Parameter[1]	Cochrane River																		
	Longnose Sucker				Lake Trout										Lake Whitefish				
	2011		2012		2011					2012					2011				
	SP06-01		SP3-1	SP3-1, SP5-1	AN01-01					SP3-1				SP4-1	SP06-01			SP08-01	
	LSU02	LSU03	LSU09, LSU10	LSU11, LSU02	LT01	LT02	LT03	LT04	LT05	LT05	LT06	LT07	LT08	LT01	LW01	LW02	LW03	LW01	LW02
Metals																			
Aluminum	1.6	2.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	0.31	0.15	0.03	0.05	0.01	0.01	<0.01	<0.01	<0.01	0.01	0.01	0.02	0.01	0.02	0.03	0.09	0.05	0.57	0.04
Boron	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium	<0.1	<0.1	<0.1	<0.1	0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	0.18	0.27	0.23	0.51	0.24	0.28	0.22	0.12	0.25	0.35	0.2	0.17	0.18	0.19	0.2	0.12	0.18	0.11	0.17
Iron	3.4	11.0	1.6	3.3	2.2	3.4	2.1	0.7	1.7	2.2	1.6	1.4	2.5	1.8	3.3	3.0	2.2	1.8	2.1
Lead	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Manganese	1.30	0.41	0.10	0.20	0.06	0.10	0.06	0.05	0.07	0.08	0.07	0.04	0.07	0.10	0.06	0.23	0.14	0.07	0.17
Mercury	0.04	0.07	0.01	0.01	0.09	0.10	0.12	0.18	0.30	0.16	0.14	0.20	0.20	0.06	0.07	0.05	0.03	0.06	0.05
Molybdenum	<0.02	<0.02	0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	<0.01	0.03	<0.01	<0.01	0.05	0.03	0.02	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.02
Selenium	0.4	0.34	0.29	0.31	0.19	0.26	0.21	0.36	0.22	0.24	0.22	0.2	0.27	0.23	0.53	0.47	0.31	0.23	0.28
Silver	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Thallium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium	0.13	0.2	0.06	0.08	0.06	0.07	0.07	0.07	0.07	0.06	0.06	0.06	0.07	0.06	0.06	0.07	0.08	0.07	0.08
Uranium	0.006	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	0.002	0.002	0.002	0.001
Zinc	4.9	6.4	3.6	5	3.2	3.4	3.2	2.7	2.8	3.6	3.3	2.8	3.3	3.6	3	7.8	4.7	3	5.1
Physical Properties																			
Moisture (%)	77.34	79.75	75.12	77.46	74.01	72.45	69.01	77.64	75.75	74.03	68.41	72.4	66.27	73.59	82.51	85.72	77.81	80.67	79.64
Radionuclides																			
Lead-210 (Bq/g)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0009	<0.0009	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Polonium-210 (Bq/g)	0.0039	0.0013	0.0006	0.0009	0.0004	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	0.0008	0.0032	0.0003	0.0008
Radium-226 (Bq/g)	<0.00006	<0.00006	<0.00008	<0.00007	<0.00005	<0.00006	<0.00007	<0.00006	<0.00006	<0.00007	<0.00006	<0.00008	<0.00009	<0.00006	<0.00006	<0.00006	<0.00007	<0.00006	<0.000005
Thorium-230 (Bq/g)	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00001
Trace Elements																			
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.18	0.15	0.17	0.11	0.1	0.13	0.07	0.03	0.06	0.04	0.05	0.05	0.04	0.05	0.14	0.18	0.07	0.02	0.07
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	0.005	0.005	<0.002	0.003	0.003	<0.002	0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.008	0.003	0.002	0.005	0.008
Strontium	3.4	1.2	0.26	0.22	0.11	0.1	0.04	0.04	0.05	0.1	0.05	0.12	0.05	0.05	0.18	1.3	1.1	0.08	0.68
Vanadium	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

APPENDIX B, TABLE 10

Detailed fish flesh chemistry data collected from the Cochrane River for the EARMP technical program, 2011 and 2012.

Parameter[1]	Cochrane River																	
	Lake Whitefish					Northern Pike									WSU			
	2012					2011					2012				2012			
	SP1-1	SP2-1		SP3-1		AN01-01		AN02-01			SP1-2	SP4-1		SP6-1	SP1-2		SP3-1	SP4-1
	LW01	LW01	LW02	LW01	LW02	NP06	NP07	NP01	NP02	NP03	NP01	NP02	NP03	NP01	WSU03	WSU04	WSU02	WSU12
Metals																		
Aluminum	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	0.02	0.17	0.02	0.02	0.04	<0.01	0.05	0.13	0.03	0.01	0.02	0.01	0.02	0.02	0.04	0.04	0.04	0.04
Boron	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	0.15	0.14	0.29	0.15	0.22	0.18	0.2	0.17	0.19	0.14	0.35	0.23	0.17	0.16	0.36	0.34	0.35	0.34
Iron	2.3	2.0	1.8	2.4	3.7	11.0	1.5	3.4	1.8	1.3	4.0	1.8	1.5	1.0	2.8	4.6	4.0	2.5
Lead	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Manganese	0.07	0.08	0.10	0.09	0.14	0.19	0.11	0.13	0.09	0.13	0.09	0.10	0.10	0.07	0.11	0.14	0.10	0.08
Mercury	0.03	0.16	0.11	0.04	0.06	0.34	0.24	0.04	0.11	0.18	0.06	0.26	0.22	0.15	0.02	0.02	0.02	0.02
Molybdenum	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	0.03	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
Selenium	0.23	0.31	0.27	0.56	0.57	0.26	0.22	0.24	0.25	0.23	0.25	0.24	0.28	0.22	0.26	0.31	0.25	0.29
Silver	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Thallium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium	0.07	0.08	0.08	0.06	0.06	0.08	0.09	0.09	0.09	0.1	0.06	0.07	0.08	0.07	0.08	0.08	0.08	0.07
Uranium	<0.001	<0.001	<0.001	0.001	<0.001	0.018	0.002	<0.001	0.002	0.009	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	3.3	4.2	4.4	3.5	5.3	5.4	6.7	5.9	5.3	6.1	7.3	4.8	5.6	3.8	3.8	5.4	4.7	5.2
Physical Properties																		
Moisture (%)	77.84	78.36	77.41	80.52	79.83	78.49	76.84	77.79	78.47	77.74	78.85	79.51	78.25	80.25	81.3	82.49	79.93	77.99
Radionuclides																		
Lead-210 (Bq/g)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Polonium-210 (Bq/g)	0.0003	<0.0002	0.0002	0.0012	0.0008	0.0024	0.0025	0.0023	0.0037	0.0012	0.0042	0.0005	0.0016	0.0039	0.001	0.0028	0.0038	0.0032
Radium-226 (Bq/g)	<0.00006	<0.00007	<0.00006	<0.00008	0.0001	<0.00008	<0.00006	<0.00007	<0.00007	<0.00006	<0.00007	0.00008	0.0002	<0.00006	<0.00008	<0.00006	<0.00007	<0.00006
Thorium-230 (Bq/g)	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001
Trace Elements																		
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.02	0.06	0.04	0.14	0.21	0.01	0.01	0.02	0.02	0.02	0.03	0.03	0.05	0.05	0.06	0.11	0.04	0.13
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	<0.002	0.002	<0.002	0.003	0.003	<0.002	<0.002	0.003	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	0.003	0.006	0.003	0.003
Strontium	0.05	0.09	0.14	0.06	0.25	0.11	0.12	0.19	0.12	0.11	0.07	0.03	0.04	0.03	0.04	0.05	0.05	0.04
Vanadium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

[1]All concentrations are presented on a µg/g wet weight basis, unless specified otherwise.

APPENDIX B, TABLE 11

Detailed fish flesh chemistry data collected from Crackingstone Inlet for the EARMP technical program, 2011 and 2012.

Parameter[1]	Crackingstone Inlet																														
	Lake Trout											Lake Whitefish										Northern Pike									
	2011					2012						2011					2012					2011					2012				
	SP01-01					SP02-01						SP01-01					SP01-01			SP01-03		SP01-01					AN01-01				
	LT01	LT02	LT03	LT04	LT05	LT01	LT02	LT03	LT04	LT06		LW06	LW07	LW08	LW09	LW10	LW01	LW02	LW03	LW04	LW05	NP01	NP02	NP03	NP04	NP05	NP01	NP02	NP03	NP04	NP05
Metals																															
Aluminum	0.9	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	0.03	<0.01	0.04	0.01	<0.01	0.01	0.02	0.02	0.02	0.01		0.63	0.6	0.01	0.17	0.04	0.02	0.01	0.02	0.02	<0.01	0.02	0.04	0.01	0.12	<0.01	0.02	0.03	0.02	0.02	0.02
Boron	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	0.27	0.13	0.2	0.24	0.22	0.3	0.23	0.15	0.22	0.24		0.19	0.25	0.15	0.19	0.2	0.2	0.17	0.22	0.12	0.2	0.28	0.25	0.25	0.16	0.17	0.2	0.14	0.13	0.17	0.18
Iron	5.3	1.9	1.9	2.3	3.4	1.5	2.1	1.2	1.2	1.2		1.3	2.1	4.4	1.8	4.3	1.4	0.9	1.3	2.6	2	2.8	2.3	2.4	2	1.3	1.7	1.1	0.7	3.8	1.9
Lead	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Manganese	0.2	0.06	0.07	0.06	0.09	0.06	0.09	0.08	0.09	0.05		0.09	0.08	0.07	0.11	0.11	0.07	0.07	0.07	0.14	0.08	0.12	0.13	0.11	0.13	0.07	0.1	0.09	0.08	0.12	0.09
Mercury	0.13	0.17	0.18	0.17	0.13	0.08	0.15	0.22	0.08	0.08		0.04	0.04	0.09	0.02	0.02	0.03	0.02	0.03	0.02	0.02	0.09	0.06	0.05	0.13	0.14	0.16	0.15	0.08	0.06	0.14
Molybdenum	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	<0.01	0.01	<0.01	0.02	<0.01	0.07	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	0.16	0.15	0.12	0.21	0.18	0.17	0.15	0.14	0.15	0.15		0.18	0.21	0.58	2.6	0.28	0.37	0.33	0.55	0.85	0.32	0.64	0.52	0.32	0.36	0.42	0.59	0.4	0.38	0.34	0.66
Silver	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Thallium	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium	0.11	0.07	0.08	0.08	0.08	0.01	0.02	0.01	<0.01	<0.01		0.07	0.07	0.06	0.08	0.07	0.02	0.01	0.01	0.02	0.01	0.09	0.07	0.07	0.09	0.07	0.01	0.01	0.02	0.01	<0.01
Uranium	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	0.007	0.006	0.008	0.012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	6.5	3.4	3.8	2.6	7.8	2.8	2.9	2.6	3.3	2.5		3.6	4.4	5.3	5	4.1	3.4	3.7	4.2	3	3.2	6.2	6.6	7.9	6	3.5	5.9	3.3	3.4	8.5	3.8
Physical Properties																															
Moisture (%)	66.65	72.8	72.26	70.93	75.14	74.44	75.35	80.02	75.97	76.17		75.91	75.86	76.21	73.83	74.66	73.3	75.53	76.72	74.93	75.2	78.43	78.59	79.09	78.21	77.81	77.48	78.26	77.67	78.08	77.64
Radionuclides																															
Lead-210 (Bq/g)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Polonium-210 (Bq/g)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	0.0007	0.0007	<0.0002	0.0006	0.0004	0.0003	0.0007	0.0002	0.0008	0.001	0.0003	0.001	0.0004	0.0006	0.0013	0.0004	0.0012	0.0018
Radium-226 (Bq/g)	<0.00007	<0.00006	<0.00007	<0.00006	0.0004	<0.00006	<0.00006	<0.00006	<0.00007	<0.00009		<0.00008	<0.00006	0.0003	<0.00007	<0.00008	<0.00005	0.0002	<0.0001	<0.00008	0.00009	0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00007	<0.00007	<0.00008	<0.00006	<0.0001
Thorium-230 (Bq/g)	<0.0001	0.0002	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0002		0.0004	<0.0001	<0.0002	<0.0001	<0.0002	<0.0001	<0.0002	<0.0002	0.0006	<0.0002	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002
Trace Elements																															
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.11	0.08	0.12	0.07	0.06	0.06	0.05	0.04	0.09	0.05		0.12	0.05	0.12	0.11	0.11	0.09	0.02	0.03	0.3	0.24	0.05	0.06	0.05	0.05	0.1	0.19	0.08	0.05	0.05	0.06
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002		<0.002	0.009	0.004	<0.002	0.004	0.002	0.004	<0.002	<0.002	<0.002	0.002	0.002	0.002	0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Strontium	0.17	0.17	0.46	0.07	0.12	0.1	0.04	0.04	0.14	0.1		0.22	0.18	0.34	0.75	0.45	0.13	0.08	0.12	0.1	0.17	0.14	0.27	0.13	0.57	0.09	0.16	0.18	0.09	0.11	0.06
Vanadium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02		<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

[1]All concentrations are presented on a µg/g wet weight basis, unless specified otherwise.

APPENDIX B, TABLE 12

Detailed fish flesh chemistry data collected from the Fond du Lac River for the EARMP technical program, 2011 and 2012.

Parameter[1]	Fond du Lac River																								
	Longnose Sucker								Lake Trout							Lake Whitefish									
	2011					2012			2011		2012					2011					2012				
	SP05-01			SP06-02		SP7-1			SP05-01	SP07-02	SP1-1		SP4-1	SP6-1	SP7-1	SP04-01					SP1-1	SP3-1		SP3-2	SP7-1
	LSU06	LSU07	LSU11	LSU01	LSU02	LSU05, LSU06	LSU07	LSU08	LT08	LT15	LT01	LT02	LT02	LT01	LT01	LW01	LW02	LW03	LW04	LW05	LW03	LW01	LW02, LW03	LW04	LW02
Metals																									
Aluminum	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	0.08	0.04	0.05	0.07	0.02	0.04	0.05	0.06	0.02	<0.01	0.02	0.04	0.02	0.02	0.02	<0.01	<0.01	0.02	<0.01	<0.01	0.02	0.02	0.02	0.01	<0.01
Boron	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.004	<0.002	0.006	<0.002	<0.002	<0.002	<0.002	0.004	<0.002
Chromium	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	0.26	0.21	0.38	0.27	0.39	0.21	0.23	0.22	0.44	0.19	0.28	0.32	0.42	0.21	0.25	0.14	0.15	0.15	0.1	0.16	0.14	0.2	0.18	0.14	0.15
Iron	2	2	3.5	2.7	3.8	2.7	2.7	3.5	4.1	1.9	2.2	3.4	2.6	1.6	2.2	1.8	1.7	2.1	1.9	2.2	1.3	2.7	1.9	3	2.4
Lead	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Manganese	0.26	0.12	0.14	0.41	0.09	0.09	0.24	0.22	0.21	0.05	0.07	0.10	0.10	0.10	0.07	0.09	0.11	0.10	0.11	0.11	0.08	0.12	0.13	0.08	0.07
Mercury	0.06	0.09	0.04	0.20	0.08	0.04	0.12	0.07	0.42	0.40	0.22	0.17	0.17	0.15	0.21	0.08	0.05	0.04	0.07	0.03	0.18	0.09	0.08	0.23	0.23
Molybdenum	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	<0.01	0.04	<0.01	0.02	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	0.31	0.41	0.32	0.38	0.34	0.24	0.31	0.39	0.25	0.23	0.28	0.2	0.24	0.26	0.17	0.64	0.4	0.4	0.78	0.31	0.33	0.23	0.34	0.26	0.26
Silver	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Thallium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium	0.09	0.07	0.07	0.07	0.07	0.05	0.07	0.06	0.07	0.07	0.07	0.08	0.07	0.07	0.07	0.07	0.06	0.06	0.07	0.06	0.07	0.07	0.07	0.06	0.07
Uranium	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	4.2	4	5.4	3.6	4.9	3	3.5	3	10	3.1	3.1	4.1	3.7	3.4	4.4	3.3	3	3.6	2.6	4.1	6.6	3.7	3.8	3.5	3.5
Physical Properties																									
Moisture (%)	75.91	76.73	76.04	79.62	79.17	76.59	76.21	74.11	72.27	79.61	72.68	65.49	76.75	74	76.05	75.91	78.64	79.11	75.83	77.43	74.3	75.85	77.14	83.85	79.16
Radionuclides																									
Lead-210 (Bq/g)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Polonium-210 (Bq/g)	0.0021	0.0029	0.0034	0.0023	0.0007	0.0005	0.0007	0.0017	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0008	0.0011	<0.0002	0.0004	0.0005	0.0003	<0.0002	<0.0002	0.0004	0.0004
Radium-226 (Bq/g)	<0.00006	<0.00006	<0.00006	0.00009	<0.00006	<0.00007	<0.00006	<0.00006	<0.0001	<0.00007	<0.00006	0.0001	0.0001	0.0002	<0.00006	<0.0002	0.00020	<0.00007	<0.00006	0.00009	0.0001	<0.00006	<0.00006	<0.00006	0.0001
Thorium-230 (Bq/g)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0003	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Trace Elements																									
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.19	0.22	0.15	0.06	0.1	0.09	0.11	0.11	0.04	0.04	0.02	0.03	0.04	0.04	0.02	0.11	0.14	0.19	0.31	0.07	0.03	0.03	0.03	0.05	0.02
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	0.003	0.002	0.003	0.004	0.003	0.002	0.003	0.003	0.003	<0.002	<0.002	0.003	0.002	<0.002	<0.002	<0.002	0.002	<0.002	0.002	0.006	<0.002	<0.002	<0.002	0.004	<0.002
Strontium	0.51	0.06	0.07	0.55	0.09	0.07	0.27	0.27	0.49	0.03	0.04	0.11	0.22	0.11	0.1	0.13	0.09	0.12	0.12	0.11	0.14	0.12	0.1	0.1	0.12
Vanadium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

APPENDIX B, TABLE 12

Detailed fish flesh chemistry data collected from the Fond du Lac River for the EARMP technical program, 2011 and 2012.

Parameter[1]	Fond du Lac River																			
	Northern Pike										White Sucker									
	2011					2012					2011					2012				
	SP04-01					SP3-2		SP4-1	SP5-1	SP6-1	SP05-01					SP3-2			SP6-1	SP7-1
	NP06	NP07	NP08	NP09	NP10	NP01	NP02	NP01	NP01	NP05	WSU01	WSU02	WSU03	WSU04	WSU05	WSU07	WSU08	WSU09	WSU03	WSU03
Metals																				
Aluminum	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	0.04	0.02	<0.01	0.06	0.04	0.02	<0.01	0.02	0.06	0.04	0.15	0.15	0.02	0.04	0.02	0.02	0.03	0.03	0.03	0.04
Boron	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	0.29	0.25	0.18	0.55	0.22	0.17	0.16	0.2	0.15	0.13	0.43	0.65	0.33	0.34	0.28	0.25	0.21	0.28	0.36	0.21
Iron	2.3	2.3	1.7	3.7	1.9	2.2	1.5	4.5	1.3	5.8	5.7	8	2.8	2.9	2.5	1.3	2.1	2.2	2.9	3.5
Lead	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	0.003	0.003	<0.002
Manganese	0.37	0.21	0.12	0.34	0.26	0.13	0.09	0.12	0.43	0.25	0.68	0.61	0.10	0.09	0.12	0.09	0.11	0.11	0.09	0.09
Mercury	0.06	0.20	0.20	0.09	0.08	0.09	0.16	0.16	0.14	0.08	0.11	0.16	0.06	0.06	0.33	0.03	0.03	0.02	0.04	0.05
Molybdenum	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.04	0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	0.26	0.31	0.24	0.27	0.28	0.2	0.24	0.25	0.23	0.22	0.32	0.44	0.37	0.27	0.21	0.29	0.26	0.28	0.32	0.26
Silver	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Thallium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium	0.07	0.07	0.06	0.06	0.08	0.05	0.07	0.06	0.06	0.06	0.09	0.09	0.07	0.08	0.07	0.07	0.06	0.06	0.06	0.06
Uranium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.002	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	5.1	4.2	4	8.3	5.3	10	3.3	5.2	3.8	4.1	5.5	5.9	5.6	3.5	3.5	2.7	3.1	3.3	3.3	2.8
Physical Properties																				
Moisture (%)	77.94	76.92	78.89	78.56	78.58	79.18	79.34	75.95	71.29	78.47	77.74	78.84	76.68	75.14	78.11	78.89	79.45	79.24	76.88	80.67
Radionuclides																				
Lead-210 (Bq/g)	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Polonium-210 (Bq/g)	0.0031	0.0016	0.0011	0.0032	0.0031	0.0014	0.0022	0.0026	0.0029	0.0026	0.002	0.0012	0.0021	0.0025	0.0008	0.0024	0.0012	0.0007	0.002	0.0009
Radium-226 (Bq/g)	<0.00006	0.00010	<0.00007	0.00007	<0.00007	0.0001	<0.00006	0.0001	<0.00006	<0.00007	<0.00006	<0.00006	<0.00007	<0.00006	0.00010	<0.00006	<0.00007	<0.00006	<0.00007	<0.00007
Thorium-230 (Bq/g)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Trace Elements																				
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.02	0.03	0.03	0.02	0.02	0.03	0.02	0.02	0.02	0.01	0.05	0.05	0.2	0.08	0.04	0.09	0.04	0.11	0.13	0.05
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	0.003	0.009	0.004	0.006	0.003	<0.002	<0.002	0.002	<0.002	<0.002	0.006	0.008	0.004	0.003	0.006	<0.002	0.002	<0.002	0.003	0.002
Strontium	0.46	0.22	0.07	0.57	0.53	0.18	0.04	0.08	0.41	0.2	1.7	1.1	0.06	0.07	0.07	0.04	0.06	0.03	0.08	0.03
Vanadium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

[1]All concentrations are presented on a μg/g wet weight basis, unless specified otherwise.

APPENDIX B, TABLE 13

Detailed fish flesh chemistry data collected from Waterbury Lake for the EARMP technical program, 2011 and 2012.

Parameter[1]	Waterbury Lake															
	Longnose Sucker						Lake Trout									
	2011					2012	2011					2012				
	SP08-01					SP7-1	SP08-01					AN2-1				
	LSU11, LSU12	LSU13	LSU14	LSU15, LSU16	LSU17, LSU18	WSU12, LSU13, LSU23	LT03	LT04	LT05	LT06	LT07	LT01	LT02	LT03	LT04	LT05
Metals																
Aluminum	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	0.22	0.06	0.07	0.08	0.04	0.15	<0.01	0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.02	0.01	0.02
Boron	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	0.11	0.11	0.15	0.24	0.14	0.23	0.27	0.31	0.27	0.22	0.3	0.24	0.24	0.36	0.44	0.39
Iron	1.5	0.9	1.2	1.9	1.6	1.9	3.1	2.8	3.5	2.6	2.9	3.2	2.6	2.8	2.6	2.7
Lead	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	0.006	<0.002	<0.002	<0.002
Manganese	0.43	0.57	0.99	0.33	0.28	0.26	0.09	0.11	0.09	0.15	0.10	0.07	0.08	0.08	0.10	0.08
Mercury	0.03	0.02	0.02	0.02	0.02	0.02	0.19	0.10	0.16	0.16	0.17	0.23	0.09	0.12	0.13	0.07
Molybdenum	<0.02	<0.02	0.04	0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	0.02	<0.01	0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	0.17	0.25	0.21	0.25	0.2	0.17	0.31	0.17	0.14	0.16	0.2	0.23	0.25	0.21	0.2	0.22
Silver	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Thallium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium	0.06	0.06	0.06	0.08	0.06	0.05	0.08	0.08	0.08	0.08	0.07	0.07	0.08	0.08	0.07	0.08
Uranium	<0.001	<0.001	0.004	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	7.2	3.6	3.6	5.9	3.7	4.8	3.8	4	9.1	7.6	3.3	4	4.3	3.8	3.4	4.1
Physical Properties																
Moisture (%)	80.61	80.66	79.81	78.71	81.03	80.72	78.09	74.57	77.94	74.29	75.83	82.57	79.43	72.73	72.24	73.96
Radionuclides																
Lead-210 (Bq/g)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
Polonium-210 (Bq/g)	0.0004	0.0004	0.0003	0.0007	<0.0002	0.0018	<0.0002	0.0003	<0.0002	0.0004	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Radium-226 (Bq/g)	<0.00007	<0.00007	0.00008	<0.00007	<0.00007	<0.00007	<0.00006	<0.00006	<0.00005	<0.00006	0.0001	<0.00008	<0.00006	<0.00006	<0.00006	<0.00007
Thorium-230 (Bq/g)	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Trace Elements																
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.03	0.04	0.05	0.08	0.08	0.06	0.02	0.07	0.04	0.03	0.03	0.03	0.02	0.04	0.04	0.02
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	0.003	<0.002	0.004	<0.002	0.004	<0.002	<0.002	0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Strontium	0.68	0.83	1.4	0.68	0.39	0.38	0.13	0.19	0.17	0.19	0.1	0.23	0.08	0.11	0.09	0.14
Vanadium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

APPENDIX B, TABLE 13

Detailed fish flesh chemistry data collected from Waterbury Lake for the EARMP technical program, 2011 and 2012.

Parameter[1]	Waterbury Lake																
	Lake Whitefish								Northern Pike								WSU
	2011			2012					2011			2012					2012
	SP08-01			SP4-1		SP7-1			SP01-01	SP08-01		SP2-1	SP7-1				SP7-1
	LW08	LW09	LW10	LW01	LW03	LW06	LW07	LW08	NP03	NP01	NP02	NP01	NP01	NP02	NP03	NP04, NP05	WSU09, WSU10, WSU11
Metals																	
Aluminum	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	0.01	0.05	0.89	0.04	0.02	0.02	0.02	0.02	<0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.08
Boron	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	0.17	0.14	0.19	0.2	0.17	0.53	0.18	0.18	0.17	0.15	0.17	0.3	0.25	0.2	0.17	0.17	0.24
Iron	2.9	1.9	3.1	5.6	2.1	4.6	1.8	1.5	2.1	1.5	1.5	3.1	1.7	2.2	1.3	1.5	2.8
Lead	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.007
Manganese	0.14	0.24	0.10	0.26	0.10	0.12	0.13	0.13	0.11	0.11	0.17	0.10	0.12	0.10	0.14	0.11	0.18
Mercury	0.08	0.01	0.01	0.06	0.03	0.01	0.01	0.01	0.20	0.21	0.14	0.07	0.02	0.19	0.02	0.02	0.01
Molybdenum	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.02	0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	0.8	0.66	1.1	0.22	0.22	0.22	0.25	0.2	0.32	0.28	0.21	0.29	0.24	0.24	0.25	0.21	0.27
Silver	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Thallium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium	0.07	0.08	0.07	0.08	0.08	0.08	0.1	0.08	0.08	0.07	0.07	0.06	0.07	0.07	0.08	0.06	0.05
Uranium	<0.001	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	0.018	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	4.4	4.9	3.7	3.8	3.4	5	5.4	4.4	3.9	4.8	4	7.7	5.7	5.4	4.8	7.4	6.3
Physical Properties																	
Moisture (%)	79.39	72.53	79.47	78.23	78.64	77.11	52.52	78.17	81.23	75.81	78.74	79.47	78.84	80.77	79.01	78.68	81.39
Radionuclides																	
Lead-210 (Bq/g)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Polonium-210 (Bq/g)	0.0009	0.002	0.0014	0.0003	<0.0002	<0.0002	0.0006	<0.0002	0.0004	0.0003	0.0013	0.0017	0.0048	0.0035	0.004	0.004	0.0015
Radium-226 (Bq/g)	0.0001	0.0001	<0.00008	<0.00006	<0.00006	<0.00007	<0.0001	<0.00008	<0.00006	<0.0002	<0.00006	0.0001	0.0001	0.0002	0.0002	<0.00007	<0.00006
Thorium-230 (Bq/g)	<0.0001	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0001	<0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Trace Elements																	
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.03	0.03	0.03	0.03	0.03	0.05	0.04	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.06
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	0.003	0.003	<0.002	0.004	<0.002	0.003	<0.002	<0.002	0.002	<0.002	<0.002	0.002	<0.002	0.003	<0.002	<0.002	0.002
Strontium	0.34	1	0.21	0.16	0.23	0.33	0.24	0.23	0.1	0.09	0.31	0.18	0.17	0.13	0.11	0.18	0.92
Vanadium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

[1]All concentrations are presented on a µg/g wet weight basis, unless specified otherwise.

APPENDIX B, TABLE 14

Detailed fish flesh chemistry data collected from Bobby's Lake for the EARMP technical program, 2009.

Parameter[1]	Bobby's Lake								
	Northern Pike					White Sucker			
	GN4-1		HG1-1		HG2-1	GN2-1	HG2-1		
	NP01	NP02	NP01	NP02	NP01	WSU01	WSU03	WSU04	WSU05
Metals									
Aluminum	0.30	0.21	0.10	0.09	0.20	0.20	0.55	0.15	0.15
Barium	0.04	0.01	<0.01	0.09	0.02	0.01	0.07	0.02	0.03
Boron	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	0.32	0.17	0.14	0.38	0.14	0.33	0.24	0.21	0.23
Iron	3.5	1.5	1.7	4.2	2.6	2.7	3.1	3.1	3.1
Lead	0.003	0.002	0.002	0.003	0.004	<0.002	0.01	0.002	0.004
Manganese	0.16	0.10	0.10	0.28	0.10	0.09	0.11	0.12	0.17
Mercury	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]	-[2]
Molybdenum	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
Selenium	0.17	0.29	0.19	0.15	0.22	0.32	0.13	0.31	0.17
Silver	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Thallium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium	0.07	0.10	0.07	0.07	0.08	0.10	0.07	0.11	0.07
Uranium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Zinc	5.9	5.0	5.0	8.4	5.8	3.4	2.7	2.9	2.9
Physical Properties									
Ash (%)	3.1	1.3	1.2	1.2	1.2	1.4	1.1	1.1	1.3
Radionuclides									
Lead-210 (Bq/g)	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001
Polonium-210 (Bq/g)	0.0023	0.0008	0.001	0.0004	0.0007	0.0004	0.0003	<0.0002	0.0003
Radium-226 (Bq/g)	<0.0002	<0.00007	0.00008	<0.00006	<0.00006	<0.00007	<0.00006	<0.00005	<0.00005
Thorium-230 (Bq/g)	<0.0003	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Trace Elements									
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.01	0.01	0.01	0.01	0.02	0.01	0.01	<0.01	0.02
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	0.002	<0.002	<0.002	0.003	<0.002	0.003	0.003	<0.002	0.002
Strontium	0.33	0.11	0.12	0.99	0.13	0.05	0.06	0.12	0.37
Vanadium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

[1]All concentrations are presented on a µg/g wet weight basis, unless specified otherwise.

[2]Mercury was not measured as part of the program for which these data were collected. All analyses on mercury, therefore, did not include data from this waterbody.

APPENDIX B, TABLE 15

Detailed fish flesh chemistry data collected from Cree Lake for the EARMP technical program, 2011 and 2012.

Parameter[1]	Cree Lake																			
	Longnose Sucker										Lake Trout									
	2011					2012					2011					2012				
	SP09-01					SP01-01			SP01-02	SP01-03	AN01				SP01-01	SP03-01		SP04-01		
	LSU07	LSU08, LSU09	LSU10, LSU11	LSU12, LSU13	LSU14, LSU15	LSU08, LSU10	LSU09	LSU11, LSU12	LSU09	LSU03	LT01	LT02	LT03	LT04	LT01	LT01	LT02	LT07	LT08	LT09
Metals																				
Aluminum	0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	0.08	0.05	0.02	0.06	0.08	0.07	0.12	0.12	0.08	0.08	0.60	<0.01	0.02	0.03	0.01	0.02	0.02	0.01	0.01	0.01
Boron	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	0.005	<0.002	0.004	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	0.34	0.25	0.19	0.26	0.18	0.21	0.26	0.37	0.20	0.21	0.18	0.31	0.85	0.33	0.34	0.29	0.27	0.17	0.19	0.13
Iron	4.6	4.6	1.8	8.5	1.8	1.0	2.3	2.4	1.0	1.2	1.8	3.2	5.8	2.1	2.2	2.8	2.3	3.1	14.0	1.4
Lead	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.016	<0.002	<0.002
Manganese	0.69	1.40	0.31	2.00	0.71	0.25	1.10	0.66	0.52	0.59	0.09	0.15	0.13	0.10	0.11	0.06	0.12	0.08	0.22	0.04
Mercury	0.04	0.01	0.02	0.01	0.02	0.02	0.02	0.03	0.02	0.02	0.04	0.09	0.04	0.06	0.04	0.29	0.14	0.22	0.22	**0.53**
Molybdenum	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06
Nickel	0.02	0.07	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	0.27	0.57	0.53	0.32	0.33	0.23	0.28	0.31	0.33	0.3	0.22	0.2	0.28	0.24	0.26	0.2	0.25	0.22	0.21	0.15
Silver	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Thallium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium	0.11	0.09	0.08	0.08	0.08	0.01	0.03	0.02	0.01	0.02	0.06	0.09	0.07	0.08	0.08	0.01	0.02	0.01	0.1	0.01
Uranium	0.003	0.002	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	5.1	5	4.1	4.8	4.8	4.3	4.9	5.6	4.2	4.3	2.5	5.5	5.4	3.3	4.7	3.6	3	3	3.9	2.2
Physical Properties																				
Moisture (%)	75.72	77.95	77.45	77.03	77.28	79.43	80.05	76.73	78.28	78.16	77.12	76.83	72.94	72.92	75.39	82.63	77.19	80.95	79.54	81.46
Radionuclides																				
Lead-210 (Bq/g)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Polonium-210 (Bq/g)	0.0007	0.0022	0.0035	0.003	0.0023	0.0005	0.0003	0.0002	0.0004	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002
Radium-226 (Bq/g)	<0.00007	<0.0001	<0.00006	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0003	<0.00006	0.00007	0.00009	<0.00007	<0.00006	<0.00007	<0.00004	<0.00006
Thorium-230 (Bq/g)	<0.0001	<0.0003	<0.0001	<0.0002	<0.0003	<0.0002	<0.0002	<0.0002	<0.0003	<0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	0.0002	<0.0001	<0.0001
Trace Elements																				
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.08	0.02	0.02	0.04	0.06	0.03	0.02	0.01	0.02	0.05	0.02	0.02	0.03	0.02	0.02	0.01	0.01	<0.01	0.01	<0.01
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	0.003	0.006	0.008	0.004	0.005	<0.002	0.005	0.003	<0.002	0.002	<0.002	<0.002	0.004	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Strontium	0.58	0.37	0.23	0.72	0.8	0.27	1	0.66	0.46	0.62	0.18	0.19	0.45	0.16	0.25	0.37	0.09	0.1	0.1	0.1
Vanadium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

APPENDIX B, TABLE 15

Detailed fish flesh chemistry data collected from Cree Lake for the EARMP technical program, 2011 and 2012.

Parameter[1]	Cree Lake																								
	Lake Whitefish										Northern Pike					White Sucker									
	2011					2012					2012					2011					2012				
	SP01-01, SP03-01	SP06-01	SP07-01, SP09-01	SP09-01		SP02-01	SP04-01				SP01-01	SP01-02		SP01-03		SP09-01					SP01-01			SP01-02	
	LW02, LW02	LW02	LW02, LW01	LW19	LW20, LW21	LW01, LW02	LW01	LW02	LW03, LW04	LW05, LW06	NP07	NP07	NP08	NP01	NP02	WSU02	WSU03	WSU04	WSU05	WSU06	WSU01	WSU02	WSU03	WSU01	WSU02
Metals																									
Aluminum	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	0.7	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	0.15	0.57	0.68	0.55	0.60	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.02	0.05	0.02	0.04	0.16	0.06	0.04	0.04	0.06	0.04	0.09	0.06	0.06
Boron	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	0.32	0.18	0.21	0.26	0.28	0.19	0.24	0.15	0.18	0.18	0.23	0.20	0.33	0.19	0.17	0.36	0.22	0.25	0.20	0.39	0.20	0.20	0.18	0.27	0.22
Iron	2.4	1.6	3.0	2.1	4.4	1.5	2.5	1.0	1.5	2.6	1.9	1.5	3.0	2.6	1.2	3.7	1.9	5.1	2.4	3.7	6.5	1.7	1.8	2.2	4.2
Lead	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Manganese	0.55	0.08	0.12	0.11	0.14	0.07	0.12	0.09	0.12	0.26	0.10	0.10	0.13	0.16	0.13	0.28	0.63	0.81	0.23	0.22	0.37	0.11	0.13	0.28	0.21
Mercury	0.01	0.02	0.02	0.05	0.02	0.02	0.02	0.06	0.03	0.02	0.14	0.28	0.16	0.02	0.06	0.01	0.02	0.01	0.02	0.01	0.02	0.02	0.01	0.01	<0.01
Molybdenum	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	0.03	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	0.28	0.42	0.51	0.29	0.52	0.46	0.42	0.29	0.3	0.72	0.28	0.26	0.26	0.23	0.24	0.21	0.21	0.2	0.18	0.2	0.24	0.19	0.18	0.26	0.2
Silver	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Thallium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium	0.08	0.1	0.07	0.08	0.08	<0.01	0.02	0.01	0.02	0.01	0.02	0.01	0.01	0.02	<0.01	0.06	0.09	0.08	0.08	0.09	0.02	0.02	0.02	0.03	0.03
Uranium	<0.001	<0.001	0.004	0.002	0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	12	4.1	6.4	3.9	6.1	2.9	3.9	4.3	3.8	4.4	5.1	4.8	7.9	5.8	8.6	4.1	5.5	4.7	4.3	4.4	4.2	5.1	4.1	3.4	4.3
Physical Properties																									
Moisture (%)	77.79	73.24	77.39	76.93	78.46	77.24	74.15	76.98	78.27	77.02	76.53	78.64	76.7	77.05	77.09	77.35	76.3	79.19	79.36	73.98	79.34	77.63	77.82	78.33	77.37
Radionuclides																									
Lead-210 (Bq/g)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.0009	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001
Polonium-210 (Bq/g)	0.0008	<0.0002	0.0022	<0.0002	0.0023	0.0017	0.0002	<0.0002	<0.0002	0.0008	0.0004	<0.0002	0.0008	0.001	0.0004	0.002	0.0008	0.002	0.001	0.0006	0.0002	0.0004	0.0003	0.0006	0.0007
Radium-226 (Bq/g)	<0.00008	<0.00007	0.0001	<0.00006	0.00008	<0.0001	<0.00006	<0.00009	<0.00008	<0.00005	<0.00005	<0.00007	0.00008	<0.0001	<0.00006	<0.00008	<0.00009	0.0001	<0.00007	0.0002	0.0002	<0.00009	<0.0001	<0.0001	<0.0001
Thorium-230 (Bq/g)	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0002	<0.0003	<0.0002	<0.0002	<0.0003	<0.0002
Trace Elements																									
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.02	0.03	0.02	0.06	0.01	<0.01	0.02	<0.01	0.04	<0.01	0.01	<0.01	<0.01	0.01	<0.01	0.05	0.11	0.06	0.06	0.05	0.05	0.04	0.04	0.02	0.08
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	0.002	<0.002	0.004	<0.002	0.005	<0.002	<0.002	<0.002	<0.002	0.002	0.002	<0.002	0.002	<0.002	<0.002	0.003	<0.002	0.005	0.002	0.003	0.002	0.002	<0.002	0.002	0.002
Strontium	4.3	0.47	0.56	0.25	0.33	0.12	0.36	0.29	0.29	0.19	0.26	0.13	0.24	0.69	0.32	0.22	1.2	0.54	0.21	0.2	0.32	0.13	0.2	0.4	0.35
Vanadium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

Bold: values exceeding the mercury guideline of 0.5 µg/g.

[1]All concentrations are presented on a µg/g wet weight basis, unless specified otherwise.

APPENDIX B, TABLE 16

Detailed fish flesh chemistry data collected from Ellis Bay for the EARMP technical program, 2011 and 2012.

Parameter[1]	Ellis Bay																					
	Lake Trout										Lake Whitefish							Northern Pike				
	2011					2012					2011					2012		2012				
	SP01-01					SP01-01					SP01-01					SP01-01		AN01-01				
	LT01	LT02	LT03	LT04	LT05	LT01	LT02	LT03	LT04	LT05	LW06	LW07	LW08	LW09	LW10	LW06	LW07	NP01	NP02	NP03	NP04	NP05
Metals																						
Aluminum	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	0.04	0.01	<0.01	<0.01	<0.01	0.05	0.08	0.02	0.04	0.02	<0.01	0.04	0.06	<0.01	<0.01	0.03	0.02	0.02	0.02	0.02	0.02	<0.01
Boron	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	0.52	0.52	0.11	0.32	0.28	0.24	0.28	0.33	0.58	0.21	0.12	0.15	0.38	0.11	0.15	0.18	0.18	0.39	0.45	0.16	0.17	0.28
Iron	4.5	3.0	1.0	2.2	2.0	1.5	2.7	3.5	5.8	1.6	1.5	1.2	3.6	1.1	2.2	1.8	3.9	2.8	3.2	1.3	0.6	3.2
Lead	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002
Manganese	0.10	0.09	0.09	0.07	0.08	0.06	0.09	0.60	0.08	0.06	0.12	0.19	0.13	0.12	0.10	0.11	0.11	0.08	0.09	0.08	0.08	0.08
Mercury	0.13	0.20	0.28	0.07	0.18	0.17	0.08	0.06	0.21	0.14	0.07	0.06	0.03	0.03	0.02	0.05	0.06	0.19	0.13	0.08	0.17	0.24
Molybdenum	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	0.03	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Selenium	0.14	0.18	0.15	0.16	0.18	0.15	0.16	0.15	0.18	0.1	0.29	0.25	0.25	0.22	0.25	0.31	0.25	0.2	0.17	0.22	0.18	0.19
Silver	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Thallium	<0.01	0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium	0.07	0.15	0.06	0.07	0.06	0.01	0.02	0.02	0.01	<0.01	0.07	0.07	0.06	0.06	0.07	0.02	<0.01	0.02	0.02	0.02	0.01	0.01
Uranium	0.014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	11	3.8	2.9	3.8	3.5	2.6	3.2	2.6	10	6.3	3	2.8	4.4	3.3	3.1	2.8	3.2	4.2	9.8	5.4	4.9	6.5
Physical Properties																						
Moisture (%)	73.73	71.7	74.1	70.34	67.36	73.93	76.07	75.33	76.29	72.6	74.81	78.24	73.86	77.91	76.16	74.12	74.97	76.89	77.35	76.06	77.29	79.91
Radionuclides																						
Lead-210 (Bq/g)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Polonium-210 (Bq/g)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0007	<0.0002	<0.0002	0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.0002	0.0004	0.0008	0.0003	0.0003
Radium-226 (Bq/g)	<0.00007	<0.00006	0.0002	0.00009	0.0001	<0.00007	<0.00007	<0.00006	<0.00005	<0.00004	<0.00006	<0.00006	<0.0002	<0.00006	0.0003	<0.00007	<0.00006	<0.00006	<0.00007	<0.00008	<0.00006	0.00008
Thorium-230 (Bq/g)	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0003	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0002	<0.0002	<0.003
Trace Elements																						
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.12	0.08	0.12	0.08	0.12	0.06	0.14	0.04	0.06	0.29	0.38	0.24	0.36	0.31	0.17	0.37	0.24	0.09	0.15	0.09	0.12	0.1
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	0.003	0.003	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	0.007	0.002	0.002	<0.002	0.003	0.003	0.003	<0.002	<0.002	0.003
Strontium	0.3	0.19	0.26	0.2	0.15	0.06	0.13	0.07	0.68	0.65	0.15	0.74	1	0.18	0.24	0.15	0.23	0.16	0.2	0.18	0.11	0.14
Vanadium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

[1]All concentrations are presented on a µg/g wet weight basis, unless specified otherwise.

APPENDIX B, TABLE 17

Detailed fish flesh chemistry data collected from Pasfield Lake for the EARMP technical program, 2011 and 2012.

Parameter[1]	Pasfield Lake																											
	Longnose Sucker						Lake Trout										Lake Whitefish										Northern Pike		
	2011			2012			2011					2012					2011					2012					2011	2012	
	SP07-01			SP10-1	SP11-1		AN03-01		SP03-01	SP05-01		SP4-1				SP5-1	SP07-01					SP10-1	SP11-1				SP02-01	SP11-1	SP08-2
	LSU11	LSU12	LSU13	LSU02, LSU03	LSU02	LSU04, LSU05, WSU06	LT01	LT02	LT01	LT01	LT02	LT01	LT02	LT03	LT04	LT01	LW01, LW02	LW03, LW04	LW05, LW06	LW07, LW08	LW09, LW10	LW01	LW03, LW04, LW04, LW07	LW03, LW05, LW06	LW08, LW10, LW11, LW12, LW13	LW09, LW11, LW14, LW15	NP02	NP01	NP01
Metals																													
Aluminum	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	0.04	0.08	0.06	0.09	0.03	0.2	0.01	<0.01	0.69	0.02	0.63	0.02	0.02	0.02	0.02	0.02	0.71	0.68	0.66	0.06	0.02	0.03	0.04	0.02	0.07	0.02	0.01	0.02	0.03
Boron	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Chromium	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Copper	0.26	0.25	0.21	0.34	0.30	0.28	0.28	0.71	0.55	0.32	0.32	0.34	0.84	0.20	0.22	0.20	0.22	0.19	0.27	0.20	0.27	0.20	0.25	0.34	0.25	0.29	0.15	0.20	0.32
Iron	2.2	3.9	2.0	8.0	2.8	2.0	3.7	6.8	8.0	3.0	5.0	5.7	7.6	3.3	3.8	2.2	1.4	2.0	3.3	2.5	3.2	9.3	3.1	2.9	2.5	2.9	1.5	1.6	3.2
Lead	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Manganese	0.18	0.33	0.27	0.25	0.12	0.33	0.09	0.09	0.08	0.10	0.14	0.08	0.07	0.06	0.09	0.06	0.10	0.11	0.11	0.17	0.12	0.16	0.13	0.13	0.14	0.10	0.11	0.09	0.11
Mercury	0.01	0.02	0.04	0.01	0.03	<0.01	0.09	0.08	0.16	0.04	0.10	0.15	0.17	0.24	0.14	0.16	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.11	0.04	0.08
Molybdenum	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel	0.03	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	<0.01
Selenium	0.26	0.25	0.25	0.19	0.18	0.2	0.35	0.37	0.37	0.35	0.33	0.24	0.24	0.23	0.22	0.25	0.26	0.28	0.27	0.27	0.31	0.22	0.24	0.21	0.19	0.18	0.21	0.2	0.2
Silver	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Thallium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Titanium	0.06	0.09	0.08	0.06	0.06	0.09	0.07	0.07	0.08	0.08	0.07	0.05	0.07	0.06	0.05	0.06	0.08	0.08	0.07	0.07	0.08	0.06	0.06	0.05	0.06	0.06	0.19	0.06	0.06
Uranium	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	4.4	7.7	4.1	6.4	4	5.4	4.1	4.8	5	4.7	13	3.2	5.8	4	3.4	2.9	5.8	5.1	6.5	6.2	5.7	3.5	5.1	4	8	4.9	6.9	6.9	10
Physical Properties																													
Moisture (%)	72.49	78	72.37	78.95	75.02	77.8	77.03	79.44	77.88	74.17	79.65	74.51	78.51	70.46	79.23	79.26	78.17	77.43	77.92	78.46	78.52	77.93	79.55	80.03	79.17	80.73	78.45	77.77	78.94
Radionuclides																													
Lead-210 (Bq/g)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Polonium-210 (Bq/g)	0.0034	0.0016	0.0026	0.0032	0.0013	0.01	<0.0002	0.0002	0.0002	<0.0002	0.0004	<0.0002	0.0004	<0.0002	<0.0002	0.0003	0.0058	0.0038	0.008	0.0055	0.0049	0.0008	0.0048	0.0038	0.0078	0.0064	0.001	<0.0002	0.0027
Radium-226 (Bq/g)	0.0006	0.00007	<0.00006	0.0001	<0.00007	<0.00008	<0.00007	0.0002	<0.00006	<0.00007	<0.00006	<0.00006	0.0002	<0.00009	0.00008	<0.00006	<0.00007	0.00009	<0.00006	<0.00007	<0.00007	0.00008	0.0001	<0.00008	<0.00006	<0.00006	<0.0001	0.0002	<0.00006
Thorium-230 (Bq/g)	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	<0.0003	<0.0002	<0.0001
Trace Elements																													
Antimony	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.11	0.14	0.08	0.05	0.13	0.05	0.09	0.05	0.03	0.05	0.01	0.01	0.04	0.02	0.02	0.01	0.08	0.04	0.04	0.07	0.04	0.03	0.04	0.03	0.04	0.04	0.02	0.02	0.03
Beryllium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt	0.003	0.003	<0.002	<0.002	0.003	<0.002	<0.002	0.006	0.004	0.002	0.003	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.003	0.004	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.002
Strontium	0.39	2.3	0.92	0.65	0.18	1	0.34	0.23	0.45	0.58	1.4	0.15	0.23	0.3	0.16	0.16	0.72	0.42	1.2	2.2	0.51	0.5	0.78	0.56	1.4	0.53	0.27	0.31	0.63
Vanadium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

[1]All concentrations are presented on a µg/g wet weight basis, unless specified otherwise.

APPENDIX B, TABLE 18

Fish flesh chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	Far-Field Exposure Areas																	
		Cochrane River					Crackingstone Inlet			Fond du Lac River					Waterbury Lake				
		LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	WSU	LSU	LT	LW	NP	WSU
Metals																			
Aluminum	Average	1.25	0.5	0.5	0.5	0.5	0.54	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	S.D.	0.93	-[2]	-	-	-	0.13	-[3]	-	0[3]	-	-	-	-	-	-	-	-	-
	Min	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Max	2.4	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	<MDL	2	10	10	9	4	8	10	10	7	7	10	10	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Barium	Average	0.14	0.01	0.11	0.03	0.04	0.02	0.15	0.03	0.05	0.02	0.01	0.03	0.05	0.10	0.01	0.13	0.02	0.08
	S.D.	0.128	0.004	0.170	0.038	0	0.010	0.248	0.032	0.019	0.009	0.005	0.019	0.052	0.068	0.005	0.306	0.005	-
	Min	0.03	<0.01	0.02	<0.01	0.04	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.02	0.04	<0.01	0.01	<0.01	0.08
	Max	0.31	0.02	0.57	0.13	0.04	0.04	0.63	0.12	0.08	0.04	0.02	0.06	0.15	0.22	0.02	0.89	0.02	0.08
	<MDL	0	3	0	1	0	2	1	1	0	1	5	2	0	0	5	0	1	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Boron	Average	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Max	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	<MDL	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Cadmium	Average	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	S.D.	-	-	-	-	-	-	0.0003	-	0.0004	-	0.0014	-	0	-	-	-	-	-
	Min	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Max	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	0.003	<0.002	0.006	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	<MDL	4	10	10	9	4	10	9	10	7	7	7	10	9	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Chromium	Average	0.1	0.11	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	S.D.	-	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Max	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	<MDL	4	8	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Copper	Average	0.298	0.220	0.173	0.199	0.348	0.220	0.189	0.193	0.271	0.301	0.151	0.230	0.334	0.163	0.304	0.220	0.198	0.240
	S.D.	0.146	0.064	0.053	0.062	0.010	0.051	0.036	0.051	0.074	0.098	0.026	0.122	0.131	0.058	0.072	0.126	0.051	-
	Min	0.18	0.12	0.11	0.14	0.34	0.13	0.12	0.13	0.21	0.19	0.1	0.13	0.21	0.11	0.22	0.14	0.15	0.24
	Max	0.51	0.35	0.29	0.35	0.36	0.3	0.25	0.28	0.39	0.44	0.2	0.55	0.65	0.24	0.44	0.53	0.3	0.24
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Iron	Average	4.8	2.0	2.5	3.0	3.5	2.2	2.2	2.0	2.9	2.6	2.1	2.7	3.4	1.5	2.9	2.9	1.9	2.8
	S.D.	4.2	0.7	0.7	3.2	1.0	1.3	1.2	0.9	0.7	0.9	0.5	1.5	2.0	0.4	0.3	1.5	0.6	-
	Min	1.6	0.7	1.8	1	2.5	1.2	0.9	0.7	2	1.6	1.3	1.3	1.3	0.9	2.6	1.5	1.3	2.8
	Max	11	3.4	3.7	11	4.6	5.3	4.4	3.8	3.8	4.1	3	5.8	8	1.9	3.5	5.6	3.1	2.8
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Lead	Average	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.003	0.002	0.002	0.007
	S.D.	-	-	-	-	-	-	-	-	-	0.003	-	-	0.0005	-	0.001	0	-	-
	Min	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.007
	Max	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.009	<0.002	<0.002	0.003	<0.002	0.006	0.002	<0.002	0.007
	<MDL	4	10	10	9	4	10	10	10	8	6	10	10	7	6	8	6	8	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1

APPENDIX B, TABLE 18

Fish flesh chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	Far-Field Exposure Areas																	
		Cochrane River					Crackingstone Inlet			Fond du Lac River					Waterbury Lake				
		LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	WSU	LSU	LT	LW	NP	WSU
Manganese	Average	0.50	0.07	0.12	0.11	0.11	0.09	0.09	0.10	0.20	0.10	0.10	0.23	0.21	0.48	0.10	0.15	0.12	0.18
	S.D.	0.55	0.02	0.05	0.03	0.03	0.04	0.02	0.02	0.11	0.05	0.02	0.12	0.23	0.28	0.02	0.06	0.02	-
	Min	0.1	0.04	0.06	0.07	0.08	0.05	0.07	0.07	0.09	0.05	0.07	0.09	0.09	0.26	0.07	0.1	0.1	0.18
	Max	1.3	0.1	0.23	0.19	0.14	0.2	0.14	0.13	0.41	0.21	0.13	0.43	0.68	0.99	0.15	0.26	0.17	0.18
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Mercury[4]	Average	0.03	0.16	0.07	0.18	0.02	0.14	0.03	0.11	0.09	0.25	0.11	0.13	0.09	0.02	0.14	0.03	0.11	0.01
	S.D.	0.03	0.07	0.04	0.10	0	0.05	0.02	0.04	0.05	0.11	0.08	0.05	0.09	0.004	0.05	0.03	0.09	-
	Min	0.01	0.06	0.03	0.04	0.02	0.08	0.02	0.05	0.04	0.15	0.03	0.06	0.02	0.02	0.07	0.01	0.02	0.01
	Max	0.07	0.3	0.16	0.34	0.02	0.22	0.09	0.16	0.2	0.42	0.23	0.2	0.33	0.03	0.23	0.08	0.21	0.01
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Molybdenum	Average	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.025	0.02	0.02	0.02	0.02
	S.D.	0	-	-	-	-	-	0[5]	-	0	-	-	-	-	0.008	-	-	-	-
	Min	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Max	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02
	<MDL	2	10	10	9	4	10	9	10	7	7	10	10	10	3	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Nickel	Average	0.015	0.019	0.012	0.022	0.013	0.017	0.017	0.015	0.018	0.017	0.010	0.011	0.018	0.015	0.01	0.010	0.015	0.01
	S.D.	0.010	0.014	0.004	0.020	0.005	0.019	0.022	0.011	0.012	0.015	-	0.003	0.011	0.008	-	0	0.008	-
	Min	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	0.03	0.05	0.02	0.06	0.02	0.07	0.08	0.04	0.04	0.05	<0.01	0.02	0.04	0.03	<0.01	0.01	0.03	<0.01
	<MDL	3	6	8	6	3	7	9	8	5	5	10	9	6	3	10	6	5	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Selenium	Average	0.335	0.240	0.376	0.243	0.278	0.158	0.627	0.463	0.338	0.233	0.395	0.250	0.302	0.208	0.209	0.459	0.255	0.270
	S.D.	0.048	0.049	0.140	0.019	0.028	0.024	0.722	0.128	0.055	0.037	0.178	0.032	0.065	0.036	0.049	0.348	0.039	-
	Min	0.29	0.19	0.23	0.22	0.25	0.12	0.18	0.32	0.24	0.17	0.23	0.2	0.21	0.17	0.14	0.2	0.21	0.27
	Max	0.4	0.36	0.57	0.28	0.31	0.21	2.6	0.66	0.41	0.28	0.78	0.31	0.44	0.25	0.31	1.1	0.32	0.27
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Silver	Average	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Max	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	<MDL	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Thallium	Average	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	S.D.	-	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	<MDL	4	10	10	9	4	9	10	10	8	7	10	10	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Tin	Average	0.010	0.011	0.01	0.01	0.01	0.01	0.011	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	S.D.	-	0.003	-	-	-	-	0.003	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	<MDL	4	9	10	9	4	10	9	10	8	7	10	10	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1

APPENDIX B, TABLE 18

Fish flesh chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	Far-Field Exposure Areas																	
		Cochrane River					Crackingstone Inlet			Fond du Lac River					Waterbury Lake				
		LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	WSU	LSU	LT	LW	NP	WSU
Titanium	Average	0.118	0.065	0.071	0.081	0.078	0.048	0.042	0.045	0.069	0.071	0.066	0.064	0.071	0.062	0.077	0.080	0.070	0.050
	S.D.	0.062	0.005	0.009	0.013	0.005	0.039	0.030	0.036	0.011	0.004	0.005	0.008	0.012	0.010	0.005	0.009	0.008	-
	Min	0.06	0.06	0.06	0.06	0.07	<0.01	0.01	<0.01	0.05	0.07	0.06	0.05	0.06	0.05	0.07	0.07	0.06	0.05
	Max	0.2	0.07	0.08	0.1	0.08	0.11	0.08	0.09	0.09	0.08	0.07	0.08	0.09	0.08	0.08	0.1	0.08	0.05
	<MDL	0	0	0	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Uranium	Average	0.0023	0.0013	0.0014	0.0040	0.0010	0.0010	0.0039	0.0010	0.0010	0.0010	0.0010	0.0010	0.0011	0.0015	0.0012	0.0011	0.0035	0.0010
	S.D.	0.0025	0.0009	0.0005	0.0059	-	0	0.0040	-	0	-	-	-	0.0003	0.0012	0.0006	0.0004	0.0059	-
	Min	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Max	0.006	0.004	0.002	0.018	<0.001	0.001	0.012	<0.001	0.001	<0.001	<0.001	<0.001	0.002	0.004	0.003	0.002	0.018	<0.001
	<MDL	3	9	4	5	4	9	6	10	7	7	10	10	7	5	9	6	5	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Zinc	Average	5.0	3.2	4.4	5.7	4.8	3.8	4.0	5.5	4.0	4.5	3.8	5.3	3.9	4.8	4.7	4.4	5.5	6.3
	S.D.	1.1	0.3	1.4	1.0	0.7	1.8	0.8	1.9	0.9	2.5	1.1	2.2	1.2	1.5	2.0	0.7	1.4	-
	Min	3.6	2.7	3	3.8	3.8	2.5	3	3.3	3	3.1	2.6	3.3	2.7	3.6	3.3	3.4	3.9	6.3
	Max	6.4	3.6	7.8	7.3	5.4	7.8	5.3	8.5	5.4	10	6.6	10	5.9	7.2	9.1	5.4	7.7	6.3
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Physical Properties																			
Moisture (%)	Average	77	72	80	78	80	74	75	78	77	74	78	78	78	80	76	75	79	81
	S.D.	2	4	3	1	2	4	1	0	2	4	3	2	2	1	3	9	2	-
	Min	75	66	77	77	78	67	73	77	74	65	74	71	75	79	72	53	76	81
	Max	80	78	86	80	82	80	77	79	80	80	84	79	81	81	83	79	81	81
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Radionuclides																			
Lead-210 (Bq/g)	Average	0.001	0.00098	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.00150	0.001	0.001	0.00110	0.001	0.001	0.001
	S.D.	-	-	-	-	-	-	-	-	-	-	-	0.00108	-	-	0.00032	-	-	-
	Min	<0.001	<0.0009	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Max	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	0.002	<0.001	<0.001	<0.001
	<MDL	4	10	10	9	4	10	10	10	8	7	10	8	10	6	9	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Polonium-210 (Bq/g)	Average	0.00168	0.00022	0.00084	0.00248	0.00270	0.00020	0.00042	0.00088	0.00179	0.00020	0.00045	0.00238	0.00158	0.00063	0.00024	0.00073	0.00250	0.0015
	S.D.	0.00151	0.00006	0.00089	0.00127	0.00121	-	0.00023	0.00048	0.00108	-	0.00029	0.00077	0.00069	0.00060	0.00007	0.00067	0.00178	-
	Min	0.0006	<0.0002	<0.0002	0.0005	0.001	<0.0002	<0.0002	0.0003	0.0005	<0.0002	<0.0002	0.0011	0.0007	<0.0002	<0.0002	<0.0002	0.0003	0.0015
	Max	0.0039	0.0004	0.0032	0.0042	0.0038	<0.0002	0.0007	0.0018	0.0034	<0.0002	0.0011	0.0032	0.0025	0.0018	0.0004	0.002	0.0048	0.0015
	<MDL	0	8	1	0	0	10	3	0	0	7	3	0	0	1	7	3	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Radium-226 (Bq/g)	Average	0.00007	0.00007	0.00006	0.00008	0.00007	0.00010	0.00011	0.00007	0.00007	0.00010	0.00010	0.00008	0.00007	0.000072	0.00007	0.00008	0.00012	0.00006
	S.D.	-	-	0.00002	0.00004	-	0.00011	0.00008	0.00001	0.00001	0.00005	0.00006	0.00002	0.00001	0.000004	0.00001	0.00002	0.00007	-
	Min	<0.00006	<0.00005	<0.000005	<0.00006	<0.00006	<0.00006	<0.00005	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00007	<0.00005	<0.00006	<0.00006	<0.00006
	Max	<0.00008	<0.00009	0.0001	0.0002	<0.00008	0.0004	0.0003	0.0001	0.00009	0.0002	0.0002	0.0001	0.0001	0.00008	0.0001	0.0001	0.0002	<0.00006
	<MDL	4	10	9	7	4	9	7	9	7	4	6	6	9	5	9	6	4	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Thorium-230 (Bq/g)	Average	0.00013	0.00012	0.00010	0.00011	0.00013	0.00013	0.00023	0.00013	0.00010	0.00011	0.00013	0.00010	0.00010	0.00010	0.00011	0.00015	0.00014	0.00010
	S.D.	-	-	-	-	-	0.00005	0.00016	0.00007	-	-	-	-	-	0	-	-	-	-
	Min	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Max	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	0.0006	0.0003	<0.0001	<0.0002	<0.0003	<0.0001	<0.0001	0.0001	<0.0002	<0.0002	<0.0004	<0.0001
	<MDL	4	10	10	9	4	7	8	9	8	7	10	10	10	5	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1

APPENDIX B, TABLE 18

Fish flesh chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	Far-Field Exposure Areas																	
		Cochrane River					Crackingstone Inlet			Fond du Lac River					Waterbury Lake				
		LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	WSU	LSU	LT	LW	NP	WSU
Trace Elements																			
Antimony	Average	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Max	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	<MDL	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Arsenic	Average	0.153	0.062	0.095	0.027	0.085	0.073	0.119	0.074	0.129	0.033	0.098	0.022	0.084	0.057	0.034	0.031	0.019	0.060
	S.D.	0.031	0.031	0.068	0.015	0.042	0.027	0.089	0.044	0.054	0.010	0.093	0.006	0.051	0.021	0.015	0.011	0.004	-
	Min	0.11	0.03	0.02	0.01	0.04	0.04	0.02	0.05	0.06	0.02	0.02	0.01	0.04	0.03	0.02	0.01	0.01	0.06
	Max	0.18	0.13	0.21	0.05	0.13	0.12	0.3	0.19	0.22	0.04	0.31	0.03	0.2	0.08	0.07	0.05	0.02	0.06
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Beryllium	Average	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Max	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	<MDL	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Cobalt	Average	0.0038	0.0021	0.0038	0.0022	0.0038	0.0021	0.0033	0.0020	0.0029	0.0023	0.0026	0.0035	0.0038	0.0028	0.0020	0.0026	0.0021	0.0020
	S.D.	0.0015	0.0003	0.0024	0.0004	0.0015	0.0003	0.0022	0	0.0006	0.0005	0.0013	0.0023	0.0021	0.0010	0	0.0007	0.0004	-
	Min	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002
	Max	0.005	0.003	0.008	0.003	0.006	0.003	0.009	0.002	0.004	0.003	0.006	0.009	0.008	0.004	0.002	0.004	0.003	0.002
	<MDL	1	7	2	7	0	9	5	5	0	4	6	4	2	3	8	4	5	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Strontium	Average	1.27	0.07	0.39	0.09	0.05	0.14	0.25	0.18	0.24	0.16	0.12	0.28	0.32	0.73	0.14	0.34	0.16	0.92
	S.D.	1.49	0.03	0.47	0.05	0.01	0.12	0.21	0.15	0.20	0.16	0.02	0.20	0.58	0.37	0.05	0.27	0.07	-
	Min	0.22	0.04	0.05	0.03	0.04	0.04	0.08	0.06	0.06	0.03	0.09	0.04	0.03	0.38	0.08	0.16	0.09	0.92
	Max	3.4	0.12	1.3	0.19	0.05	0.46	0.75	0.57	0.55	0.49	0.14	0.57	1.7	1.4	0.23	1	0.31	0.92
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Vanadium	Average	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	S.D.	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Max	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	<MDL	3	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1

APPENDIX B, TABLE 18

Fish flesh chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	References														Pooled References				
		Bobby's Lake[2]		Cree Lake					Ellis Bay			Pasfield Lake								
		NP	WSU	LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	LSU	LT	LW	NP	WSU
Metals																				
Aluminum	Average	0.18	0.26	0.52	0.5	0.5	0.5	0.54	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.51	0.50	0.50	0.41	0.46
	S.D.	0.09	0.19	0.06	-	-	-	0.07	-	-	-	-	-	-	-	0.05	-	-	0.15	0.17
	Min	0.09	0.15	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.09	<0.15
	Max	0.30	0.55	0.7	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	0.5	0.7
	<MDL	0	0	8	10	10	5	7	10	7	5	6	10	10	3	14	30	27	13	7
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Barium	Average	0.03	0.03	0.08	0.07	0.26	0.02	0.07	0.03	0.03	0.02	0.08	0.15	0.23	0.02	0.08	0.08	0.19	0.02	0.06
	S.D.	0.03	0.03	0.030	0.185	0.296	0.015	0.037	0.023	0.019	0.004	0.062	0.271	0.313	0.010	0.04	0.19	0.27	0.02	0.04
	Min	<0.01	0.01	0.02	<0.01	0.01	0.01	0.04	<0.01	<0.01	<0.01	0.03	<0.01	0.02	0.01	0.02	<0.01	<0.01	<0.01	0.01
	Max	0.09	0.07	0.12	0.6	0.68	0.05	0.16	0.08	0.06	0.02	0.2	0.69	0.71	0.03	0.20	0.69	0.71	0.09	0.16
	<MDL	1	0	0	1	0	0	0	3	3	1	0	1	0	0	0	5	3	2	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Boron	Average	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Max	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	<MDL	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Cadmium	Average	0.002	0.002	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	S.D.	-	-	0.001	-	-	-	0	-	-	-	-	-	-	-	0.0009	-	-	-	0
	Min	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Max	<0.002	<0.002	0.005	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.005	<0.002	<0.002	<0.002	0.002
	<MDL	5	4	7	10	10	5	9	10	7	5	6	10	10	3	13	30	27	18	13
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Chromium	Average	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	S.D.	-	-	-	-	0	-	-	-	-	-	-	-	-	-	-	-	0	-	-
	Min	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Max	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1
	<MDL	5	4	10	10	9	5	10	10	7	5	6	10	10	3	16	30	26	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Copper	Average	0.23	0.25	0.247	0.306	0.219	0.224	0.249	0.339	0.181	0.290	0.273	0.398	0.248	0.223	0.26	0.35	0.22	0.24	0.25
	S.D.	0.11	0.05	0.064	0.205	0.054	0.063	0.072	0.153	0.092	0.129	0.045	0.225	0.047	0.087	0.06	0.19	0.07	0.10	0.06
	Min	0.14	0.21	0.18	0.13	0.15	0.17	0.18	0.11	0.11	0.16	0.21	0.2	0.19	0.15	0.18	0.11	0.11	0.14	0.18
	Max	0.38	0.33	0.37	0.85	0.32	0.33	0.39	0.58	0.38	0.45	0.34	0.84	0.34	0.32	0.37	0.85	0.38	0.45	0.39
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Iron	Average	2.7	3.0	2.9	3.9	2.3	2.0	3.3	2.8	2.2	2.2	3.5	4.9	3.3	2.1	3.1	3.9	2.6	2.3	3.2
	S.D.	1.2	0.2	2.4	3.8	1.0	0.8	1.6	1.5	1.1	1.2	2.3	2.0	2.2	1.0	2.3	2.7	1.6	1.0	1.4
	Min	1.5	2.7	1	1.4	1	1.2	1.7	1	1.1	0.6	2	2.2	1.4	1.5	1.0	1.0	1.0	0.6	1.7
	Max	4.2	3.1	8.5	14	4.4	3	6.5	5.8	3.9	3.2	8	8	9.3	3.2	8.5	14.0	9.3	4.2	6.5
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Lead	Average	0.003	0.005	0.0021	0.0034	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.003
	S.D.	0.001	0.004	0.0003	0.0044	0.0006	0.0004	-	-	0.0004	-	-	0	0	-	0.0002	0.0026	0.0004	0.0006	0.0022
	Min	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Max	0.004	0.010	0.003	0.016	0.004	0.003	<0.002	<0.002	0.003	<0.002	<0.002	0.002	0.002	<0.002	0.003	0.016	0.004	0.004	0.010
	<MDL	0	1	9	9	9	4	10	10	6	5	6	9	9	3	15	28	24	12	11
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14

APPENDIX B, TABLE 18

Fish flesh chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	References														Pooled References				
		Bobby's Lake[2]		Cree Lake					Ellis Bay			Pasfield Lake								
		NP	WSU	LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	LSU	LT	LW	NP	WSU
Manganese	Average	0.15	0.12	0.82	0.11	0.17	0.12	0.33	0.13	0.13	0.08	0.25	0.09	0.13	0.10	0.61	0.11	0.14	0.12	0.27
	S.D.	0.08	0.03	0.54	0.05	0.14	0.03	0.22	0.16	0.03	0.004	0.08	0.02	0.02	0.01	0.51	0.10	0.09	0.05	0.21
	Min	0.10	0.09	0.25	0.04	0.07	0.1	0.11	0.06	0.1	0.08	0.12	0.06	0.1	0.09	0.12	0.04	0.07	0.08	0.09
	Max	0.28	0.17	2	0.22	0.55	0.16	0.81	0.6	0.19	0.09	0.33	0.14	0.17	0.11	2.00	0.60	0.55	0.28	0.81
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Mercury	Average	-	-	0.02	0.17	0.03	0.13	0.01	0.15	0.05	0.16	0.02	0.13	0.01	0.08	0.02	0.15	0.03	0.13	0.01
	S.D.	-	-	0.01	0.16	0.02	0.10	0.01	0.07	0.02	0.06	0.01	0.06	-	0.04	0.010	0.101	0.019	0.077	0.005
	Min	-	-	0.01	0.04	0.01	0.02	<0.01	0.06	0.02	0.08	<0.01	0.04	<0.01	0.04	<0.01	0.04	<0.01	0.02	<0.01
	Max	-	-	0.04	0.53	0.06	0.28	0.02	0.28	0.07	0.24	0.04	0.24	<0.01	0.11	0.04	0.53	0.07	0.28	0.02
	<MDL	-	-	0	0	0	0	1	0	0	0	1	0	10	0	1	0	10	0	1
	N	-	-	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	13	10
Molybdenum	Average	0.02	0.02	0.02	0.024	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	S.D.	-	-	-	0.013	-	-	-	-	-	-	-	-	-	-	-	0.01	-	-	-
	Min	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Max	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	<0.02
	<MDL	5	4	10	9	10	5	10	10	7	5	6	10	10	3	16	29	27	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Nickel	Average	0.01	0.01	0.018	0.011	0.016	0.010	0.010	0.012	0.011	0.01	0.020	0.010	0.011	0.023	0.02	0.01	0.01	0.01	0.01
	S.D.	0.01	0.01	0.019	0.003	0.013	-	0	0.006	0.004	-	0.017	0	0.003	0.023	0.017	0.004	0.009	0.010	0.003
	Min	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	0.03	0.02	0.07	0.02	0.05	<0.01	0.01	0.03	0.02	<0.01	0.05	0.01	0.02	0.05	0.07	0.03	0.05	0.05	0.02
	<MDL	4	3	7	9	8	5	9	8	6	5	4	9	9	2	11	26	23	16	12
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Selenium	Average	0.20	0.23	0.347	0.223	0.421	0.254	0.207	0.155	0.260	0.192	0.222	0.295	0.243	0.203	0.300	0.224	0.313	0.214	0.214
	S.D.	0.05	0.10	0.112	0.037	0.140	0.019	0.025	0.024	0.030	0.019	0.035	0.064	0.042	0.006	0.11	0.07	0.12	0.04	0.05
	Min	0.15	0.13	0.23	0.15	0.28	0.23	0.18	0.1	0.22	0.17	0.18	0.22	0.18	0.2	0.18	0.10	0.18	0.15	0.13
	Max	0.29	0.32	0.57	0.28	0.72	0.28	0.26	0.18	0.31	0.22	0.26	0.37	0.31	0.21	0.57	0.37	0.72	0.29	0.32
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Silver	Average	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Max	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	<MDL	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Thallium	Average	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	S.D.	-	-	-	-	-	-	-	0	-	-	-	-	-	-	-	0	-	-	-
	Min	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
	<MDL	5	4	10	10	10	5	10	8	7	5	6	10	10	3	16	28	27	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Tin	Average	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	<MDL	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14

APPENDIX B, TABLE 18

Fish flesh chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	References														Pooled References				
		Bobby's Lake[2]		Cree Lake					Ellis Bay			Pasfield Lake								
		NP	WSU	LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	LSU	LT	LW	NP	WSU
Titanium	Average	0.08	0.09	0.053	0.053	0.048	0.014	0.052	0.048	0.051	0.016	0.073	0.066	0.067	0.103	0.06	0.06	0.06	0.05	0.06
	S.D.	0.01	0.02	0.038	0.037	0.037	0.005	0.031	0.044	0.025	0.005	0.015	0.011	0.011	0.075	0.033	0.033	0.027	0.047	0.032
	Min	0.07	0.07	0.01	0.01	<0.01	<0.01	0.02	<0.01	<0.01	0.01	0.06	0.05	0.05	0.06	0.01	<0.01	<0.01	<0.01	0.02
	Max	0.10	0.11	0.11	0.1	0.1	0.02	0.09	0.15	0.07	0.02	0.09	0.08	0.08	0.19	0.11	0.15	0.10	0.19	0.11
	<MDL	0	0	0	0	1	1	0	1	1	0	0	0	0	0	0	1	2	1	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Uranium	Average	0.001	0.001	0.0013	0.0011	0.0015	0.0010	0.0010	0.0023	0.0011	0.0010	0.0010	0.0010	0.0014	0.0010	0.001	0.001	0.001	0.001	0.001
	S.D.	-	0	0.0007	0.0003	0.0010	-	0	0.0041	0.0004	-	-	-	0.0013	-	0.0005	0.0024	0.0010	-	0
	Min	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Max	<0.001	0.001	0.003	0.002	0.004	<0.001	0.001	0.014	0.002	<0.001	<0.001	<0.001	0.005	<0.001	0.003	0.014	0.005	<0.001	0.001
	<MDL	5	3	7	9	6	5	9	9	6	5	6	10	9	3	13	28	21	18	12
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Zinc	Average	6.0	3.0	4.7	3.7	5.2	6.4	4.4	5.0	3.2	6.2	5.3	5.1	5.5	7.9	4.9	4.6	4.8	6.5	4.0
	S.D.	1.4	0.3	0.5	1.2	2.6	1.7	0.6	3.1	0.5	2.2	1.5	2.9	1.3	1.8	1.0	2.5	2.0	1.8	0.8
	Min	5.0	2.7	4.1	2.2	2.9	4.8	3.4	2.6	2.8	4.2	4	2.9	3.5	6.9	4	2.2	2.8	4.2	2.7
	Max	8.4	3.4	5.6	5.5	12	8.6	5.5	11	4.4	9.8	7.7	13	8	10	7.7	13	12	10	5.5
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Physical Properties																				
Moisture (%)	Average	-[6]	-[6]	78	78	77	77	78	73	76	78	76	77	79	78	77.0	76.0	77.2	77.6	77.7
	S.D.	-[6]	-[6]	1	3	2	1	2	3	2	1	3	3	1	1	2.2	3.6	1.9	1.1	1.6
	Min	-[6]	-[6]	76	73	73	77	74	67	74	76	72	70	77	78	72.4	67.4	73.2	76.1	74.0
	Max	-[6]	-[6]	80	83	78	79	79	76	78	80	79	80	81	79	80.1	82.6	80.7	79.9	79.4
	<MDL	-[6]	-[6]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	-[6]	-[6]	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	13	10
Radionuclides																				
Lead-210 (Bq/g)	Average	0.001	0.001	0.001	0.001	0.001	0.00098	0.00110	0.00100	0.00114	0.001	0.001	0.001	0.001	0.001	0.0010	0.0010	0.0010	0.0011	0.0011
	S.D.	0.0004	-	0	-	-	0.00004	0.00032	-	0.00038	-	-	-	0	-	0	-	0.0002	0.0002	0.0003
	Min	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0009	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0009	<0.001
	Max	0.002	<0.001	0.001	<0.001	<0.001	0.001	0.002	<0.001	0.002	<0.001	<0.001	<0.001	0.001	<0.001	0.0010	<0.001	0.0020	0.0020	0.0020
	<MDL	4	4	9	10	10	3	9	10	6	5	6	10	9	3	15	30	25	15	13
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Polonium-210 (Bq/g)	Average	0.0010	0.0003	0.00133	0.00022	0.00088	0.00056	0.00086	0.00025	0.00024	0.00040	0.00368	0.00025	0.00516	0.00130	0.0022	0.0002	0.0023	0.0008	0.0007
	S.D.	0.0007	0.0001	0.00128	0.00006	0.00087	0.00033	0.00064	0.00016	0.00011	0.00023	0.00321	0.00008	0.00211	0.00128	0.0024	0.0001	0.0026	0.0007	0.0006
	Min	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	0.0002	0.0013	<0.0002	0.0008	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
	Max	0.0023	0.0004	0.0035	0.0004	0.0023	0.001	0.002	0.0007	0.0005	0.0008	0.01	0.0004	0.008	0.0027	0.0100	0.0007	0.0080	0.0027	0.0020
	<MDL	0	1	1	8	4	1	0	9	5	0	0	5	0	1	1	22	9	2	1
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Radium-226 (Bq/g)	Average	0.00009	0.00006	0.00009	0.00009	0.00008	0.00007	0.00011	0.00008	0.00012	0.00007	0.00016	0.00010	0.00007	0.00012	0.00012	0.00009	0.00009	0.00009	0.00010
	S.D.	0.00006	-	-	0.00007	0.00002	0.00002	0.00005	0.00005	0.00010	0.00001	0.00021	0.00006	0.00001	0.00007	0.00013	0.00006	0.00005	0.00004	0.00005
	Min	<0.00006	<0.00005	<0.00006	<0.00004	<0.00005	<0.00005	<0.00007	<0.00004	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00004	<0.00005	<0.00005	<0.00005
	Max	0.00008	<0.00007	<0.0001	0.0003	0.0001	0.0001	0.0002	0.0002	0.0003	0.00008	0.0006	0.0002	0.0001	0.0002	0.00060	0.00030	0.00030	0.00020	0.00020
	<MDL	4	4	10	6	8	4	7	7	6	4	3	7	7	2	13	20	21	14	11
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Thorium-230 (Bq/g)	Average	0.0001	0.0001	0.00022	0.00012	0.00013	0.00012	0.00021	0.00012	0.00014	0.00072	0.00012	0.00011	0.00011	0.00020	0.0002	0.0001	0.0001	0.0003	0.0002
	S.D.	0.0001	-	-	0.00004	-	0.00004	-	-	-	-	-	-	-	-	-	0.00004	-	0.00068	-
	Min	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Max	0.0001	<0.0001	<0.0003	0.0002	<0.0002	0.0002	<0.0003	<0.0002	<0.0003	<0.003	<0.0002	<0.0002	<0.0002	<0.0003	<0.0003	0.0002	<0.0003	0.0001	<0.0003
	<MDL	4	4	10	9	10	4	10	10	7	5	6	10	10	3	16	29	27	16	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14

APPENDIX B, TABLE 18

Fish flesh chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	References														Pooled References				
		Bobby's Lake[2]		Cree Lake					Ellis Bay			Pasfield Lake								
		NP	WSU	LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	LSU	LT	LW	NP	WSU
Trace Elements																				
Antimony	Average	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Max	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	<MDL	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Arsenic	Average	0.01	0.01	0.035	0.016	0.023	0.010	0.056	0.111	0.296	0.110	0.093	0.033	0.045	0.023	0.06	0.05	0.10	0.04	0.04
	S.D.	0.004	0.005	0.022	0.007	0.016	0.000	0.025	0.071	0.081	0.025	0.039	0.025	0.016	0.006	0.04	0.06	0.12	0.05	0.03
	Min	0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.02	0.04	0.17	0.09	0.05	0.01	0.03	0.02	0.01	<0.01	<0.01	<0.01	<0.01
	Max	0.02	0.02	0.08	0.03	0.06	0.01	0.11	0.29	0.38	0.15	0.14	0.09	0.08	0.03	0.14	0.29	0.38	0.15	0.11
	<MDL	0	1	0	2	3	3	0	0	0	0	0	0	0	0	0	2	3	3	1
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Beryllium	Average	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Max	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	<MDL	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Cobalt	Average	0.002	0.003	0.0040	0.0022	0.0025	0.0020	0.0025	0.0022	0.0029	0.0026	0.0025	0.0028	0.0023	0.0020	0.003	0.002	0.003	0.002	0.003
	S.D.	0.0004	0.0006	0.0020	0.0006	0.0011	0	0.0010	0.0004	0.0019	0.0005	0.0005	0.0013	0.0007	0	0.0018	0.0009	0.0012	0.0004	0.0009
	Min	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Max	0.003	0.003	0.008	0.004	0.005	0.002	0.005	0.003	0.007	0.003	0.003	0.006	0.004	0.002	0.008	0.006	0.007	0.003	0.005
	<MDL	3	1	2	8	6	3	2	6	3	2	3	5	6	1	5	19	15	9	3
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Strontium	Average	0.34	0.15	0.57	0.20	0.72	0.33	0.38	0.27	0.38	0.16	0.91	0.40	0.88	0.40	0.70	0.29	0.69	0.30	0.31
	S.D.	0.38	0.15	0.24	0.12	1.27	0.21	0.31	0.22	0.34	0.03	0.75	0.38	0.56	0.20	0.50	0.27	0.86	0.24	0.29
	Min	0.11	0.05	0.23	0.09	0.12	0.13	0.13	0.06	0.15	0.11	0.18	0.15	0.42	0.27	0.18	0.06	0.12	0.11	0.05
	Max	0.99	0.37	1	0.45	4.3	0.69	1.2	0.68	1	0.2	2.3	1.4	2.2	0.63	2.30	1.40	4.30	0.99	1.20
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Vanadium	Average	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Max	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	<MDL	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14

S.D.: standard deviation; Min: minimum; Max: maximum; <MDL: number of samples with concentrations measured at less than the method detection limit; N: total number of samples (sample size).

LSU: longnose sucker; LT: lake trout; LW: lake whitefish; NP: northern pike; WSU: white sucker.

For values measured at less than the method detection limit (MDL), all computations were performed with values set at the MDL.

[1] All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise.

[2] No fish chemistry data were available for Bobby's Lake in 2011 and 2012; the 2009 fish chemistry data were used as a substitute.

[3] When all values were less than the method detection limit (MDL), standard deviations were not computed.

[4] No mercury data were available for Bobby's Lake.

[5] Standard deviations of 0 signify no variation, not a very small value.

[6] Moisture was not available for Bobby's Lake samples.

APPENDIX B, TABLE 19

Detailed fish bone chemistry data collected from the Cochrane River for the EARMP technical program, 2011 and 2012.

Parameter[1]	Cochrane River																		
	Longnose Sucker				Lake Trout										Lake Whitefish				
	2011		2012		2011					2012					2011				
	SP06-01		SP3-1	SP3-1, SP5-1	AN01-01					SP3-1				SP04-01	SP06-01			SP08-01	
	LSU02	LSU03	LSU09, LSU10	LSU11, LSU02	LT01	LT02	LT03	LT04	LT05	LT05	LT06	LT07	LT08	LT01	LW01	LW02	LW03	LW01	LW02
Metals																			
Aluminum	7	<0.5	<0.5	2.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.8	3.9	0.9	1.8	1.6
Barium	5.8	4.6	1.8	3.4	0.85	0.67	0.86	1.2	0.82	0.67	0.77	0.6	0.85	0.9	9	10	3.3	4.6	3.2
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2
Copper	0.2	0.19	0.29	0.35	0.02	0.05	0.07	<0.02	<0.02	0.13	0.13	0.08	0.11	0.15	0.03	0.04	0.07	0.03	<0.02
Iron	18	5.1	4.5	5.2	6.4	3.8	3.1	3.7	5.4	2	3	1.3	2.9	6.8	5.1	6.3	7.6	6.4	4.8
Lead	<0.01	<0.01	<0.01	0.09	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.05	0.02	0.03	0.05
Manganese	20	12	5.6	13	1.2	1.5	1.7	1.6	1.8	1.3	1.4	1.3	1.2	2.1	10	11	5.4	12	5.1
Mercury	<0.01	0.01	-[2]	-[2]	0.07	0.03	0.06	0.13	0.14	0.02	0.02	0.03	0.02	0.02	0.06	0.04	0.01	0.03	0.02
Molybdenum	0.32	0.23	0.27	0.16	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	0.11	0.11	0.02	0.06	0.13	0.11	0.12	0.12	0.13	0.04	0.04	0.02	0.02	0.03	0.12	0.12	0.1	0.12	0.13
Selenium	0.33	0.31	0.28	0.22	0.16	0.2	0.17	0.21	0.19	0.14	0.18	0.13	0.15	0.16	0.46	0.42	0.26	0.22	0.21
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Tin	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	0.34	0.29	0.14	0.23	0.28	0.32	0.25	0.26	0.37	0.24	0.21	0.16	0.22	0.19	0.33	0.27	0.29	0.26	0.3
Uranium	0.13	0.03	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	0.12	0.04	0.17	0.04
Zinc	25	24	18	15	16	20	18	21	21	17	23	17	20	20	26	23	43	34	38
Physical Properties																			
Moisture (%)	58.6	46.0	55.2	47.0	48.6	51.1	51.6	54.8	49.2	50.4	49.3	51.9	51.8	52.8	63.0	60.4	53.3	54.7	57.2
Radionuclides																			
Lead-210 (Bq/g)	<0.003	<0.002	<0.003	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Polonium-210 (Bq/g)	0.004	0.002	0.002	0.002	0.0005	<0.0005	<0.0005	0.0006	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.002	0.002	0.007	0.002	0.004
Radium-226 (Bq/g)	<0.001	<0.002	<0.0009	<0.002	<0.005	<0.0008	<0.0009	<0.001	0.002	<0.001	<0.0009	<0.001	<0.001	0.001	0.001	0.003	<0.001	<0.001	0.001
Thorium-230 (Bq/g)	<0.002	<0.003	<0.002	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	0.002
Trace Elements																			
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	0.1	0.11	0.14	0.08	0.09	0.11	0.15	0.04	0.06	0.13	0.08	0.05	0.06	0.18	0.13	0.13	0.09	0.04	0.04
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.02	0.02	<0.01	0.01	0.02	0.02	0.02	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02	0.02	0.03	0.02
Strontium	88	81	36	40	40	39	39	46	42	38	42	33	34	37	113	112	95	89	114
Vanadium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.18	0.26	0.07	0.09	0.11

APPENDIX B, TABLE 19

Detailed fish bone chemistry data collected from the Cochrane River for the EARMP technical program, 2011 and 2012.

Parameter[1]	Cochrane River																	
	Lake Whitefish					Northern Pike									White Sucker			
	2012					2011					2012				2012			
	SP1-1	SP2-1		SP3-1		AN01-01		AN02-01			SP1-2	SP4-1		SP6-1	SP1-2			SP3-1
	LW01	LW01	LW02	LW01	LW02	NP06	NP07	NP01	NP02	NP03	NP01	NP02	NP03	NP01	WSU02	WSU03	WSU04	WSU12
Metals																		
Aluminum	1.7	1.7	<0.5	1.3	2.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5
Barium	2.7	4.2	2.4	12	8.2	3.6	2.9	2.8	3.2	3.8	2.7	3.8	3.1	2.5	4.1	6.4	4.8	3.7
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.5	0.3	<0.2	<0.2	<0.2	<0.2	<0.2
Copper	0.12	0.13	0.11	0.15	0.11	0.2	0.14	0.16	0.21	0.16	0.09	0.11	0.12	0.13	0.22	0.24	0.28	0.28
Iron	6.5	4.8	3.6	3.7	3.8	2.5	2.7	4	23	3.9	1.9	4.9	4	2	3.1	3.9	4.7	3.2
Lead	0.03	0.03	<0.01	0.04	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01
Manganese	7.6	6	3	13	10	24	24	21	16	23	9.2	12	15	10	11	17	13	16
Mercury	<0.01	-[2]	0.01	<0.01	0.02	0.07	0.04	0.02	0.03	0.04	<0.01	0.02	0.02	0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	0.1	0.18	0.24
Nickel	0.04	0.07	0.03	0.06	0.03	0.09	0.09	0.1	0.07	0.09	0.02	0.04	0.03	0.03	0.04	0.06	0.05	0.05
Selenium	0.19	0.2	0.16	0.34	0.3	0.19	0.17	0.17	0.2	0.18	0.11	0.1	0.1	0.12	0.16	0.24	0.27	0.23
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Tin	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	0.24	0.26	0.21	0.23	0.23	0.17	0.21	0.22	0.38	0.31	0.21	0.21	0.22	0.2	0.24	0.3	0.24	0.31
Uranium	0.08	0.02	<0.01	0.08	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	0.02	0.02
Zinc	24	42	28	26	19	61	63	69	55	90	37	24	54	43	15	21	20	21
Physical Properties																		
Moisture (%)	50.7	56.4	51.5	53.4	49.8	59.4	55.3	58.1	61.0	56.5	53.7	52.9	49.2	55.7	47.9	45.5	50.6	35.8
Radionuclides																		
Lead-210 (Bq/g)	<0.002	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Polonium-210 (Bq/g)	0.002	0.002	0.001	0.003	0.002	0.002	0.001	0.003	0.002	0.001	0.002	<0.0005	0.0008	0.002	0.005	0.003	0.004	0.005
Radium-226 (Bq/g)	<0.001	<0.001	0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.002	<0.001	<0.002
Thorium-230 (Bq/g)	<0.002	<0.002	<0.002	<0.002	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.002	<0.003	<0.002	<0.003	<0.003	<0.003	<0.003
Trace Elements																		
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	0.03	0.12	0.06	0.1	0.16	0.03	0.04	0.04	0.03	0.04	0.03	0.03	0.04	0.03	0.03	0.05	0.08	0.08
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	<0.01	0.01	<0.01	<0.01	0.01	0.01	0.02	0.02
Strontium	80	116	79	118	87	47	38	43	42	52	34	46	35	34	50	74	60	65
Vanadium	0.1	0.06	<0.05	0.18	0.16	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05

[1]All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise.

[2]Mercury analyses were not performed on these samples by SRC laboratories due to these samples being disposed of by SRC.

APPENDIX B, TABLE 20

Detailed fish bone chemistry data collected from Crackingstone Inlet for the EARMP technical program, 2011 and 2012.

Parameter[1]	Crackingstone Inlet																													
	Lake Trout										Lake Whitefish										Northern Pike									
	2011					2012					2011					2012					2011					2012				
	SP01-01					SP02-01					SP01-01					SP01-01					SP01-01					AN01-01				
	LT01	**LT02**	**LT03**	**LT04**	**LT05**	**LT01**	**LT02**	**LT03**	**LT04**	**LT06**	**LW06**	**LW07**	**LW08**	**LW09**	**LW10**	**LW01**	**LW02**	**LW03**	**LW04**	**LW05**	**NP01**	**NP02**	**NP03**	**NP04**	**NP05**	**NP01**	**NP02**	**NP03**	**NP04**	**NP05**
Metals																														
Aluminum	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.7	1.4	1	1.9	2.6	0.9	1.2	<0.5	2	1.3	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	1.1	0.76	1.1	0.83	1.1	1.4	0.88	0.78	0.93	1.4	14	9.3	3.4	12	18	13	4.1	3.3	14	12	7.3	6	4.8	6.7	5.6	5.2	8	5.5	4.6	7.8
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Copper	0.18	0.12	0.11	0.17	0.17	0.15	0.15	0.12	0.18	0.16	0.12	0.21	0.14	0.13	0.11	0.15	0.18	0.2	0.22	0.14	0.15	0.12	0.16	0.13	0.14	0.12	0.2	0.17	0.22	0.23
Iron	3.5	2.2	2.2	6	10	7.2	4.8	4.9	2.4	2.9	5.7	6.7	5.7	5.4	7.6	5.7	3.4	6.4	6.4	3.9	4.9	3.9	2.8	3.9	4	2.5	5.9	3.6	2.2	5.7
Lead	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.08	<0.01	0.01	0.02	0.04	0.02	0.03	0.02	0.04	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Manganese	0.9	0.6	0.89	0.92	0.71	0.53	0.84	0.53	1.3	1.3	6.6	6.4	4	7.3	13	5.4	9.6	3.2	7.5	4.9	16	12	9	11	9.5	13	13	9.8	8.8	17
Mercury	0.03	0.07	0.03	0.03	0.03	0.01	0.03	0.05	0.02	0.01	<0.01	<0.01	0.04	<0.01	0.02	<0.01	0.01	0.01	<0.01	<0.01	0.02	<0.01	0.01	0.02	0.02	<0.01	0.02	<0.01	<0.01	0.02
Molybdenum	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	0.07	0.08	0.07	0.06	0.08	0.06	0.05	0.06	0.05	0.06	0.15	0.18	0.17	0.12	0.13	0.06	0.04	0.05	0.05	0.05	0.09	0.09	0.07	0.12	0.11	0.05	0.08	0.06	0.05	0.05
Selenium	0.15	0.11	0.09	0.18	0.16	0.13	0.14	0.13	0.15	0.15	0.15	0.19	0.45	1.8	0.24	0.26	0.2	0.37	0.77	0.18	0.32	0.33	0.23	0.24	0.28	0.27	0.28	0.22	0.22	0.42
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	0.02	0.02	0.02	<0.02	0.03	0.02	0.03	<0.02	0.02	0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Tin	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	0.17	0.19	0.23	0.15	0.4	0.28	0.24	0.24	0.3	0.32	0.3	0.31	0.31	0.31	0.37	0.3	0.17	0.22	0.25	0.27	0.27	0.23	0.21	0.32	0.31	0.25	0.28	0.28	0.26	0.23
Uranium	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.19	0.16	0.4	1.8	0.29	0.25	0.54	0.28	0.96	0.24	0.29	0.2	0.05	0.15	0.28	0.21	0.17	0.06	0.09	0.16
Zinc	21	19	22	19	23	29	29	22	26	30	38	49	34	36	37	32	19	52	30	26	61	68	70	57	55	42	63	57	65	53
Physical Properties																														
Moisture (%)	48.2	47.8	51.1	50.6	49.9	49.0	52.9	51.6	55.8	54.0	48.1	56.5	50.4	55.4	55.3	52.1	52.4	62.7	58.0	59.4	59.1	58.4	55.5	55.3	55.6	55.9	56.7	56.0	53.4	54.8
Radionuclides																														
Lead-210 (Bq/g)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002
Polonium-210 (Bq/g)	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0006	<0.0005	<0.0005	0.002	0.001	0.001	0.002	0.0007	0.002	0.002	0.001	0.003	0.004	0.001	0.0008	<0.0005	<0.0005	0.0008	0.0006	0.001	<0.0005	<0.0005	0.001
Radium-226 (Bq/g)	<0.0009	<0.001	<0.0008	<0.0009	<0.001	<0.001	<0.0009	<0.001	<0.0008	<0.0009	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.005	<0.0009	0.003	0.001	0.002	<0.001	<0.001	0.005	0.002	<0.001	0.002	<0.001	<0.001	0.002
Thorium-230 (Bq/g)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.003
Trace Elements																														
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	0.26	0.34	0.29	0.26	0.16	0.34	0.39	0.28	0.36	0.19	0.27	0.14	0.16	0.18	0.2	0.25	0.03	0.13	0.48	0.51	0.08	0.17	0.15	0.12	0.14	0.16	0.12	0.13	0.13	0.1
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.01	0.01	0.01	<0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.03	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.02	0.01	0.01
Strontium	77	60	85	49	72	116	74	71	94	120	264	233	175	211	286	232	76	155	197	187	81	85	86	113	98	75	92	92	80	82
Vanadium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	2	0.24	0.08	0.05	0.11	1	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	0.05

[1]All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise.

APPENDIX B, TABLE 21

Detailed fish bone chemistry data collected from the Fond du Lac River for the EARMP technical program, 2011 and 2012.

Parameter[1]	Fond du Lac River																								
	Longnose Sucker								Lake Trout							Lake Whitefish									
	2011					2012			2011		2012					2011					2012				
	SP05-01			SP06-02		SP7-1			SP05-01	SP07-02	SP1-1		SP4-1	SP6-1	SP7-1	SP04-01					SP1-1	SP3-1		SP3-2	SP7-1
	LSU06	LSU07	LSU11	LSU01	LSU02	LSU05, LSU06	LSU07	LSU08	LT08	LT15	LT01	LT02	LT02	LT01	LT01	LW01	LW02	LW03	LW04	LW05	LW03	LW01	LW02, LW03	LW04	LW02
Metals																									
Aluminum	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	1.9	1.9	4.1	4.5	1.6	0.7	0.5	0.8	1.1	1.1
Barium	2.5	7.3	7.7	3.9	3.5	5.7	3.8	5.1	0.91	0.85	1.2	0.87	1.1	1.2	1.2	13	18	14	11	5.9	4.2	3.7	3	4.8	4.8
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	<0.2	<0.2	<0.2
Copper	0.24	0.19	0.2	0.24	0.21	0.33	0.34	0.36	0.1	0.15	0.12	0.18	0.18	0.16	0.14	0.1	0.09	0.1	0.07	0.1	0.16	0.19	0.15	0.19	0.11
Iron	3.5	6.6	5.9	4	3.4	3.8	6.1	4.3	2.5	6.1	5.2	2.8	3.3	3.3	3.6	5.4	4	4.6	7	7.3	4.9	4.9	6.4	4.7	4.1
Lead	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.01
Manganese	8.3	22	29	20	11	14	17	20	2.4	2.3	3.3	1.6	2.2	3.5	2	12	23	19	27	15	5.8	5.3	6.8	7.1	11
Mercury	0.02	0.01	0.01	0.04	0.03	<0.01	0.02	0.01	0.23	0.23	0.05	0.04	0.04	0.03	0.04	0.02	0.01	0.02	0.04	0.01	0.03	0.02	0.03	0.08	0.2
Molybdenum	0.23	0.31	0.33	0.16	0.23	0.36	0.28	0.34	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	0.08	0.2	0.15	0.1	0.08	0.13	0.08	0.1	0.08	0.09	0.1	0.07	0.16	0.06	0.08	0.09	0.08	0.09	0.13	0.1	0.09	0.08	0.06	0.08	0.09
Selenium	0.32	0.36	0.32	0.34	0.28	0.25	0.23	0.31	0.15	0.21	0.19	0.09	0.12	0.17	0.16	0.42	0.32	0.37	0.55	0.26	0.22	0.2	0.26	0.2	0.21
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Tin	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	0.17	0.55	0.34	0.33	0.15	0.29	0.22	0.24	0.25	0.25	0.56	0.31	0.24	0.26	0.32	0.25	0.24	0.34	0.29	0.36	0.27	0.2	0.36	0.21	0.28
Uranium	0.02	0.05	0.05	0.03	0.03	0.03	0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	0.18	0.33	0.13	0.06	0.01	0.01	0.02	0.05	0.22
Zinc	17	37	33	18	17	30	17	23	26	24	19	22	19	21	25	33	28	28	35	39	52	39	50	32	46
Physical Properties																									
Moisture (%)	46.7	51.0	52.3	49.8	42.5	51.6	44.0	43.1	51.4	58.7	46.9	54.6	56.4	50.6	51.5	62.5	57.9	48.5	50.1	56.1	51.2	48.2	52.2	53.7	56.8
Radionuclides																									
Lead-210 (Bq/g)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Polonium-210 (Bq/g)	0.002	0.005	0.003	0.003	0.001	0.002	0.003	0.003	0.001	0.0006	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	0.002	0.002	0.002	0.002	0.004	0.0008	0.001	0.002	0.001	0.002
Radium-226 (Bq/g)	<0.001	<0.001	<0.001	<0.001	<0.002	0.006	<0.001	<0.002	<0.001	<0.001	<0.0009	<0.0008	<0.0009	0.002	<0.001	0.002	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0009	<0.001	0.007
Thorium-230 (Bq/g)	<0.002	<0.003	<0.002	<0.003	<0.003	<0.002	<0.003	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.002	<0.002	<0.002	<0.002	0.004	<0.002	<0.003	<0.002
Trace Elements																									
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	0.18	0.09	0.1	0.09	0.11	0.12	0.1	0.06	0.11	0.05	0.12	0.08	0.07	0.11	0.11	0.16	0.19	0.17	0.23	0.09	0.12	0.28	0.17	0.05	0.05
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.01	0.03	0.03	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.03	0.02	0.01	0.01	0.02	0.02
Strontium	45	127	119	61	48	87	57	78	58	58	57	49	48	51	62	98	122	133	156	121	129	108	95	106	151
Vanadium	<0.05	<0.05	<0.05	<0.05	<0.05	0.08	0.06	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.18	0.21	0.41	<0.05	<0.05	<0.05	<0.05	0.07	0.08

APPENDIX B, TABLE 21

Detailed fish bone chemistry data collected from the Fond du Lac River for the EARMP technical program, 2011 and 2012.

Parameter[1]	Fond du Lac River																			
	Northern Pike										White Sucker									
	2011					2012					2011					2012				
	SP04-01					SP3-2		SP4-1	SP5-1	SP6-1	SP05-01					SP3-2			SP6-1	SP7-1
	NP06	NP072	NP08	NP09	NP10	NP01	NP02	NP01	NP01	NP05	WSU01	WSU02	WSU03	WSU04	WSU05	WSU07	WSU08	WSU09	WSU03	WSU03
Metals																				
Aluminum	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	3.4	3.2	2.8	3.5	3.5	3.4	2.9	4.3	3.2	3.7	4.2	4.1	5.2	4.3	8.3	5.2	4.2	4.4	4.8	5.8
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Copper	0.17	0.15	0.13	0.14	0.15	0.16	0.18	0.17	0.14	0.17	0.26	0.4	0.28	0.19	0.27	0.32	0.38	0.51	0.33	0.28
Iron	6.4	3.2	3.8	4.4	3.5	3.7	4.6	3.9	3.5	2.7	5.5	3.8	5.4	2.4	6.6	9.4	4.9	5	3.5	5.1
Lead	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Manganese	31	21	17	24	23	24	20	27	25	27	17	18	23	19	34	14	14	14	15	20
Mercury	0.01	0.03	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	0.1	0.16	0.21	0.09	0.23	0.1	0.16	0.24	0.15
Nickel	0.09	0.09	0.09	0.08	0.08	0.09	0.07	0.1	0.08	0.08	0.08	0.08	0.13	0.09	0.12	0.07	0.07	0.08	0.07	0.08
Selenium	0.2	0.24	0.17	0.18	0.22	0.14	0.07	0.18	0.18	0.17	0.27	0.31	0.31	0.17	0.2	0.21	0.17	0.21	0.21	0.19
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Tin	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	0.35	0.27	0.24	0.28	0.24	0.38	0.29	0.29	0.32	0.36	0.31	0.21	0.24	0.21	0.34	0.22	0.2	0.22	0.2	0.23
Uranium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.03	0.02	0.08	0.06	0.01	0.02	0.01	0.02	0.02
Zinc	67	62	62	55	66	63	52	63	54	59	20	17	22	17	26	20	17	18	17	21
Physical Properties																				
Moisture (%)	56.9	55.9	54.2	60.4	62.7	55.8	52.0	52.8	58.1	48.4	43.0	51.5	45.2	49.7	42.2	38.3	44.7	41.4	45.4	49.0
Radionuclides																				
Lead-210 (Bq/g)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Polonium-210 (Bq/g)	0.001	0.001	0.002	0.002	0.003	0.0008	0.001	0.001	0.002	0.002	0.002	0.003	0.005	0.007	0.001	0.004	0.005	0.003	0.006	0.004
Radium-226 (Bq/g)	0.002	<0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Thorium-230 (Bq/g)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.002	<0.003	<0.002	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Trace Elements																				
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	0.02	0.07	0.05	0.02	0.03	0.05	<0.02	0.04	0.04	<0.02	0.05	0.05	0.12	0.07	0.04	0.07	0.04	0.08	0.08	0.06
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.03	0.02	0.03	0.02	0.02	0.01	0.02	0.02
Strontium	51	46	44	48	48	57	47	60	46	55	65	54	77	68	86	69	60	70	65	66
Vanadium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

[1]All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise.

APPENDIX B, TABLE 22

Detailed fish bone chemistry data collected from Waterbury Lake for the EARMP technical program, 2011 and 2012.

Parameter [1]	Waterbury Lake															
	Longnose Sucker						Lake Trout									
	2011					2012	2011					2012				
	SP08-01					SP7-1	SP08-01					AN2-1				
	LSU11, LSU12	LSU13	LSU14	LSU15, LSU16	LSU17, LSU18	WSU12, LSU13, LSU23	LT03	LT04	LT05	LT06	LT07	LT01	LT02	LT03	LT04	LT05
Metals																
Aluminum	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	<0.5
Barium	6.6	5.1	3.7	5.2	4.1	3.5	1.4	1.3	1.3	0.92	1.2	0.83	1.3	1.1	1.4	1.1
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.4	<0.2	<0.2
Copper	0.2	0.16	0.21	0.22	0.17	0.18	0.14	0.19	0.17	0.18	0.1	0.11	0.14	0.13	0.14	0.22
Iron	3.3	3.6	4.5	4.1	2.8	7.2	14	5.9	5.5	3.6	2.7	3.1	2.9	5.9	4	4.3
Lead	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	<0.01	<0.01	<0.01
Manganese	97	53	54	49	50	21	3.9	3.8	3.7	2.5	2.7	2.5	3.4	2.2	2.3	2.4
Mercury	<0.01	0.01	<0.01	<0.01	0.01	<0.01	0.1	0.06	0.1	0.08	0.1	0.07	<0.01	0.03	<0.01	<0.01
Molybdenum	0.19	0.15	0.43	0.22	0.25	0.13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	0.09	0.07	0.07	0.07	0.07	0.04	0.11	0.07	0.06	0.07	0.06	0.05	0.04	0.03	0.04	0.04
Selenium	0.35	0.25	0.19	0.19	0.2	0.16	0.23	0.14	0.13	0.14	0.15	0.21	0.15	0.12	0.12	0.16
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Tin	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	0.31	0.21	0.17	0.19	0.2	0.15	0.28	0.27	0.22	0.21	0.31	0.28	0.25	0.18	0.23	0.18
Uranium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	26	21	21	25	23	19	28	26	23	25	21	25	25	24	24	24
Physical Properties																
Moisture (%)	58.6	58.8	54.4	57.0	61.2	57.5	55.0	54.2	53.1	53.1	51.8	52.4	54.1	50.4	50.0	51.7
Radionuclides																
Lead-210 (Bq/g)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Polonium-210 (Bq/g)	0.001	0.002	0.002	0.002	0.0009	0.006	0.0006	<0.0005	<0.0005	<0.0005	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0006
Radium-226 (Bq/g)	<0.001	0.004	<0.001	<0.001	<0.001	0.002	0.001	<0.0008	<0.001	0.002	0.001	0.001	<0.001	<0.0009	0.001	<0.0009
Thorium-230 (Bq/g)	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Trace Elements																
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	0.04	0.03	0.03	0.06	0.05	0.03	0.05	0.1	0.09	0.1	0.1	0.03	0.05	0.13	0.12	0.1
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.02	0.01	0.01	0.01	0.01	<0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Strontium	201	143	133	148	128	83	132	129	109	95	111	105	132	119	112	115
Vanadium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

APPENDIX B, TABLE 22

Detailed fish bone chemistry data collected from Waterbury Lake for the EARMP technical program, 2011 and 2012.

Parameter[1]	Waterbury Lake																
	Lake Whitefish								Northern Pike								White Sucker
	2011			2012					2011			2012					2012
	SP08-01			SP4-1		SP7-1			SP01-01	SP08-01		SP2-1	SP7-1				SP7-1
	LW08	LW09	LW10	LW01	LW03	LW06	LW07	LW08	NP03	NP01	NP02	NP01	NP01	NP02	NP03	NP04, NP05	WSU09, WSU10, WSU11
Metals																	
Aluminum	1.4	2	1.4	<0.5	0.7	0.6	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	6.6	6.4	4.3	3.4	4.7	6.5	4.1	4.3	4.2	4.1	3.6	3.5	3.6	4.8	2.4	3.4	5
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Copper	0.13	0.03	0.04	0.09	0.1	0.14	0.09	0.16	0.17	0.12	0.12	0.16	0.24	0.19	0.24	0.22	0.39
Iron	4	6.3	8.7	3.1	3.3	3.7	2.8	4.8	3.9	2.4	2.7	3.9	4	3.6	2.7	2.6	5.3
Lead	0.02	0.02	0.02	0.01	0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Manganese	15	28	20	16	24	57	19	32	15	24	21	20	34	27	26	30	39
Mercury	0.02	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.01	0.01	0.02	0.01	0.04	<0.01	0.01	<0.01
Molybdenum	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.36
Nickel	0.07	0.1	0.09	0.03	0.06	0.06	0.05	0.03	0.09	0.12	0.1	0.09	0.07	0.08	0.05	0.17	0.06
Selenium	0.59	0.55	0.71	0.14	0.18	0.16	0.17	0.17	0.21	0.16	0.14	0.18	0.19	0.18	0.2	0.18	0.16
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Tin	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	0.21	0.25	0.3	0.19	0.36	0.3	0.26	0.22	0.22	0.28	0.25	0.33	0.35	0.45	0.2	0.22	0.24
Uranium	0.01	0.02	0.01	<0.01	0.02	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	24	25	27	33	39	55	39	43	45	51	51	48	66	70	50	44	23
Physical Properties																	
Moisture (%)	62.3	58.1	63.7	52.8	44.5	56.4	55.0	52.3	53.6	53.2	55.1	56.9	58.6	52.3	58.6	56.7	58.8
Radionuclides																	
Lead-210 (Bq/g)	<0.002	0.004	<0.002	0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Polonium-210 (Bq/g)	0.003	0.007	0.005	0.003	0.003	0.002	0.002	0.0007	0.002	0.001	0.0012	0.001	0.002	0.002	0.002	0.002	0.005
Radium-226 (Bq/g)	<0.001	0.002	<0.0009	0.002	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.001
Thorium-230 (Bq/g)	<0.002	<0.002	<0.002	<0.002	<0.003	<0.002	<0.002	<0.002	<0.003	<0.002	0.003	<0.002	0.003	<0.003	<0.002	<0.002	0.004
Trace Elements																	
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	0.02	0.02	0.03	0.03	0.08	0.06	0.13	0.05	<0.02	0.04	0.03	0.02	0.05	0.02	0.04	<0.02	0.04
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.01	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.01	0.02
Strontium	191	179	166	168	260	297	230	194	102	106	116	134	96	129	75	104	167
Vanadium	0.14	0.25	0.18	0.06	0.06	0.08	0.06	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

[1]All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise.

APPENDIX B, TABLE 23

Detailed fish bone chemistry data collected from Bobby's Lake for the EARMP technical program, 2009.

Parameter[1]	Bobby's Lake								
	NP					WSU			
	GN4-1		HG1-1		HG2-1	GN2-1	HG2-1		
	NP01	NP02	NP01	NP02	NP01	WSU01	WSU03	WSU04	WSU05
Metals									
Aluminum	0.31	0.22	0.32	0.43	1.00	0.08	0.37	<0.02	0.15
Barium	3.5	5.7	2.0	7.8	4.5	2.0	6.1	1.9	3.9
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Copper	0.22	0.22	0.39	0.18	0.21	0.35	0.34	0.26	0.32
Iron	3.6	3.9	4.6	4.1	5.5	5.1	5.7	3.9	4.7
Lead	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Manganese	14.0	20.0	8.8	29.0	19.0	45.0	39.0	22.0	22.0
Molybdenum	<0.05	<0.05	<0.05	<0.05	<0.05	0.12	<0.05	0.06	<0.05
Nickel	0.12	0.08	0.08	0.05	0.12	0.10	0.09	0.06	0.07
Selenium	0.12	0.21	0.18	0.13	0.14	0.27	0.10	0.25	0.14
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Tin	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	0.17	0.31	0.21	0.32	0.30	0.33	0.23	0.24	0.25
Uranium	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Zinc	45	50	51	74	57	20	19	13	16
Physical Properties									
Ash (%)	23.0	22.8	20.8	25.5	22.6	29.0	30.8	26.7	32.3
Radionuclides									
Lead-210 (Bq/g)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Polonium-210 (Bq/g)	0.002	0.0008	0.0007	0.001	<0.0005	0.001	0.0008	0.0006	0.002
Radium-226 (Bq/g)	0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.002	<0.001	<0.002
Thorium-230 (Bq/g)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.003	<0.003	<0.003
Trace Elements									
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.03	0.01	0.01	0.02	0.01	0.02	0.02	0.01	0.02
Strontium	55	90	50	120	96	58	123	50	90
Vanadium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

[1]All concentrations are presented on a µg/g wet weight basis, unless specified otherwise.

APPENDIX B, TABLE 24

Detailed fish bone chemistry data collected from Cree Lake for the EARMP technical program, 2011 and 2012.

Parameter[1]	Cree Lake																			
	Longnose Sucker										Lake Trout									
	2011					2012					2011					2012				
	SP09-01					SP01-01			SP01-02	SP01-03	AN01-01				SP01-01	SP03-01		SP04-01		
	LSU07	LSU08, LSU09	LSU10, LSU11	LSU12, LSU13	LSU14, LSU15	LSU08, LSU10	LSU09	LSU11, LSU12	LSU09	LSU03	LT01	LT02	LT03	LT04	LT01	LT01	LT02	LT07	LT08	LT09
Metals																				
Aluminum	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.3	<0.5	<0.5	<0.5	<0.5
Barium	9.1	10	6.2	5.6	7.1	8.2	9.1	7.3	7.3	14	1.3	1.6	2.1	2.3	1.8	1.6	1.4	1.9	1.6	1.9
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	1.3	1.3	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Copper	0.21	0.26	0.34	0.26	1	0.22	0.21	0.27	0.52	0.36	0.14	0.1	0.24	0.04	0.31	0.13	0.15	0.12	0.08	0.1
Iron	5.9	15	12	11	11	4.8	7.9	8.3	3	3.8	6.3	7.3	5.1	4.5	5.1	4.9	3.4	5.3	2.7	4.5
Lead	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Manganese	159	104	38	94	138	87	140	80	93	150	2.4	3.7	4.6	4.8	3.7	3	1.8	3.7	3	2.5
Mercury	0.02	<0.01	<0.01	0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	0.04	0.05	0.02	0.02	0.01	0.11	0.02	0.1	0.04	0.23
Molybdenum	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	0.13	0.13	0.1	0.06	0.09	0.06	0.08	0.04	0.05	0.08	0.11	0.13	0.1	0.13	0.12	0.06	0.05	0.06	0.07	0.07
Selenium	0.24	0.25	0.21	0.27	0.28	0.28	0.25	0.27	0.29	0.27	0.27	0.17	0.22	0.19	0.22	0.2	0.2	0.24	0.19	0.21
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Tin	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	0.33	0.45	0.27	0.22	0.26	0.26	0.44	0.24	0.28	0.39	0.32	0.29	0.25	0.32	0.3	0.29	0.26	0.29	0.37	0.32
Uranium	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	27	43	27	24	27	30	40	23	24	36	19	27	27	31	25	26	23	25	22	32
Physical Properties																				
Moisture (%)	46.2	52.9	49.1	55.5	55.7	51.7	60.8	55.9	55.9	55.3	59.6	56.8	54.2	51.4	56.2	59.6	51.3	57.4	51.2	53.9
Radionuclides																				
Lead-210 (Bq/g)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Polonium-210 (Bq/g)	0.003	0.002	0.013	0.005	0.004	0.0008	0.002	0.0005	0.001	0.0008	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.001	<0.0005	0.0009	0.0005
Radium-226 (Bq/g)	<0.001	<0.001	0.010	0.001	<0.001	<0.001	0.002	<0.001	0.002	<0.001	0.001	0.001	<0.0009	<0.0009	<0.0009	<0.001	<0.001	<0.001	<0.001	<0.001
Thorium-230 (Bq/g)	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003
Trace Elements																				
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	0.06	0.05	0.06	0.03	0.03	0.03	<0.02	0.02	<0.02	0.03	0.11	0.03	0.05	0.03	0.06	<0.02	0.06	0.03	0.08	0.02
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.03	0.03	0.02	0.01	0.02	0.02	0.02	0.01	0.01	0.02	0.01	0.02	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.02
Strontium	178	275	182	130	174	181	226	126	164	263	102	130	136	166	121	112	115	142	173	171
Vanadium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

APPENDIX B, TABLE 24

Detailed fish bone chemistry data collected from Cree Lake for the EARMP technical program, 2011 and 2012.

Parameter[1]	Cree Lake																								
	Lake Whitefish										Northern Pike					White Sucker									
	2011					2012					2012					2011					2012				
	SP01-01, SP03-01	SP06-01	SP07-01, SP09-01	SP09-01		SP02-01	SP04-01				SP01-01	SP01-02		SP01-03		SP09-01					SP01-01			SP01-02	
	LW02, LW02	LW02	LW02, LW01	LW19	LW20, LW21	LW01, LW02	LW01	LW02	LW03, LW04	LW05, LW06	NP07	NP07	NP08	NP01	NP02	WSU02	WSU03	WSU04	WSU05	WSU06	WSU01	WSU02	WSU03	WSU01	WSU02
Metals																									
Aluminum	0.6	<0.5	0.9	<0.5	1.6	0.6	0.7	3	2	1.8	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	0.7	<0.5
Barium	7.7	3.2	4	5.4	6.2	4.6	7.1	3.8	5.7	5.4	4.6	6.2	6.3	6.7	8.5	16	11	7.7	7.9	8.5	9.6	11	6.2	5.4	5.9
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	1	1.2	1.4	1.2	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.3	1.4	1.3	1.2	1.3
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Copper	0.06	0.05	0.04	0.05	0.05	0.21	0.32	0.28	0.28	0.36	0.16	0.24	0.14	0.18	0.21	0.28	0.39	0.28	0.38	0.25	0.59	0.26	0.25	0.65	0.48
Iron	4.7	8.2	7.5	6.5	14	3.7	4.3	3.6	6.8	5.4	1.8	6.5	3.3	2.5	2.7	26	19	11	13	19	2.2	3	8.9	4.4	2.5
Lead	0.02	<0.01	0.02	<0.01	0.03	0.01	0.02	0.01	0.03	0.02	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.02	<0.01	0.01	<0.01
Manganese	18	4.5	30	11	39	9.7	34	11	35	25	16	49	45	18	27	153	74	80	54	90	67	88	28	55	40
Mercury	<0.01	0.01	0.01	0.02	<0.01	0.01	<0.01	0.01	<0.01	0.02	0.01	0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	0.09	0.1	0.09	0.15	0.13	0.06	0.07	0.06	0.06	0.04	0.05	0.1	0.09	0.05	0.06	0.19	0.11	0.1	0.12	0.11	0.07	0.09	0.03	0.05	0.04
Selenium	0.2	0.28	0.39	0.23	0.42	0.27	0.26	0.22	0.55	0.47	0.16	0.16	0.16	0.15	0.19	0.2	0.16	0.19	0.15	0.15	0.17	0.15	0.14	0.21	0.18
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Tin	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	0.25	0.22	0.25	0.25	0.33	0.31	0.33	0.23	0.3	0.23	0.27	0.44	0.43	0.27	0.36	0.5	0.33	0.29	0.29	0.4	0.28	0.44	0.2	0.22	0.2
Uranium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	60	39	27	52	48	32	60	44	48	29	52	40	43	59	55	38	30	23	26	32	21	37	16	18	19
Physical Properties																									
Moisture (%)	62.0	48.7	62.8	51.9	60.1	56.2	56.7	58.0	59.5	54.8	52.6	43.9	48.9	62.6	52.4	46.4	45.4	45.9	52.3	44.4	52.8	52.9	54.6	57.7	54.5
Radionuclides																									
Lead-210 (Bq/g)	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Polonium-210 (Bq/g)	0.002	0.001	0.007	<0.0005	0.005	0.008	0.005	0.001	0.0019	0.006	0.0007	<0.0005	0.001	0.0006	0.0009	0.003	0.003	0.004	0.003	0.002	0.001	0.002	0.002	0.002	0.0009
Radium-226 (Bq/g)	0.001	<0.001	<0.0008	<0.001	0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thorium-230 (Bq/g)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.003	<0.002	<0.002	<0.003	<0.003	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Trace Elements																									
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	0.05	0.1	0.02	0.11	0.03	0.09	0.05	0.09	0.03	0.04	0.03	<0.02	<0.02	0.02	0.04	0.04	0.07	0.04	0.05	0.04	0.03	0.04	0.04	0.02	0.04
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.01	0.01	0.02	0.02	0.01	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.01
Strontium	234	225	164	314	215	252	315	206	212	148	113	159	170	141	133	388	207	179	194	208	168	224	121	126	139
Vanadium	<0.05	<0.05	0.1	<0.05	0.13	<0.05	<0.05	<0.05	0.14	0.06	<0.05	<0.05	<0.05	<0.05	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

[1]All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise.

APPENDIX B, TABLE 25

Detailed fish bone chemistry data collected from Ellis Bay for the EARMP technical program, 2011 and 2012.

Parameter[1]	Ellis Bay																					
	Lake Trout										Lake Whitefish							Northern Pike				
	2011					2012					2011					2012		2012				
	SP01-01					SP01-01					SP01-01					SP01-01		AN01-01				
	LT01	**LT02**	**LT03**	**LT04**	**LT05**	**LT01**	**LT02**	**LT03**	**LT04**	**LT05**	**LW06**	**LW07**	**LW08**	**LW09**	**LW10**	**LW06**	**LW07**	**NP01**	**NP02**	**NP03**	**NP04**	**NP05**
Metals																						
Aluminum	0.6	0.7	1.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.3	4.2	2.2	2.2	1.6	2.8	3.3	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	1.1	0.7	0.88	1.3	1.1	1.4	1.4	0.83	1.6	0.79	10	15	9.2	8	9.4	16	20	5.1	5.8	5.6	4.9	5
Boron	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Copper	0.26	0.18	0.08	0.16	0.1	0.19	0.18	0.19	0.2	0.15	0.09	0.19	0.24	0.11	0.09	0.12	0.27	0.28	0.19	0.19	0.19	0.21
Iron	5.7	2.6	2.3	4.2	2.2	1.8	3	7.2	3.4	3.3	3.6	4.3	5.5	5.9	4.7	4.6	8.3	2.9	1.7	2.9	3.2	1.5
Lead	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.03	0.04	0.07	0.02	<0.01	0.03	0.08	<0.01	<0.01	<0.01	<0.01	<0.01
Manganese	0.9	1.1	2	2.1	1.5	0.46	0.74	0.72	0.86	0.64	16	29	6.2	20	14	16	15	12	15	11	8.6	9.6
Mercury	0.04	0.05	0.06	0.02	0.04	0.03	0.02	0.01	0.04	0.04	0.01	0.03	0.02	0.01	<0.01	0.01	0.02	0.02	0.02	<0.01	<0.01	0.02
Molybdenum	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	0.19	0.08	0.07	0.08	0.07	0.06	0.06	0.05	0.05	0.04	0.09	0.13	0.07	0.12	0.09	0.06	0.06	0.07	0.06	0.06	0.08	0.07
Selenium	0.14	0.13	0.12	0.13	0.13	0.11	0.12	0.16	0.12	0.08	0.21	0.24	0.21	0.21	0.21	0.25	0.23	0.11	0.12	0.12	0.12	0.11
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.02	0.04	<0.02	0.04	<0.02	0.03	0.02	0.03	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02
Tin	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	0.34	0.2	0.24	0.18	0.21	0.3	0.3	0.27	0.29	0.24	0.24	0.44	0.19	0.35	0.27	0.34	0.38	0.37	0.26	0.32	0.39	0.3
Uranium	<0.01	<0.01	0.49	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.51	0.61	0.26	0.84	0.54	0.87	0.47	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	22	18	16	27	18	25	27	24	28	20	25	27	21	38	27	28	33	65	55	61	58	62
Physical Properties																						
Moisture (%)	45.4	50.4	50.3	50.1	49.2	48.8	51.6	49.2	56.7	50.1	50.5	56.9	49.5	52.6	56.2	54.6	52.6	54.4	52.8	54.9	50.0	52.7
Radionuclides																						
Lead-210 (Bq/g)	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.004	<0.005	<0.002	<0.002	<0.002	<0.002	<0.002
Polonium-210 (Bq/g)	<0.0004	<0.0004	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.002	0.004	0.002	0.0007	0.001	0.001	0.002	<0.0005	<0.0005	<0.0005	<0.0005	0.0007
Radium-226 (Bq/g)	<0.001	<0.0008	<0.0009	<0.001	<0.0008	<0.0009	<0.0009	<0.001	<0.001	<0.0009	<0.001	<0.001	0.002	<0.001	<0.0009	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Thorium-230 (Bq/g)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	0.005
Trace Elements																						
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	0.21	0.23	0.29	0.16	0.21	0.44	0.2	0.29	0.16	0.27	0.41	0.18	0.37	0.29	0.33	0.34	0.36	0.12	0.14	0.28	0.1	0.1
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.02	<0.01	<0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02	0.02
Strontium	70	54	62	77	82	110	107	87	101	68	217	287	156	239	191	219	238	105	95	109	116	106
Vanadium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.14	0.19	<0.05	0.12	0.12	0.27	0.39	<0.05	<0.05	<0.05	<0.05	<0.05

[1]All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise.

APPENDIX B, TABLE 26

Detailed fish bone chemistry data collected from Pasfield Lake for the EARMP technical program, 2011 and 2012.

Parameter[1]	Pasfield Lake																												
	Longnose Sucker						Lake Trout										Lake Whitefish										Northern Pike		
	2011			2012			2011					2012					2011					2012					2011	2012	
	SP07-01			SP10-1		SP11-1	AN03-01			SP05-01		SP4-1				SP5-1	SP07-01					SP10-1	SP11-1				SP02-01	SP11-1	SP08-2
	LSU11	LSU12	LSU13	LSU02, LSU03	LSU04, LSU05, WSU06	LSU02	LT01	LT02	LT01	LT01	LT02	LT01	LT02	LT03	LT04	LT01	LW01, LW02	LW03, LW04	LW05, LW06	LW07, LW08	LW09, LW10	LW01	LW03, LW04, LW04, LW07	LW03, LW05, LW06	LW08, LW10, LW11, LW12,	LW09, LW11, LW14, LW15	NP02	NP01	NP01
Metals																													
Aluminum	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	0.6	0.8	0.9	0.8	0.8	0.6	0.6	0.7	1	0.9	<0.5	<0.5	0.6
Barium	5.3	4.1	7.5	4.6	4.7	6.2	1.2	1.7	1.3	1.5	1.6	1.2	1.5	1.6	1.6	1.6	3.9	4.9	3.6	4	4.3	5.2	3.8	5.2	5.6	3.9	3.8	3.7	5.1
Boron	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	<0.2	<0.2	<0.2	<0.2	2.7	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.3	<0.2	<0.2	<0.2	<0.2	3.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Copper	0.4	0.24	0.15	0.26	0.32	0.37	0.1	0.11	0.04	0.1	0.08	0.17	0.23	0.17	0.21	0.18	0.1	0.07	0.16	0.08	0.04	0.25	0.16	0.19	0.16	0.2	0.12	0.22	0.14
Iron	6.1	3.4	4.2	2.3	7.1	3.4	5.9	5.8	5.8	4.2	5.8	3.6	4.6	3.7	6	4.8	3.6	5.3	6	58	15	5.1	5.1	6.2	4	6	3.4	3.4	2
Lead	<0.01	<0.01	0.03	0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	0.03	0.04	0.04	0.04	0.03	0.04	0.03	0.05	0.03	<0.01	<0.01	<0.01
Manganese	30	10	25	22	19	22	2.5	3.7	1.5	1.5	3.4	3.6	2.2	3.8	6.2	4.1	5.5	7.4	9.9	7.3	8.2	5.9	8.6	8.3	10	5.8	7.4	12	8
Mercury	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	0.05	0.1	0.02	0.08	0.04	0.04	0.14	0.04	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.01
Molybdenum	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel	0.07	0.08	0.14	0.06	0.06	0.07	0.1	0.11	0.11	0.1	0.12	0.12	0.09	0.08	0.09	0.08	0.09	0.09	0.08	0.31	0.15	0.1	0.06	0.06	0.08	0.06	0.09	0.09	0.12
Selenium	0.28	0.21	0.18	0.18	0.17	0.16	0.28	0.32	0.25	0.28	0.29	0.27	0.25	0.24	0.27	0.25	0.19	0.33	0.23	0.21	0.23	0.18	0.18	0.23	0.19	0.25	0.13	0.16	0.12
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Tin	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Titanium	0.14	0.21	0.29	0.25	0.24	0.36	0.29	0.34	0.3	0.28	0.28	0.25	0.35	0.36	0.34	0.45	0.31	0.24	0.27	0.28	0.27	0.26	0.18	0.28	0.27	0.22	0.22	0.3	0.67
Uranium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	26	23	25	22	23	23	20	28	21	26	27	29	36	31	29	32	37	29	36	38	42	49	48	36	58	70	61	71	39
Physical Properties																													
Moisture (%)	54.2	51.4	46.1	57.9	57.2	50.4	56.1	56.7	57.0	54.7	58.5	49.2	55.6	60.2	54.5	53.1	61.6	63.0	57.0	60.8	63.1	58.4	57.6	58.2	60.9	61.3	54.8	58.6	50.4
Radionuclides																													
Lead-210 (Bq/g)	<0.002	<0.002	0.003	<0.002	<0.002	0.005	0.003	0.003	<0.002	<0.002	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	0.005	0.012	0.003	0.003	0.003	0.004	0.003	0.005	0.004	0.007	<0.002	<0.002	<0.002
Polonium-210 (Bq/g)	0.009	0.006	0.009	0.023	0.021	0.006	<0.0005	<0.0005	0.0006	0.001	0.001	0.0007	0.0007	0.001	0.002	0.0008	0.008	0.019	0.011	0.011	0.010	0.006	0.011	0.016	0.013	0.020	<0.0005	0.0020	0.0007
Radium-226 (Bq/g)	0.006	<0.001	<0.001	0.001	0.001	0.002	0.001	<0.001	<0.0009	<0.0008	<0.001	<0.001	0.001	<0.0009	<0.0009	<0.001	<0.0009	0.002	0.003	<0.0009	<0.0006	0.002	0.002	0.002	0.002	0.001	<0.001	<0.0009	<0.001
Thorium-230 (Bq/g)	<0.002	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003
Trace Elements																													
Antimony	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Arsenic	0.05	0.1	0.05	0.05	0.03	0.07	0.06	0.07	0.07	0.06	0.03	0.1	0.07	0.06	0.06	0.1	0.05	0.05	0.04	0.06	0.04	0.06	0.05	0.04	0.04	0.08	0.03	0.03	0.02
Beryllium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	0.01	0.01	0.02	0.01	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.02	0.02	0.01	0.02	0.02	0.01	0.03	0.02	0.02	0.01	0.02	0.01	0.01	0.02	0.01	0.01
Strontium	197	169	233	186	178	181	163	151	152	170	189	185	182	193	188	189	296	266	260	252	301	343	311	290	356	308	164	170	218
Vanadium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.08	0.12	0.11	0.15	0.12	0.17	0.11	0.16	0.21	0.15	<0.05	<0.05	<0.05

[1] All concentrations and activity levels are presented in μg/g on a wet weight basis, except when specified otherwise.

APPENDIX B, TABLE 27

Fish bone chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	Far-Field Exposure Areas																	
		Cochrane River					Crackingstone Inlet			Fond du Lac River					Waterbury Lake				
		LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	WSU	LSU	LT	LW	NP	WSU
Metals																			
Aluminum	Average	2.6	0.5	1.8	0.5	0.6	0.6	1.6	0.5	0.6	0.51	1.8	0.5	0.5	0.5	0.6	1.0	0.5	0.5
	S.D.	3.1	-[3]	1.0	-	0.1	0.3	0.7	0.0	0.4	0.04	1.4	-	0.1	-	0.3	0.6	0.1	-
	Min	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Max	7	<0.5	3.9	<0.5	0.7	1.5	2.7	0.6	1.5	0.6	4.5	<0.5	0.8	<0.5	1.5	2	0.8	<0.5
	<MDL	2	10	1	9	3	9	1	9	6	6	0	10	8	6	8	3	7	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Barium	Average	3.9	0.8	6.0	3.2	4.8	1.0	10.3	6.2	4.9	1.0	8.2	3.4	5.1	4.7	1.2	5.0	3.7	5.0
	S.D.	1.7	0.2	3.5	0.5	1.2	0.2	5.1	1.2	1.9	0.2	5.3	0.4	1.3	1.2	0.2	1.3	0.7	-
	Min	1.8	0.6	2.4	2.5	3.7	0.76	3.3	4.6	2.5	0.85	3	2.8	4.1	3.5	0.83	3.4	2.4	5
	Max	5.8	1.2	12	3.8	6.4	1.4	18	8	7.7	1.2	18	4.3	8.3	6.6	1.4	6.6	4.8	5
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Boron	Average	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Max	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	<MDL	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Cadmium	Average	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	S.D.	-	-	-	-	-	-	-	-	-	-	-	0[4]	-	-	-	-	-	-
	Min	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	<MDL	4	10	10	9	4	10	10	10	8	7	10	9	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Chromium	Average	0.2	0.21	0.2	0.2	0.2	0.2	0.21	0.2	0.2	0.21	0.21	0.2	0.2	0.2	0.22	0.21	0.2	0.2
	S.D.	-	0.03	-	0.1	-	-	0.03	-	-	0.04	0.03	0	-	-	0.06	0.04	0	-
	Min	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Max	<0.2	0.3	<0.2	0.5	<0.2	<0.2	0.3	<0.2	<0.2	0.3	0.3	0.2	<0.2	<0.2	0.4	0.3	0.2	<0.2
	<MDL	4	9	10	7	4	10	7	10	8	6	9	8	10	6	9	7	7	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Copper	Average	0.26	0.08	0.08	0.15	0.26	0.15	0.16	0.16	0.26	0.15	0.13	0.16	0.32	0.19	0.15	0.10	0.18	0.39
	S.D.	0.08	0.05	0.05	0.04	0.03	0.03	0.04	0.04	0.07	0.03	0.04	0.02	0.09	0.02	0.04	0.05	0.05	-
	Min	0.19	<0.02	<0.02	0.09	0.22	0.11	0.11	0.12	0.19	0.10	0.07	0.13	0.19	0.16	0.1	0.03	0.12	0.39
	Max	0.35	0.15	0.15	0.21	0.28	0.18	0.22	0.23	0.36	0.18	0.19	0.18	0.51	0.22	0.22	0.16	0.24	0.39
	<MDL	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Iron	Average	8.2	3.8	5.3	5.4	3.7	4.6	5.7	3.9	4.7	3.8	5.3	4.0	5.2	4.3	5.2	4.6	3.2	5.3
	S.D.	6.5	1.8	1.4	6.7	0.7	2.5	1.3	1.3	1.3	1.3	1.2	1.0	1.9	1.6	3.3	2.0	0.7	-
	Min	4.5	1.3	3.6	1.9	3.1	2.2	3.4	2.2	3.4	2.5	4	2.7	2.4	2.8	2.7	2.8	2.4	5.3
	Max	18	6.8	7.6	23	4.7	10	7.6	5.9	6.6	6.1	7.3	6.4	9.4	7.2	14	8.7	4	5.3
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Lead	Average	0.03	0.01	0.03	0.01	0.01	0.01	0.03	0.01	0.01	0.01	0.012	0.012	0.01	0.01	0.016	0.014	0.01	0.01
	S.D.	0.04	-	0.01	-	0	-	0.02	-	0	-	0.004	0.006	0	-	0.019	0.005	-	-
	Min	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	0.09	<0.01	0.05	<0.01	0.01	<0.01	0.08	<0.01	0.01	<0.01	0.02	0.03	0.01	<0.01	0.07	0.02	<0.01	<0.01
	<MDL	3	10	1	9	1	10	1	10	7	7	5	9	9	6	9	2	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1

APPENDIX B, TABLE 27

Fish bone chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	Far-Field Exposure Areas																	
		Cochrane River					Crackingstone Inlet			Fond du Lac River					Waterbury Lake				
		LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	WSU	LSU	LT	LW	NP	WSU
Manganese	Average	12.7	1.5	8.3	17.1	14.3	0.9	6.8	11.9	17.7	2.5	13.2	23.9	18.8	54.0	2.9	26.4	24.6	39.0
	S.D.	5.9	0.3	3.4	6.0	2.8	0.3	2.9	2.9	6.6	0.7	7.6	4.0	6.1	24.4	0.7	13.7	6.0	-
	Min	5.6	1.2	3	9.2	11	0.53	3.2	8.8	8.3	1.6	5.3	17	14	21	2.2	15	15	39
	Max	20	2.1	13	24	17	1.3	13	17	29	3.5	27	31	34	97	3.9	57	34	39
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Mercury	Average	0.01[5]	0.054	0.023[5]	0.029	0.010	0.031	0.014	0.015	0.019	0.094	0.046	0.022	0.018	0.010	0.057	0.011	0.019	0.010
	S.D.	0[5]	0.046	0.017[5]	0.019	-	0.018	0.010	0.005	0.011	0.093	0.058	0.008	0.013	0	0.039	0.004	0.014	-
	Min	<0.01	0.02	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.03	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	0.01	0.14	0.06	0.07	<0.01	0.07	0.04	0.02	0.04	0.23	0.2	0.04	0.05	0.01	0.1	0.02	0.04	<0.01
	<MDL	1	0	2	1	4	0	6	4	1	0	0	0	5	4	3	5	1	1
	N	2[5]	10	9[5]	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Molybdenum	Average	0.25	0.05	0.05	0.05	0.15	0.05	0.05	0.05	0.28	0.05	0.05	0.05	0.15	0.23	0.05	0.05	0.05	0.36
	S.D.	0.07	-	-	-	0.08	-	-	-	0.07	-	-	-	0.06	0.11	-	-	-	-
	Min	0.16	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	0.16	<0.05	<0.05	<0.05	0.07	0.13	<0.05	<0.05	<0.05	0.36
	Max	0.32	<0.05	<0.05	<0.05	0.24	<0.05	<0.05	<0.05	0.36	<0.05	<0.05	<0.05	0.24	0.43	<0.05	<0.05	<0.05	0.36
	<MDL	0	10	10	9	0	10	10	10	0	7	10	10	0	0	10	8	8	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Nickel	Average	0.08	0.08	0.08	0.06	0.05	0.06	0.10	0.08	0.12	0.09	0.09	0.09	0.09	0.07	0.06	0.06	0.10	0.06
	S.D.	0.04	0.05	0.04	0.03	0.01	0.01	0.06	0.03	0.04	0.03	0.02	0.01	0.02	0.02	0.02	0.03	0.04	-
	Min	0.02	0.02	0.03	0.02	0.04	0.05	0.04	0.05	0.08	0.06	0.06	0.07	0.07	0.04	0.03	0.03	0.05	0.06
	Max	0.11	0.13	0.13	0.1	0.06	0.08	0.18	0.12	0.2	0.16	0.13	0.1	0.13	0.09	0.11	0.1	0.17	0.06
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Selenium	Average	0.29	0.17	0.28	0.15	0.23	0.14	0.46	0.28	0.30	0.16	0.30	0.18	0.23	0.22	0.16	0.33	0.18	0.16
	S.D.	0.05	0.03	0.10	0.04	0.05	0.03	0.51	0.06	0.04	0.04	0.12	0.05	0.05	0.07	0.04	0.24	0.02	-
	Min	0.22	0.13	0.16	0.1	0.16	0.09	0.15	0.22	0.23	0.09	0.2	0.07	0.17	0.16	0.12	0.14	0.14	0.16
	Max	0.33	0.21	0.46	0.2	0.27	0.18	1.8	0.42	0.36	0.21	0.55	0.24	0.31	0.35	0.23	0.71	0.21	0.16
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Silver	Average	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	<MDL	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Thallium	Average	0.02	0.02	0.02	0.02	0.02	0.022	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	S.D.	-	-	-	-	-	0.004	0	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Max	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	<MDL	4	10	10	9	4	2	9	10	8	7	10	10	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Tin	Average	0.025	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	S.D.	0.010	-	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Max	0.04	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	<MDL	3	10	9	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1

APPENDIX B, TABLE 27

Fish bone chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	Far-Field Exposure Areas																	
		Cochrane River					Crackingstone Inlet			Fond du Lac River					Waterbury Lake				
		LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	WSU	LSU	LT	LW	NP	WSU
Titanium	Average	0.25	0.25	0.26	0.24	0.27	0.25	0.28	0.26	0.29	0.31	0.28	0.30	0.24	0.21	0.24	0.26	0.29	0.24
	S.D.	0.09	0.06	0.04	0.07	0.04	0.08	0.06	0.04	0.13	0.11	0.06	0.05	0.05	0.06	0.04	0.06	0.08	-
	Min	0.14	0.16	0.21	0.17	0.24	0.15	0.17	0.21	0.15	0.24	0.2	0.24	0.2	0.15	0.18	0.19	0.2	0.24
	Max	0.34	0.37	0.33	0.38	0.31	0.4	0.37	0.32	0.55	0.56	0.36	0.38	0.34	0.31	0.31	0.36	0.45	0.24
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Uranium	Average	0.045	0.010	0.069	0.010	0.018	0.010	0.511	0.166	0.033	0.010	0.107	0.010	0.029	0.010	0.011	0.013	0.010	0.010
	S.D.	0.057	-	0.048	-	0.005	0	0.511	0.083	0.012	-	0.107	-	0.023	-	0.003	0.005	-	-
	Min	0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.16	0.05	0.02	<0.01	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	0.13	<0.01	0.17	<0.01	0.02	0.01	1.8	0.29	0.05	<0.01	0.33	<0.01	0.08	<0.01	0.02	0.02	<0.01	<0.01
	<MDL	0	10	1	9	0	9	0	0	0	7	0	10	0	6	9	3	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Zinc	Average	20.5	19.3	30.3	55.1	19.3	24.0	35.3	59.1	24.0	22.3	38.2	60.3	19.5	22.5	24.5	35.6	53.1	23.0
	S.D.	4.8	2.2	8.4	19.2	2.9	4.2	9.8	8.2	8.2	2.8	8.7	5.1	3.0	2.7	1.8	10.6	9.6	-
	Min	15	16	19	24	15	19	19	42	17	19	28	52	17	19	21	24	44	23
	Max	25	23	43	90	21	30	52	70	37	26	52	67	26	26	28	55	70	23
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Physical Properties																			
Moisture (%)	Average	52	51	55	56	45	51	55	56	48	53	54	56	45	58	53	56	56	59
	S.D.	6	2	4	4	6	3	4	2	4	4	5	4	4	2	2	6	2	-
	Min	46	49	50	49	36	48	48	53	43	47	48	48	38	54	50	44	52	59
	Max	59	55	63	61	51	56	63	59	52	59	62	63	51	61	55	64	59	59
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Radionuclides																			
Lead-210 (Bq/g)	Average	0.0028	0.0019	0.0022	0.0021	0.0020	0.0020	0.0022	0.0020	0.0020	0.0020	0.0022	0.0020	0.0020	0.0020	0.0020	0.0024	0.0020	0.0020
	S.D.	-	-	-	-	-	-	-	0	-	-	0.0006	-	-	-	-	0.0007	-	-
	Min	<0.002	<0.001	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Max	<0.003	<0.002	<0.004	<0.003	<0.002	<0.002	<0.004	0.002	<0.002	<0.002	0.004	<0.002	<0.002	<0.002	<0.002	0.004	<0.002	<0.002
	<MDL	4	10	10	9	4	10	10	9	8	7	8	10	10	6	10	5	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Polonium-210 (Bq/g)	Average	0.00250	0.00051	0.00270	0.00159	0.00425	0.00051	0.00187	0.00072	0.00275	0.00060	0.00188	0.00158	0.00400	0.00232	0.00055	0.00321	0.00165	0.00500
	S.D.	0.00100	0.00003	0.00170	0.00080	0.00096	0.00003	0.00103	0.00023	0.00116	0.00018	0.00090	0.00072	0.00183	0.00188	0.00010	0.00196	0.00049	-
	Min	0.0020	<0.0005	0.0010	<0.0005	0.0030	<0.0005	0.0007	<0.0005	0.0010	<0.0005	0.0008	0.0008	0.0010	0.0009	<0.0005	0.0007	0.0010	0.0050
	Max	0.0040	0.0006	0.0070	0.0030	0.0050	0.0006	0.0040	0.0010	0.0050	0.0010	0.0040	0.0030	0.0070	0.0060	0.0008	0.0070	0.0020	0.0050
	<MDL	0	7	0	1	0	9	0	4	0	4	0	0	0	0	8	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Radium-226 (Bq/g)	Average	0.00148	0.00146	0.00130	0.00100	0.00200	0.00092	0.00169	0.00180	0.00188	0.00109	0.00179	0.00110	0.00120	0.00167	0.00106	0.00124	0.00100	0.00100
	S.D.	-	0.00129	0.00067	-	0.00082	-	0.00134	0.00123	0.00173	0.00041	0.00188	0.00032	-	0.00121	0.00034	0.00047	0	-
	Min	<0.0009	<0.0008	<0.001	<0.001	<0.001	<0.0008	<0.0009	<0.001	<0.001	<0.0008	<0.0009	<0.001	<0.001	<0.001	<0.0008	<0.0009	<0.001	0.001
	Max	<0.002	0.005	0.003	<0.001	0.003	<0.001	0.005	0.005	0.006	0.002	0.007	0.002	<0.002	0.004	0.002	0.002	0.001	0.001
	<MDL	4	8	5	9	3	10	6	5	7	6	7	6	10	4	5	5	7	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Thorium-230 (Bq/g)	Average	0.0025	0.0020	0.0022	0.0022	0.0030	0.0020	0.0020	0.0022	0.0026	0.0020	0.0024	0.0020	0.0028	0.0020	0.0019	0.0021	0.0025	0.0040
	S.D.	-	-	0.0004	-	-	-	-	-	-	-	0.0007	-	-	0	-	-	0.0005	-
	Min	<0.002	<0.002	<0.002	<0.002	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.002	0.004
	Max	<0.003	<0.002	0.003	<0.003	<0.003	<0.002	<0.002	<0.003	<0.003	<0.002	0.004	<0.002	<0.003	0.002	<0.002	<0.003	0.003	0.004
	<MDL	4	10	9	9	4	10	10	10	8	7	9	10	10	5	10	8	6	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1

APPENDIX B, TABLE 27

Fish bone chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	Far-Field Exposure Areas																	
		Cochrane River					Crackingstone Inlet			Fond du Lac River					Waterbury Lake				
		LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	WSU	LSU	LT	LW	NP	WSU
Trace Elements																			
Antimony	Average	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Max	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	<MDL	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Arsenic	Average	0.108	0.095	0.090	0.034	0.060	0.287	0.235	0.130	0.106	0.093	0.151	0.036	0.066	0.040	0.087	0.053	0.030	0.040
	S.D.	0.025	0.046	0.045	0.005	0.024	0.073	0.152	0.027	0.035	0.026	0.075	0.017	0.024	0.013	0.033	0.038	0.012	-
	Min	0.08	0.04	0.03	0.03	0.03	0.16	0.03	0.08	0.06	0.05	0.05	<0.02	0.04	0.03	0.03	0.02	<0.02	0.04
	Max	0.14	0.18	0.16	0.04	0.08	0.39	0.51	0.17	0.18	0.12	0.28	0.07	0.12	0.06	0.13	0.13	0.05	0.04
	<MDL	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	2	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Beryllium	Average	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	<MDL	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Cobalt	Average	0.015	0.015	0.017	0.012	0.015	0.01	0.022	0.014	0.020	0.010	0.018	0.018	0.021	0.012	0.011	0.014	0.013	0.020
	S.D.	0.006	0.005	0.007	0.004	0.006	0	0.006	0.005	0.008	0	0.006	0.004	0.006	0.004	0.003	0.005	0.005	-
	Min	<0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.01	0.01	0.01	0.01	0.02
	Max	0.02	0.02	0.03	0.02	0.02	0.01	0.03	0.02	0.03	0.01	0.03	0.02	0.03	0.02	0.02	0.02	0.02	0.02
	<MDL	1	5	0	3	0	1	0	0	0	0	0	0	0	1	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Strontium	Average	61	39	100	41	62	82	202	88	78	55	122	50	68	139	116	211	108	167
	S.D.	27	4	16	6	10	23	60	11	31	5	21	5	9	38	12	47	19	-
	Min	36	33	79	34	50	49	76	75	45	48	95	44	54	83	95	166	75	167
	Max	88	46	118	52	74	120	286	113	127	62	156	60	86	201	132	297	134	167
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1
Vanadium	Average	0.050	0.050	0.126	0.050	0.050	0.050	0.373	0.053	0.059	0.050	0.120	0.050	0.050	0.050	0.050	0.114	0.050	0.050
	S.D.	-	-	0.067	-	0	-	0.642	0.009	0.014	-	0.118	-	-	-	-	0.070	-	-
	Min	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06	<0.05	<0.05
	Max	<0.05	<0.05	0.26	<0.05	0.05	<0.05	2	0.08	0.08	<0.05	0.41	<0.05	<0.05	<0.05	<0.05	0.25	<0.05	<0.05
	<MDL	4	10	1	9	3	10	3	8	5	7	5	10	10	6	10	0	8	1
	N	4	10	10	9	4	10	10	10	8	7	10	10	10	6	10	8	8	1

APPENDIX B, TABLE 27

Fish bone chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	References														Pooled References				
		Bobby's Lake[2]		Cree Lake					Ellis Bay			Pasfield Lake								
		NP	WSU	LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	LSU	LT	LW	NP	WSU
Metals																				
Aluminum	Average	0.46	0.16	0.6	0.8	1.2	0.5	0.6	0.6	2.8	0.5	0.5	0.5	0.8	0.5	0.6	0.6	1.5	0.5	0.5
	S.D.	0.31	0.15	0.3	0.9	0.8	-	0.3	0.3	0.9	-	0.1	0	0.1	0.1	0.3	0.5	1.1	0.2	0.3
	Min	0.22	<0.02	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.6	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.22	<0.02
	Max	1.00	0.37	1.6	3.3	3	<0.5	1.4	1.6	4.2	<0.5	0.7	0.5	1	0.6	1.6	3.3	4.2	1	1.4
	<MDL	0	1	8	9	2	5	7	7	0	5	5	8	0	2	13	24	2	12	8
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Barium	Average	4.7	3.48	8.4	1.8	5.3	6.5	8.9	1.1	12.5	5.3	5.4	1.5	4.4	4.2	7.3	1.4	6.9	5.3	7.4
	S.D.	2.2	1.98	2.4	0.3	1.4	1.4	3.2	0.3	4.5	0.4	1.3	0.2	0.7	0.8	2.5	0.4	4.2	1.6	3.8
	Min	2.0	1.90	5.6	1.3	3.2	4.6	5.4	0.7	8	4.9	4.1	1.2	3.6	3.7	4.1	0.7	3.2	2.0	1.9
	Max	7.8	6.10	14	2.3	7.7	8.5	16	1.6	20	5.8	7.5	1.7	5.6	5.1	14.0	2.3	20.0	8.5	16.0
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Boron	Average	0.5	0.5	0.8	0.5	0.9	0.5	0.9	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.5	0.6	0.5	0.8
	S.D.	-	-	0.4	-	0.4	-	0.4	0.1	-	-	-	-	-	-	0.4	0.1	0.3	-	0.4
	Min	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	Max	<0.5	<0.5	1.4	<0.5	1.4	<0.5	1.4	0.8	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.4	0.8	1.4	<0.5	1.4
	<MDL	5	4	6	10	5	5	5	9	7	5	6	10	10	3	12	29	22	18	9
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Cadmium	Average	0.01	0.010	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	<MDL	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Chromium	Average	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.62	0.21	0.52	0.2	0.4	0.2	0.3	0.2	0.2
	S.D.	-	-	-	-	-	-	-	-	-	-	1.02	0.03	1.01	-	0.63	0.02	0.62	-	-
	Min	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Max	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	2.7	0.3	3.4	<0.2	2.7	0.3	3.4	<0.2	<0.2
	<MDL	5	4	10	10	10	5	10	10	7	5	5	9	9	3	15	29	26	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Copper	Average	0.24	0.32	0.37	0.14	0.17	0.19	0.38	0.17	0.16	0.21	0.29	0.14	0.14	0.16	0.34	0.15	0.16	0.21	0.36
	S.D.	0.08	0.04	0.24	0.08	0.13	0.04	0.15	0.05	0.07	0.04	0.09	0.06	0.07	0.05	0.20	0.06	0.09	0.06	0.13
	Min	0.18	0.26	0.21	0.04	0.04	0.14	0.25	0.08	0.09	0.19	0.15	0.04	0.04	0.12	0.15	0.04	0.04	0.12	0.25
	Max	0.39	0.35	1.00	0.31	0.36	0.24	0.65	0.26	0.27	0.28	0.4	0.23	0.25	0.22	1.00	0.31	0.36	0.39	0.65
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Iron	Average	4.3	4.9	8.3	4.9	6.5	3.4	10.9	3.6	5.3	2.4	4.4	5.0	11.4	2.9	6.8	4.5	8.0	3.3	9.2
	S.D.	0.7	0.8	3.9	1.3	3.1	1.8	8.3	1.7	1.5	0.8	1.8	1.0	16.7	0.8	3.8	1.5	10.4	1.3	7.5
	Min	3.6	3.9	3	2.7	3.6	1.8	2.2	1.8	3.6	1.5	2.3	3.6	3.6	2	2.3	1.8	3.6	1.5	2.2
	Max	5.5	5.7	15	7.3	14	6.5	26	7.2	8.3	3.2	7.1	6	58	3.4	15.0	7.3	58.0	6.5	26.0
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Lead	Average	0.01	0.01	0.01	0.01	0.018	0.01	0.012	0.01	0.040	0.01	0.017	0.01	0.035	0.01	0.01	0.01	0.03	0.01	0.01
	S.D.	-	-	0	-	0.008	0	0.004	0	0.026	-	0.008	0	0.008	-	0.006	0	0.017	0	0.004
	Min	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	<0.01	<0.01	0.01	<0.01	0.03	0.01	0.02	0.01	0.08	<0.01	0.03	0.01	0.05	<0.01	0.03	0.01	0.08	0.01	0.02
	<MDL	5	4	9	10	2	4	7	9	1	5	2	9	0	3	11	28	3	17	11
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14

APPENDIX B, TABLE 27

Fish bone chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	References														Pooled References				
		Bobby's Lake[2]		Cree Lake					Ellis Bay			Pasfield Lake								
		NP	WSU	LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	LSU	LT	LW	NP	WSU
Manganese	Average	18.2	32.0	108.3	3.3	21.7	31.0	72.9	1.1	16.6	11.2	21.3	3.3	7.7	9.1	75.7	2.6	15.2	18.3	61.2
	S.D.	7.5	11.8	37.8	1.0	12.4	15.2	34.6	0.6	6.9	2.5	6.7	1.4	1.6	2.5	52.6	1.4	10.2	12.1	35.1
	Min	8.8	22.0	38	1.8	4.5	16	28	0.46	6.2	8.6	10	1.5	5.5	7.4	10.0	0.5	4.5	7.4	22.0
	Max	29.0	45.0	159	4.8	39	49	153	2.1	29	15	30	6.2	10	12	159.0	6.2	39.0	49.0	153.0
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Mercury	Average	-[6]	-[6]	0.011	0.064	0.012	0.010	0.010	0.035	0.016	0.016	0.010	0.061	0.010	0.013	0.01	0.05	0.01	0.01	0.01
	S.D.	-[6]	-[6]	0.003	0.068	0.004	0	-	0.015	0.008	0.005	0	0.036	-	0.006	0.003	0.045	0.005	0.005	-
	Min	-[6]	-[6]	<0.01	0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
	Max	-[6]	-[6]	0.02	0.23	0.02	0.01	<0.01	0.06	0.03	0.02	0.01	0.14	<0.01	0.02	0.02	0.23	0.03	0.02	<0.01
	<MDL	-[6]	-[6]	6	0	4	1	10	0	1	2	5	0	10	1	11	0	15	4	10
	N	-[6]	-[6]	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	13	10
Molybdenum	Average	0.05	0.07	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.06
	S.D.	-	0.03	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02
	Min	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Max	<0.05	0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.12
	<MDL	5	2	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	12
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Nickel	Average	0.09	0.08	0.08	0.09	0.09	0.07	0.09	0.08	0.09	0.07	0.08	0.10	0.11	0.10	0.08	0.09	0.09	0.08	0.09
	S.D.	0.03	0.02	0.03	0.03	0.03	0.02	0.05	0.04	0.03	0.01	0.03	0.01	0.08	0.02	0.03	0.03	0.05	0.02	0.04
	Min	0.05	0.06	0.04	0.05	0.04	0.05	0.03	0.04	0.06	0.06	0.06	0.08	0.06	0.09	0.04	0.04	0.04	0.05	0.03
	Max	0.12	0.10	0.13	0.13	0.15	0.1	0.19	0.19	0.13	0.08	0.14	0.12	0.31	0.12	0.14	0.19	0.31	0.12	0.19
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Selenium	Average	0.16	0.19	0.26	0.21	0.33	0.16	0.17	0.12	0.22	0.12	0.20	0.27	0.22	0.14	0.24	0.20	0.26	0.14	0.18
	S.D.	0.04	0.08	0.02	0.03	0.12	0.02	0.02	0.02	0.02	0.01	0.04	0.02	0.05	0.02	0.04	0.07	0.09	0.03	0.05
	Min	0.12	0.10	0.21	0.17	0.2	0.15	0.14	0.08	0.21	0.11	0.16	0.24	0.18	0.12	0.16	0.08	0.18	0.11	0.10
	Max	0.21	0.27	0.29	0.27	0.55	0.19	0.21	0.16	0.25	0.12	0.28	0.32	0.33	0.16	0.29	0.32	0.55	0.21	0.27
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Silver	Average	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	<MDL	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Thallium	Average	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.026	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	S.D.	-	-	-	-	-	-	-	0.008	-	0	-	-	-	-	-	0.006	-	0	-
	Min	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Max	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	0.02	<0.02
	<MDL	5	4	10	10	10	5	10	4	7	4	6	10	10	3	16	24	27	17	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Tin	Average	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	Max	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
	<MDL	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14

APPENDIX B, TABLE 27

Fish bone chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	References														Pooled References				
		Bobby's Lake[2]		Cree Lake					Ellis Bay			Pasfield Lake								
		NP	WSU	LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	LSU	LT	LW	NP	WSU
Titanium	Average	0.26	0.26	0.31	0.30	0.27	0.35	0.32	0.26	0.32	0.33	0.25	0.32	0.26	0.40	0.29	0.29	0.28	0.33	0.30
	S.D.	0.07	0.05	0.08	0.03	0.04	0.08	0.10	0.05	0.09	0.05	0.07	0.06	0.04	0.24	0.08	0.05	0.06	0.11	0.09
	Min	0.17	0.23	0.22	0.25	0.22	0.27	0.2	0.18	0.19	0.26	0.14	0.25	0.18	0.22	0.14	0.18	0.18	0.17	0.20
	Max	0.32	0.33	0.45	0.37	0.33	0.44	0.5	0.34	0.44	0.39	0.36	0.45	0.31	0.67	0.45	0.45	0.44	0.67	0.50
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Uranium	Average	0.01	0.01	0.011	0.010	0.011	0.010	0.010	0.058	0.586	0.010	0.010	0.010	0.010	0.010	0.01	0.03	0.16	0.01	0.01
	S.D.	-	0	0.003	-	0.003	-	-	0.152	0.213	-	-	-	-	-	0.003	0.088	0.277	-	0
	Min	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.26	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	<0.01	0.01	0.02	<0.01	0.02	<0.01	<0.01	0.49	0.87	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.49	0.87	<0.01	0.01
	<MDL	5	3	9	10	8	5	10	9	0	5	6	10	10	3	15	29	18	18	13
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Zinc	Average	55.4	17.0	30.1	25.7	43.9	49.8	26.0	22.5	28.4	60.2	23.7	27.9	44.3	57.0	27.7	25.4	40.0	55.4	23.4
	S.D.	11.2	3.2	7.1	3.9	12.0	8.0	7.9	4.3	5.5	3.8	1.5	4.8	12.3	16.4	6.4	4.8	12.6	9.8	8.0
	Min	45	13	23	19	27	40	16	16	21	55	22	20	29	39	22	16	21	39.0	13
	Max	74	20	43	32	60	59	38	28	38	65	26	36	70	71	43	36	70	74.0	38
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Physical Properties																				
Moisture (%)	Average	-[7]	-[7]	54	55	57	52	51	50	53	53	53	56	60	55	53.5	53.6	57.2	53.0	50.7
	S.D.	-[7]	-[7]	4	3	4	7	5	3	3	2	4	3	2	4	4.1	3.9	4.2	4.5	4.7
	Min	-[7]	-[7]	46	51	49	44	44	45	50	50	46	49	57	50	46.1	45.4	48.7	43.9	44.4
	Max	-[7]	-[7]	61	60	63	63	58	57	57	55	58	60	63	59	60.8	60.2	63.1	62.6	57.7
	<MDL	-[7]	-[7]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	-[7]	-[7]	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	13	10
Radionuclides																				
Lead-210 (Bq/g)	Average	0.002	0.002	0.0020	0.0020	0.0022	0.0020	0.0022	0.0021	0.0027	0.0020	0.0027	0.0024	0.0049	0.0020	0.002	0.002	0.003	0.002	0.002
	S.D.	-	-	-	-	0.0004	-	-	0.0003	-	-	0.0012	0.0007	0.0028	-	0.0008	0.0005	0.0022	-	-
	Min	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Max	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.004	0.003	<0.005	<0.002	0.005	0.004	0.012	<0.002	0.005	0.004	0.012	<0.002	<0.004
	<MDL	5	4	10	10	9	5	10	9	7	5	4	7	0	3	14	26	16	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Polonium-210 (Bq/g)	Average	0.0010	0.0011	0.00321	0.00059	0.00374	0.00074	0.00229	0.00048	0.00181	0.00054	0.01233	0.00088	0.01250	0.00107	0.0066	0.0007	0.0065	0.0008	0.0020
	S.D.	0.0006	0.0006	0.00375	0.00019	0.00277	0.00021	0.00096	-	0.00111	0.00009	0.00763	0.00044	0.00455	0.00081	0.0070	0.0003	0.0057	0.0005	0.0010
	Min	<0.0005	0.0006	0.0005	<0.0005	<0.0005	<0.0005	0.0009	<0.0004	0.0007	<0.0005	0.0060	<0.0005	0.0060	<0.0005	0.0005	<0.0004	<0.0005	<0.0005	0.0006
	Max	0.0020	0.0020	0.0130	0.0010	0.0080	0.0010	0.0040	<0.0005	0.0040	0.0007	0.0230	0.0020	0.0200	0.0020	0.0230	0.0020	0.0200	0.0020	0.0040
	<MDL	1	0	0	7	1	1	0	10	0	4	0	2	0	1	0	19	1	7	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Radium-226 (Bq/g)	Average	0.001	0.0015	0.00210	0.00097	0.00108	0.00120	0.00130	0.00092	0.00113	0.00100	0.00200	0.00095	0.00164	0.00097	0.0021	0.0009	0.0013	0.0011	0.0014
	S.D.	0	-	0.00281	0.00005	0.00033	-	0.00095	-	0.00039	-	0.00200	0.00007	0.00075	-	0.0025	0.0001	0.0006	0.0002	0.0008
	Min	<0.001	<0.001	<0.001	<0.0009	<0.0008	<0.001	<0.001	<0.0008	<0.0009	<0.001	<0.001	<0.0008	<0.0006	<0.0009	<0.001	<0.0008	<0.0006	<0.0009	<0.001
	Max	0.001	<0.002	0.010	0.001	0.002	<0.002	0.004	<0.001	0.002	<0.001	0.006	0.001	0.003	<0.001	0.0100	0.0010	0.0030	0.0020	0.0040
	<MDL	3	4	6	8	7	5	9	10	6	5	2	8	3	3	8	26	16	16	13
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Thorium-230 (Bq/g)	Average	0.002	0.003	0.0021	0.0021	0.0020	0.0024	0.0023	0.0020	0.0020	0.0028	0.0022	0.0019	0.0020	0.0023	0.002	0.002	0.002	0.0024	0.003
	S.D.	-	-	-	-	-	-	-	-	-	0.0013	-	-	-	-	-	-	-	0.0008	-
	Min	<0.002	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.002	<0.002	<0.001	<0.002	<0.002	<0.002
	Max	<0.002	<0.003	<0.003	<0.003	<0.002	<0.003	<0.003	<0.002	<0.002	0.005	<0.003	<0.002	<0.002	<0.003	<0.003	<0.003	<0.002	0.005	<0.003
	<MDL	5	4	10	10	10	5	10	10	7	4	6	10	10	3	16	30	27	17	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14

APPENDIX B, TABLE 27

Fish bone chemistry descriptive statistics for the EARMP technical program, 2011 and 2012.

Parameter[1]	Data	References														Pooled References				
		Bobby's Lake[2]		Cree Lake					Ellis Bay			Pasfield Lake								
		NP	WSU	LSU	LT	LW	NP	WSU	LT	LW	NP	LSU	LT	LW	NP	LSU	LT	LW	NP	WSU
Trace Elements																				
Antimony	Average	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Max	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	<MDL	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Arsenic	Average	0.02	0.02	0.035	0.049	0.061	0.026	0.041	0.246	0.326	0.148	0.058	0.068	0.051	0.027	0.04	0.12	0.13	0.06	0.04
	S.D.	0.004	-	0.016	0.029	0.033	0.009	0.013	0.083	0.074	0.076	0.024	0.020	0.013	0.006	0.02	0.10	0.13	0.07	0.01
	Min	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.02	0.16	0.18	0.1	0.03	0.03	0.04	0.02	<0.02	<0.02	0.02	<0.02	<0.02
	Max	0.03	<0.02	0.06	0.11	0.11	0.04	0.07	0.44	0.41	0.28	0.1	0.1	0.08	0.03	0.10	0.44	0.41	0.28	0.07
	<MDL	4	4	2	1	0	2	0	0	0	0	0	0	0	0	2	1	0	6	4
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Beryllium	Average	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	S.D.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Min	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Max	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	<MDL	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Cobalt	Average	0.02	0.02	0.019	0.017	0.017	0.016	0.019	0.011	0.020	0.018	0.017	0.017	0.017	0.013	0.02	0.02	0.02	0.02	0.02
	S.D.	0.009	0.01	0.007	0.005	0.005	0.005	0.006	0.003	0	0.004	0.008	0.005	0.007	0.006	0.008	0.005	0.005	0.006	0.005
	Min	0.01	0.01	0.01	0.01	0.01	0.01	0.01	<0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	<0.01	0.01	0.01	0.01
	Max	0.03	0.02	0.03	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.03	0.02	0.03	0.02	0.03	0.02	0.03	0.03	0.03
	<MDL	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Strontium	Average	82.2	80.25	190	137	229	143	195	82	221	106	191	176	298	184	190	132	252	123	163
	S.D.	29.4	33.33	50	26	55	22	77	19	41	8	23	16	34	30	41	44	56	42	85
	Min	50.0	50.00	126	102	148	113	121	54	156	95	169	151	252	164	126	54	148	50	50
	Max	120.0	123.00	275	173	315	170	388	110	287	116	233	193	356	218	275	193	356	218	388
	<MDL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14
Vanadium	Average	0.05	0.05	0.051	0.050	0.073	0.060	0.050	0.050	0.183	0.050	0.050	0.050	0.138	0.050	0.05	0.05	0.13	0.05	0.05
	S.D.	-	-	0.003	-	0.036	0.022	-	-	0.114	-	-	-	0.037	-	0.002	-	0.077	0.012	-
	Min	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
	Max	<0.05	<0.05	0.06	<0.05	0.14	0.1	<0.05	<0.05	0.39	<0.05	<0.05	<0.05	0.21	<0.05	0.06	<0.05	0.39	0.10	<0.05
	<MDL	5	4	9	10	6	4	10	10	1	5	6	10	0	3	15	30	7	17	14
	N	5	4	10	10	10	5	10	10	7	5	6	10	10	3	16	30	27	18	14

S.D.: standard deviation; Min: minimum; Max: maximum; <MDL: number of samples with concentrations measured at less than the method detection limit; N: total number of samples (sample size).

LSU: longnose sucker; LT: lake trout; LW: lake whitefish; NP: northern pike; WSU: white sucker.

For values measured at less than the method detection limit (MDL), all computations were performed with values set at the MDL.

[1]All concentrations and activity levels are presented in µg/g on a wet weight basis, except when specified otherwise.

[2]No fish chemistry data were available for Bobby's Lake in 2011 and 2012; the 2009 fish chemistry data were used as a substitute.

[3]When all values were less than the method detection limit (MDL), standard deviations were not computed.

[4]Standard deviations of 0 signify no variation, not a very small value.

[5]Mercury was not measured in two LSU and 1 LW in 2012 in Cochrane River because SRC disposed of the samples without taking these measurements.

[6]No mercury data were available for Bobby's Lake.

[7]Moisture was not available for Bobby's Lake samples.

APPENDIX C

QA/QC METHODS AND RESULTS

APPENDIX C: QA/QC METHODS AND RESULTS

INTRODUCTION

All sample collection and handling procedures, including preservation, shipping, and laboratory analyses followed appropriate Standard Operating Procedures (SOPs) and quality assurance/quality control (QA/QC) protocols. CanNorth's SOPs were developed using methods and procedures described in the Metal Mining Environmental Effects Monitoring (EEM) Guidance Document (EC 2012), primary literature, the Environmental Monitoring Guidelines for Operational Monitoring at Uranium and Gold Mining and Milling Operations in Saskatchewan (SEPS 1989), and by standard-setting organizations such as the United States Environmental Protection Agency (U.S. EPA). CanNorth's SOPs are compiled into field manuals which are carried by the field staff on each survey. All SOPs and field data sheets are reviewed annually to ensure they contain up to date information and to meet the requirements of our ISO 9001 certification.

All chemistry samples were analyzed by the Saskatchewan Research Council (SRC) in Saskatoon. The SRC Analytical Laboratories are certified and accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA). As such, the SRC laboratories adhere to strict QA/QC standards and protocols. With each set of samples run, SRC tests reference materials, duplicates, and spiked samples.

METHODS

Water Quality

Some of the specific QA/QC methods employed during the water quality sampling program included:

- accuracy of limnology measurements – the YSI meters underwent calibration by the manufacturer (annually), before every field trip, and frequently while in the field; back-up surface pH measurements were taken using a Hach kit;
- sampling remedial actions – samples were discarded if the sampling quality control measures were not met (e.g., discarding water samples if sediment was disturbed);
- contamination control – the sampling equipment was cleaned prior to the start of sampling and was rinsed on completion of sample collection at each sampling station;

- sample shipping – chain-of-custody forms were used in the transportation of samples so the samples could be tracked from the field to the laboratory; and,
- use of blanks and field duplicate samples:
    - A field blank was used to check contamination from all potential sources of contamination in the field (EC 2012). A field blank sample was collected by bringing deionized water in the field that was supplied by the lab. The field blank sample underwent the same sample collection, handling, and processing steps as the test samples. One field blank sample was collected per sampling season.
    - A trip blank sample was used to check contamination from sample bottles, caps, and preservatives during transport, storage, and analyses (EC 2012). The sample bottle was filled with deionized water in the laboratory, and it was preserved in the same manner as the test samples. The trip blank sample was transported to and from the field without modification and was opened at the time of analyses. One trip blank sample was collected per sampling season.
    - A field duplicate sample was taken to ensure that sampling and laboratory analyses produced repeatable results (EC 2012). At least one duplicate water sample was collected per sampling season with a minimum frequency of 10% of the water quality sampling stations.

Sediment Quality

Some of the specific QA/QC methods employed during the sediment sampling program included:

- sampling remedial actions – samples were discarded if the sampling quality control measures were not met (e.g., sediment was overflowing out of the top of the core tube);
- contamination control – the sampling equipment was cleaned prior to the start of sampling (all core tubes were acid washed by SRC) and a new core tube was used at each waterbody;
- sample shipping – chain-of-custody forms were used in the transportation of samples so the samples could be tracked from the field to the laboratory; and,
- use of duplicate samples:

- Field duplicate samples were taken at a frequency of approximately 10% of the samples collected to ensure that sampling and laboratory analyses produced repeatable results (EC 2012).

Benthic Invertebrate Community

Benthic invertebrate taxonomic identification and enumeration was completed by Dr. Jack Zloty, Professor Emeritus from the University of Calgary based in Summerland, British Columbia. The QA/QC program for the collection of benthic invertebrate community data included a verification of sorting efficiency in approximately 10% of the randomly selected samples as recommended in Glozier et al. (2002). This involved a re-examination of the sample residue for the selected samples under a dissecting microscope to recover any organisms that may have been missed in the initial sorting. The criteria for an acceptable sort are that more than 90% of the total number of organisms is picked during the initial sort (Glozier et al. 2002). If more than 10% of organisms are found during the re-sort, then all the samples within that particular batch of samples requires re-sorting. Another criterion that requires a re-sort is if the entire taxonomic group of invertebrates was overlooked during the initial sort, even if the number of missed organisms constituted less than 10% of the total number of organisms in a sample. If the sorting efficiency was acceptable (>90%), then the re-sorted organisms were left out of any further analysis because they are not part of the complete sorting process.

The effects of sub-sampling on abundance estimates were examined on approximately 10% of benthic invertebrate samples that underwent sub-sampling. The randomly selected samples had the remaining unsorted material sorted in its entirety. The estimates were then compared to the actual counts and the accuracy of the estimates was calculated. If the error exceeded 20% for any group of samples, all samples within that group of samples were completely sorted to assure the sub-sampling process was not compromising data integrity (EC 2012).

RESULTS

For the water and sediment samples, the Relative Percent Difference (RPD) was calculated between the duplicates and the Data Quality Objective (DQO) for the RPDs was set at 40%. The intent of applying this 40% value was to provide a benchmark for the initial data screening process, which determined whether the results were acceptable or required further investigation. It is estimated that at concentrations near the detection limit (DL), measurement uncertainty is very high, often approaching 100% at concentrations within five times the DL (J. Zimmer, SRC, pers. comm. 2013). Thus, RPDs of greater than 40% were only considered a potential issue if the test and duplicate results were greater than five times the DL and outside the range of laboratory precision. Similarly, analyte concentrations in the field and trip blank samples should be at or below the DL since they are composed of deionized water. Thus if analyte concentrations were greater than five times the DL in the field and trip blank samples they were further investigated. It is noted that the deionized water that was used to prepare the blank samples can absorb carbon dioxide (CO_2) from the air resulting in low pH in the blank samples (J. Zimmer, SRC, pers. comm. 2011). Therefore, discrepancies between pH values measured in the blank samples and the DLs are not considered as errant.

Further investigations involved contacting SRC to re-check values and checking SRC's internal QA/QC results for potential issues with a specific batch of samples. The QA/QC chemistry tables present the DLs, sample precisions, calculated RPDs, identify whether analyte concentrations are higher than five times the DL, and flag analytes that exceed the above mentioned criteria.

Water Chemistry

The water chemistry program QA/QC include two main components: (1) the QA/QC associated with the samples from the original EARMP technical program study area and (2) the QA/QC results associated with Bobby's Lake[1] in 2009 and 2012 and RF-4 in 2008 and 2012.

The SRC QA/QC report concluded that all the 2011 and 2012 QC for the core EARMP technical program study area were within the specified limits and were considered acceptable. In addition to the laboratory QA/QC results, the results of the field duplicate, field blank, and trip blank are presented in Appendix C, Table 1. Of the 54 parameters assessed, 6 (bicarbonate, chloride, lead, zinc, ammonia as nitrogen, and arsenic) had instances where the RPD ≥ 40%. However, several of these concentrations measured at or close to the MDL (<5 times the MDL; chloride, lead, zinc, arsenic) in at least one of the samples, and therefore, these values have a high degree of uncertainty (EC 2012) associated with them. Additionally, the differences between the sample and the duplicate concentrations remained within the margin of error for the remaining parameters when taking into consideration the precision level associated with the measurements (Appendix C, Table 1). Thus, none of the duplicates differed by an RPD ≥ 40% when

[1] Detailed discussion of the inclusion of Bobby's Lake and RF-4 as reference areas into the EARMP technical program is provided in the main document.

considering the precision level of the measurements and the uncertainty of values less than 5 times the MDL. In addition, all analytical results for the field blank and trip blank samples were low or non-detectable. Therefore, these water chemistry results were considered acceptable.

For Bobby's Lake and RF-4, the SRC QA/QC analyses, trip blanks, field blanks, and field duplicates were also performed and no irregularities were identified (CanNorth 2009; CanNorth 2010; CanNorth 2013a; CanNorth 2013b). The water chemistry results for Bobby's Lake and RF-4 presented herein were thus deemed accurate.

Sediment Chemistry

Similar to the water quality program, the sediment chemistry QA/QC results include two main components: (1) the QA/QC associated with the samples from the original EARMP technical program study area and (2) the QA/QC results associated with Bobby's Lake[2] in 2009 and 2012 and RF-4 in 2008 and 2012.

The SRC QA/QC report concluded that all the 2011 and 2012 QC for the core EARMP technical program study area were within the specified limits and were considered acceptable. In addition to these laboratory QA/QC results, the results of the field duplicates from 2011 and 2012 are presented in Appendix B, Table 4. A 40% RPD was used as a threshold to compare duplicate sample COPC concentrations to primary sample values. There were 10 instances where the RPD was ≥ 40% (Appendix C, Table 4). However, in most cases, the difference between the two values was within the margin of error associated to the precision of the measurement, because they were at or close to the MDL (<5 times the DL; boron, tin, lead-210, radium-226, thorium-230, antimony) in at least one of the two duplicated samples, and therefore, these values have a high degree of uncertainty (EC 2012). The only exceptions were manganese, zinc, and loss on ignition (LOI) in 2011, where the differences between the sample and the duplicate exceeded the margin of error associated to the precision of the measurements. The difference between the test values and field duplicates were attributed to heterogeneity within the sampling station in accordance with Environment Canada (2012). Thus, the 2011 and 2012 sediment chemistry results are deemed acceptable.

[2] Detailed discussion of the inclusion of Bobby’s Lake and RF-4 as reference areas into the EARMP technical program is provided in the main document.

In Bobby's Lake and RF-4, the SRC QA/QC analyses during laboratory chemical analysis and field duplicates were also performed and no irregularities were identified (CanNorth 2009; CanNorth 2010; CanNorth 2013a; CanNorth 2013b). The sediment chemistry results for Bobby's Lake and RF-4 were therefore deemed acceptable.

Benthic Invertebrates

As part of the QA/QC program for benthic invertebrate data, the re-sorting of sample residues was conducted on approximately 10% of the samples to determine the level of sorting efficiency. Five samples were randomly selected for the re-sort. Results of the re-sort are detailed in Appendix C, Table 3. The sorting efficiencies were equal to, or greater than, 98.5%, as required by Environment Canada for benthic invertebrate community surveys (EC 2012). Thus, these results satisfied the DQO objective of less than 10% of organisms missed in the initial sorting.

LITERATURE CITED

Canada North Environmental Services (CanNorth). 2009. Rabbit Lake Operation 2008 comprehensive aquatic environment monitoring report. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

Canada North Environmental Services (CanNorth). 2010. Millennium Project 2009 additional aquatic baseline investigations. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

Canada North Environmental Services (CanNorth). 2013a. Wheeler River aquatic studies program. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

Canada North Environmental Services (CanNorth). 2013b. Rabbit Lake Operation 2012 environment monitoring program. Prepared for Cameco Corporation, Saskatoon, Saskatchewan.

Environment Canada (EC). 2012. Metal mining technical guidance for environmental effects monitoring. Environment Canada, National Environmental Effects Monitoring Office, Science Policy and Environmental Quality Branch, Ottawa, Ontario.

Glozier N.E., J.M. Culp, and D. Halliwell. 2002. Revised guidance for sample sorting and subsampling protocols for EEM benthic invertebrate community surveys. Environment Canada, Saskatoon, Saskatchewan.

Saskatchewan Environment and Public Safety (SEPS). 1989. Environmental monitoring guidelines (for operational monitoring at uranium and gold mining and milling operations in Saskatchewan), Saskatchewan Environment and Public Safety, Mines Pollution Control Branch.

LIST OF TABLES

APPENDIX C, TABLE 1

Water chemistry QA/QC results for the EARMP technical program, 2011-2012.

Parameter[1]	2011									2012								
	Concentration					Precision				Concentration					Precision			
	Sample	Duplicate	RPD[2] (%)	Field Blank	Trip Blank	Sample	Duplicate	Field Blank	Trip Blank	Sample	Duplicate	RPD[2] (%)	Field Blank	Trip Blank	Sample	Duplicate	Field Blank	Trip Blank
Inorganic Ions																		
Bicarbonate	21	17	21.1	<1	<1	4	4	-	-	17	26	**41.9**	<1	<1	4	5	-	-
Calcium	3.4	3.3	3.0	<0.1	<0.1	0.4	0.4	-	-	3.5	3.4	2.9	<0.1	<0.1	0.2	0.2	-	-
Carbonate	<1	<1	0.0	<1	<1	-	-	-	-	<1	<1	0.0	<1	<1	-	-	-	-
Chloride	0.3	0.2	**40.0**	<0.1	<0.1	0.1	0.1	-	-	0.3	0.3	0.0	<0.1	<0.1	0.1	0.1	-	-
Hydroxide	<1	<1	0.0	<1	<1	-	-	-	-	<1	<1	0.0	<1	<1	-	-	-	-
Magnesium	0.9	0.8	11.8	<0.1	<0.1	0.1	0.1	-	-	1	1	0.0	<0.1	<0.1	0.1	0.1	-	-
Potassium	0.6	0.6	0.0	<0.1	<0.1	0.2	0.2	-	-	0.6	0.7	15.4	<0.1	<0.1	0.2	0.2	-	-
Sodium	1.4	1.3	7.4	<0.1	<0.1	0.2	0.1	-	-	1.4	1.4	0.0	<0.1	<0.1	0.1	0.1	-	-
Sulfate	4.4	4	9.5	<0.2	<0.2	0.7	0.7	-	-	4	4.1	2.5	<0.2	<0.2	0.4	0.4	-	-
Metals																		
Aluminum	0.012	0.0086	33.0	<0.0005	<0.0005	0.002	0.002	-	-	0.0058	0.005	14.8	<0.0005	<0.0005	0.002	0.001	-	-
Barium	0.0046	0.0047	2.2	<0.0005	<0.0005	0.001	0.001	-	-	0.004	0.0042	4.9	<0.0005	<0.0005	-	-	-	-
Boron	<0.01	<0.01	0.0	<0.01	<0.01	-	-	-	-	<0.01	<0.01	0.0	<0.01	<0.01	-	-	-	-
Cadmium	0.00001	0.00001	0.0	0.00001	0.00002	0.00001	0.00001	0.00001	0.00001	<0.00001	0.00001	0.0	<0.00001	<0.00001	-	0.00001	-	-
Chromium	<0.0005	<0.0005	0.0	<0.0005	<0.0005	-	-	-	-	<0.0005	<0.0005	0.0	<0.0005	<0.0005	-	-	-	-
Copper	<0.0002	<0.0002	0.0	<0.0002	<0.0002	-	-	-	-	<0.0002	<0.0002	0.0	<0.0002	<0.0002	-	-	-	-
Iron	0.03	0.032	6.5	<0.0005	<0.0005	0.003	0.004	-	-	0.023	0.023	0.0	<0.0005	<0.0005	0.003	0.003	-	-
Lead	<0.0001	0.0002	**66.7**	<0.0001	0.0001	-	0.0001	-	0.0001	<0.0001	<0.0001	0.0	<0.0001	<0.0001	-	-	-	-
Manganese	0.0064	0.0066	3.1	<0.0005	<0.0005	0.0008	0.0008	-	-	0.0054	0.0057	5.4	<0.0005	<0.0005	0.001	0.001	-	-
Mercury (µg/L)	<0.01	<0.01	0.0	<0.01	<0.01	-	-	-	-	<0.01	<0.01	0.0	<0.01	<0.01	-	-	-	-
Molybdenum	0.0012	0.0012	0.0	<0.0001	<0.0001	0.0004	0.0004	-	-	0.0012	0.0012	0.0	<0.0001	<0.0001	0.0004	0.0004	-	-
Nickel	<0.0001	<0.0001	0.0	<0.0001	<0.0001	-	-	-	-	<0.0001	0.0001	0.0	<0.0001	<0.0001	-	0.0001	-	-
Selenium	<0.0001	<0.0001	0.0	<0.0001	<0.0001	-	-	-	-	<0.0001	<0.0001	0.0	<0.0001	<0.0001	-	-	-	-
Silver	<0.00005	<0.00005	0.0	<0.00005	<0.00005	-	-	-	-	<0.00005	<0.00005	0.0	<0.00005	<0.00005	-	-	-	-
Thallium	<0.0002	<0.0002	0.0	<0.0002	<0.0002	-	-	-	-	<0.0002	<0.0002	0.0	<0.0002	<0.0002	-	-	-	-
Tin	<0.0001	<0.0001	0.0	<0.0001	<0.0001	-	-	-	-	0.0019	0.0013	37.5	<0.0001	<0.0001	0.0004	0.0003	-	-
Titanium	<0.0002	<0.0002	0.0	<0.0002	<0.0002	-	-	-	-	<0.0002	0.0002	0.0	<0.0002	<0.0002	-	0.0002	-	-
Uranium (µg/L)	<0.1	<0.1	0.0	<0.1	<0.1	-	-	-	-	<0.1	<0.1	0.0	<0.1	<0.1	-	-	-	-
Zinc	<0.0005	<0.0005	0.0	<0.0005	<0.0005	-	-	-	-	<0.0005	0.0008	**46.2**	<0.0005	<0.0005	-	0.0007	-	-
Nutrients																		
Ammonia as nitrogen	0.01	<0.01	0.0	<0.01	<0.01	0.01	-	-	-	<0.01	0.05	**133.3**	<0.01	<0.01	-	0.03	-	-
Nitrate	<0.04	<0.04	0.0	<0.04	<0.04	-	-	-	-	<0.04	<0.04	0.0	<0.04	<0.04	-	-	-	-
Organic carbon	2.9	2.8	3.5	<0.2	<0.2	0.3	0.3	-	-	2.8	2.8	0.0	<0.2	<0.2	0.7	0.7	-	-
Phosphorus	<0.01	<0.01	0.0	<0.01	<0.01	-	-	-	-	<0.01	<0.01	0.0	<0.01	<0.01	-	-	-	-
Total Kjeldahl nitrogen	0.15	0.17	12.5	0.06	0.05	0.09	0.1	0.05	0.05	0.19	0.16	17.1	<0.05	0.1	0.1	0.1	-	0.07
Total nitrogen	0.15	0.17	12.5	0.06	0.05	-	-	-	-	0.19	0.16	17.1	<0.05	0.1	-	-	-	-
Physical Properties																		
P. alkalinity	<1	<1	0.0	<1	<1	-	-	-	-	<1	<1	0.0	<1	<1	-	-	-	-
pH	7.18	7.1	1.1	5.38	5.36	0.1	0.1	0.1	0.1	7.05	7.05	0.0	5.36	5.19	0.1	0.1	0.1	0.1
Specific conductivity (µS/cm)	36	35	2.8	<1	<1	4	3	1	1	33	33	0.0	<1	<1	3	3	1	1
Sum of ions	32	27	16.9	<1	<1	5	5	-	-	28	37	27.7	<1	<1	5	6	-	-

APPENDIX C, TABLE 1

Water chemistry QA/QC results for the EARMP technical program, 2011-2012.

Parameter[1]	2011									2012								
	Concentration					Precision				Concentration					Precision			
	Sample	Duplicate	RPD[2] (%)	Field Blank	Trip Blank	Sample	Duplicate	Field Blank	Trip Blank	Sample	Duplicate	RPD[2] (%)	Field Blank	Trip Blank	Sample	Duplicate	Field Blank	Trip Blank
Total alkalinity	17	14	19.4	<1	<1	2	2	1	1	14	21	40.0	<1	<1	2	2	1	1
Total dissolved solids	30	30	0.0	<1	**2**	5	5	-	1	23	26	12.2	3	4	4	5	2	2
Total hardness	12	12	0.0	<1	<1	3	3	-	-	13	12	8.0	<1	<1	3	3	-	-
Total suspended solids	<1	<1	0.0	<1	<1	-	-	-	-	1	<1	0.0	<1	<1	1	-	-	-
Turbidity (NTU)	0.5	0.5	0.0	<0.1	<0.1	0.1	0.1	-	-	0.2	0.2	0.0	<0.1	<0.1	0.1	0.1	-	-
Radionuclides																		
Lead-210 (Bq/L)	<0.02	<0.02	0.0	<0.02	<0.02	-	-	-	-	<0.02	<0.02	0.0	<0.02	<0.02	-	-	-	-
Polonium-210 (Bq/L)	<0.005	<0.005	0.0	<0.005	<0.005	-	-	-	-	<0.005	<0.005	0.0	<0.005	<0.005	-	-	-	-
Radium-226 (Bq/L)	<0.005	<0.005	0.0	<0.005	<0.005	-	-	-	-	<0.005	<0.005	0.0	<0.005	0.007	-	-	-	0.005
Thorium-230 (Bq/L)	<0.01	<0.01	0.0	<0.01	<0.01	-	-	-	-	<0.01	<0.01	0.0	<0.01	<0.01	-	-	-	-
Trace Elements																		
Antimony	<0.0002	<0.0002	0.0	<0.0002	<0.0002	-	-	-	-	<0.0002	<0.0002	0.0	<0.0002	<0.0002	-	-	-	-
Arsenic (µg/L)	<0.1	0.2	**66.7**	<0.1	<0.1	-	0.1	-	-	<0.1	<0.1	0.0	<0.1	<0.1	-	-	-	-
Beryllium	<0.0001	<0.0001	0.0	<0.0001	<0.0001	-	-	-	-	<0.0001	<0.0001	0.0	<0.0001	<0.0001	-	-	-	-
Cobalt	<0.0001	<0.0001	0.0	<0.0001	<0.0001	-	-	-	-	<0.0001	<0.0001	0.0	<0.0001	<0.0001	-	-	-	-
Fluoride	0.06	0.06	0.0	0.01	<0.01	0.02	0.02	0.01	-	0.05	0.06	18.2	<0.01	<0.01	0.02	0.02	-	-
Strontium	0.012	0.012	0.0	<0.0005	<0.0005	0.002	0.002	-	-	0.012	0.012	0.0	<0.0005	<0.0005	0.002	0.002	-	-
Vanadium	<0.0001	<0.0001	0.0	<0.0001	<0.0001	-	-	-	-	<0.0001	<0.0001	0.0	<0.0001	<0.0001	-	-	-	-

[1]All concentrations are in mg/L, except when specified otherwise.

[2]Relative percent difference (computed as ABS((Duplicate-Sample)/(Duplicate+Sample)/2*100)). ABS = absolute value.

Bold values: RPDs >40%.

APPENDIX C, TABLE 2

Sediment chemistry QA/QC results for the EARMP technical program, 2011-2012.

Parameter[1]	Cochrane River			Crackingstone Inlet			Crackingstone Inlet			Cree Lake			Ellis Bay			Ellis Bay			Pasfield Lake			Waterbury Lake			MDL[3]
	2011			2011			2012			2012			2011			2012			2012			2011			
	5	5D	RPD[2]	1	1D	RPD[2]	1	1D	RPD[2]	4	4D	RPD[2]	3	3D	RPD[2]	3	3D	RPD[2]	3	3D	RPD[2]	4	4D	RPD[2]	
Metals																									
Aluminum	12100	11900	1.7	8600	7700	11.0	7800	6400	4.9	1780	1490	4.4	20300	21600	6.2	16400	14600	2.9	1480	1170	5.8	2300	2400	4.3	20
Barium	82	80	2.5	55	48	13.6	56	48	3.8	24	20	4.5	270	240	11.8	170	180	1.4	18.0	17.0	1.4	24	28	15.4	0.5
Boron	6	5	18.2	8	7	13.3	6.0	5.0	4.5	<1.0	<1.0	0	34	36	5.7	23	21	2.3	<1.0	<1.0	0	2	1	**66.7**	1
Cadmium	0.3	0.4	28.6	<0.1	<0.1	0	<0.1	<0.1	0	0.2	0.2	0	0.4	0.3	28.6	0.3	0.3	0	<0.1	<0.1	0	<0.1	<0.1	0	0.1
Chromium	23	22	4.4	17	15	12.5	16.0	14.0	3.3	3.5	3	3.8	30	32	6.5	26	37	8.7	2.6	1.8	9.1	3.5	4.5	25.0	0.5
Copper	7.8	7.7	1.3	3.6	3.2	11.8	3.7	3.6	0.7	1.8	1.8	0	21	23	9.1	19	20	1.3	1.0	0.7	8.8	0.7	1	35.3	0.5
Iron	20800	19900	4.4	10600	9900	6.8	12700	10400	5.0	3500	3100	3.0	29300	25100	15.4	22200	25900	3.8	2570	2300	2.8	2200	2100	4.7	20
Lead	9.3	9.3	0	4.4	4.2	4.7	4.3	3.9	2.4	3.2	3.2	0	7.8	8.4	7.4	6.4	6	1.6	3.1	2.2	8.5	2.4	2	18.2	0.1
Manganese	280	240	15.4	220	200	9.5	260	200	6.5	170	180	1.4	1600	1000	**46.2**	1170	990	4.2	47	49	1.0	200	220	9.5	20
Molybdenum	5.6	4.9	13.3	0.5	0.5	0	0.7	0.5	8.3	0.2	0.2	0	2	1.7	16.2	2.2	2	2.4	0.2	0.2	0	0.8	0.9	11.8	0.1
Nickel	11	11	0	6.6	6.3	4.7	6.6	5.4	5.0	2.2	2.1	1	22	22	0	18	23	6	1	1	14	1.3	1.7	26.7	0.1
Selenium	0.5	0.6	18.2	0.8	0.7	13.3	0.8	1.0	5.6	0.2	0.3	10.0	0.6	0.7	15.4	0.6	0.6	0	0.1	0.1	0	0.2	0.2	0	0.1
Silver	<0.1	<0.1	0	<0.1	<0.1	0.0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	0.1
Thallium	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	0.2
Tin	0.8	0.7	13.3	0.4	0.4	0	0.4	0.4	0	0.1	<0.1	0	0.8	0.9	11.8	0.8	0.6	7.1	0.1	0.1	0	0.3	0.2	**40.0**	0.1
Titanium	920	880	4.4	720	650	10.2	690	560	5.2	170	130	7	1200	1200	0	1080	980	2	120	78	11	140	170	19.4	20
Uranium	4.3	4.2	2.4	38	32	17.1	46	42	2.3	0.3	0.2	10.0	8.7	9.5	8.8	6.6	7.2	2.2	0.2	0.1	16.7	0.2	0.2	0	0.1
Zinc	41	41	0	15	19	23.5	14	12	3.8	12	12	0	46	48	4.3	37	35	1.4	8.7	6.2	8.4	7.9	13	**48.8**	0.5
Physical Properties																									
LOI (%)	16.41	16.95	3.2	2.46	2.26	8.5	3.5	3.4	0.5	12.1	12.1	0.1	16.84	16.2	3.9	14.1	17.43	5.3	9.4	6.6	8.7	3.12	6.41	**69.0**	0.05
Moisture (%)	92.1	93	0.4	43	41	5.8	47	51	2.1	88	87	0.15	88	87	1.14	88	90	0.53	74	74	0.15	76	82	7.8	0.01
Radionuclides																									
Lead-210 (Bq/g)	0.35	0.36	2.8	0.17	0.12	34.5	0.1	0.08	11.9	0.26	0.17	10.5	0.26	0.28	7.4	0.14	0.19	7.6	0.3	0.2	5.3	0.06	<0.04	**40.0**	0.04
Polonium-210 (Bq/g)	0.37	0.33	11.4	0.14	0.12	15.4	0.2	0.14	3.3	0.25	0.23	2.1	0.26	0.27	3.8	0.17	0.26	10.5	0.3	0.2	11.0	0.06	0.06	0	0.01
Radium-226 (Bq/g)	<0.01	<0.01	0	0.09	0.06	**40.0**	0.2	0.28	10.9	<0.01	0.02	16.7	0.09	0.08	11.8	0.09	0.1	2.6	<0.01	0.01	0	0.02	<0.01	**66.7**	0.01
Thorium-230 (Bq/g)	<0.02	<0.02	0	5	4.1	19.8	4.7	5.40	3.5	0.03	<0.02	10.0	0.05	0.11	**75.0**	<0.02	0.05	21.4	<0.02	<0.02	0	<0.02	<0.02	0	0.02
Trace Elements																									
Antimony	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	0.3	0.3	0	0.3	0.2	10	<0.2	<0.2	0	0.4	<0.2	**66.7**	0.2
Arsenic	2.1	2	4.9	2.6	2.7	3.8	3.5	3.0	3.8	0.9	0.8	2.9	7.5	5.7	27.3	5.6	6.4	3.3	0.8	0.6	7.1	0.7	0.8	13.3	0.1
Beryllium	0.6	0.6	0	0.3	0.3	0	0.3	0.2	10.0	<0.1	<0.1	0	0.7	0.8	13.3	0.5	0.5	0	<0.1	<0.1	0	<0.1	<0.1	0	0.1
Cobalt	3.4	3.3	3.0	2.7	2.5	7.7	2.6	2.2	4.2	0.6	0.6	0	6	6.1	1.7	5.2	4.9	1.5	0.3	0.2	10.0	0.6	0.8	28.6	0.2
Strontium	20	19	5.1	30	29	3.4	32	27	4.2	18	16	2.9	82	88	7.1	69	62	2.7	21.0	18.0	3.8	17	15	12.5	0.5
Vanadium	26	25	3.9	36	33	8.7	34	31	2.3	5.1	4.5	3.1	35	37	5.6	31	29	1.7	4.9	3.7	7.0	5.2	6.3	19.1	0.1

[1]All values are in µg/g, unless specified otherwise.

[2]RPD = ABS((Duplicate-Sample)/(Duplicate+Sample)/2*100)

[3]MDL = Method detection limit.

Bolded RPD values exceed or are equal to 40%.

APPENDIX C, TABLE 3

Benthic invertebrate QA/QC results for the EARMP technical program, 2011-2012.

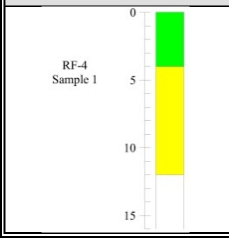
Waterbody	**Replicate Station**	**Number of Organisms**		**Sorting Efficiency (%)**
		Initial Sort	**Re-sort**	
Waterbury Lake (2011)	1	704	9	98.7
Waterbury Lake (2012)	1	555	6	98.9
Cree Lake (2011)	4	940	14	98.5
Fond du Lac River (2011)	4	260	2	99.2
Fond du Lac River (2012)	4	303	4	98.7
Pasfield Lake (2012)	5	1695	20	98.8
Waterbody	**Replicate Station**	**Number of Organisms**		**Subsampling Accuracy (%)**
		Estimated	**Actual**	
Fond du Lac River	2	80	92	13.0
		100	92	-8.7
		104	92	-13.0
		84	92	8.7

Sorting Efficiency = [1-(R / (I + R))] * 100 where, I = # in initial sort, R = # in re-sort.
Subsampling Accuracy = 1-(estimated # in sample / actual # in sample) x 100.
Bolded values indicate exceedances of data quality control limits.

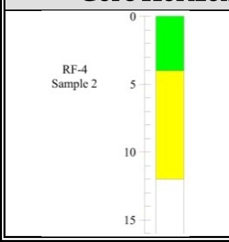
APPENDIX D

CORE LOGS

Project Number	1270	**Waterbody**	Wollaston Lake (Shallow Bay Reference RF-4)
Date	24-Apr-2008	**Area**	1
Personnel	RW/DS	**Station**	1
Equipment	Tech Ops	**Depth (m)**	6.4

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-4 cm	Red brown	Medium	Silt/sand	No	Nil	Black spots
	4-12 cm	Light brown	Firm	Clay	No	Nil	Black streaks

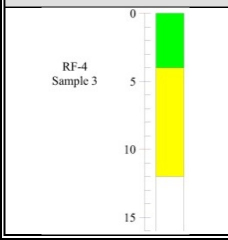
Project Number	1270	**Waterbody**	Wollaston Lake (Shallow Bay Reference RF-4)
Date	24-Apr-2008	**Area**	1
Personnel	RW/DS	**Station**	2
Equipment	Tech Ops	**Depth (m)**	6.3

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-4 cm	Red brown	Medium	Silt/sand	No	Nil	Black spots
	4-12 cm	Light brown	Firm	Clay	No	Nil	Black streaks

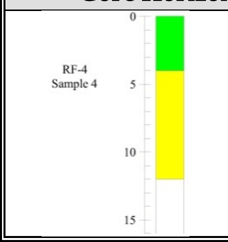
Wollaston Lake (Shallow Bay Reference RF-4), Station 1, Sample 1

Wollaston Lake (Shallow Bay Reference RF-4), Station 1, Sample 2

Project Number 1270
Date 24-Apr-2008
Personnel RW/DS
Equipment Tech Ops
Waterbody Wollaston Lake (Shallow Bay Reference RF-4)
Area 1
Station 3
Depth (m) 6.32

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-4 cm	Red brown	Medium	Silt/sand	No	Nil	Black spots
	4-12 cm	Light brown	Firm	Clay	No	Nil	Black streaks

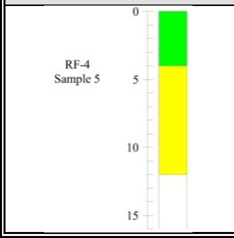
Project Number 1270
Date 24-Apr-2008
Personnel RW/DS
Equipment Tech Ops
Waterbody Wollaston Lake (Shallow Bay Reference RF-4)
Area 1
Station 4
Depth (m) 6.49

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-4 cm	Red brown	Medium	Silt/sand	No	Nil	Black spots
	4-12 cm	Light brown	Firm	Clay	No	Nil	Black streaks

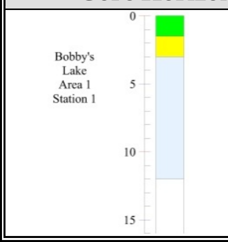
Wollaston Lake (Shallow Bay Reference RF-4), Station 1, Sample 3

Wollaston Lake (Shallow Bay Reference RF-4), Station 1, Sample 4

Project Number	1270	**Waterbody**	Wollaston Lake (Shallow Bay Reference RF-4)
Date	24-Apr-2008	**Area**	1
Personnel	RW/DS	**Station**	5
Equipment	Tech Ops	**Depth (m)**	6.5

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-4 cm	Red brown	Medium	Silt/sand	No	Nil	Black spots
	4-12 cm	Light brown	Firm	Clay	No	Nil	Black streaks

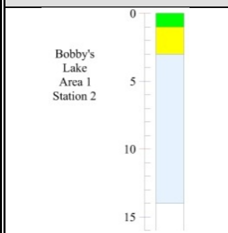
Project Number	1340	**Waterbody**	Bobby's Lake
Date	4-Oct-2009	**Area**	1
Personnel	RF/AP	**Station**	1
Equipment	Tech Ops	**Depth (m)**	5.5

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-1.5 cm	Dark Brown	Loose	Silty/Fine	No	Nil	
	1.5-3 cm	Reddish Brown	Loose	Silty	No	Nil	
	3-12 cm	Greyish Brown	Medium	Silty/Clay	No	Nil	

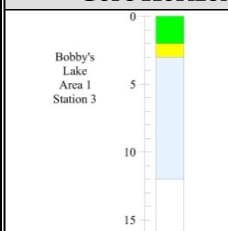
Wollaston Lake (Shallow Bay Reference RF-4), Station 1, Sample 5

Bobby's Lake, Station 1, Sample 1

Project Number	1340	**Waterbody**	Bobby's Lake
Date	4-Oct-2009	**Area**	1
Personnel	RF/AP	**Station**	2
Equipment	Tech Ops	**Depth (m)**	6.0

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-1 cm	Dark Brown	Loose	Silty	No	Nil	
	1-3 cm	Reddish Brown	Loose	Silty	No	Nil	
	3-14 cm	Greyish Brown	Medium	Clay/Sandy	No	Nil	

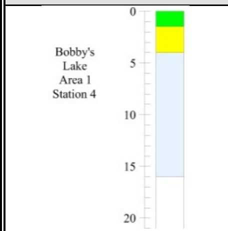
Project Number	1340	**Waterbody**	Bobby's Lake
Date	4-Oct-2009	**Area**	1
Personnel	RF/AP	**Station**	3
Equipment	Tech Ops	**Depth (m)**	6.1

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2 cm	Dark Brown	Loose	Silty	No	Nil	
	2-3 cm	Reddish Brown	Loose	Silty	No	Nil	
	3-12 cm	Greyish Brown	Medium	Silty/Clay	Yes	Nil	

Bobby's Lake, Station 1, Sample 2

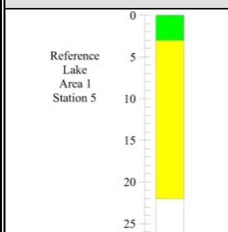
Bobby's Lake, Station 1, Sample 3

Project Number	1340	**Waterbody**	Bobby's Lake
Date	4-Oct-2009	**Area**	1
Personnel	RF/AP	**Station**	4
Equipment	Tech Ops	**Depth (m)**	6.0



Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-1.5 cm	Dark Brown	Loose	Silty	No	Nil	
1.5-4 cm	Reddish Brown	Loose	Silty	No	Nil	
4-16 cm	Greyish Brown	Medium	Silty/Clay	No	Nil	

Project Number	1340	**Waterbody**	Bobby's Lake
Date	4-Oct-2009	**Area**	1
Personnel	RF/AP	**Station**	5
Equipment	Tech Ops	**Depth (m)**	6.25

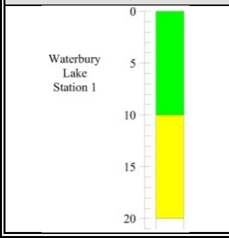


Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-3 cm	Dark Reddish Brown	Loose	Silty	No	Nil	
3-22 cm	Greyish Brown	Medium	Silty/Clay	No	Nil	

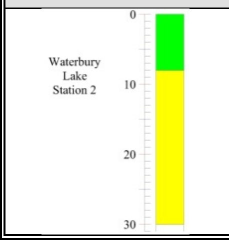
Bobby's Lake, Station 1, Sample 4

Bobby's Lake, Station 1, Sample 5

Project Number	1489	**Waterbody**	Waterbury Lake
Date	22-Sep-2011	**Area**	1
Personnel	PC/SP	**Station**	1
Equipment	Tech Ops	**Depth (m)**	7.2

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-10	Brown Mottled with Pale Gray	Soft	Smooth-Sandy	No	-	-
	10-20	Pale-Gray	Compact	Clayish-Sandy	No	-	-

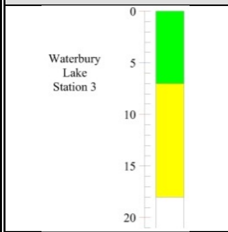
Project Number	1489	**Waterbody**	Waterbury Lake
Date	22-Sep-2011	**Area**	1
Personnel	PC/SP	**Station**	2
Equipment	Tech Ops	**Depth (m)**	7.8

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-8	Brown Mottled with Pale Gray	Soft	Smooth-Sandy	No	-	-
	8-30	Pale-Gray	Compact	Clayish-Sandy	No	-	-

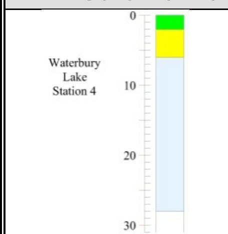
Waterbury Lake, Area 1 Station 1

Waterbury Lake, Area 1 Station 2

Project Number 1489 **Waterbody** Waterbury Lake
Date 22-Sep-2011 **Area** 1
Personnel PC/SP **Station** 3
Equipment Tech Ops **Depth (m)** 6.9

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-7	Dark Beige	Soft	Smooth-Sandy	No	-	-
	7-18	Gray	Medium-Hard	Clayish-Sandy	No	-	-

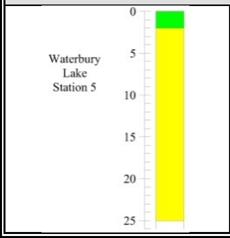
Project Number 1489 **Waterbody** Waterbury Lake
Date 23-Sep-2011 **Area** 1
Personnel PC/SP **Station** 4
Equipment Tech Ops **Depth (m)** 6.3

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Brown	Soft	Smooth-Sandy	Yes	-	-
	2-6	Brown-Gray	Medium-Hard	Sandy-Clayish	No	-	-
	6-28	Gray	Medium-Hard	Clayish-Sandy	No	-	-

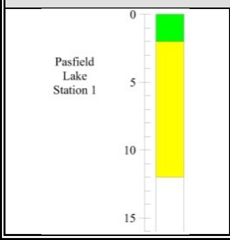

Waterbury Lake, Area 1 Station 3


Waterbury Lake, Area 1 Station 4

Project Number	1489	**Waterbody**	Waterbury Lake
Date	23-Sep-2011	**Area**	1
Personnel	PC/SP	**Station**	5
Equipment	Tech Ops	**Depth (m)**	6.4

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Brown	Soft	Smooth-Sandy	Yes	-	-
	2-25	Gray	Medium-Compact	Clayish-Sandy	No	-	-

Project Number	1489	**Waterbody**	Pasfield Lake
Date	24-Sep-2011	**Area**	1
Personnel	PC/SP	**Station**	1
Equipment	Tech Ops	**Depth (m)**	6.8

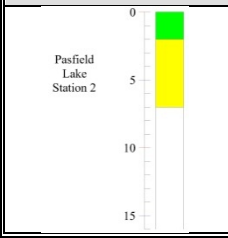
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Dingy-Brown	Soft	Floculent	Yes	-	-
	2-12	Dark Gray mottled with Beige	Medium-Hard	Silty-Sandy	No	-	-

Waterbury Lake, Area 1 Station 5

Pasfield Lake, Area 1 Station 1

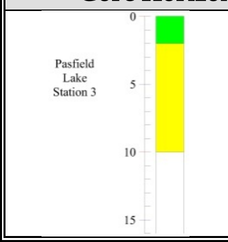
Project Number 1489
Date 24-Sep-2011
Personnel PC/SP
Equipment Tech Ops

Waterbody Pasfield Lake
Area 1
Station 2
Depth (m) 6.7

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Gray-Brown	Soft	Floculent	Yes	-	-
	2-7	Dark Gray mottled with Beige	Medium-Hard	Silt-Sand	No	-	-

Project Number 1489
Date 24-Sep-2011
Personnel PC/SP
Equipment Tech Ops

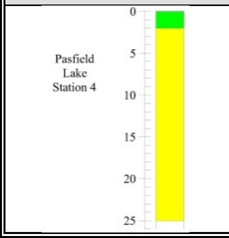
Waterbody Pasfield Lake
Area 1
Station 3
Depth (m) 6.6

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Brown-Green	Soft	Floculent	Yes	-	-
	2-10	Beige	Medium-Hard	Sandy	No	-	-

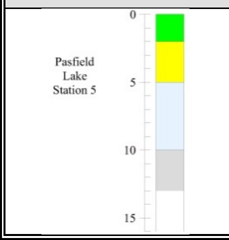
Pasfield Lake, Area 1 Station 2

Pasfield Lake, Area 1 Station 3

Project Number	1489	**Waterbody**	Pasfield Lake
Date	24-Sep-2011	**Area**	1
Personnel	PC/SP	**Station**	4
Equipment	Tech Ops	**Depth (m)**	7.2

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Brown-Dark Gray	Soft	Floculent	Yes	-	-
	2-25	Dark Gray	Medium-Soft	Silty-Sandy	No	-	-

Project Number	1489	**Waterbody**	Pasfield Lake
Date	24-Sep-2011	**Area**	1
Personnel	PC/SP	**Station**	5
Equipment	Tech Ops	**Depth (m)**	6.5

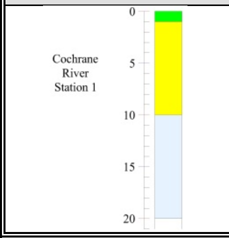
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Gray-Brown	Soft	Floculent	Yes	-	-
	2-5	Dark Gray-Beige	Medium-Hard	Sandy-Silty	Yes	-	-
	5-10	Beige	Medium-Hard	Sandy	No	-	-
	10-13	Gray	Medium-Hard	Sandy-Silt	No	-	-

Pasfield Lake, Area 1 Station 4

Pasfield Lake, Area 1 Station 5

Project Number 1489
Date 26-Sep-2011
Personnel PC/SP
Equipment Tech Ops

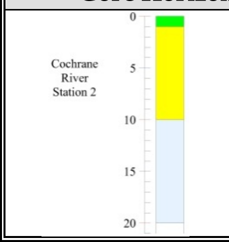
Waterbody Cochrane River
Area 1
Station 1
Depth (m) 7.4



Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-1	Brown-Orange	Soft	Smooth	Yes	-	-
1-10	Dark Gray with Black Speckles	Soft	Smooth	Yes	-	-
10-20	Medium Gray	Soft	Smooth	No	-	-

Project Number 1489
Date 26-Sep-2011
Personnel PC/SP
Equipment Tech Ops

Waterbody Cochrane River
Area 1
Station 2
Depth (m) 7.6



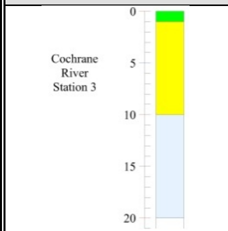
Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-1	Brown-Orange	Soft	Smooth	Yes	-	-
1-10	Dark Gray with Black Speckles	Soft	Smooth	Yes	-	-
10-20	Medium Gray	Soft	Smooth	No	-	-

Cochrane River, Area 1 Station 1

Cochrane River, Area 1 Station 2

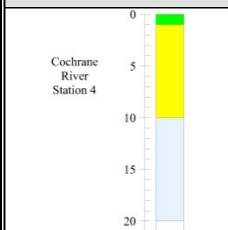
Project Number 1489
Date 26-Sep-2011
Personnel PC/SP
Equipment Tech Ops

Waterbody Cochrane River
Area 1
Station 3
Depth (m) 6.9

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-1	Brown-Orange	Soft	Smooth	Yes	-	-
	1-10	Dark Gray with Black Speckles	Soft	Smooth	Yes	-	-
	10-20	Medium Gray	Soft	Smooth	No	-	-

Project Number 1489
Date 26-Sep-2011
Personnel PC/SP
Equipment Tech Ops

Waterbody Cochrane River
Area 1
Station 4
Depth (m) 7.5

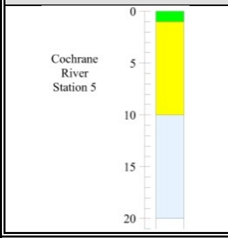
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-1	Brown-Orange	Soft	Smooth	Yes	-	-
	1-10	Dark Gray with Black Speckles	Soft	Smooth	Yes	-	-
	10-20	Medium Gray	Soft	Smooth	No	-	-

Cochrane River, Area 1 Station 3

Cochrane River, Area 1 Station 4

Project Number 1489
Date 26-Sep-2011
Personnel PC/SP
Equipment Tech Ops

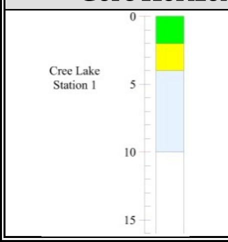
Waterbody Cochrane River
Area 1
Station 5
Depth (m) 7.4



Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-1	Brown-Orange	Soft	Smooth	Yes	-	-
1-10	Dark Gray with Black Speckles	Soft	Smooth	Yes	-	-
10-20	Medium Gray	Soft	Smooth	No	-	-

Project Number 1489
Date 28-Sep-2011
Personnel PC/SP
Equipment Tech Ops

Waterbody Cree Lake
Area 1
Station 1
Depth (m) 7.4



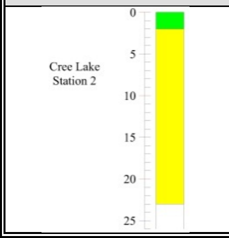
Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-2	Brown	Soft	Fine-Silty	Yes	-	Wood Debris in Small Amounts
2-4	Gray	Medium-Soft	Silty	No	-	-
4-10	Rusty	Medium-Soft	Silty	No	-	-

Cochrane River, Area 1 Station 5

Cree Lake, Area 1 Station 1

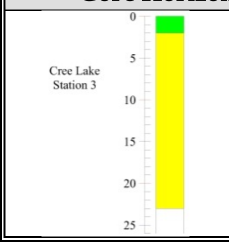
Project Number 1489
Date 28-Sep-2011
Personnel PC/SP
Equipment Tech Ops

Waterbody Cree Lake
Area 1
Station 2
Depth (m) 7.6

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Gray-Brown	Soft	Floculent	Yes	-	Lots of Black Dots
	2-23	Gray-Brown	Medium-Soft	Silt-Sand	Yes	-	A Few Black Dots

Project Number 1489
Date 28-Sep-2011
Personnel PC/SP
Equipment Tech Ops

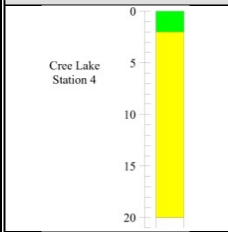
Waterbody Cree Lake
Area 1
Station 3
Depth (m) 7.5

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Gray-Brown	Soft	Floculent	Yes	-	Lots of Black Dots
	2-23	Gray-Brown	Medium-Soft	Silt-Sand	Yes	-	A Few Black Dots

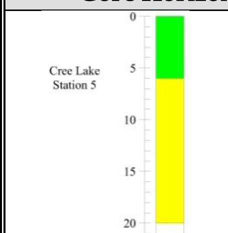

Cree Lake, Area 1 Station 2


Cree Lake, Area 1 Station 3

Project Number	1489	**Waterbody**	Cree Lake
Date	28-Sep-2011	**Area**	1
Personnel	PC/SP	**Station**	4
Equipment	Tech Ops	**Depth (m)**	8.5

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Rusty-Brown-Gray	Soft	Smooth	Yes	-	-
	2-20	Gray with Black Dots	Medium-Soft	Silt-Sand	Yes	-	-

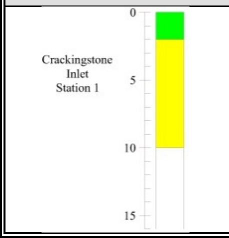
Project Number	1489	**Waterbody**	Cree Lake
Date	28-Sep-2011	**Area**	1
Personnel	PC/SP	**Station**	5
Equipment	Tech Ops	**Depth (m)**	7.4

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-6	Brown-Beige	Soft	Smooth	Yes	-	-
	6-20	Beige-Gray	Medium-Soft	Silt-Sand	Yes	-	-

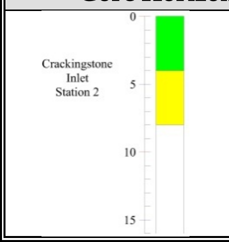
Cree Lake, Area 1 Station 4

Cree Lake, Area 1 Station 5

Project Number	1489	**Waterbody**	Crackingstone Inlet (Lake Athabasca)
Date	2-Oct-2011	**Area**	1
Personnel	PC/SP	**Station**	1
Equipment	Tech Ops	**Depth (m)**	7.8

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Orangish-Brown	Medium-Soft	Silty	No	-	-
	2-10	Gray-Brown	Hard	Clayish	No	-	-

Project Number	1489	**Waterbody**	Crackingstone Inlet (Lake Athabasca)
Date	2-Oct-2011	**Area**	1
Personnel	PC/SP	**Station**	2
Equipment	Tech Ops	**Depth (m)**	6.2

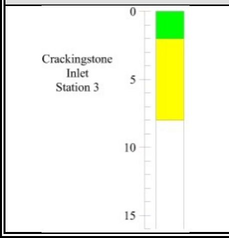
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-4	Orangish-Brown	Medium-Soft	Silty	No	-	-
	4-8	Gray-Brown	Hard	Clayish	No	-	-

Crackingstone Inlet (Lake Athabasca), Area 1 Station 1

Crackingstone Inlet (Lake Athabasca), Area 1 Station 2

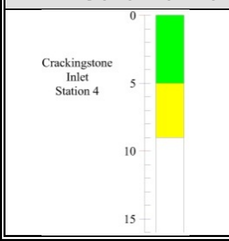
Project Number 1489
Date 2-Oct-2011
Personnel PC/SP
Equipment Tech Ops

Waterbody Crackingstone Inlet (Lake Athabasca)
Area 1
Station 3
Depth (m) 7.7

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Orangish-Brown	Medium-Soft	Silty	No	-	-
	2-8	Gray-Brown	Hard	Clayish	No	-	-

Project Number 1489
Date 2-Oct-2011
Personnel PC/SP
Equipment Tech Ops

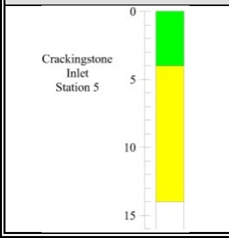
Waterbody Crackingstone Inlet (Lake Athabasca)
Area 1
Station 4
Depth (m) 7.6

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-5	Orangish-Brown	Medium-Soft	Silty	No	-	-
	5-9	Gray-Brown	Hard	Clayish	No	-	-

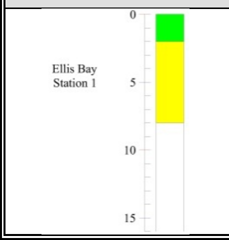
Crackingstone Inlet (Lake Athabasca), Area 1 Station 3

Crackingstone Inlet (Lake Athabasca), Area 1 Station 4

Project Number	1489	**Waterbody**	Crackingstone Inlet (Lake Athabasca)
Date	2-Oct-2011	**Area**	1
Personnel	PC/SP	**Station**	5
Equipment	Tech Ops	**Depth (m)**	7.2

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-4	Orangish-Brown	Medium-Soft	Silty	No	-	-
	4-14	Gray-Brown	Hard	Clayish	No	-	-

Project Number	1489	**Waterbody**	Ellis Bay (Lake Athabasca)
Date	4-Oct-2011	**Area**	1
Personnel	PC/RF	**Station**	1
Equipment	Tech Ops	**Depth (m)**	7.3

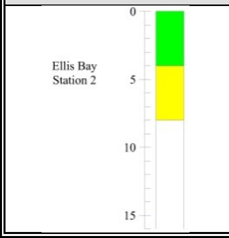
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Orange and Greenish	Soft	Medium-Floculent	Yes	-	-
	2-8	Medium-Gray	Soft	Silt-Clay	Some	-	-

Crackingstone Inlet (Lake Athabasca), Area 1 Station 4

Ellis Bay (Lake Athabasca), Area 1 Station

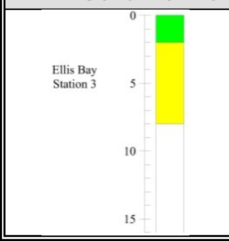
Project Number 1489
Date 4-Oct-2011
Personnel PC/RF
Equipment Tech Ops

Waterbody Ellis Bay (Lake Athabasca)
Area 1
Station 2
Depth (m) 7.2

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-4	Orangish-Beige with Gray	Soft	Smooth	Yes	-	-
	2-8	Medium-Gray	Medium-Soft	Silt-Clayish	Yes	-	-

Project Number 1489
Date 4-Oct-2011
Personnel PC/RF
Equipment Tech Ops

Waterbody Ellis Bay (Lake Athabasca)
Area 1
Station 3
Depth (m) 7.15

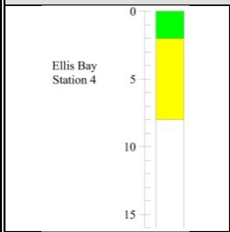
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Orange and Greenish	Soft	Medium-Floculent	Yes	-	-
	2-8	Medium-Gray	Soft	Silt-Clay	Some	-	-

Ellis Bay (Lake Athabasca), Area 1 Station 2

Ellis Bay (Lake Athabasca), Area 1 Station 3

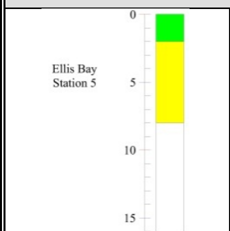
Project Number 1489
Date 5-Oct-2011
Personnel PC/RF
Equipment Tech Ops

Waterbody Ellis Bay (Lake Athabasca)
Area 1
Station 4
Depth (m) 6.9

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Orange and Greenish	Soft	Medium-Floculent	Yes	-	-
	2-8	Medium-Gray	Soft	Silt-Clay	Some	-	-

Project Number 1489
Date 5-Oct-2011
Personnel PC/RF
Equipment Tech Ops

Waterbody Ellis Bay (Lake Athabasca)
Area 1
Station 5
Depth (m) 7.1

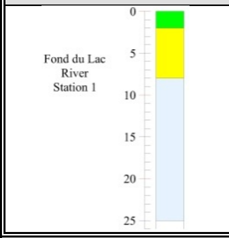
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Orange and Greenish	Soft	Medium-Floculent	Yes	-	-
	2-8	Medium-Gray	Soft	Silt-Clay	Some	-	-

Ellis Bay (Lake Athabasca), Area 1 Station 4

Ellis Bay (Lake Athabasca), Area 1 Station 5

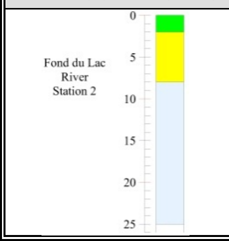
Project Number 1489
Date 26-Oct-2011
Personnel PC/RF
Equipment Tech Ops

Waterbody Fond du Lac River
Area 1
Station 1
Depth (m) 7.5

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Gray/Rusty-Brown	Soft	Fine-Silty	Yes	-	-
	2-8	Gray	Soft	Silty	No	-	-
	8-25	Gray	Medium-Soft	Silty	No	-	-

Project Number 1489
Date 26-Oct-2011
Personnel PC/RF
Equipment Tech Ops

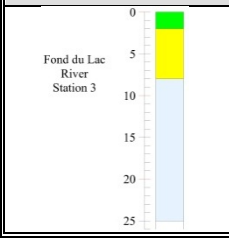
Waterbody Fond du Lac River
Area 1
Station 2
Depth (m) 7.5

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Gray/Rusty-Brown	Soft	Fine-Silty	Yes	-	-
	2-8	Gray	Soft	Silty	No	-	-
	8-25	Gray	Medium-Soft	Silty	No	-	-

Fond du Lac River, Area 1 Station 1

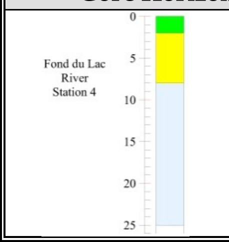
Fond du Lac River, Area 1 Station 2

Project Number	1489	**Waterbody**	Fond du Lac River
Date	26-Oct-2011	**Area**	1
Personnel	PC/RF	**Station**	3
Equipment	Tech Ops	**Depth (m)**	7.5



Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-2	Gray/Rusty-Brown	Soft	Fine-Silty	Yes	-	-
2-8	Gray	Soft	Silty	No	-	-
8-25	Gray	Medium-Soft	Silty	No	-	-

Project Number	1489	**Waterbody**	Fond du Lac River
Date	28-Oct-2011	**Area**	1
Personnel	PC/RF	**Station**	4
Equipment	Tech Ops	**Depth (m)**	7.6

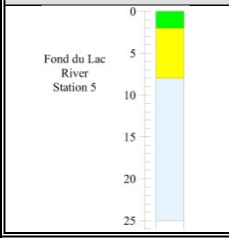


Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-2	Gray/Rusty-Brown	Soft	Fine-Silty	Yes	-	-
2-8	Gray	Soft	Silty	No	-	-
8-25	Gray	Medium-Soft	Silty	No	-	-

Fond du Lac River, Area 1 Station 3

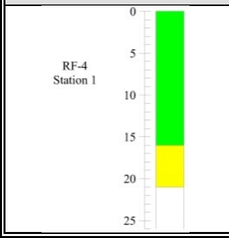
Fond du Lac River, Area 1 Station 4

Project Number	1489	**Waterbody**	Fond du Lac River
Date	28-Oct-2011	**Area**	1
Personnel	PC/RF	**Station**	5
Equipment	Tech Ops	**Depth (m)**	7.2

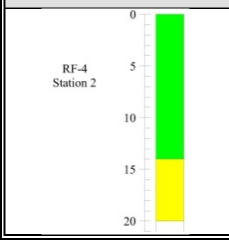
Core Horizons (cm)		**Colour**	**Consistency**	**Texture**	**Organics**	**Odour**	**Comments**
	0-2	Gray/Rusty-Brown	Soft	Fine-Silty	Yes	-	-
	2-8	Gray	Soft	Silty	No	-	-
	8-25	Gray	Medium-Soft	Silty	No	-	-

Fond du Lac River, Area 1 Station 5

Project Number 1602 | **Waterbody** RF-4 (Wollaston Lake Shallow Bay Reference)
Date 12-Apr-2012 | **Area** RF-4
Personnel KK/ MT/ GM/ EF | **Replicate Station** 1
Equipment Tech-ops | **Depth (m)** 6.4

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-16	Red Brown	Loose	Silt	-	-	-
	16-21	Light Brown	Loose	Silt	Yes	-	-

Project Number 1602 | **Waterbody** RF-4 (Wollaston Lake Shallow Bay Reference)
Date 12-Apr-2012 | **Area** RF-4
Personnel KK/ MT/ GM/ EF | **Replicate Station** 2
Equipment Tech-ops | **Depth (m)** 5.9

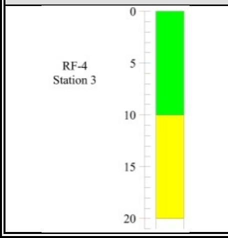
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-14	Brown	Loose	Silt	-	-	-
	14-20	Light Brown	Loose	Silt	-	-	-

RF-4 (Wollaston Lake Shallow Bay Reference), Area RF-4, Sample 1

RF-4 (Wollaston Lake Shallow Bay Reference), Area RF-4, Sample 2

Project Number 1602
Date 12-Apr-2012
Personnel KK/ MT/ GM
Equipment Tech-ops

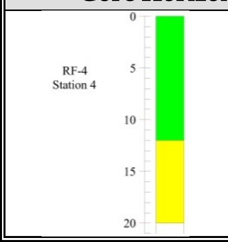
Waterbody RF-4 (Wollaston Lake Shallow Bay Reference)
Area RF-4
Replicate Station 3
Depth (m) 5.95



Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-10	Brown	Loose	Silt	-	-	-
10-20	Light Brown	Loose	Silt	Y	-	-

Project Number 1602
Date 12-Apr-2012
Personnel KK/MT/GM/EF
Equipment Tech-ops

Waterbody RF-4 (Wollaston Lake Shallow Bay Reference)
Area RF-4
Replicate Station 4
Depth (m) 5.95



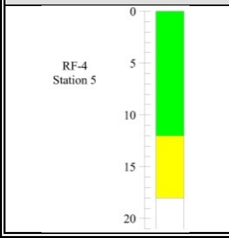
Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-12	Brown	Loose	Silt	-	-	-
12-20	Light Brown	Loose	Silt	Y	-	-

RF-4 (Wollaston Lake Shallow Bay Reference), Area RF-4, Sample 3

RF-4 (Wollaston Lake Shallow Bay Reference), Area RF-4, Sample 4

Project Number 1602
Date 12-Apr-2012
Personnel KK/MT/GM/EF
Equipment Tech-ops

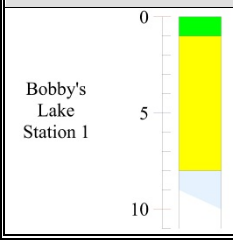
Waterbody RF-4 (Wollaston Lake Shallow Bay Reference)
Area RF-4
Replicate Station 5
Depth (m) 6.12



Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-12	Brown	Loose	Silt	-	-	-
12-18	Light Brown	Loose	Silt	Y	-	-

Project Number 1499
Date 1-Oct-2012
Personnel ED/LB
Equipment Tech-Ops Corer

Waterbody Bobby’s Lake
Area 1
Station 1
Depth (m) 3.5

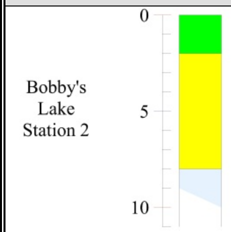


Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-1	Green-grey	Jelly	Very fine	Yes	Sulphur	-
1-8	Grey-green	Jelly	Very fine	No	Sulphur	-
8+	Greyish	Jelly	Very fine	No	No	-

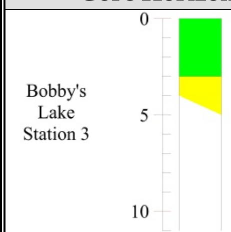

RF-4 (Wollaston Lake Shallow Bay Reference), Area RF-4, Sample 5


Bobby’s Lake, Area 1, Station 1

Project Number 1499
Date 2-Oct-2012
Personnel ED/LB
Equipment Tech-Ops Corer
Waterbody Bobby's Lake
Area 1
Station 2
Depth (m) 5.6

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Dark brown	Flocculent	Very fine	No	Sulphur	Different from rest
	2-8	Dark brown	Jelly	Very fine	No	Sulphur	-
	8+	Lighter brown	Jelly	Very fine	No	Sulphur	-

Project Number 1499
Date 3-Oct-2012
Personnel ED/LB
Equipment Tech-Ops Corer
Waterbody Bobby's Lake
Area 1
Station 3
Depth (m) 3.8

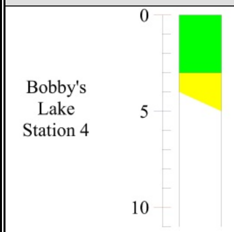
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-3	Brown-green	Watery sand	Fine to gritty	No	No	Slightly flocculent
	3+	Green-brown/grey	Watery sand	Fine to gritty	No	No	Lumpier

Bobby's Lake, Area 1, Station 2

Bobby's Lake, Area 1, Station 3

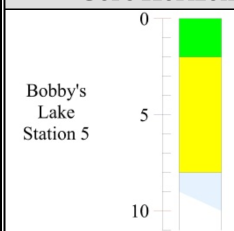
Project Number 1499
Date 3-Oct-2012
Personnel ED/LB
Equipment Tech-Ops Corer

Waterbody Bobby's Lake
Area 1
Station 4
Depth (m) 5.8

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-3	Red-brown	Slightly flocculent	Fine	No	Sulphur	-
	3+	Green-grey	Lumpy	Fine	No	Sulphur	-

Project Number 1499
Date 3-Oct-2012
Personnel ED/LB
Equipment Tech-Ops Corer

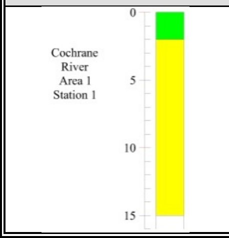
Waterbody Bobby's Lake
Area 1
Station 5
Depth (m) 6.0

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Brown	Flocculent	Very fine	Yes	Sulphur	-
	2-8	Brown-grey/green	Watery	Fine	No	Sulphur	-
	8+	Grey/green	Watery	Fine	No	Sulphur	-

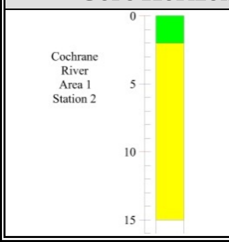
Bobby's Lake, Area 1, Station 4

Bobby's Lake, Area 1, Station 5

Project Number	1611	**Waterbody**	Cochrane River
Date	18-Sep-2012	**Area**	1
Personnel	PC/SP	**Station**	1
Equipment	Tech Ops	**Depth (m)**	7.7

Core Horizons (cm)		**Colour**	**Consistency**	**Texture**	**Organics**	**Odour**	**Comments**
	0-2	Orangish-brown	Soft	Smooth	Yes	No	-
	2-15	Pale gray	Medium-soft	Silty	Yes	No	-

Project Number	1611	**Waterbody**	Cochrane River
Date	18-Sep-2012	**Area**	1
Personnel	PC/SP	**Station**	2
Equipment	Tech Ops	**Depth (m)**	7.9

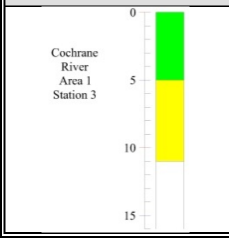
Core Horizons (cm)		**Colour**	**Consistency**	**Texture**	**Organics**	**Odour**	**Comments**
	0-2	Orangish-brown	Soft	Smooth	Yes	No	-
	2-15	Medium gray	Medium-soft	Silty	Yes	No	-

Cochrane River, Area 1 Station 1

Cochrane River, Area 1 Station 2

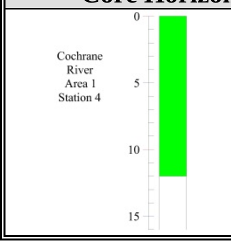
Project Number 1611
Date 18-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Cochrane River
Area 1
Station 3
Depth (m) 7.4

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-5	Medium gray	Soft	Smooth	Yes	No	-
	5-11	Medium gray	Medium-soft	Silty	Yes	No	-

Project Number 1611
Date 19-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Cochrane River
Area 1
Station 4
Depth (m) 7.5

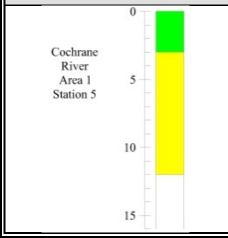
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-12	Medium gray	Soft	Smooth-silty	Yes	No	-

Cochrane River, Area 1 Station 3

Cochrane River, Area 1 Station 4

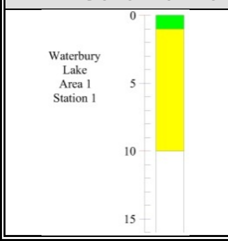
Project Number 1611
Date 19-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Cochrane River
Area 1
Station 5
Depth (m) 7.2

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-3	Medium gray	Soft	Smooth	Yes	No	-
	3-12	Medium gray	Medium-soft	Silty	Yes	No	-

Project Number 1611
Date 20-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Waterbury Lake
Area 1
Station 1
Depth (m) 7.8

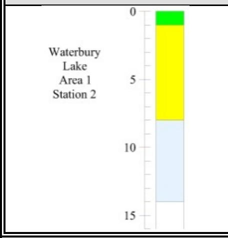
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-1	Gray	Soft	Smooth-floculent	Yes	No	-
	1-10	Gray	Medium-soft	Silty	Yes	No	-

Cochrane River, Area 1 Station 5

Waterbury Lake, Area 1 Station 1

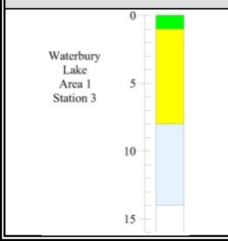
Project Number 1611
Date 20-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Waterbury Lake
Area 1
Station 2
Depth (m) 8.0

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-1	Brownish	Soft	Smooth	Yes	No	-
	1-8	Beige-gray	Medium-soft	Silty	Yes	No	Black dots-
	8-14	Gray	Medium-soft	Silty	Yes	No	-

Project Number 1611
Date 20-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Waterbury Lake
Area 1
Station 3
Depth (m) 7.3

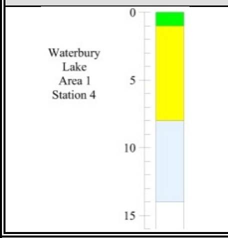
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-1	Orangish-gray	Soft	Smooth	Yes	No	-
	1-8	Orangish-gray	Medium-soft	Silty	Yes	No	-
	8-14	Gray	Medium-soft	Silty	No	No	-

Waterbury Lake, Area 1 Station 2

Waterbury Lake, Area 1 Station 3

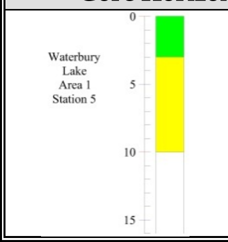
Project Number 1611
Date 20-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Waterbury Lake
Area 1
Station 4
Depth (m) 6.5

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-1	Orangish-gray	Soft	Smooth	Yes	No	-
	1-8	Orangish-gray	Medium-soft	Silty	Yes	No	-
	8-14	Gray	Medium-soft	Silty	No	No	-

Project Number 1611
Date 20-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Waterbury Lake
Area 1
Station 5
Depth (m) 6.5

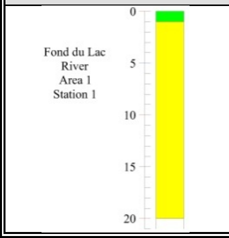
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-3	Orangish-brown	Soft	Smooth	Yes	No	-
	3-10	Gray	Medium-soft	Silty	Yes	No	-


Waterbury Lake, Area 1 Station 4


Waterbury Lake, Area 1 Station 5

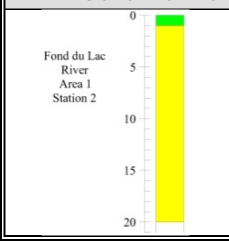
Project Number 1611
Date 22-Sep-2012
Personnel PC/RF
Equipment Tech Ops

Waterbody Fond du Lac River
Area 1
Station 1
Depth (m) 7.2

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-1	Orangish-brown gray	Soft	Smooth	Yes	No	-
	1-20	Dark gray	Medium-soft	Silty	Yes	No	-

Project Number 1611
Date 22-Sep-2012
Personnel PC/RF
Equipment Tech Ops

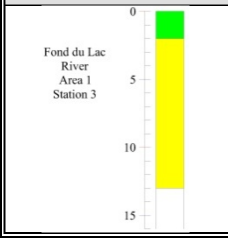
Waterbody Fond du Lac River
Area 1
Station 2
Depth (m) 7.8

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-1	Orangish-brown gray	Soft	Smooth	Yes	No	-
	1-20	Dark gray	Medium-soft	Silty	Yes	No	-

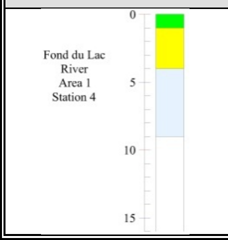
Fond du Lac River, Area 1 Station 1

Fond du Lac River, Area 1 Station 2

Project Number	1611	**Waterbody**	Fond du Lac River
Date	22-Sep-2012	**Area**	1
Personnel	PC/RF	**Station**	3
Equipment	Tech Ops	**Depth (m)**	7.4

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Orangish-brown gray	Soft	Smooth	Yes	No	-
	2-13	Dark gray	Medium-soft	Silty	Yes	No	-

Project Number	1611	**Waterbody**	Fond du Lac River
Date	22-Sep-2012	**Area**	1
Personnel	PC/RF	**Station**	4
Equipment	Tech Ops	**Depth (m)**	6.9

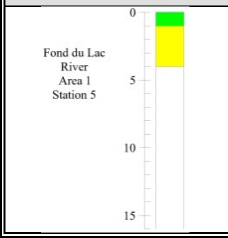
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-1	Brown and gray	Soft	Smooth	Yes	No	-
	1-4	Gray	Medium-soft	Grainy	Yes	No	Speckles
	4-9	Dark gray	Medium-soft	Silty-clayish	No	No	

Fond du Lac River, Area 1 Station 3

Fond du Lac River, Area 1 Station 4

Project Number 1611
Date 22-Sep-2012
Personnel PC/RF
Equipment Tech Ops

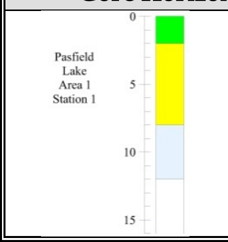
Waterbody Fond du Lac River
Area 1
Station 5
Depth (m) 6.7



Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-1	Brownish-gray	Soft	Smooth	Yes	No	-
1-4	Beige-gray	Medium-soft	Silty	Yes	No	-

Project Number 1611
Date 24-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Pasfield Lake
Area 1
Station 1
Depth (m) 6.5



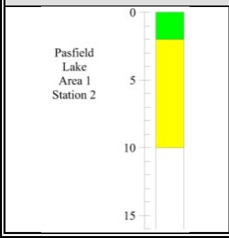
Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-2	Beige-brown	Soft	Floculent	Yes	No	Orange dots (chironomid cases)
2-8	Beige	Hard	Sandy	No	No	-
8-12	Beige-gray	Hard	Silty-sandy	No	No	-


Fond du Lac River, Area 1 Station 5


Pasfield Lake, Area 1 Station 1

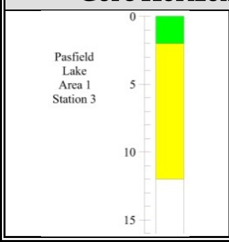
Project Number 1611
Date 24-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Pasfield Lake
Area 1
Station 2
Depth (m) 6.4

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Brownish-beige	Soft	Floculent	Yes	No	-
	2-10	Beige	Hard	Sandy	No	No	-

Project Number 1611
Date 24-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Pasfield Lake
Area 1
Station 3
Depth (m) 6.5

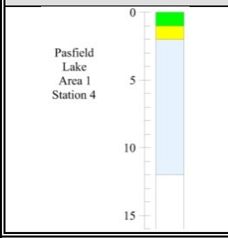
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Brownish-beige	Soft	Floculent	Yes	No	-
	2-12	Beige	Hard	Sandy	No	No	-

Pasfield Lake, Area 1 Station 2

Pasfield Lake, Area 1 Station 3

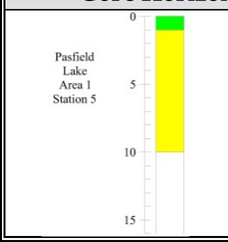
Project Number 1611
Date 24-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Pasfield Lake
Area 1
Station 4
Depth (m) 6.9

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-1	Dingy-brown	Soft	Floculent	Yes	No	-
	1-2	Beige	Hardish	Sandy	No	No	-
	2-12	Medium-gray	Medium-soft	Silty	No	No	-

Project Number 1611
Date 24-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Pasfield Lake
Area 1
Station 5
Depth (m) 6.2

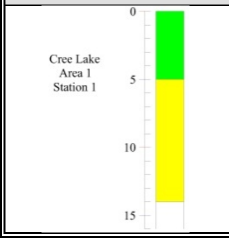
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-1	Dingy-brown	Soft	Floculent	Yes	No	-
	1-10	Beige	Hard	Sandy	No	No	-

Pasfield Lake, Area 1 Station 4

Pasfield Lake, Area 1 Station 5

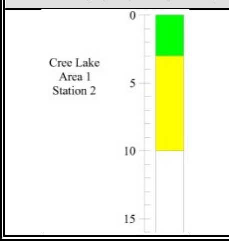
Project Number 1611
Date 26-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Cree Lake
Area 1
Station 1
Depth (m) 7.9

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-5	Brown-beige	Soft	Floculent	Yes	No	-
	5-14	Brown-beige	Soft	Silty	Yes	No	-

Project Number 1611
Date 26-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Cree Lake
Area 1
Station 2
Depth (m) 7.7

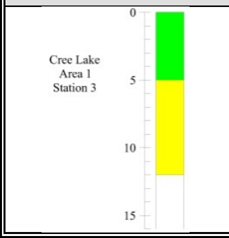
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-3	Brownish-beige	Soft	Floculent	Yes	No	-
	3-10	Beige-gray	Harder	Silt-sand	No	No	-

Cree Lake, Area 1 Station 1

Cree Lake, Area 1 Station 2

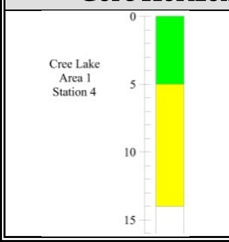
Project Number 1611
Date 26-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Cree Lake
Area 1
Station 3
Depth (m) 8.0

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-5	Brown-beige	Soft	Floculent	Yes	No	-
	5-12	Brown-beige	Soft	Silty	Yes	No	-

Project Number 1611
Date 26-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Cree Lake
Area 1
Station 4
Depth (m) 8.0

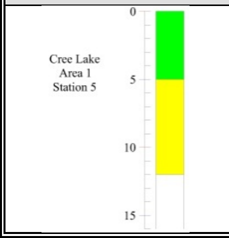
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-5	Brown-beige	Soft	Floculent	Yes	No	-
	5-14	Brown-beige	Soft	Silty	Yes	No	-

Cree Lake, Area 1 Station 3

Cree Lake, Area 1 Station 4

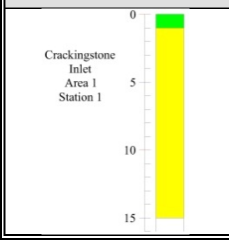
Project Number 1611
Date 26-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Cree Lake (Lake Athabasca)
Area 1
Station 5
Depth (m) 7.3

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-5	Brown-beige	Soft	Floculent	Yes	No	-
	5-12	Brown-beige	Soft	Silty	Yes	No	-

Project Number 1611
Date 28-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Crackingstone Inlet
Area 1
Station 1
Depth (m) 7.7

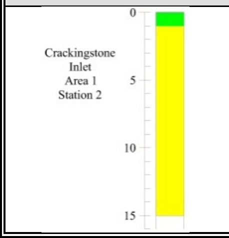
Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-1	Orangish-brown	Soft	Smooth	Yes	No	-
	1-15	Gray	Compact	Clayish	No	No	-

Cree Lake, Area 1 Station 5

Crackingstone Inlet (Lake Athabasca), Area 1 Station 1

Project Number 1611
Date 28-Sep-2012
Personnel PC/SP
Equipment Tech Ops

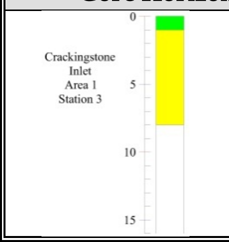
Waterbody Crackingstone Inlet (Lake Athabasca)
Area 1
Station 2
Depth (m) 6.2



Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-1	Orangish-brown	Soft	Smooth	Yes	No	-
1-15	Gray	Compact	Clayish	No	No	-

Project Number 1611
Date 29-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Crackingstone Inlet (Lake Athabasca)
Area 1
Station 3
Depth (m) 7.9



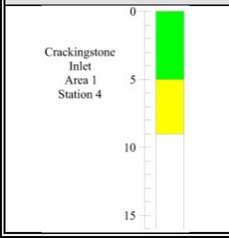
Core Horizons (cm)	Colour	Consistency	Texture	Organics	Odour	Comments
0-1	Orangish-brown	Soft	Smooth	Yes	No	-
1-8	Gray	Compact	Clayish	No	No	-

Crackingstone Inlet (Lake Athabasca), Area 1 Station 2

Crackingstone Inlet (Lake Athabasca), Area 1 Station 3

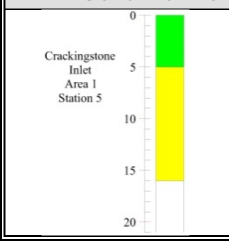
Project Number 1611
Date 29-Sep-2012
Personnel PC/SP
Equipment Tech Ops

Waterbody Crackingstone Inlet (Lake Athabasca)
Area 1
Station 4
Depth (m) 8.0

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-5	Orangish-brown	Soft	Smooth	Yes	No	Black organic blotches
	5-9	Gray	Compact	Clayish	No	No	-

Project Number 1611
Date 29-Sep-2012
Personnel PC/SP
Equipment Tech Ops

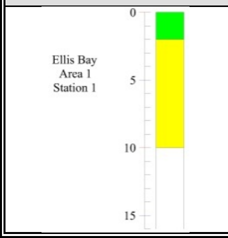
Waterbody Crackingstone Inlet (Lake Athabasca)
Area 1
Station 5
Depth (m) 7.7

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-5	Orangish-brown	Soft	Smooth	Yes	No	Minor black organic blotches
	5-16	Gray	Compact	Clayish	No	No	-

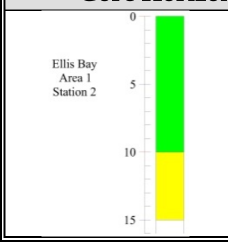

Crackingstone Inlet (Lake Athabasca), Area 1 Station 4


Crackingstone Inlet (Lake Athabasca), Area 1 Station 5

Project Number	1611	**Waterbody**	Ellis Bay (Lake Athabasca)
Date	01-Oct-2012	**Area**	1
Personnel	PC/RF	**Station**	1
Equipment	Tech Ops	**Depth (m)**	6.4

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Medium-gray	Loose	Fine	Yes	No	-
	2-10	Medium-gray	More compact	Silty	No	No	-

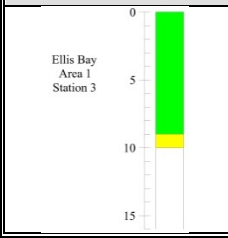
Project Number	1611	**Waterbody**	Ellis Bay (Lake Athabasca)
Date	01-Oct-2012	**Area**	1
Personnel	PC/RF	**Station**	2
Equipment	Tech Ops	**Depth (m)**	6.8

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-10	Medium-gray	Loose	Fine	Yes	No	Aquatic moss on sediment surface
	10-15	Medium-gray	More compact	Silty	No	No	-

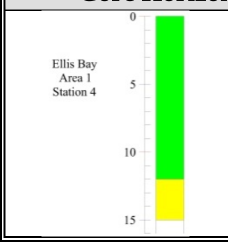
Ellis Bay (Lake Athabasca), Area 1 Station 1

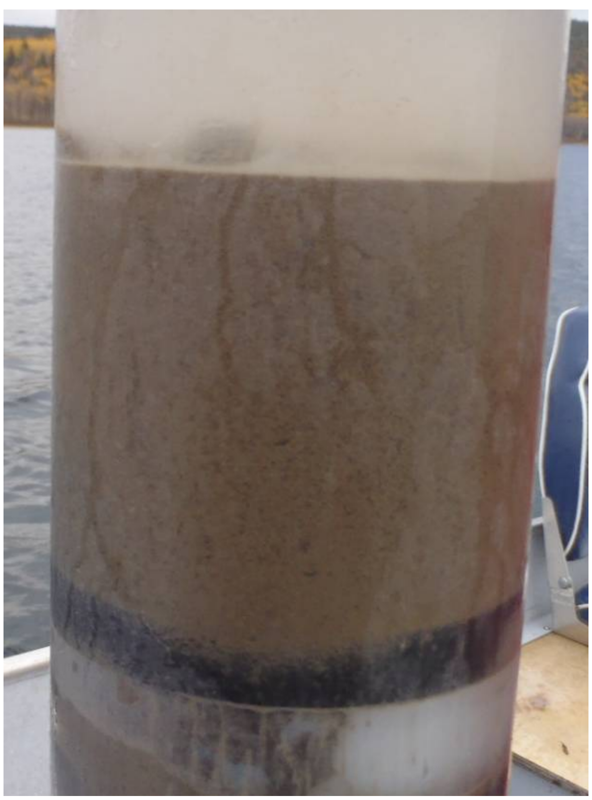
Ellis Bay (Lake Athabasca), Area 1 Station 2

Project Number 1611
Date 02-Oct-2012
Personnel PC/RF
Equipment Tech Ops
Waterbody Ellis Bay (Lake Athabasca)
Area 1
Station 3
Depth (m) 7.0

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-9	Medium-gray	Loose	Fine	Yes	No	-
	9-10	Medium-gray	More compact	Silty	No	No	-

Project Number 1611
Date 02-Oct-2012
Personnel PC/RF
Equipment Tech Ops
Waterbody Ellis Bay (Lake Athabasca)
Area 1
Station 4
Depth (m) 7.1

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-12	Medium-gray	Loose	Fine	Yes	No	-
	12-15	Medium-gray	More compact	Silty	No	No	-

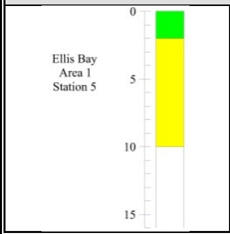


Ellis Bay (Lake Athabasca), Area 1 Station 3

Ellis Bay (Lake Athabasca), Area 1 Station 4

Project Number 1611
Date 02-Oct-2012
Personnel PC/RF
Equipment Tech Ops

Waterbody Ellis Bay (Lake Athabasca)
Area 1
Station 5
Depth (m) 7.9

Core Horizons (cm)		Colour	Consistency	Texture	Organics	Odour	Comments
	0-2	Medium-gray	Loose	Fine	Yes	No	-
	2-10	Medium-gray	More compact	Silty	No	No	-

Ellis Bay (Lake Athabasca), Area 1 Station 5

APPENDIX E

DETAILED BENTHIC INVERTEBRATE METHODS

BENTHIC MACROINVERTEBRATE TAXONOMIC IDENTIFICATION AND ENUMERATION METHODS

The individual samples are processed separately. Each sample is divided into the coarse and the fine fractions. The coarse fractions are sorted completely and the fine fractions are subsampled independently using a modification of the subsampling method (Wrona et al. 1982). The basic methodology is provided below.

Pre-Sort Washing

Pour sample into sieves (2 mm, 1 mm, 0.180 mm) and wash with running water to remove preservative (formalin not a concern in this case) and silt; if there are only small amounts of larger organic material, the 2 mm sieve can be omitted.

Transfer the coarse fraction (contents of the 2 mm and 1 mm sieves) into an individual container and add 70% alcohol. Label container with site number and fraction size. Now this fraction is ready for sorting.

Transfer the fine fraction (contents of 0.180 mm sieve) into a 2 L container for decanting. Add warm water to the 2 L container, swirl, and decant water and organic material into the 0.180 mm sieve, repeating until all organic material is washed out of the sand; then scan container under magnifying glass for heavy-shelled or stone-cased animals and pick them out; then discard sand and gravel. Transfer this fine fraction into an individual container and add 70% alcohol. Label container with site number and fraction size. Now this fraction is ready for sorting.

Sorting Coarse Fraction

The coarse fraction is sorted in its entirety. Sort out all organisms from the coarse fraction by the "grid method" and place them into properly labelled vials (if there are large numbers of Ephemeroptera, Plecoptera, Trichoptera or any other group place them in a separate vial). The grid method consists of a petri dish with a gridded bottom (1 cm x 1 cm). Add small amounts of organic material into the petri dish and pick out all benthic invertebrates with fine (#5) forceps under ~ 6 X magnification, proceeding row by row. Once done with a dish, re-mix material, and quickly re-scan to catch any animals that were missed.

Sorting Fine Fraction

In some situations, there is very little organic material in the fine fractions and usually very few organisms, in which case subsampling as described below, is not required for the fine fractions. These samples would be picked in their entirety.

When there is a lot of organic material in the fine fractions and/or large numbers of organisms, a subsampling of the fine fractions is to be done based on the Wrona et al. (1982) method:

Pour contents of 0.180 mm fraction container into the Imhoff cone and ensure that all material is transferred from the container. Fill the cone to the 1 L mark with diluted alcohol and allow bubbling for about 5 minutes to ensure thorough mixing. Remove ten 25 ml subsamples from the Imhoff cone with the 25 ml subsampler container and pour into gridded petri dishes (total volume of 250 ml removed). Examine each 25 ml subsample under the microscope (~12 X magnification) and go through each petri dish twice.

Generally, the recommended portion to subsample is a minimum of one-quarter (250 ml). However, if very large numbers of organisms are present the following guidelines are provided:

- if each 25 ml subsample contains less than 35 organisms, then do twenty 25 ml subsamples (total volume 500 ml);
- if each 25 ml subsample contains 35 to 50 organisms, then do all ten 25 ml subsamples (total volume of 250 ml);
- if each 25 ml subsample contains 50 to 75 organisms, then do eight 25 ml subsamples (total volume of 200 ml);
- if each 25 ml subsample contains 75 to 100 organisms, then do five 25 ml subsamples (total volume of 125 ml);
- if each 25 ml subsample contains 100 to 150 organisms, then do four 25 ml subsamples (total volume of 100 ml); and,
- if each 25 ml subsample contains > 150 organisms, contact the project manager for confirmation, prior to doing two 25 ml subsamples (total volume of 50 ml).

Place the sorted and the unsorted material from the subsamples into separate containers for archiving and label them properly.

Taxonomic Identification

All organisms will be identified to the lowest practical taxonomic level (usually genus or species wherever feasible).

In most instances, “identification to the lowest taxonomic level” is defined as:

Nematoda	phylum
Oligochaeta	family
Gastropoda	genus/species
Turbellaria	family
Hirudinea	species
Mollusca	genus/species
Hydracarina	leave at this level
Cladocera	leave at this level
Copepoda	order
Ostracoda	leave at this level
Amphipoda	genus
Insecta	genus/species
Terrestrial	leave at this level

Organisms that cannot be identified to the desired level of taxonomic precision (e.g., immatures or damaged) will be reported as a separate category (at the finest level of taxonomic resolution possible). Organisms that require detailed microscopic examination for identification (e.g., Chironomidae and Oligochaeta) will be mounted onto microscope slides using an appropriate mounting medium (e.g., Canada balsam, Permount, Hohers’s). The most common species may be distinguishable on the basis of gross morphology and may require only a few mounts (5 to 10) as checks. All rare or less commonly occurring species are mounted for identification.

A reference collection is provided of all taxa identified from the samples. These collections are retained for taxonomic verification, ensuring consistent taxonomy and for quality control checks. They are stored in individual glass jars with rubber lined metal lids. All organisms will be identified to the desired taxonomic level using current literature and nomenclature.

QA/QC for Benthic Invertebrate Taxonomic Enumeration

Dr. Jack Zloty follows the QA/QC procedures outlined in "Revised guidance for sorting and subsampling protocols for EEM benthic invertebrate community surveys" by Glozier et al. (2002). In addition, reference collections are maintained and recent taxonomic keys are followed in the identification process. Details on the QA/QC methods employed are subsequently provided.

Sorting Efficiency

To assess sorting efficiency, at least 10% of all samples from each study are re-sorted and any organisms found on the second sort are enumerated. The criteria for an acceptable sort is that 90% of the total number of organisms are recovered during the initial sort (Glozier et al. 2002). If > 10% of the total number of organisms are found during the re-sort, then all the samples within the particular group require re-sorting. The sorting efficiency will be calculated and reported for each sample.

Reference Collection

A reference collection is provided for all taxa identified from the samples. These collections are retained for taxonomic verification, ensuring consistent taxonomy, and for QC checks.

Rare and Damaged Organisms

Organisms that cannot be identified to the desired level of taxonomic precision (e.g., immatures or damaged) will be reported as a separate category (at the finest level of taxonomic resolution possible). Organisms which require detailed microscopic examination for identification (e.g., Chironomidae and Oligochaeta) will be mounted onto microscope slides using an appropriate mounting medium (e.g., Canada balsam, Permount, Hohers). The most common species may be distinguishable on the basis of gross morphology and may require only a few mounts (5 to 10) as checks. All rare or less commonly occurring species are mounted for identification. A list of references used in taxonomic identification will be provided.

Literature Cited

Glozier N.E., J.M. Culp, and D. Halliwell. 2002. Revised guidance for sample sorting and subsampling protocols for EEM benthic invertebrate community surveys. Environment Canada, Saskatoon, Saskatchewan.

Wrona, F.J., J.M. Culp, and R.W. Davies. 1982. Macroinvertebrate subsampling: A simplified apparatus and approach. Can. J. Fish. Aquat. Sci. 39: 1051-1054.

Taxonomic References

Alder, P.H., D.C. Currie, and D. M. Wood. 2004. The Black Flies (Simulidae) of North America. Cornell University Press. 941pp.

Brinkhurst, R.O. 1986. Guide to the freshwater aquatic microdrile oligochaetes of North America. Can. Spec. Publ. Fish. Aquatic Sci. 98: 1-259.

Clifford, H.F. 1991. Aquatic Invertebrates of Alberta. University of Alberta Press, Edmonton, Alberta. 538 pp.

Coffman, W.P., and L.C. Ferrington, Jr. 1996. pp. 635-754, In R.W. Merritt, and K.W. Cummins (eds). An introduction to the aquatic insects of North America. (3rd ed.). Kendall/Hunt Publishing Company, Dubuque, Iowa. 862 pp.

Edmunds, G.F., Jr., S.L. Jensen, and L. Berner. 1976. The mayflies of North and Central America. University of Minnesota Press, Minneapolis. 330 pp.

Epler J. H. 2001. Identification manual for the larval Chironomidae (Diptera) of North and South Carolina. Special publication SJ2001-SP13. North Carolina Department of Environment and Natural Resources. 176 pp.

Maschwitz, D.E., and E.F. Cook. 2000. Revision of the Nearctic species of the genus Polypedilum Kieffer (Diptera: Chironomidae) in the Subgenus *P*. (*Polypedilum*) Kieffer and *P*. (*Urespedilum*) Oyewo and Saether. Ohio Biological Survey Buletin (New Series) Vol. 12. N. 3. 135pp.

McAlpine, J.F., B.V. Peterson, G.E. Shewell, H.J. Teskey, J.R. Vockeroth, and D.M. Wood (cords). 1981. Manual of Nearctic Diptera, Vol. 1. Res. Branch, Agric. Can. Monogr. 28. 674 pp.

McCafferty, W.P., and R.P. Randolph. 1998. Canadian mayflies: A faunistic compendium. Proc. Ent. Soc. Ont. 129: 47-97.

Merritt, R.W., and K.W. Cummins (eds). 1996. An introduction to the aquatic insects of North America. (3rd ed.). Kendall/Hunt Publishing Company, Dubuque, Iowa. 862 pp.

Oliver, D.R., and M.E. Roussel. 1983. The genera of larval midges of Canada (Diptera: Chironomidae). Part 11. The insects and arachnids of Canada. Biosys. Res. Inst., Ottawa. 263 pp.

Pennak, R.W. 1989. Fresh-water invertebrates of the United States. (3rd ed.). John Wiley & Sons, New York. 628 pp.

Soponis, A.R. 1977. A revision of the Nearctic species of Orthocladius (Orthocladius) Van Der Wulp (Diptera: Chironomidae). Mem. Ent. Soc. Can. 102: 1-187.

Stewart, K.W., and B.P. Stark. 1993. Nymphs of North American stonefly genera (Plecoptera). University of North Texas Press, Denton, Texas.

Thorp J.H., and A.P. Covich (eds). 1991. Ecology and classification of North American freshwater invertebrates. Academic Press. 911pp.

Westfall, M.J., Jr., and M.L. May. 1996. Damselflies of North America. Scientific Publishers, Gainesville. 649 pp.

Wiederholm, T. (ed.). 1983. Chironomidae of the holarctic region. Keys and diagnoses. Part 1. Larvae. Ent. Scand. Suppl. 19: 1-457.

Wiggins, G.B. 1996. Larvae of the North American caddisfly genera (Trichoptera). (2nd ed.). University of Toronto Press, Toronto, Ontario. 457 pp.

Zloty, J, and G. Pritchard. 1997. Larvae and adults of *Ameletus* mayflies (Ephemeroptera: Ameletidae) from Alberta. Can. Ent. 129: 251-289.