APPENDIX C

TECHNICAL MEMO

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TO:	Yellowknife Gold Project	**DATE:**	April 14, 2011
C:	Rick Hoos	**MEMO NO.:**	
FROM:	Justin Rogers, M.Sc. Jim Stronach, P.Eng., Ph.D.	**EBA FILE:**	V23201097
SUBJECT:	Narrow Lake Water Quality Modelling		

1.0 INTRODUCTION

To assist in predicting the possible effects of YGP seasonal effluent discharges on the downstream receiving environment, a water quality modelling study was conducted. The model employed simulated the limnology of Narrow Lake in response to runoff from the Narrow Lake watershed, meteorological forcing and Tailings Containment Area (TCA) inflows. The temperature and concentration of contaminants were modelled for an eight year period in response to average hydrological conditions.

The fate and transport of six potential contaminants were modelled: arsenic, copper, cyanide, nickel, lead and zinc. These chemical parameters were selected on the basis that they are considered to be typical parameters of environmental concern and because these parameters are regulated under the Metal Mining Effluent Regulations (MMER). As part of the modelling effort, anticipated dilution of the seasonal tailings effluent decant inflows in Narrow Lake were calculated and compared against current CCME guideline values for the protection of aquatic life and regulated MMER effluent limits.

2.0 BACKGROUND LIMNOLOGY OF NARROW LAKE

In summer, Narrow Lake stratifies into a shallow surface layer of warm water (epilimnion) and a cool deep layer (hypolimnion), separated by a thermocline. The two layers can have considerably different water quality. As surface temperatures decrease in the fall and eventually become similar to the temperature of the hypolimnion, the lake stratification is eventually broken down by wind-induced mixing. In winter, ice forms on the surface, forming an insulating layer and shielding the lake from wind and therefore eliminates wind-induced vertical mixing. Thermal stratification and a 'reverse' winter thermocline form under the ice as freshwater is densest near 4 °C and water between zero and 4 °C remains close to the surface. During ice melt in the spring surface water warms to 4 °C and sinks causing vertical mixing and destroy the winter thermocline

Narrow Lake has two deep (>11m) basins that are isolated from the surface for much of the summer. Water column profiles collected by EBA in 2004 and 2005 showed significantly depleted dissolved oxygen (DO) at depth in one of these basins in August (Tyhee NWT Corp 2008). These DO levels are not necessarily critical, but it is clear that stratification is a common and important physical process in Narrow Lake. The preservation of cooler water at depth is an important consideration for fish habitat. The seasonal hypoxia (low DO) is also relevant to habitat quality, as well as having possible effects on the behaviour of various contaminants. Neither dissolved oxygen or biological processes were included in the modelling.

3.0 HYDROLOGY

Monthly hydrologic data were taken directly from the water balance model, which is discussed in Section 4.12.3. Monthly runoff values, in millimetres, were applied to the Narrow Lake drainage area, including the lake surface area, of 3.8 square kilometres. Monthly discharges from the TCA were applied at the north end of the lake, and runoff discharges were applied at the location of an existing drainage (Figure 1). Input of runoff at one existing drainage is a simplification of actual hydrology, in which overland flow and other smaller drainages would contribute some of the flow. However, the energetic wind-induced mixing in the lake effectively mixes surface inflows regardless of their location, so that the spatial distribution of runoff flows is of minimal significance to lake physics. The volume entering Narrow Lake and therefore dilution will still be accurately represented.

The water balance assumes no runoff or TCA outflows during winter. The average flows entering Narrow Lake during ice-free months are shown in Figure 2. The outflow is located at the south end of the lake and a stage-discharge curve, based on lake levels and assumed outlet geometry, was used to calculate outflow discharges. Stream temperatures were estimated monthly based on air temperatures. The water balance is calculated for average conditions as well as for ten-year extreme dry and extreme wet conditions. The modelling was conducted using the average hydrologic conditions.

4.0 METEOROLOGY

Winds are important for the mixing energy they provide to the lake surface, as well as their effect on temperature fluxes. Cloud cover and air temperatures are also needed for determining water temperatures and ice cover. Yellowknife Airport meteorological data were used to meet the model requirements for wind, temperature, and cloud cover data. The Yellowknife station, located approximately 80 km southwest of Narrow Lake, is maintained by the Meteorological Service of Canada and has been collecting hourly climate data such as wind, air temperature, humidity and cloud cover since 1953.

Tyhee's local meteorological station has a six year period of record, but the Narrow Lake modelling required the longer-term data, including cloud cover data. From a comparison of local wind data with Yellowknife wind data, it was found that wind speeds at the site were, on average, 86% of those at Yellowknife, and the wind time series was altered accordingly.

5.0 CONTAMINANT FLUXES

The projected effluent quality used in the model was derived from a two-week old tailings effluent solution generated from a Lock Cycle Test effluent that was subsequently analyzed and reported by Inspectorate IPL for metals concentrations (Appendix J). Table 1 summarizes the predicted concentrations of the contaminants of concern in the tailings effluent and subsequently the TCA.

Some assumptions regarding processes and dilution in the TCA were necessary to provide reasonable estimates of the contaminant flux into Narrow Lake. A dilution calculation was performed using fluxes into the TCA from water sources, as calculated in the water balance. For example, the concentration of arsenic in the plant effluent is 256 µg/L, while the water flowing from Round Lake into the TCA varies from 4.5 to 26 µg/L, and precipitation and natural runoff are assumed to have a concentration of zero. On average,

contaminant concentrations in the TCA are 78% of the concentrations in the plant effluent. Detailed modelling of concentrations in the TCA was not conducted and some seasonal variation is expected.

Based on this calculation, the concentrations of the six contaminants after dilution in the TCA, and therefore discharged to Narrow Lake, are shown in the second column of Table 1. It was assumed that the concentration of the plant effluent was constant, regardless of whether the process water was recycled or fresh. Seasonal changes in the TCA concentration were not calculated and the TCA was assumed to quickly reach steady state. Detailed modelling of the way in which the TCA approaches steady state over the first two to three years of operation was not conducted, pending completion of detailed design and selection of implementation schedule.

Table 1: Contaminant Concentration in Representative Tailings Effluent and Tailings Containment Area

Parameter	Plant Effluent Concentration (Total µg/L)	TCA Concentration (Total µg/L)
Arsenic (As)	256.0	199.7
Copper (Cu)	6.4	5.0
Cyanide (CN)	30.9	24.1
Nickel (Ni)	2.1	1.6
Lead (Pb)	1.1	0.9
Zinc (Zn)	33.9	26.4

6.0 HYDRODYNAMIC MODEL

Releases and fate of contaminants from the tailings effluent discharge were simulated using EBA's proprietary three-dimensional hydrodynamic model H3D. It is a three-dimensional time-stepping model that computes the water velocity on a rectangular grid, as well as scalar fields such as temperature and contaminant concentrations. The contaminants were modelled as inert tracers, added at the tailings containment area release point and tracked in the model until it leaves the model domain. Non-conservative processes, such as chemical alteration, precipitation, or deposition, were not modelled.

Wind forcing produces currents within enclosed water bodies as well as water level differences and fluctuations. It also significantly affects vertical mixing, and hence scalar distribution. Turbulence modelling is important in determining the distribution of velocity and scalars such as water temperature and contaminants. The diffusion coefficients for momentum and scalars at each computational cell depend on the level of turbulence at that point. For momentum, H3D uses a shear-dependent turbulence formulation in the horizontal, and a shear stratification dependent formulation in the vertical. These parameters have been shown to correctly simulate the annual temperature cycle within several lakes in British Columbia, and are consistent with current practice (Stronach 2008). For scalars, the eddy diffusivity values are set equal to the corresponding eddy viscosity values.

The model operates in a time-stepping mode over the period of simulation. During each time step, values of velocity, temperature and concentrations of other scalars are updated in each cell. The effects of incoming solar radiation, outgoing longwave radiation, and sensible and latent heat flux on water temperature were included in the model. Evaporation and precipitation mass fluxes from the lake surface

were not modelled as they are accounted for in the water balance, but the effect of evaporation on lake temperature was included, and both processes are represented in the water balance runoff calculations. The ice formation and melting module is closely coupled to the temperature and heat transfer calculation.

7.0 MODEL IMPLEMENTATION

The Narrow Lake model was constructed with 20-metre horizontal grid resolution and 0.5 metre vertical resolution. The vertical resolution is constant throughout the water column, in order to simulate stratification at any depth and represent possible subsurface discharge of TCA inflows. Lake bathymetry was collected by EBA for Tyhee in 2004 (Tyhee NWT Corp, 2008). The model bathymetry and grid is shown in Figure 1, along with the locations of inflows and outflows.

The model was run for a period of eight years, which is the current planned operating life of the mine and also a sufficient time for the concentrations in Narrow Lake to reach steady state. Hydrologic conditions remained constant throughout a model run, but meteorological forcing varied from year to year.

The most important control on contaminant concentrations in Narrow Lake is the balance between TCA inflows to Narrow Lake and runoff from the local Narrow Lake drainage. The average monthly flows entering Narrow Lake from the TCA and the local Narrow Lake drainage area are shown in Figure 2. Outflow was calculated based on lake level and a stage-discharge relationship.

8.0 MODEL RESULTS

Model outputs consist of hourly water temperature and contaminant dilution throughout the lake for eight years. To help visualize these results, an example of model output in cross-section form is shown in Figure 3. The cross-section is down the axis of the lake, with the inflow from the TCA on the right, outflow on the far left, and inflows from runoff entering the model near the middle. This example is from July 1 of the second year of simulation, a time during which the lake is stratified. The colour fill represents lake temperature, and the two layers can be seen, with a strong thermocline between 5 and 7 metres depth. The contour lines and labels show contaminant dilution. Dilution is the ratio of the initial concentration of a contaminant, in this case flowing into Narrow Lake, to its concentration at the point under consideration. Thus, high dilution is equivalent to low concentration, and vice versa. The concentrations are still increasing in Year 2, but this example shows a time when water at depth is somewhat lower in concentration than the surface layer. Minimal dilution is available from runoff.

Time series data were extracted from the model at two locations: the surface near the outflow location and the bottom of the deeper southern basin. A time series of temperature over eight years is shown in Figure 4, with the surface temperatures in red and the bottom in blue. Both summer and winter stratification are apparent, as well as the gradual increase of bottom temperatures and mixing that occurs in the fall. Times during which the lake is vertically mixed show up as overlapping lines. A temperature difference of greater than 10 °C is common in the summer, which has been observed by EBA in the 2004 and 2005 water temperature profiles.

The time series of contaminant dilution under average hydrologic conditions at the same two locations is shown in Figure 5. The first three to four years are periods of major increases in contaminant concentration, or decreasing dilution, since the lake starts out with generally very small values of contaminants compared to the values delivered by the TCA stream. As time goes on, into Years 2, 3 and 4, contaminant concentrations in the lake build up, and a new, elevated, steady state concentration is reached by about Year 5. Using the final minimum dilution of approximately 1.16, the TCA concentration required to meet CCME guidelines in Narrow Lake was calculated. For example, to meet the CCME guideline of 5 µg/L for arsenic, a TCA concentration of 5 multiplied by 1.16, or 5.8, is required. Table 2 shows the contaminant concentrations required in Narrow Lake for arsenic, copper and cyanide. The nickel, lead and zinc concentrations in the TCA already meet CCME guidelines and are not altered in Table 2.

Table 2: Required TCA Concentrations of Six Potential Contaminants

Parameter	TCA Concentration	CCME Water Quality Guideline (µg/L)	Required TCA Concentration	MMER Effluent Discharge Authorized Limit (µg/L)
As (µg/L)	199.7	5	5.8	500
Cu (µg/L)	5.0	2-4	2.3	300
Cyanide (µg/L)	24.1	5	5.8	1000
Ni (µg/L)	1.6	25-150	-	500
Pb (µg/L)	0.9	1-7	-	200
Zn (µg/L)	26.4	30	-	500

Figure 6 shows the modelled arsenic concentration in Narrow Lake over eight years assuming the required TCA concentration is met. The Narrow Lake water balance shows that runoff and TCA discharge starts in May. Narrow Lake starts with a well-mixed water column, indicated by the coincidence of the surface and bottom concentration lines in the first month or so. For the rest of the first summer, the bottom waters slowly increase in concentration but concentrations in the surface waters increase much more quickly as TCA outflows mix only with the top few metres of the lake. Mixing in the fall of the first year results in a constant concentration of around 2.5 µg/L until May of Year 2. This pattern of surface increases and relatively lower-concentration bottom waters continues until approximately Year 5. After this year, the May 'freshet' from the TCA causes both surface and bottom water concentration to increase by 4-5%, after which surface waters decrease due to a decrease in the ratio between TCA flows and runoff during the summer (Figure 6).

After Year 5, the lake reaches a relatively steady state as concentrations approach the long-term average dilution of TCA flows with local Narrow Lake drainage.

The concentrations of nickel, lead, and zinc in Narrow Lake, due to effluent discharge from the TCA, are predicted from the model to be well within CCME Guideline limits, while arsenic, copper, and cyanide levels are anticipated to approach CCME guideline limits assuming the required TCA concentrations are met. Maximum concentrations tend to occur in May, while minimums are generally seen in the fall when the TCA flows are lower as compared to the runoff.

9.0 EFFECTS ASSESSMENT

In summary, the Narrow Lake watershed does not produce sufficient runoff to significantly dilute contaminant concentrations flowing from the TCA. All potential contaminants are below the MMER authorized limits, but arsenic, cyanide, and copper require additional treatment to meet the CCME guidelines. The numerical modelling, as summarized in Table 2, provides guidance with respect to the level of treatment required for these contaminants.

Steady state concentrations are achieved in approximately Year 5 (Figure 6) as levels increase only another 2% by Year 8. Both stratification and the balance between runoff and TCA discharge play a role in the rate of approach to steady state. Once steady-state conditions are reached, concentration increases are seen in both the surface and bottom waters during the high TCA discharge months of May and June. The concentrations in bottom water remain high after the lake stratifies, and drop to average values during the fall overturning of the lake. Surface concentrations decrease during summer and fall as less water is discharged from the TCA.

YELLOWKNIFE GOLD PROJECT

APPENDIX C

2004 WATER QUALITY SAMPLING PROGRAM

February, 2005

Tyhee NWT Corp

Tyhee NWT Corp

APPENDIX C

2004 WATER QUALITY SAMPLING PROGRAM

TYHEE NWT CORP

YELLOWKNIFE GOLD PROJECT

Prepared for:

TYHEE NWT CORP

Prepared by:

EBA ENGINEERING CONSULTANTS LTD.
Calgary, Alberta

FEBRUARY 2005

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1.0 INTRODUCTION

1.1 General

Tyhee NWT Corp. (Tyhee) retained EBA Engineering Consultants Ltd. (EBA) to conduct a water-quality sampling program at their Yellowknife Gold Project (YPG) site, Northwest Territories (NWT).

The objective of the water-quality program was to document the present state of the water quality in the following lakes: Nicholas, Eclipse, Brien, Narrow, Winter and Round. The Canadian Council of Ministers of the Environment (CCME) – Canadian Water Quality Guidelines (CWQG) for the Protection of Freshwater Aquatic Life (FAL) (December, 2003) is used as the cornerstones for this report.

1.2 Site Description

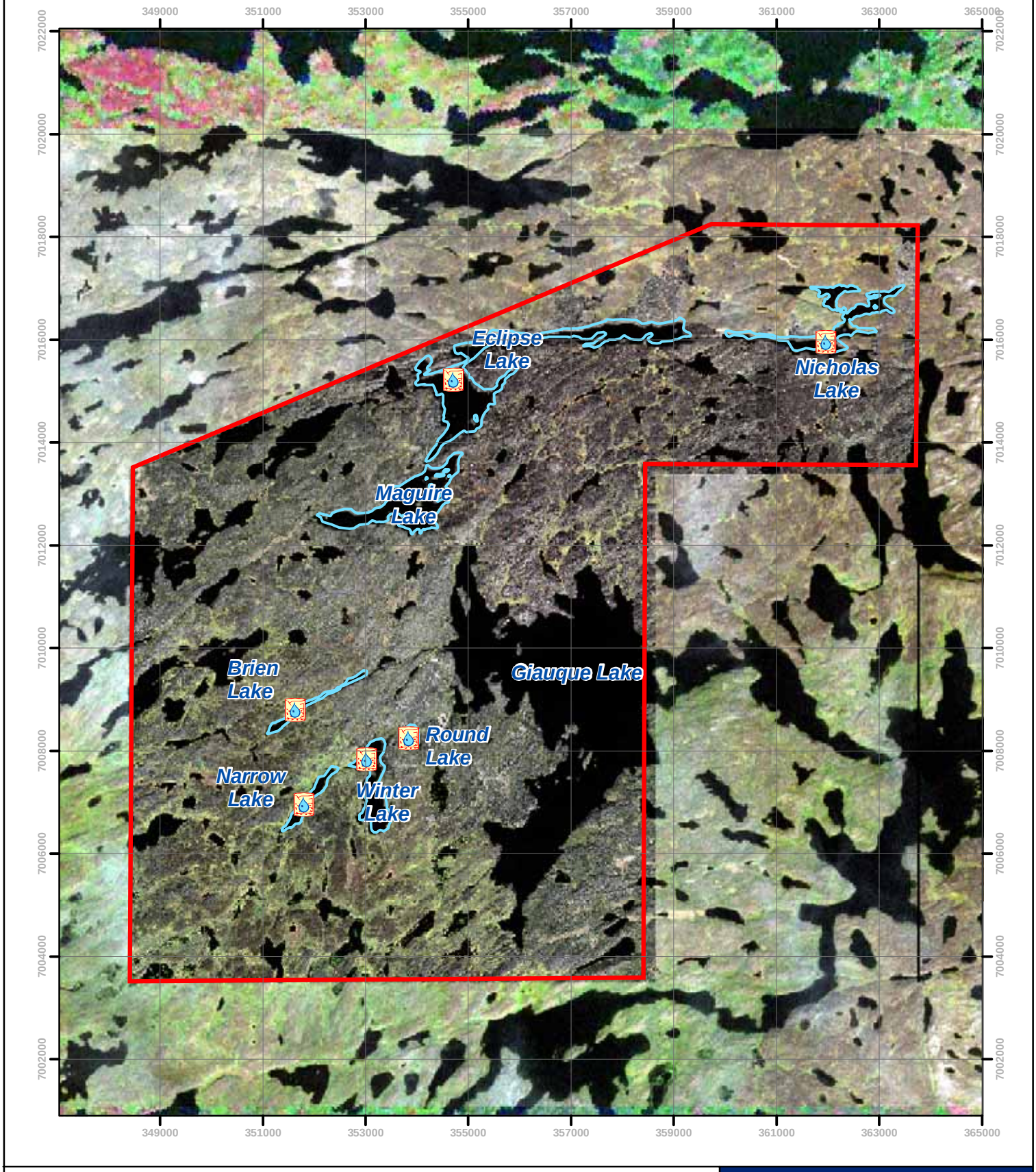
The YGP is located approximately 84 km north-northeast of Yellowknife, NWT at latitude 63^{o} 10’ North and longitude 113^{o} 53’ West.

Six water quality sampling locations were selected, one on each of the six lakes listed above. Figure 1 shows the locations of the sampling points.

2.0 FIELD PROGRAM

Water quality samples were collected at Nicholas, Eclipse, Brien, Narrow, Winter and Round lakes on May 12, 2004 and May 13, 2004, July 14, 2004, August 12, 2004, and August 13, 2004, and September 29, 2004 and September 30, 2004. The May trip occurred prior to ice melt. July and August represent mid-summer and late summer period. September represents the fall turnover period.

A Global Positioning System (GPS) was used to locate the stations based on the UTM coordinates. Table 1 presents the UTM coordinates for each sampling station during the 2004 May sampling program. The sampling in May was dine from a light plane equipped with skies and the landings were on ice. The samplings in July, August and September were conducted from a float plant, the locations were duplicated as near as possible. However, at the deeper stations there was some drift during sampling and the later samplings were not exactly the same locations as in May.



Local Study Area

2004 Study Lakes

Water Sampling Station

N
W
E
S

0 0.5 1 2 3 Km

1:100,750

UTM Z12 NAD83

Yellowknife Gold Project

2004
Water Quality Sampling Stations

Tyhee NWT Corp

EBA ENGINEERING CONSULTANTS LTD.

February, 2005

Figure 1

Figure1_tyhee_water-sampling-locations-2004.mxd

Table 1
UTM Coordinates of Water Sampling Stations

Lake	Station	Northing	Easting
Nicholas	A	7 015 752	361 949
Eclipse	A	7 015 020	354 702
Brien	A	7 008 600	351 623
Narrow	A	7 006 757	351 793
Winter	A	7 007 631	353 016
Round	A	7 008 046	353 835

Datum: NAD 1927, Zone 12V North

The May sampling event occurred under winter conditions. Once the station was located with a GPS, an 8' diameter manual ice auger was used to drill through the ice. The ice auger was kept covered and clean prior to use. A clam tent was placed over the ice hole and a small propane heater was used inside the tent to keep equipment from freezing. The July, August and September sampling events occurred during ice free periods and did not require the use of an ice auger, a clam tent or propane heater. To ensure bottom sediments were not disturbed during sampling, an Eagle FishEasy model fish-finder sonar was used to establish water depth prior to collecting measurements and samples.

A WTW ProfiLine Oxi 197 model dissolved oxygen (DO) and temperature meter was used to measure oxygen and temperature profiles in-situ at 1 m intervals. The metre was equipped with a 60 m cable attached to a TA 197 electrode. The cable was marked in 1 m intervals in order to identify the sampling depth. Calibration of the electrode in the field was completed prior to each use. The electrode was lowered to the desired depth and then raised and lowered approximately 0.3 m at the designated depth, until the DO readings stabilized. These readings were recorded on standard data sheets.

Water samples were collected using a 4.2 L capacity Kemmerer bottle model 1540-C22 constructed of transparent acrylic with silicone seals. The Kemmerer bottle was acid washed in Yellowknife prior to each sampling event. In the field, the Kemmerer bottle was lowered to the desired depth and held for two minutes, to allow the water at the targeted depth to flow around the sampling unit. Once the water had a chance to flow through the unit, a messenger was sent down, triggering both ends of the Kemmerer bottle to close; thereby, locking in the water sample at that depth. The bottle was then raised to the surface and placed on a clean surface. A valve located at the bottom of the Kemmerer bottle allowed water to be removed from the bottle in a controlled manner.

The sampling program entailed collecting water samples from the top and bottom of the water column for Nicholas, Eclipse and Narrow lakes. However, due to the shallow nature of Brien, Winter and Round lakes, only one sample sampled (middle) was taken. In addition, duplicates for each station were also collected. The average measured depths for Nicholas, Eclipse, Brien, Narrow, Winter and Round lakes were 15.5 m, 51.0 m, 5.8 m, 8.6 m, 3.0 m and 0.8 m, respectively.

Dissolved metal samples were filtered in the field using dedicated disposable Nalgene 45 μm filters. Water samples collected for both total and dissolved metals were preserved using 1 mL of ultra-pure 1:1 nitric acid. Samples collected for nutrients were preserved with 2 mL of 1:1 sulfuric acid. Water samples collected for total organic carbon were preserved with 1 mL of 1:1 sulfuric acid. Cyanide samples were preserved with 1 mL of 6N Sodium Hydroxide. Redox (Round Lake only) requires no preservatives.

3.0 QUALITY ASSURANCE/QUALITY (QA/QC) CONTROL PROGRAM

Enviro-Test Laboratories (ETL) of Edmonton prepared sample bottles. Total and dissolved ultra-low level metal bottles were acid-washed with ultra-trace grade 1:1 nitric acid by ETL in the laboratory. Powderless latex gloves were worn during handling of bottles and equipment to minimize contamination. All bottles were rinsed three times with the source water (i.e., the same water the bottle was filled with) prior to water collection. To minimize trace metals contamination from the filters, the filters were rinsed three times with the source water prior filling the bottles.

As part of a QA/QC program, travel blanks, field blanks and duplicates were collected. Travel blanks and field blanks were utilized in order to assess contamination from sample containers or other equipment used in the collection and handling of samples, and to detect other systematic or random errors from sampling through to analysis. Duplicates were collected to test the accuracy of sampling procedures and laboratory methodology.

Travel blanks were prepared by ETL and shipped along with the sample bottles to the Tyhee camp. Bottles were filled with deionized water and preserved in the laboratory prior to shipment. Travel blank bottles remained completely sealed until they were returned to ETL for analysis. Since it was important for the laboratory to use the same type of filter as the ones used in the field, a disposable 45 μm Nalgene filter was submitted to the laboratory along with each sampling event. This "Filter" sample represented the dissolved ultra-low level metals travel blank. One set of travel blanks was used for each sampling event.

Field blanks were prepared in the field in the same environment in which the water samples were collected. Once in the field, field blank sample bottles were filled with deionized water and preserved. One set of field blanks was prepared for each sampling event.

One set of duplicates was collected in the field at each station.

4.0 ANALYTICAL PROGRAM

Water samples were submitted to ETL in Edmonton. ETL is a laboratory accredited by the Canadian Association for Environmental Analytical Laboratories (CAEAL).

Water samples were analyzed for total and dissolved ultra-low metals, total organic carbon (TOC), low-level nutrients, low-level routine water chemistry (major ions and physical parameters), cyanide and redox (Round Lake only). A list of specific parameters analyzed and their respective detection limits are presented in Table 2.

Table 2
Parameter Detection Limits

Parameter	Detection Limits	Units
Major Ions/Nutrients/Inorganics		
Chloride	1	mg/L
Fluoride	0.05	mg/L
Calcium	0.5	mg/L
Potassium	0.1	mg/L
Magnesium	0.1	mg/L
Sodium	0.1	mg/L
Ion Balance	---	%
TDS (Calculated)		mg/L
Hardness (as $CaCO_3$)		mg/L
Iron-Extractable	0.005	mg/L
Manganese-Extractable	0.001	mg/L
Nitrate+Nitrite-N	0.006	mg/L
Nitrate-N	0.006	mg/L
Nitrite-N	0.002	mg/L
Sulfate	0.05	mg/L
PH	0.1	pH
Conductivity	0.2	µS/cm
Bicarbonate	5	mg/L
Carbonate	5	mg/L
Hydroxide	5	mg/L
Alkalinity, Total (as $CaCO_3$)	5	mg/L
Ammonia-N	0.005	mg/L
Cyanide	0.002	mg/L
Phosphorus, Total	0.001	mg/L
Total Organic Carbon	0.2	mg/L
Dissolved Organic Carbon	0.5	?????
Total Suspended Solids	3	mg/L
Turbidity	0.1	NTU
Redox Potential	1	MV

Table 2 continued
Parameter Detection Limits

Parameter	Detection Limits	Units
Ultra-Low Metals (Total and Dissolved)		
Silver	0.0001	mg/L
Aluminum	0.0003	mg/L
Arsenic	0.00003	mg/L
Boron	0.001	mg/L
Barium	0.00005	mg/L
Beryllium	0.0002	mg/L
Bismuth	0.00003	mg/L
Calcium	0.02	mg/L
Cadmium	0.00005	mg/L
Cobalt	0.0001	mg/L
Chromium	0.00006	mg/L
Copper	0.0006	mg/L
Iron	0.005	mg/L
Lithium	0.0001	mg/L
Mercury	0.00002	mg/L
Potassium	0.005	mg/L
Magnesium	0.004	mg/L
Manganese	0.0001	mg/L
Molybdenum	0.00006	mg/L
Sodium	0.005	mg/L
Nickel	0.00006	mg/L
Lead	0.00005	mg/L
Antimony	0.00003	mg/L
Selenium	0.0001	mg/L
Silicon	0.1	mg/L
Strontium	0.0001	mg/L
Tin	0.0001	mg/L
Uranium	0.00005	mg/L
Vanadium	0.00005	mg/L
Zinc	0.0008	mg/L

5.0 FIELD RESULTS AND DISCUSSIONS

DO and water temperatures were measured in the field during each sampling event. The results were graphed with depth on the vertical axis and DO and temperature on the horizontal axis. Depth was measured in metres, DO was measured in milligrams per litre (mg/L) and temperature was measured in degrees Celsius (^{o}C).

Seasonal changes in temperature and/or DO observed at the stations during late winter, summer and fall were within expected ranges for lakes in this region at this time of year. The trend of lower DO concentrations with depth during May, July and August reflect anaerobic conditions at the bottom of the lakes and is typical of water bodies in this region. Low DO concentrations near the lake-bottom are typical for lakes in this region in summer. Welch (2000) completed a study on DO in Canadian arctic lakes. He found that lakes in the 10 m to 20 m depth range have sufficient DO near the surface to support life but even these usually have very low oxygen concentrations near the bottom. Welch attributed this occurrence to two factors. The first factor is that respiration occurs mostly at the bottom of the lake. Second, the water made slightly heavier by warming from the bottom slides downhill at the sides of the lake, carrying oxygen-depleted water with it.

Temperature levels were typical for these lakes during all seasons sampled. DO and temperature curves are almost straight lines throughout the depth during the fall sampling event, indicating that fall turnover was in progress.

5.1 Nicholas Lake

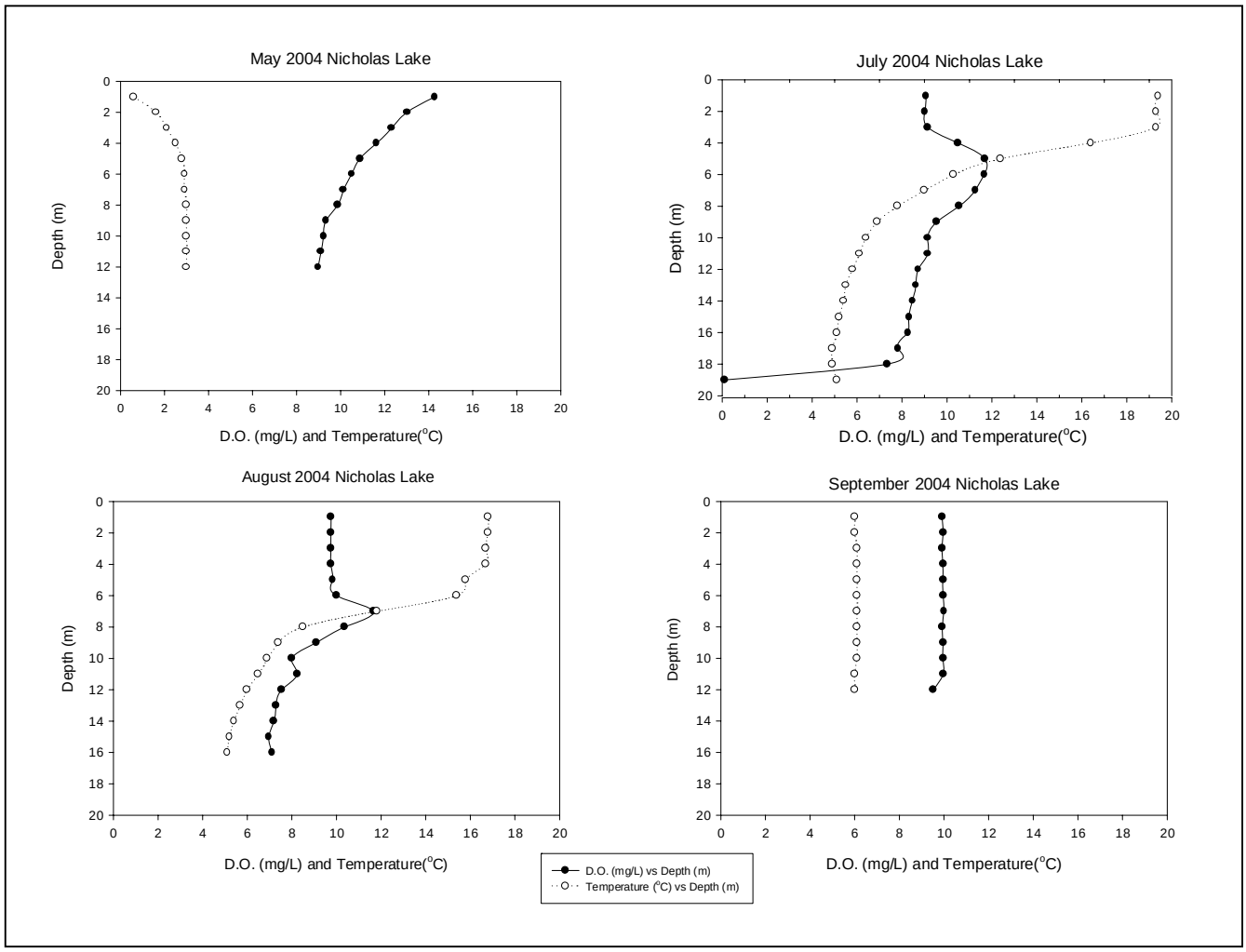
Station A on Nicholas Lake is located approximately 11 km northeast of Tyhee's camp, near the center of the lake, in the lake's widest and deepest basin. DO concentration and temperature measurements recorded at Nicholas Lake during the four sampling events are included in Table 3. Typical thermoclines were noted in Nicholas Lake in July and August. In July, it began at 4 m and in August it began at 7 m. July sampling showed significant DO depression at the bottom of the water column.

Table 3
Dissolved Oxygen (mg/L) and Temperature (°C) Measurements for Nicholas Lake, 2004

Depth (m)	May 12 to 13		July 14		Aug 12 to 13		Sept 29 to 30	
	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)
1	14.28	0.6	9.07	19.4	9.76	16.8	9.91	6.0
2	13.01	1.6	9.02	19.3	9.75	16.8	9.96	6.0
3	12.33	2.1	9.14	19.3	9.75	16.7	9.91	6.1
4	11.63	2.5	10.50	16.4	9.74	16.7	9.95	6.1
5	10.97	2.8	11.70	12.4	9.83	15.8	9.95	6.1
6	10.50	2.9	11.66	10.3	9.99	15.4	9.96	6.1
7	10.13	2.9	11.26	9.0	11.67	11.8	10.00	6.1
8	9.87	3	10.55	7.8	10.37	8.5	9.92	6.1
9	9.33	3	9.54	6.9	9.10	7.4	9.96	6.1
10	9.22	3	9.14	6.4	7.99	6.9	9.95	6.1
11	9.11	3	9.15	6.1	8.25	6.5	9.97	6.0
12	8.98	3	8.72	5.8	7.54	6.0	9.53	6.0
13	-	-	8.62	5.5	7.29	5.7	-	-
14	-	-	8.46	5.4	7.20	5.4	-	-
15	-	-	8.31	5.2	6.96	5.2	-	-
16	-	-	8.27	5.1	7.11	5.1	-	-
17	-	-	7.82	4.9	-	-	-	-
18	-	-	7.36	4.9	-	-	-	-
19	-	-	0.12	5.1	-	-	-	-
Average Temperature (°C)		2.7		9.2		10.4		6.1

- = Not sampled due to insufficient depth.

Figure 2
Dissolved Oxygen and Temperature Profiles for Nicholas Lake, 2004



5.2 Eclipse Lake

Station A on Eclipse Lake is located approximately 6.8 km north of Tyhee's camp, in the main body of the lake, the largest and deepest area. DO concentration and temperature measurements recorded at Station A during the four sampling events are included in Table 4. DO concentration and temperature profiles for this station are presented in Figure 3. For May, under ice conditions, DO concentration and temperature readings were recorded at 1.0 m; however, the 1 m value is not discussed in the analysis as it was within the ice layer.

Table 4
Dissolved Oxygen (mg/L) and Temperature (°C) Measurements for Eclipse Lake, 2004

Depth (m)	May 12 to 13		July 14		Aug 12 to 13		Sept 29 to 30	
	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)
1	13.00	0.6	10.36	19.4	10.14	16.8	11.09	6.0
2	11.40	1.8	10.34	19.2	10.11	16.7	11.06	6.0
3	10.95	2.3	10.34	19.1	10.15	16.6	10.95	6.0
4	10.65	2.5	10.73	17.9	10.06	16.6	10.92	6.0
5	10.23	2.8	12.40	13.7	10.08	16.5	10.93	6.0
6	10.23	2.8	13.19	11.1	10.03	16.2	10.76	6.0
7	10.16	2.9	12.51	8.8	10.12	15.0	10.98	6.0
8	10.22	2.9	11.96	8.0	11.12	10.1	10.93	6.0
9	10.06	3.0	11.56	7.1	10.57	7.9	10.93	6.0
10	9.86	3.0	11.18	6.5	10.08	7.0	10.97	6.0
11	9.66	3.1	11.16	6.2	9.85	6.4	-	-
12	9.61	3.1	11.12	6.0	9.76	6.1	10.91	6.0
13	9.76	3.2	11.06	5.8	9.55	5.9	-	-
14	9.67	3.2	10.96	5.7	9.49	5.8	10.88	6.0
15	9.60	3.3	10.97	5.6	9.48	5.7	-	-
16	9.51	3.3	10.88	5.5	9.54	5.7	10.88	6.0
17	9.49	3.4	10.91	5.4	9.44	5.5	-	-
18	9.42	3.4	10.89	5.2	9.53	5.4	10.88	5.9
19	9.32	3.4	10.82	5.1	9.42	5.3	-	-
20	8.67	3.5	10.79	5.0	9.44	5.2	10.77	5.9
21	-	-	10.76	4.9	9.36	5.1	-	-
22	-	-	10.70	4.8	9.30	5.0	10.84	5.9
23	-	-	10.66	4.8	9.18	4.9	-	-
24	-	-	10.59	4.7	9.14	4.9	10.82	5.9
25	-	-	10.51	4.7	9.25	4.8	-	-
26	-	-	10.48	4.7	9.17	4.8	10.58	5.9
27	-	-	10.34	4.7	9.20	4.7	-	-
28	-	-	10.39	4.6	9.19	4.7	10.56	5.9
29	-	-	10.43	4.6	9.16	4.7	-	-
30	-	-	10.43	4.6	8.98	4.6	10.45	5.9

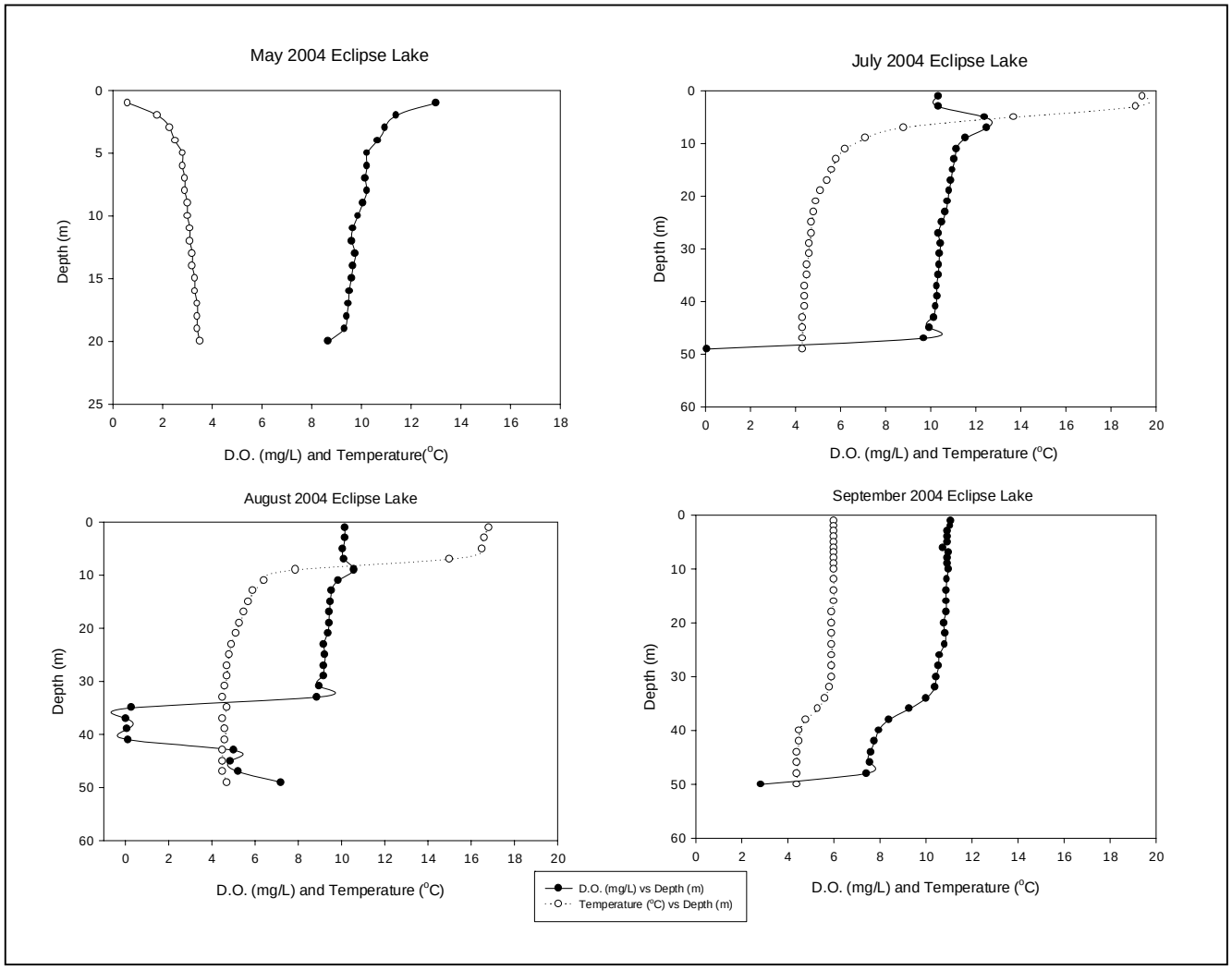
Table 4 continued
Dissolved Oxygen (mg/L) and Temperature (°C) Measurements for Eclipse Lake, 2004

Depth (m)	May 12 to 13		July 14		Aug 12 to 13		Sept 29 to 30	
	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)
31	-	-	10.39	4.6	8.97	4.6	-	-
32	-	-	10.35	4.5	8.90	4.6	10.39	5.8
33	-	-	10.37	4.5	8.84	4.5	-	-
34	-	-	10.33	4.5	8.70	4.4	10.01	5.6
35	-	-	10.33	4.5	0.27	4.7	-	-
36	-	-	10.36	4.5	0.04	4.5	9.27	5.3
37	-	-	10.27	4.5	0.04	4.5	-	-
38	-	-	10.30	4.4	0.06	4.5	8.40	4.8
39	-	-	10.28	4.4	0.09	4.6	-	-
40	-	-	10.31	4.4	0.20	4.6	7.94	4.5
41	-	-	10.22	4.4	0.11	4.6	-	-
42	-	-	10.20	4.4	3.24	4.6	7.78	4.5
43	-	-	10.13	4.3	5.01	4.5	-	-
44	-	-	10.05	4.3	4.89	4.5	7.60	4.4
45	-	-	9.95	4.3	4.84	4.5	-	-
46	-	-	9.80	4.3	4.85	4.5	7.58	4.4
47	-	-	9.71	4.3	5.21	4.5	-	-
48	-	-	0.07	4.3	7.60	4.5	7.40	4.5
49	-	-	0.09	4.3	7.20	4.7	-	-
50	-	-	0.12	4.4	7.25	4.9	2.85	4.4
Average Temperature (°C)		3.0		6.4		6.7		5.6

- = Not sampled due to insufficient depth.

The temperature DO profiles in Eclipse Lake were similar to those in Nicholas Lake during all sampling periods. Thermoclines were noted at 4 m in July and 8 m in August with significant DO depression at the bottom in July. The DO depression at the 35 m to 41 m level in August was considered to reflect a problem with instrumentation rather than true lake conditions.

Figure 3
Dissolved Oxygen and Temperature Profiles for Eclipse Lake, 2004



5.3 Brien Lake

Station A on Brien Lake is located approximately 1.8 km west of Tyhee's camp, in the main body of the lake. DO concentration and temperature measurements recorded at Station A during the four sampling events are included in Table 5 while profiles are presented in Figure 4. For May, under ice conditions, DO concentration and temperature readings were recorded at 1.0 m; however, the 1 m value is not discussed in the analysis as it was within the ice layer.

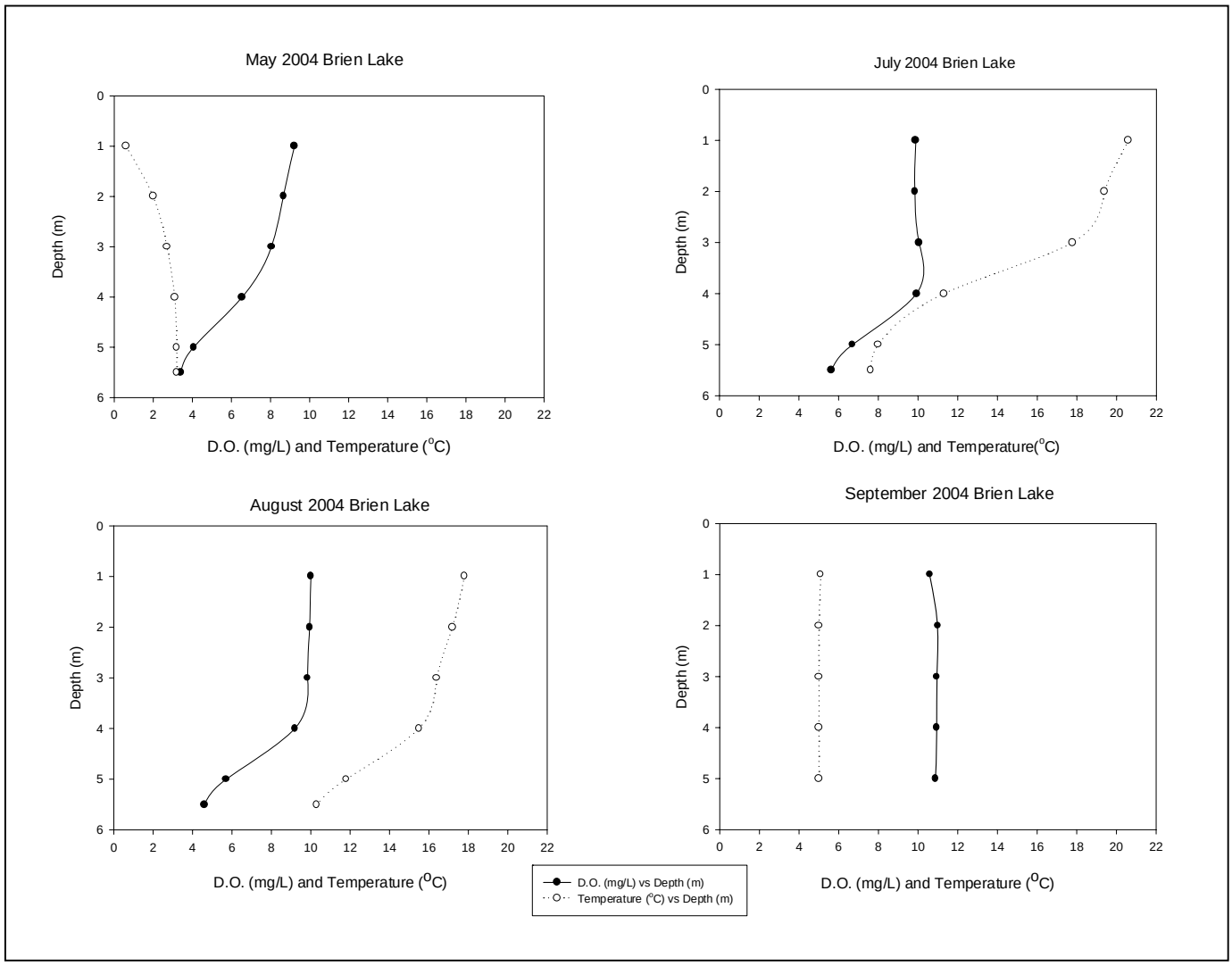
Table 5
Dissolved Oxygen (mg/L) and Temperature (°C) Measurements for Brien Lake, 2004

Depth (m)	May 12 to 13		July 14		Aug 12 to 13		Sept 29 to 30	
	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)
1	9.23	0.6	9.89	20.6	10.01	17.8	10.58	5.1
2	8.66	2.0	9.85	19.4	9.95	17.2	10.98	5.0
3	8.05	2.7	10.05	17.8	9.84	16.4	10.95	5.0
4	6.56	3.1	9.93	11.3	9.20	15.5	10.95	5.0
5	4.06	3.2	6.70	8.0	5.71	11.8	10.88	5.0
6	3.39	3.2	5.64	7.6	4.60	10.3	-	-
Average Temperature (°C)		2.8		14.1		14.8		5.0

- = Not sampled due to insufficient depth.

Brien Lake was much shallower than Eclipse or Nicholas Lakes and had a much higher surface temperature during the summer months. It also shows DO depression near the bottom in May, July and August sampling. This depression was not as significant as seen in Eclipse and Nicholas Lakes and only reached critical levels (<6 mg/L) in May. A thermocline developed in Brien Lake at the 4 m to 5 m depth in both July and August.

Figure 4
Dissolved Oxygen and Temperature Profiles for Brien Lake, 2004



5.4 Narrow Lake

Station A on Narrow Lake is located approximately 2.3 km southwest of Tyhee's camp, in the main channel of the lake. DO concentration and temperature measurements recorded at Station A during the four sampling events are included in Table 6 while profiles are presented in Figure 5. For May, under ice conditions, DO concentration and temperature readings were recorded at 1.0 m; however, the 1 m value is not discussed in the analysis as it was within the ice layer.

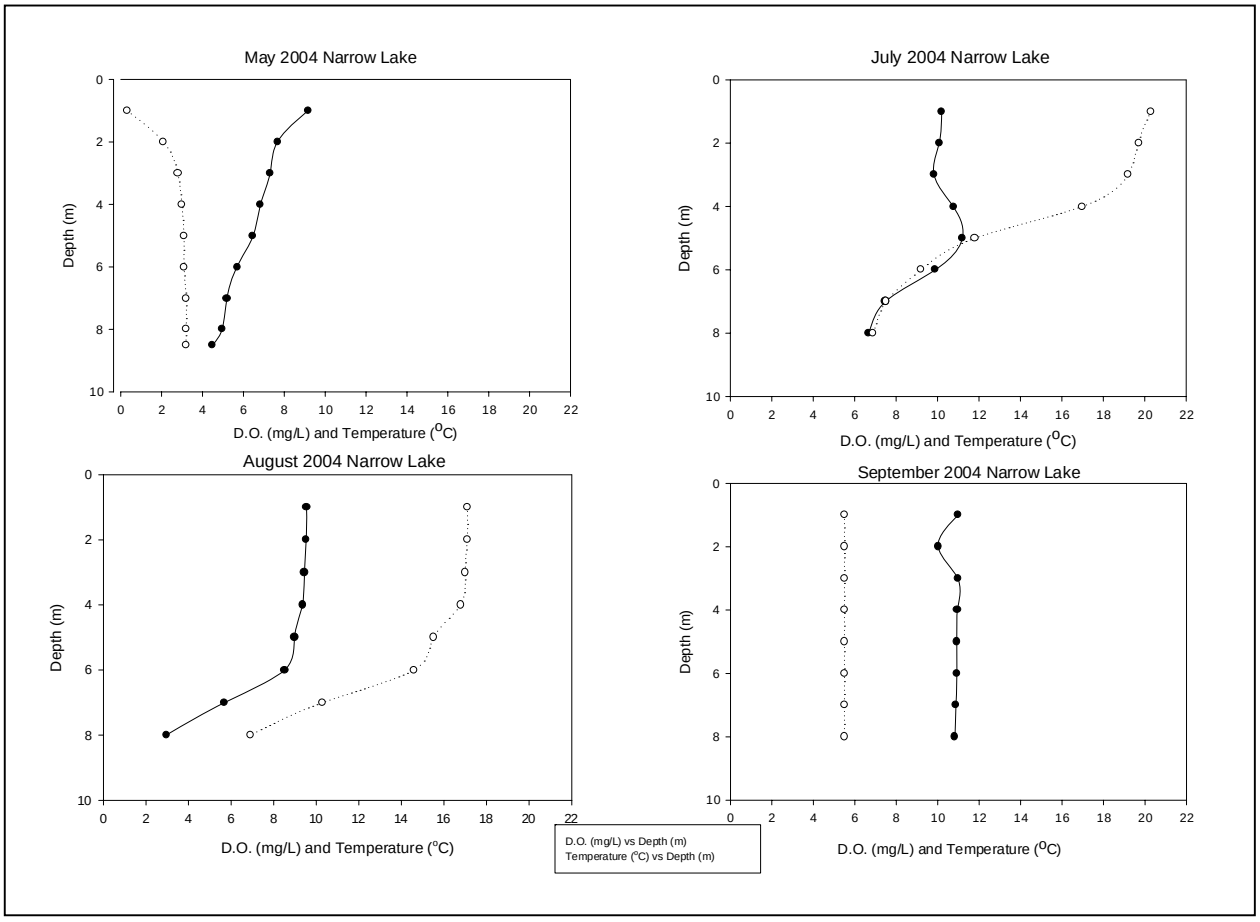
Table 6
Dissolved Oxygen (mg/L) and Temperature (^{o}C) Measurements
Narrow Lake, 2004

Depth (m)	May 12 to 13		July 14		Aug 12 to 13		Sept 29 to 30	
	DO (mg/L)	Temp (^{o}C)	DO (mg/L)	Temp (^{o}C)	DO (mg/L)	Temp (^{o}C)	DO (mg/L)	Temp (^{o}C)
1	9.16	0.3	10.20	20.3	9.54	17.1	10.99	5.5
2	7.66	2.1	10.08	19.7	9.53	17.1	10.02	5.5
3	7.31	2.8	9.83	19.2	9.45	17.0	10.97	5.5
4	6.83	3.0	10.76	17.0	9.36	16.8	10.95	5.5
5	6.48	3.1	11.21	11.8	8.98	15.5	10.93	5.5
6	5.68	3.1	9.90	9.2	8.52	14.6	10.93	5.5
7	5.20	3.2	7.49	7.5	5.69	10.3	10.88	5.5
8	4.96	3.2	6.68	6.9	2.95	6.9	10.84	5.5
9	4.50	3.2	-	-	-	-	-	-
Average Temperature (°C)		3.0		14.0		14.4		5.5

- = Not sampled due to insufficient depth.

Narrow Lake had similar depth and showed similar DO and temperature profiles over the sampling period to Brien Lake. DO depression at the bottom was noted in May, July and August. With the DO reaching critical (<6 mg/L) levels in May. A thermocline developed at the 3 m depth in July and migrated down to the 5 m depth by August.

Figure 5
Dissolved Oxygen and Temperature Profiles for Narrow Lake, 2004



5.5 Winter Lake

Station A on Winter Lake is located approximately 0.8 km southwest of Tyhee's camp, in the main body of the lake. DO concentration and temperature measurements recorded at Station A during the four sampling events are included in Table 7 while profiles are presented in Figure 6. For May, under ice conditions, DO concentration and temperature readings were recorded at 1.0 m; however, the 1 m value is not discussed in the analysis as it was within the ice layer.

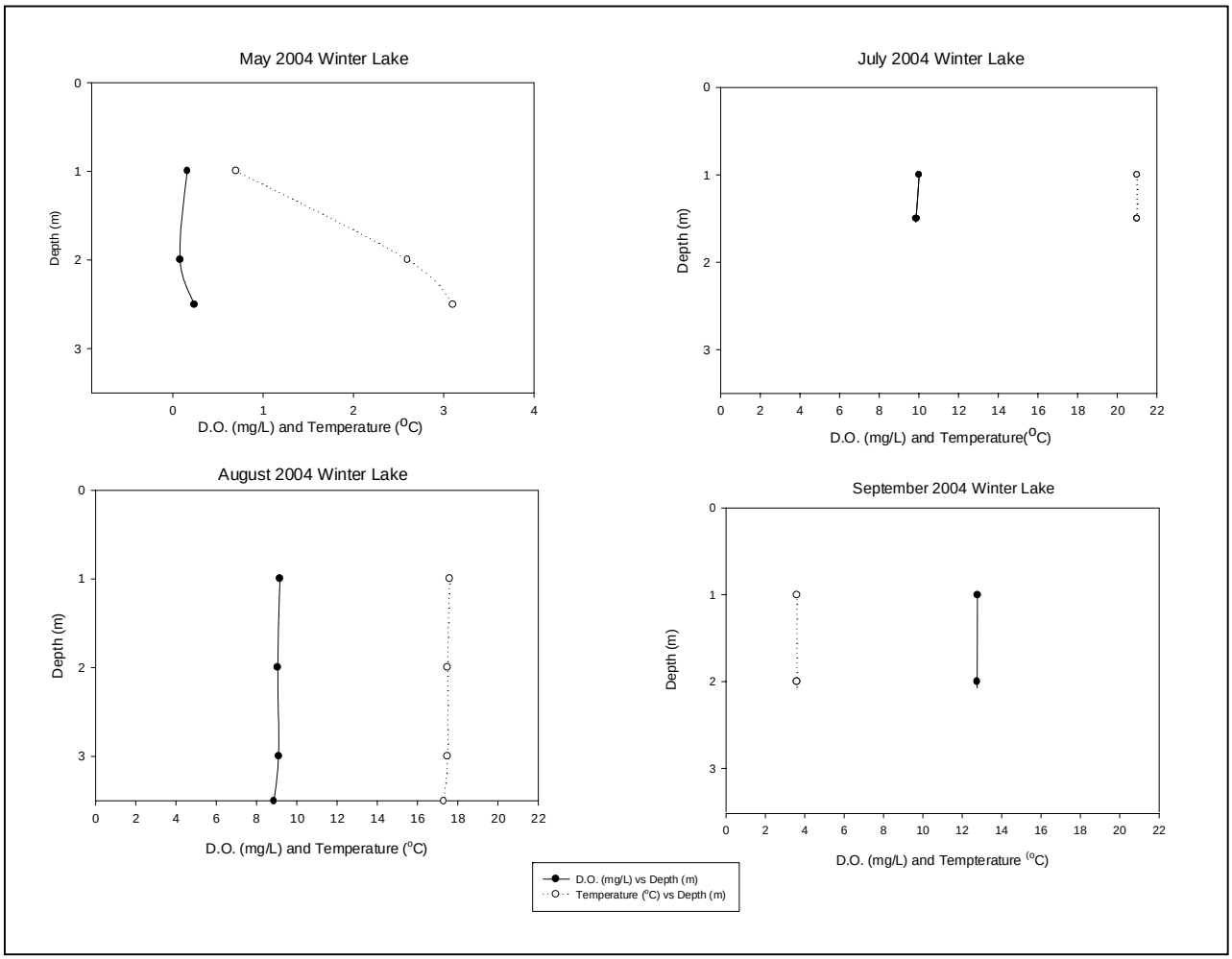
Table 7
Dissolved Oxygen (mg/L) and Temperature (^{o}C) Measurements for Winter Lake

Depth (m)	May 12 to 13		July 14		Aug 12 to 13		Sept 29 to 30	
	DO (mg/L)	Temp (^{o}C)	DO (mg/L)	Temp (^{o}C)	DO (mg/L)	Temp (^{o}C)	DO (mg/L)	Temp (^{o}C)
1	0.16	0.7	10.02	21.0	9.17	17.6	12.77	3.6
2	0.08	2.6	9.86	21.0	9.06	17.5	12.75	3.6
3	0.24	3.1	-	-	9.09	17.5	-	-
4	-	-	-	-	8.86	17.3	-	-
Average Temperature (°C)		2.9		21.0		17.5		3.6

- = Not sampled due to insufficient depth.

Winter Lake showed anoxic conditions under ice and was completely mixed in the open water season. The anoxic condition measured under ice would preclude the possibility of a fish population in this water body.

Figure 6
Dissolved Oxygen and Temperature Profiles for Winter Lake, 2004



5.6 Round Lake

Station A on Round Lake is located approximately 0.6 km southeast of Tyhee's camp, in the main body of the lake. DO concentration and temperature measurements were not recorded during the four sampling events because of low water levels.

6.0 QUALITY ASSURANCE/QUALITY CONTROL RESULTS AND DISCUSSIONS

6.1 Travel Blanks

One set of travel blanks were collected during each sampling event. Travel blanks were analyzed for total and dissolved ultra-low level metals, total and dissolved organic carbon, low-level nutrients, cyanide and low-level routine water chemistry. Results of the travel blanks collected for the 2004 water sampling program are included in Table 8.

Results of the travel blanks indicated that all analytes were below detection levels. The results showed that the integrity of the travel blanks were not compromised.

Table 8
Tyhee Travel Blanks – 2004

Analyte	May 12 to 13	July 14	August 12 to 13	September 29 to 30	Units	Detection Limit
Major Ions, Nutrients and Inorganics						
Chloride (Cl)	<1	<1	<1	<1	mg/L	1
Fluoride (F)	<0.05	<0.05	<0.05	<0.05	mg/L	0.05
Calcium (Ca)	<0.5	<0.5	<0.5	<0.5	mg/L	0.5
Potassium (K)	<0.1	<0.1	<0.1	<0.1	mg/L	0.1
Magnesium (Mg)	<0.1	<0.1	<0.1	<0.1	mg/L	0.1
Sodium (Na)	<1	<1	<1	<1	mg/L	1
Ion Balance	Low TDS	Low TDS	Low TDS	Low TDS	%	-
TDS (Calculated)	<1	<1	<1	<1	mg/L	-
Hardness (as $CaCO_3$)	<1	<1	<1	<1	mg/L	-
Iron-Extractable	0.009	0.005	<0.005	<0.005	mg/L	0.005
Manganese-Extractable	<0.001	<0.001	<0.001	<0.001	mg/L	0.001
Nitrate+Nitrite-N	<0.006	<0.006	<0.006	<0.006	mg/L	0.006
Nitrate-N	<0.006	<0.006	<0.006	<0.006	mg/L	0.006
Nitrite-N	<0.002	<0.002	<0.002	<0.002	mg/L	0.002
Sulfate (SO_4)	<0.05	<0.05	<0.05	<0.05	mg/L	0.05
pH	5.9	5.6	5.9	5.7	-	0.1
Conductivity (EC)	1.0	1.2	1.0	1.0	uS/cm	0.2
Bicarbonate (HCO_3)	<5	<5	<5	<5	mg/L	5
Carbonate (CO_3)	<5	<5	<5	<5	mg/L	5
Hydroxide (OH)	<5	<5	<5	<5	mg/L	5
Alkalinity, Total (as $CaCO_3$)	<5	<5	<5	<5	mg/L	5
Ammonia-N	<0.005	<0.005	<0.005	<0.005	mg/L	0.005
Cyanide-CN	<0.002	<0.002	<0.002	<0.002	mg/L	0.002
Phosphorus, Total	<0.001	<0.001	<0.001	<0.001	mg/L	0.001
Total Organic Carbon	<0.2	<0.2	<0.2	<0.2	mg/L	0.2
Dissolved Organic Carbon	<0.5	<0.2	<0.5	---	mg/L	0.5
Total Suspended Solids	<3	<3	<3	<3	mg/L	3
Turbidity	<0.1	<0.1	<0.1	<0.1	NTU	0.1
Redox Potential	-	121	190	161	mV	1
Total Ultra-Low Level Metals						
Silver (Ag)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Aluminum (Al)	<0.0003	<0.0003	0.0003	<0.0003	mg/L	0.0003
Arsenic (As)	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003
Boron (B)	0.006	<0.001	<0.001	<0.001	mg/L	0.001
Barium (Ba)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003
Calcium (Ca)	<0.02	<0.02	<0.02	<0.02	mg/L	0.02

Table 8 continued
Tyhee Travel Blanks – 2004

Analyte	May 12 to 13	July 14	August 12 to 13	September 29 to 30	Units	Detection Limit
Total Ultra-Low Level Metals						
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Cobalt (Co)	<0.0001	0.0001	<0.0001	<0.0001	mg/L	0.0001
Chromium (Cr)	<0.00006	<0.00006	<0.00006	<0.00006	mg/L	0.00006
Copper (Cu)	<0.0006	<0.0006	<0.0006	<0.0006	mg/L	0.0006
Iron (Fe)	<0.005	<0.005	<0.005	<0.005	mg/L	0.005
Lithium (Li)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Mercury (Hg)	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002
Potassium (K)	<0.02	<0.02	<0.02	<0.02	mg/L	0.005
Magnesium (Mg)	<0.004	<0.004	<0.004	<0.004	mg/L	0.004
Manganese (Mn)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	mg/L	0.00006
Sodium (Na)	<0.005	<0.005	<0.005	<0.005	mg/L	0.005
Nickel (Ni)	<0.00006	<0.00006	<0.00006	<0.00006	mg/L	0.00006
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Antimony (Sb)	<0.00003	0.00048	0.00016	0.00007	mg/L	0.00003
Selenium (Se)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Strontium (Sr)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Silicon (Si)	<0.1	<0.1	<0.1	<0.1	mg/L	0.1
Tin (Sn)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Uranium (U)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Vanadium (V)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Zinc (Zn)	<0.0008	<0.0008	<0.0008	<0.0008	mg/L	0.0008
Dissolved Ultra-Low Level Metals						
Silver (Ag)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Aluminum (Al)	0.0004	<0.0003	<0.0003	<0.0003	mg/L	0.0003
Arsenic (As)	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003
Boron (B)	0.007	<0.001	<0.001	<0.001	mg/L	0.001
Barium (Ba)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003
Calcium (Ca)	<0.02	<0.02	<0.02	<0.02	mg/L	0.02
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Chromium (Cr)	<0.00006	<0.00006	<0.00006	<0.00006	mg/L	0.00006
Copper (Cu)	<0.0006	<0.0006	<0.0006	<0.0006	mg/L	0.0006
Iron (Fe)	<0.005	<0.005	<0.005	<0.005	mg/L	0.005
Lithium (Li)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Mercury (Hg)	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002

Table 8 continued
Tyhee Travel Blanks – 2004

Analyte	May 12 to 13	July 14	August 12 to 13	September 29 to 30	Units	Detection Limit
Potassium (K)	<0.02	<0.02	<0.02	<0.02	mg/L	0.005
Magnesium (Mg)	<0.004	<0.004	<0.004	<0.004	mg/L	0.004
Manganese (Mn)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	mg/L	0.00006
Sodium (Na)	<0.005	<0.005	<0.005	<0.005	mg/L	0.005
Nickel (Ni)	<0.00006	<0.00006	<0.00006	<0.00006	mg/L	0.00006
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Antimony (Sb)	0.00004	0.00018	0.00016	0.00008	mg/L	0.00003
Selenium (Se)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Strontium (Sr)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Silicon (Si)	<0.1	<0.1	<0.1	<0.1	mg/L	0.1
Tin (Sn)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Uranium (U)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Vanadium (V)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Zinc (Zn)	<0.0008	<0.0008	<0.0008	<0.0008	mg/L	0.0008

Canadian Council of Ministers of the Environment -
Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (Dec. 2003).

6.2 Field Blanks

One set of field blanks were collected during each sampling event. The field blanks were analyzed for total and dissolved ultra-low level metals, total and dissolved organic carbon, low-level nutrients, cyanide and low-level routine water chemistry. Results of the field blanks collected for the 2004 water sampling program are included in Table 9.

Results of the field blanks indicated that all analytes were below detection levels

Table 9
Tyhee Field Blanks - 2004

Analyte	May 12 to 13	July 14	August 12 to 13	September 29 to 30	Units	Detection Limit
Major Ions, Nutrients and Inorganics						
Chloride (Cl)	<1	<1	<1	<1	mg/L	1
Fluoride (F)	<0.05	<0.05	<0.05	<0.05	mg/L	0.05
Calcium (Ca)	<0.5	<0.5	<0.5	<0.5	mg/L	0.5
Potassium (K)	<0.1	<0.1	<0.1	<0.1	mg/L	0.1
Magnesium (Mg)	<0.1	<0.1	<0.1	<0.1	mg/L	0.1
Sodium (Na)	<1	<1	<1	<1	mg/L	1
Ion Balance	Low TDS	Low TDS	Low TDS	Low TDS	%	-
TDS (Calculated)	<1	<1	<1	<1	mg/L	-
Hardness (as $CaCO_3$)	<1	<1	<1	<1	mg/L	-
Iron-Extractable	<0.005	<0.005	<0.005	<0.005	mg/L	0.005
Manganese-Extractable	<0.001	<0.001	<0.001	<0.001	mg/L	0.001
Nitrate+Nitrite-N	<0.006	<0.006	<0.006	<0.006	mg/L	0.006
Nitrate-N	<0.006	<0.006	<0.006	<0.006	mg/L	0.006
Major Ions, Nutrients and Inorganics						
Nitrite-N	<0.002	<0.002	<0.002	<0.002	mg/L	0.002
Sulfate (SO_4)	<0.05	<0.05	<0.05	<0.05	mg/L	0.05
pH	5.9	5.9	5.8	5.8	-	0.1
Conductivity (EC)	0.7	1	1.1	1.1	µS/cm	0.2
Bicarbonate (HCO_3)	<5	<5	<5	<5	mg/L	5
Carbonate (CO_3)	<5	<5	<5	<5	mg/L	5
Hydroxide (OH)	<5	<5	<5	<5	mg/L	5
Alkalinity, Total (as $CaCO_3$)	<5	<5	<5	<5	mg/L	5
Ammonia-N	<0.005	<0.005	<0.005	<0.005	mg/L	0.005
Cyanide-CN	<0.002	<0.002	<0.002	<0.002	mg/L	0.002
Phosphorus, Total	<0.001	<0.001	<0.001	0.001	mg/L	0.001
Total Organic Carbon	<0.2	<0.2	<0.2	0.5	mg/L	0.2
Dissolved Organic Carbon	<0.5	<0.5	<0.5	-	mg/L	0.5
Total Suspended Solids	<3	<3	<3	<3	mg/L	3
Turbidity	<0.1	<0.1	<0.1	<0.1	NTU	0.1
Redox Potential	-	144	190	237	mV	1
Total Ultra-Low Level Metals						
Silver (Ag)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Aluminum (Al)	<0.0003	<0.0003	<0.0003	<0.0003	mg/L	0.0003
Arsenic (As)	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003
Boron (B)	<0.001	<0.001	<0.001	<0.001	mg/L	0.001
Barium (Ba)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002

Table 9 continued
Tyhee Field Blanks - 2004

Analyte	May 12 to 13	July 14	August 12 to 13	September 29 to 30	Units	Detection Limit
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003
Calcium (Ca)	<0.02	<0.02	<0.02	0.03	mg/L	0.02
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Chromium (Cr)	<0.00006	<0.00006	0.00006	<0.00006	mg/L	0.00006
Copper (Cu)	<0.0006	<0.0006	<0.0006	<0.0006	mg/L	0.0006
Iron (Fe)	<0.005	<0.005	<0.005	<0.005	mg/L	0.005
Lithium (Li)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Mercury (Hg)	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002
Potassium (K)	<0.02	<0.02	<0.02	<0.02	mg/L	0.005
Magnesium (Mg)	<0.004	<0.004	<0.004	<0.004	mg/L	0.004
Manganese (Mn)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	mg/L	0.00006
Sodium (Na)	0.043	0.094	0.025	0.022	mg/L	0.005
Nickel (Ni)	<0.00006	<0.00006	<0.00006	<0.00006	mg/L	0.00006
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Antimony (Sb)	<0.00003	0.00015	0.00015	0.00009	mg/L	0.00003
Selenium (Se)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Strontium (Sr)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Silicon (Si)	<0.1	<0.1	<0.1	<0.1	mg/L	0.1
Tin (Sn)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Uranium (U)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Vanadium (V)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Zinc (Zn)	<0.0008	<0.0008	<0.0008	<0.0008	mg/L	0.0008
Dissolved Ultra-Low Level Metals						
Silver (Ag)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Aluminum (Al)	<0.0003	<0.0003	<0.0003	<0.0003	mg/L	0.0003
Arsenic (As)	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003
Boron (B)	<0.001	<0.001	<0.001	<0.001	mg/L	0.001
Barium (Ba)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003
Calcium (Ca)	0.03	0.04	0.03	0.03	mg/L	0.02
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Cobalt (Co)	<0.0001	0.0005	<0.0001	<0.0001	mg/L	0.0001
Chromium (Cr)	<0.00006	<0.00006	0.00009	<0.00006	mg/L	0.00006
Copper (Cu)	<0.0006	<0.0006	<0.0006	<0.0006	mg/L	0.0006

Table 9 continued
Tyhee Field Blanks – 2004

Analyte	May 12 to 13	July 14	August 12 to 13	September 29 to 30	Units	Detection Limit
Iron (Fe)	<0.005	<0.005	<0.005	<0.005	mg/L	0.005
Lithium (Li)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Mercury (Hg)	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002
Potassium (K)	<0.02	<0.02	<0.02	<0.02	mg/L	0.005
Magnesium (Mg)	<0.004	<0.004	<0.004	<0.004	mg/L	0.004
Manganese (Mn)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	mg/L	0.00006
Sodium (Na)	0.043	0.100	0.031	0.028	mg/L	0.005
Nickel (Ni)	<0.00006	<0.00006	<0.00006	<0.00006	mg/L	0.00006
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Antimony (Sb)	<0.00003	0.0017	0.00011	0.00011	mg/L	0.00003
Selenium (Se)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Strontium (Sr)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Silicon (Si)	<0.1	<0.1	<0.1	<0.1	mg/L	0.1
Tin (Sn)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Uranium (U)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Vanadium (V)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Zinc (Zn)	<0.0008	0.0012	0.0010	0.0016	mg/L	0.0008

Canadian Council of Ministers of the Environment -
Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (Dec. 2003).

6.3 Duplicates

Duplicates were collected during each sampling event (one at each station) and analyzed for total and dissolved ultra-low level metals, total and dissolved organic carbon, low-level nutrients, cyanide, redox and low-level routine water chemistry.

ETL performed a statistical analysis on the duplicate samples to determine if the duplicates were statistically the “same” as or “different” from the original samples. The results of the analysis indicated that the duplicates were the same as their original samples.

7.0 ANALYTICAL RESULTS AND DISCUSSIONS

Analytical results for the 2004 water sampling program are presented in Table 10, Table 11, Table 12 and Table 13.

TABLE 10: Analytical Results For Surveyed Lakes - May 12 to 13, 2004

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Duplicate	Nicholas A-1	Nicholas A-2	Nicholas A-2 Duplicate	Eclipse A-1	Eclipse A-2	Eclipse A-2 Duplicate	Round A-1	Round A-1 Duplicate	Narrow A-1	Narrow A-2	Narrow A-2 Duplicate	Winter A-1	Winter A-1 Duplicate	Nalgene	UNITS	Detection Limit	Detection Limits Round Lake	CCME Guideline*
Major Ions, Nutrients and Inorganics																						
Chloride (Cl)	<1	<1	<1	<1	1	1	1	<1	<1	<1	15	15	2	2	2	2	2	-	mg/L	1	1	-
Fluoride (F)	<0.05	<0.05	0.06	0.06	0.07	0.06	0.06	<0.05	<0.05	<0.05	0.23	0.23	0.07	0.07	0.07	0.10	0.10	-	mg/L	0.05	0.05	-
Calcium (Ca)	<0.5	<0.5	11.0	10.9	5.9	5.6	5.7	5.3	5.4	5.4	246	261	19.9	19.5	19.6	36.5	35.9	-	mg/L	0.5	0.5	-
Potassium (K)	<0.1	<0.1	1.6	1.6	1.3	1.3	1.3	1.2	1.1	1.1	27.5	28.5	3.1	3.1	3.1	5.6	5.6	-	mg/L	0.1	0.1	-
Magnesium (Mg)	<0.1	<0.1	3.7	3.6	2.7	2.5	2.5	2.4	2.5	2.5	80.6	84.7	6.4	6.3	6.4	11.2	10.8	-	mg/L	0.1	0.1	-
Sodium (Na)	<1	<1	3	3	3	3	3	2	2	2	50	52	5	5	5	9	9	-	mg/L	1	1	-
Ion Balance	Low TDS	Low TDS	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	103	109	108	107	109	106	104	-	%	-	-	-
TDS (Calculated)	<1	<1	50	49	35	34	34	29	29	29	1300	1320	98	97	97	184	182	-	mg/L	-	-	-
Hardness (as $CaCO_3$)	<1	<1	43	42	26	24	25	23	24	24	946	1000	76	75	75	137	134	-	mg/L	-	-	-
Iron-Extractable	<0.005	0.009	0.039	0.013	0.005	0.013	0.007	0.005	0.005	<0.005	0.319	0.315	0.007	0.007	0.176	0.019	0.020	-	mg/L	0.005	0.005	0.3
Manganese-Extractable	<0.001	<0.001	0.003	0.003	0.001	0.002	0.001	0.001	0.001	0.001	4.24	4.11	0.006	0.008	0.009	0.363	0.379	-	mg/L	0.001	0.001	-
Nitrate+Nitrite-N	<0.006	<0.006	0.088	0.090	0.243	0.092	0.090	0.085	0.083	0.081	<0.006	<0.006	0.110	0.110	0.113	0.272	0.264	-	mg/L	0.006	0.006	-
Nitrate-N	<0.006	<0.006	0.087	0.089	0.242	0.092	0.090	0.084	0.083	0.081	<0.006	<0.006	0.109	0.109	0.113	0.270	0.262	-	mg/L	0.006	0.006	13
Nitrite-N	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.002	-	mg/L	0.002	0.002	0.018[a]
Sulfate (SO_4)	<0.05	<0.05	8.33	8.29	8.14	7.85	7.86	7.13	7.31	7.32	680	680	33.8	33.3	33.2	73.8	72.4	-	mg/L	0.05	0.05	-
pH	5.9	5.9	7.3	7.3	7.2	7.2	7.1	7.2	7.3	7.3	7.6	7.6	7.4	7.4	7.4	7.4	7.4	-	-	0.1	0.1	6.5-9
Conductivity (EC)	0.7	1.0	91.9	92.1	66.4	63.9	64.2	56.1	57.8	57.7	1690	1690	178	177	175	308	310	-	uS/cm	0.2	0.2	-
Bicarbonate (HCO_3)	<5	<5	44	44	25	26	25	21	21	21	413	414	56	56	55	91	92	-	mg/L	5	5	-
Carbonate (CO_3)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	mg/L	5	5	-
Hydroxide (OH)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	mg/L	5	5	-
Alkalinity, Total (as $CaCO_3$)	<5	<5	36	36	20	21	20	17	17	18	338	339	46	46	45	75	75	-	mg/L	5	5	-
Ammonia-N	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	3.39	3.42	<0.005	<0.005	<0.005	0.195	0.200	-	mg/L	0.005	0.005	0.015[b]
Cyanide-CN	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.017	0.016	<0.002	<0.002	<0.002	<0.002	<0.002	-	mg/L	0.002	0.002	0.005
Phosphorus, Total	<0.001	<0.001	0.007	0.006	0.003	0.003	0.003	0.003	0.004	0.004	0.013	0.013	0.008	0.010	0.008	0.008	0.010	-	mg/L	0.001	0.001	-
Total Organic Carbon	<0.2	<0.2	12.2	12.3	5.4	5.0	5.0	5.2	5.4	5.3	38.7	39.4	13.6	12.8	12.8	20.1	20.1	-	mg/L	0.2	0.2	-
Dissolved Organic Carbon	<0.5	<0.5	11.9	12.4	5.1	4.9	4.9	5.1	5.3	5.3	36.7	37.4	13.2	12.7	12.8	19.4	19.6	-	mg/L	0.5	0.5	-
Total Suspended Solids	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	-	mg/L	3	3	-
Turbidity	<0.1	<0.1	0.15	0.15	0.10	<0.1	<0.1	<0.1	<0.1	<0.1	51.0	53	0.25	0.20	0.20	1.6	1.5	-	NTU	0.1	0.1	-
Redox Potential	-	-	-	-	-	-	-	-	-	-	106	109	-	-	-	-	-	-	mV	1	1	-
Total Ultra-Low Level Metals																						
Silver (Ag)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001	0.0004	0.0001
Aluminum (Al)	<0.0003	<0.0003	0.0128	0.0129	0.0068	0.0074	0.0073	0.0139	0.0136	0.0134	0.04	0.04	0.0064	0.0068	0.0070	0.0077	0.0075	<0.0003	mg/L	0.0003	0.02	0.005
Arsenic (As)	<0.00003	<0.00003	0.00063	0.00064	0.00054	0.00048	0.00049	0.00038	0.00040	0.00040	0.0164	0.0183	0.00103	0.00095	0.00098	0.00189	0.00185	<0.00003	mg/L	0.00003	0.0004	0.005
Boron (B)	<0.001	0.006	0.010	0.010	0.009	0.009	0.009	0.006	0.006	0.006	0.16	0.155	0.018	0.018	0.018	0.029	0.029	<0.001	mg/L	0.001	0.02	-
Barium (Ba)	<0.00005	<0.00005	0.00723	0.00706	0.00409	0.00385	0.00392	0.00297	0.00305	0.00305	0.123	0.121	0.0118	0.0117	0.0117	0.0291	0.0297	<0.00005	mg/L	0.00005	0.0002	-
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002	0.001	-
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.0001	<0.00005	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003	0.0001	-
Calcium (Ca)	<0.02	<0.02	10.1	10.2	5.29	5.01	5.02	4.79	4.97	4.99	231	229	19.2	19.0	18.9	36.0	34.9	0.03	mg/L	0.02	0.5	-
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0002	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005	0.0002	0.000017
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0013	0.0006	<0.0001	<0.0001	<0.0001	0.0002	0.0002	<0.0001	mg/L	0.0001	0.0002	-
Chromium (Cr)	<0.00006	<0.00006	0.00027	0.00030	0.00025	0.00031	0.00019	0.00024	0.00028	0.00027	<0.0008	<0.0004	0.00035	0.00021	0.00034	0.00039	0.00034	0.00006	mg/L	0.00006	0.0008	0.001
Copper (Cu)	<0.0006	<0.0006	0.0008	0.0009	0.0381	0.0022	0.0026	0.0007	0.0009	0.0009	<0.001	<0.0006	0.0014	0.0014	0.0016	0.0020	0.0016	<0.0006	mg/L	0.0006	0.001	0.002
Iron (Fe)	<0.005	<0.005	0.013	0.015	0.011	<0.005	0.006	0.015	0.010	<0.005	0.187	0.04	0.006	0.005	0.005	0.007	0.044	<0.005	mg/L	0.005	0.005	0.3
Lithium (Li)	<0.0001	<0.0001	0.0029	0.0029	0.0024	0.0022	0.0023	0.0018	0.0018	0.0018	<0.006	<0.006	0.0021	0.0021	0.0021	0.0031	0.0031	<0.0001	mg/L	0.0001	0.006	-
Mercury (Hg)	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	-	-	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002	0.00002	0.000026[c]
Potassium (K)	<0.02	<0.02	1.55	1.52	1.22	1.15	1.14	1.00	1.06	1.04	27.1	26.4	3.20	3.13	3.10	5.59	5.48	<0.02	mg/L	0.005	0.1	-
Magnesium (Mg)	<0.004	<0.004	3.48	3.48	2.38	2.31	2.31	2.28	2.38	2.33	76.0	75.1	6.34	6.16	6.09	11.2	11.0	<0.004	mg/L	0.004	0.1	-
Manganese (Mn)	<0.0001	<0.0001	0.0031	0.0032	0.0010	0.0014	0.0014	0.0007	0.0006	0.0006	4.23	4.19	0.0059	0.0082	0.0081	0.348	0.350	<0.0001	mg/L	0.0001	0.001	-
Molybdenum (Mo)	<0.00006	<0.00006	0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.0001	<0.0001	0.00008	0.00007	0.00007	0.00008	0.00008	<0.00006	mg/L	0.00006	0.0001	0.073
Sodium (Na)	0.043	<0.005	2.58	2.54	2.46	2.36	2.37	1.64	1.70	1.68	1.6	47.8	5.10	5.02	4.97	8.65	8.62	0.037	mg/L	0.005	1	-
Nickel (Ni)	<0.00006	<0.00006	0.00138	0.00143	0.00078	0.00074	0.00072	0.00079	0.00085	0.00082	0.0055	0.0036	0.00247	0.00232	0.00232	0.00479	0.00477	0.00017	mg/L	0.00006	0.0002	0.025
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005	0.0001	0.001
Antimony (Sb)	<0.00003	<0.00003	0.00004	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	0.00009	<0.00003	<0.0004	<0.0004	0.00007	<0.00003	<0.00003	0.00016	<0.00003	0.00025	mg/L	0.00003	0.0004	-
Selenium (Se)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	0.0006	<0.0001	<0.0001	<0.0001	0.0001	0.0002	<0.0001	mg/L	0.0001	0.0004	0.001
Strontium (Sr)	<0.0001	<0.0001	0.0344	0.0344	0.0253	0.0241	0.0239	0.0179	0.0185	0.0186	0.766	0.761	0.0598	0.0583	0.0580	0.0958	0.0967	<0.0001	mg/L	0.0001	0.0002	-
Silicon (Si)	<0.1	<0.1	0.5	0.5	0.6	0.7	0.6	0.3	0.3	0.3	1.6	1.6	0.7	0.7	0.7	0.3	0.3	<0.1	mg/L	0.1	0.1	-
Tin (Sn)	<0.0001	<0.0001	0.0005	0.0010	0.0060	0.0018	0.0024	0.0002	0.0018	0.0026	<0.0004	<0.0002	0.0003	0.0018	0.0025	0.0165	0.0010	<0.0001	mg/L	0.0001	0.0004	-
Uranium (U)	<0.00005	<0.00005	0.00009	0.00009	0.00010	0.00010	0.00010	0.00005	0.00006	0.00006	0.0016	0.0016	0.00008	0.00008	0.00008	0.00009	0.00008	<0.00005	mg/L	0.00005	0.0001	-
Vanadium (V)	<0.00005	<0.00005	0.00007	0.00007	<0.00005	<0.00005	0.00005	0.00005	0.00005	0.00005	0.0007	0.0007	0.00012	0.00012	0.00011	0.00014	0.00013	<0.00005	mg/L	0.00005	0.0002	-
Zinc (Zn)	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	0.0008	<0.0008	0.008	0.008	<0.0008	<0.0008	0.0010	0.0015	0.0015	0.0051	mg/L	0.0008	0.004	0.03

TABLE 10: Analytical Results For Surveyed Lakes - May 12 to 13, 2004

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Duplicate	Nicholas A-1	Nicholas A-2	Nicholas A-2 Duplicate	Eclipse A-1	Eclipse A-2	Eclipse A-2 Duplicate	Round A-1	Round A-1 Duplicate	Narrow A-1	Narrow A-2	Narrow A-2 Duplicate	Winter A-1	Winter A-1 Duplicate	Nalgene	UNITS	Detection Limit	Detection Limits Round Lake	CCME Guideline*
Dissolved Ultra-Low Level Metals																						
Silver (Ag)	<0.0001	<0.0001	<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	-	mg/L	0.0001	0.0002	0.0001
Aluminum (Al)	<0.0003	0.0004	0.0124	0.0123	0.0062	0.0067	0.0065	0.0125	0.0129	0.0131	0.04	0.04	0.0059	0.0061	0.0059	0.0064	0.0063	-	mg/L	0.0003	0.01	0.005
Arsenic (As)	<0.00003	<0.00003	0.00064	0.00062	0.00051	0.00048	0.00046	0.00038	0.00040	0.00041	0.0185	0.0173	0.00102	0.00098	0.00098	0.00171	0.00172	-	mg/L	0.00003	0.0004	0.005
Boron (B)	<0.001	0.007	0.010	0.010	0.009	0.009	0.009	0.006	0.006	0.006	0.156	0.15	0.018	0.018	0.018	0.028	0.028	-	mg/L	0.001	0.002	-
Barium (Ba)	<0.00005	<0.00005	0.00696	0.00685	0.00389	0.00385	0.00377	0.00288	0.00305	0.00308	0.123	0.121	0.0115	0.0116	0.0115	0.0285	0.0289	-	mg/L	0.00005	0.0001	-
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	-	mg/L	0.0002	0.0005	-
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	0.00011	<0.0001	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	-	mg/L	0.00003	0.00005	-
Calcium (Ca)	0.03	<0.02	10.1	10.2	5.22	5.09	5.06	4.86	4.99	4.99	230	231	19.3	19.1	19.0	35.4	34.7	-	mg/L	0.02	0.5	-
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	-	mg/L	0.00005	0.0001	0.000017
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	0.0015	<0.0001	<0.0001	<0.0001	0.0001	0.0001	-	mg/L	0.0001	0.0001	-
Chromium (Cr)	<0.00006	<0.00006	0.00032	0.00019	0.00011	0.00019	0.00017	0.00020	0.00020	0.00018	0.0007	<0.0008	0.00038	0.00040	0.00038	0.00027	0.00033	-	mg/L	0.00006	0.0004	0.001
Copper (Cu)	<0.0006	<0.0006	0.0018	0.0014	0.0424	0.0025	0.0031	0.0008	0.0009	0.0009	<0.0006	<0.001	0.0014	0.0021	0.0019	0.0018	0.0022	-	mg/L	0.0006	0.0006	0.002
Iron (Fe)	<0.005	<0.005	0.008	0.007	<0.005	0.008	0.005	<0.005	<0.005	0.021	0.329	0.313	<0.005	0.005	0.008	0.018	0.018	-	mg/L	0.005	0.005	0.3
Lithium (Li)	<0.0001	<0.0001	0.0028	0.0029	0.0023	0.0022	0.0023	0.0019	0.0018	0.0018	0.0036	0.0038	0.0022	0.0022	0.0022	0.0031	0.0031	-	mg/L	0.0001	0.0001	-
Mercury (Hg)	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	-	-	<0.00002	0.00003	<0.00002	<0.00002	0.00003	-	mg/L	0.00002	-	0.000026[c]
Potassium (K)	<0.02	<0.02	1.54	1.48	1.19	1.16	1.14	0.99	1.05	1.05	27.4	26.9	3.22	3.17	3.10	5.43	5.46	-	mg/L	0.005	0.1	-
Magnesium (Mg)	<0.004	<0.004	3.44	3.44	2.34	2.33	2.28	2.26	2.37	2.38	75.3	76.5	6.28	6.36	6.17	10.9	10.9	-	mg/L	0.004	0.01	-
Manganese (Mn)	<0.0001	<0.0001	0.0009	0.0010	0.0005	0.0005	0.0006	0.0001	0.0002	0.0002	4.20	4.24	0.0006	0.0005	0.0005	0.318	0.317	-	mg/L	0.0001	0.001	-
Molybdenum (Mo)	<0.00006	<0.00006	0.00006	0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.0001	<0.0001	0.00008	0.00007	0.00007	0.00007	0.00008	-	mg/L	0.00006	0.0001	0.073
Sodium (Na)	0.043	<0.005	2.55	2.52	2.42	2.38	2.38	1.64	1.72	1.74	49.5	49	5.14	5.12	5.01	8.49	8.64	-	mg/L	0.005	0.5	-
Nickel (Ni)	<0.00006	<0.00006	0.00143	0.00145	0.00082	0.00083	0.00081	0.00086	0.00090	0.00092	0.0035	0.0057	0.00255	0.00243	0.00245	0.00452	0.00468	-	mg/L	0.00006	0.0001	0.025
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0001	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	-	mg/L	0.00005	0.0001	0.001
Antimony (Sb)	<0.00003	0.00004	<0.00003	<0.00003	<0.00003	0.00076	<0.00003	<0.00003	<0.00003	<0.00003	0.0004	<0.0004	0.00085	<0.00003	<0.00003	<0.00003	<0.00003	-	mg/L	0.00003	0.0004	-
Selenium (Se)	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0008	0.0009	<0.0001	0.0001	<0.0001	<0.0001	0.0002	-	mg/L	0.0001	0.0004	0.001
Strontium (Sr)	<0.0001	<0.0001	0.0341	0.0345	0.0252	0.0243	0.0241	0.0181	0.0186	0.0186	0.768	0.764	0.0597	0.0592	0.0584	0.0951	0.0960	-	mg/L	0.0001	0.0001	-
Silicon (Si)	<0.1	<0.1	0.5	0.4	0.6	0.6	0.6	0.3	0.3	0.3	1.7	1.6	0.7	0.7	0.7	0.3	0.3	-	mg/L	0.1	1	-
Tin (Sn)	<0.0001	<0.0001	0.0032	0.0017	0.0064	0.0070	0.0023	0.0019	0.0047	0.0130	<0.0002	<0.0004	0.0005	0.0036	0.0025	0.0074	0.0090	-	mg/L	0.0001	0.0002	-
Uranium (U)	<0.00005	<0.00005	0.00008	0.00008	0.00008	0.00009	0.00008	<0.00005	<0.00005	<0.00005	0.0017	0.0015	0.00008	0.00007	0.00007	0.00009	0.00009	-	mg/L	0.00005	0.0001	-
Vanadium (V)	<0.00005	<0.00005	0.00005	0.00006	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	0.00005	0.0007	0.0007	0.00011	0.00011	0.00011	0.00011	0.00012	-	mg/L	0.00005	0.0001	-
Zinc (Zn)	<0.0008	<0.0008	0.0021	0.0020	0.0020	0.0023	0.0029	0.0019	0.0022	0.0022	0.013	0.008	0.0025	0.0025	0.0018	0.0028	0.0036	-	mg/L	0.0008	0.002	0.03

Canadian Council of Ministers of the Environment - Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (Dec. 2003).

Footnotes

[a] standard for nitrite [0.06mg/L(NO_2)] has been converted by a factor of 1/4.43 to reflect the results expressed as mg/l(N), then converted into ug/L.

[b] standard for ammonia [0.019mg/L(NH_4)] has been converted by a factor of 1/4.43 to reflect the results expressed as mg/l(N), then converted into ug/L.

[c] standard for inorganic Hg, (results expressed as total or dissolved Hg).

TABLE 11: Analytical Results For Surveyed Lakes – July 14, 2004

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Duplicate	Nicholas A-1	Nicholas A-1 Duplicate	Nicholas A-2	Nicholas A-2 Duplicate	Eclipse A-1	Eclipse A-1 Duplicate	Round A-1	Round A-1 Duplicate	Narrow A-1	Narrow A-2	Winter A-1	UNITS	Detection Limits	CCME Guideline *
Major Ions, Nutrients and Inorganics																		
Chloride (Cl)	<1	<1	2	2	2	2	3	2	1	1	2	3	3	3	2	mg/L	1	-
Fluoride (F)	<0.05	<0.05	0.08	0.08	0.09	0.09	0.09	0.09	0.07	0.07	0.14	0.14	0.09	0.09	0.11	mg/L	0.05	-
Calcium (Ca)	<0.5	<0.5	9.8	9.9	5.3	5.5	5.9	5.4	5.0	5.1	64.1	63.5	17.4	16.9	25.3	mg/L	0.5	-
Potassium (K)	<0.1	<0.1	1.5	1.5	1.3	1.3	1.2	1.3	1.0	1.2	7.8	7.7	2.9	2.8	3.8	mg/L	0.1	-
Magnesium (Mg)	<0.1	<0.1	3.2	3.2	2.4	2.4	2.5	2.4	2.3	2.3	22.4	22.9	5.6	5.4	7.9	mg/L	0.1	-
Sodium (Na)	<1	<1	2	2	2	2	3	2	2	2	14	14	5	4	6	mg/L	1	-
Ion Balance	Low TDS	Low TDS	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	106	106	109	104	104	%	-	-
TDS (Calculated)	<1	<1	45	45	33	32	33	31	27	29	350	351	88	85	130	mg/L	-	-
Hardness (as $CaCO_3$)	<1	<1	38	38	23	24	25	23	22	22	252	253	67	64	96	mg/L	-	-
Iron-Extractable	<0.005	0.005	0.015	0.014	0.007	0.005	0.008	0.034	0.007	0.005	0.049	0.048	0.007	0.011	0.011	mg/L	0.005	0.3
Manganese-Extractable	<0.001	<0.001	0.005	0.005	0.001	0.001	0.002	0.002	0.001	<0.001	0.063	0.060	0.013	0.015	0.031	mg/L	0.001	-
Nitrate+Nitrite-N	<0.006	<0.006	<0.006	<0.006	0.043	0.684	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.013	<0.006	mg/L	0.006	-
Nitrate-N	<0.006	<0.006	<0.006	<0.006	0.044	0.684	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.011	<0.006	mg/L	0.006	13
Nitrite-N	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/L	0.002	0.018[a]
Sulfate (SO_4)	<0.05	<0.05	7.43	7.39	7.56	7.55	7.54	7.58	6.92	6.90	204	204	29.8	29.0	55.3	mg/L	0.05	-
pH	5.9	5.6	7.7	7.7	7.6	7.3	7.4	7.5	7.6	7.5	8.0	8.1	7.9	7.5	8.1	pH	0.1	6.5-9
Conductivity (EC)	1	1.2	84.6	84.8	61.9	64.3	61.0	61.0	54.8	54.8	549	553	155	153	218	uS/cm	0.2	-
Bicarbonate (HCO_3)	<5	<5	39	39	25	16	21	20	19	21	74	74	48	48	59	mg/L	5	-
Carbonate (CO_3)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L	5	-
Hydroxide (OH)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L	5	-
Alkalinity, Total (as $CaCO_3$)	<5	<5	32	32	20	13	17	17	15	17	60	60	40	39	49	mg/L	5	-
Ammonia-N	<0.005	<0.005	<0.005	<0.005	0.009	<0.005	<0.005	<0.005	0.008	<0.005	0.025	0.022	<0.005	0.007	0.040	mg/L	0.005	0.015[b]
Cyanide-CN	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/L	0.002	0.005
Phosphorus, Total	<0.001	<0.001	0.005	0.006	0.004	0.004	0.007	0.007	0.003	0.004	0.015	0.012	0.006	0.011	0.010	mg/L	0.001	-
Total Organic Carbon	<0.2	<0.2	13.8	13.7	6.2	6.4	5.9	5.9	6.3	6.2	16.9	-	14.5	14.0	19.9	mg/L	0.2	-
Dissolved Organic Carbon	<0.5	<0.2	13.2	12.8	5.8	6.1	5.8	5.5	5.8	5.7	16.0	16.6	14.2	13.4	18.0	mg/L	0.5	-
Total Suspended Solids	<3	<3	3	<3	<3	7	7	<3	3	21	6	3	5	5	<3	mg/L	3	-
Turbidity	<0.1	<0.1	0.40	0.40	0.30	0.30	0.40	0.40	0.25	0.30	0.85	0.75	0.50	0.50	0.75	NTU	0.1	-
Redox Potential	144	121	130	120	179	184	152	176	236	151	147	145	136	150	140	mV	1	-
Total Ultra-Low Level Metals																		
Silver (Ag)	<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	mg/L	0.0001	0.0001
Aluminum (Al)	<0.0003	<0.0003	0.0186	0.0228	0.0126	0.0121	0.0111	0.0119	0.0176	0.0178	0.0419	0.0373	0.0183	0.0203	0.0266	mg/L	0.0003	0.005
Arsenic (As)	<0.00003	<0.00003	0.00069	0.00070	0.00057	0.00056	0.00048	0.00050	0.00040	0.00039	0.0106	0.0104	0.00107	0.00091	0.00180	mg/L	0.00003	0.005
Boron (B)	<0.001	<0.001	0.009	0.009	0.009	0.009	0.008	0.008	0.006	0.006	0.049	0.049	0.016	0.016	0.021	mg/L	0.001	-
Barium (Ba)	<0.00005	<0.00005	0.00680	0.00686	0.00363	0.00355	0.00405	0.00421	0.00279	0.00278	0.0286	0.0284	0.0104	0.0115	0.0146	mg/L	0.00005	-
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002	-
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003	-
Calcium (Ca)	<0.02	<0.02	9.77	9.66	4.97	5.01	4.78	5.05	4.68	4.49	62.8	59.7	17.2	16.1	25.4	mg/L	0.02	-
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005	0.000017
Cobalt (Co)	<0.0001	0.0001	<0.0001	0.0003	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0014	0.0013	<0.0001	<0.0001	0.0001	mg/L	0.0001	-
Chromium (Cr)	<0.00006	<0.00006	0.00038	0.00045	0.00023	0.00022	0.00023	0.00024	0.00021	0.00020	0.00060	0.00054	0.00044	0.00048	0.00042	mg/L	0.00006	0.001
Copper (Cu)	<0.0006	<0.0006	0.0008	0.0009	0.0633	0.0007	<0.0006	0.0020	0.0009	0.0011	0.0054	0.0055	0.0014	0.0013	0.0016	mg/L	0.0006	0.002
Iron (Fe)	<0.005	<0.005	0.015	0.027	0.012	0.012	0.015	0.015	0.009	0.005	0.088	0.083	0.012	0.017	0.022	mg/L	0.005	0.3
Lithium (Li)	<0.0001	<0.0001	0.0026	0.0027	0.0021	0.0022	0.0020	0.0020	0.0016	0.0017	0.0040	0.0043	0.0021	0.0020	0.0028	mg/L	0.0001	-
Mercury (Hg)	<0.00002	<0.00002	<0.00002	<0.00002	0.00004	<0.00002	<0.00002	<0.00002	<0.00002	0.00003	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002	0.000026[c]
Potassium (K)	<0.02	<0.02	1.48	1.52	1.21	1.16	1.13	1.18	1.00	0.96	8.03	7.22	2.90	2.62	4.04	mg/L	0.02	-
Magnesium (Mg)	<0.004	<0.004	3.28	3.33	2.35	2.30	2.15	2.26	2.14	2.17	21.9	21.2	5.64	5.12	7.88	mg/L	0.004	-
Manganese (Mn)	<0.0001	<0.0001	0.0010	0.0073	0.0020	0.0019	0.0027	0.0029	0.0012	0.0011	0.0900	0.0800	0.0157	0.0162	0.0389	mg/L	0.0001	-
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.00059	0.00058	0.00007	<0.00006	0.00008	mg/L	0.00006	0.073
Sodium (Na)	0.094	<0.005	2.38	2.42	2.41	2.34	2.23	2.34	1.55	1.57	13.5	12.5	4.56	4.22	6.10	mg/L	0.005	-
Nickel (Ni)	<0.00006	<0.00006	0.00153	0.00153	0.00092	0.00078	0.00078	0.00081	0.00085	0.00080	0.0213	0.0203	0.00247	0.00232	0.00326	mg/L	0.00006	0.025
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00033	0.00028	<0.00005	<0.00005	<0.00005	mg/L	0.00005	0.001
Antimony (Sb)	0.00015	0.00048	0.00011	0.00144	0.00107	0.00015	0.00027	0.00012	0.00013	0.00013	0.00021	0.00021	0.00012	0.00015	0.00076	mg/L	0.00003	-
Selenium (Se)	<0.0001	<0.0001	<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	mg/L	0.0001	0.001
Strontium (Sr)	<0.0001	<0.0001	0.0323	0.0321	0.0235	0.0228	0.0227	0.0235	0.0170	0.0166	0.157	0.155	0.0525	0.0486	0.0712	mg/L	0.0001	-
Silicon (Si)	<0.1	<0.1	0.2	0.2	0.5	0.5	0.5	0.5	0.2	0.2	0.3	0.3	0.4	0.6	<0.1	mg/L	0.1	-
Tin (Sn)	<0.0001	<0.0001	<0.0001	<0.0001	0.0041	0.0047	0.0003	0.0030	0.0007	0.0017	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001	-
Uranium (U)	<0.00005	<0.00005	0.00009	0.00009	0.00010	0.00010	0.00009	0.00009	0.00006	0.00006	0.00080	0.00079	0.00010	0.00008	0.00009	mg/L	0.00005	-
Vanadium (V)	<0.00005	<0.00005	0.00009	0.00011	0.00006	0.00006	<0.00005	0.00006	0.00006	0.00006	0.00028	0.00026	0.00016	0.00015	0.00028	mg/L	0.00005	-
Zinc (Zn)	<0.0008	<0.0008	0.0011	<0.0008	<0.0008	0.0021	<0.0008	<0.0008	0.0011	0.0013	0.0037	0.0039	0.0010	<0.0008	<0.0008	mg/L	0.0008	0.03

TABLE 11: Analytical Results For Surveyed Lakes – July 14, 2004

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Duplicate	Nicholas A-1	Nicholas A-1 Duplicate	Nicholas A-2	Nicholas A-2 Duplicate	Eclipse A-1	Eclipse A-1 Duplicate	Round A-1	Round A-1 Duplicate	Narrow A-1	Narrow A-2	Winter A-1	UNITS	Detection Limits	CCME Guideline *
Dissolved Ultra-Low Level Metals																		
Silver (Ag)	<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	mg/L	0.0001	0.0001
Aluminum (Al)	<0.0003	<0.0003	0.0188	0.0186	0.0109	0.0105	0.0080	0.0082	0.0167	0.0172	0.0286	0.0258	0.0133	0.0152	0.0232	mg/L	0.0003	0.005
Arsenic (As)	<0.00003	<0.00003	0.00067	0.00069	0.00060	0.00056	0.00050	0.00050	0.00040	0.00040	0.00909	0.00956	0.00100	0.00088	0.00176	mg/L	0.00003	0.005
Boron (B)	<0.001	<0.001	0.009	0.009	0.009	0.009	0.009	0.008	0.006	0.006	0.047	0.045	0.016	0.016	0.021	mg/L	0.001	-
Barium (Ba)	<0.00005	<0.00005	0.00663	0.00680	0.00370	0.00358	0.00416	0.00410	0.00284	0.00278	0.0260	0.0270	0.00980	0.0110	0.0143	mg/L	0.00005	-
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002	-
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003	-
Calcium (Ca)	0.04	<0.02	9.58	9.77	5.31	5.02	5.03	5.06	4.76	4.74	55.7	54.4	16.6	15.9	24.8	mg/L	0.02	-
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005	0.000017
Cobalt (Co)	0.0005	<0.0001	0.0001	<0.0001	0.0002	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	0.0012	0.0012	<0.0001	<0.0001	0.0002	mg/L	0.0001	-
Chromium (Cr)	<0.00006	<0.00006	0.00039	0.00038	0.00025	0.00019	0.00022	0.00023	0.00021	0.00019	0.00051	0.00049	0.00038	0.00041	0.00041	mg/L	0.00006	0.001
Copper (Cu)	<0.0006	<0.0006	0.0009	0.0008	0.0011	0.0007	0.0018	0.0025	0.0016	0.0015	0.0043	0.0047	0.0013	0.0012	0.0015	mg/L	0.0006	0.002
Iron (Fe)	<0.005	<0.005	0.019	0.019	0.005	0.008	0.005	<0.005	0.006	0.009	0.038	0.039	0.008	0.008	0.007	mg/L	0.005	0.3
Lithium (Li)	<0.0001	<0.0001	0.0027	0.0026	0.0021	0.0021	0.0021	0.0021	0.0016	0.0017	0.0039	0.0041	0.0021	0.0020	0.0028	mg/L	0.0001	-
Mercury (Hg)	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00004	0.00004	0.00005	0.00007	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002	0.000026[c]
Potassium (K)	<0.02	<0.02	1.45	1.48	1.26	1.16	1.19	1.18	1.01	0.98	6.99	6.19	2.74	2.63	3.86	mg/L	0.02	-
Magnesium (Mg)	<0.004	<0.004	3.24	3.28	2.44	2.29	2.26	2.22	2.14	2.20	19.3	18.0	5.33	5.01	7.73	mg/L	0.004	-
Manganese (Mn)	<0.0001	<0.0001	0.0010	0.0010	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0809	0.0763	0.0021	0.0025	0.0023	mg/L	0.0001	-
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	0.00036	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.00053	0.00054	0.00007	<0.00006	0.00008	mg/L	0.00006	0.073
Sodium (Na)	0.100	<0.005	2.35	2.38	2.51	2.35	2.34	2.31	1.56	1.58	11.9	10.6	4.32	4.11	6.00	mg/L	0.005	-
Nickel (Ni)	<0.00006	<0.00006	0.00152	0.00153	0.00084	0.00079	0.00080	0.00086	0.00091	0.00081	0.0184	0.0190	0.00234	0.00237	0.00306	mg/L	0.00006	0.025
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00012	0.00012	<0.00005	<0.00005	<0.00005	mg/L	0.00005	0.001
Antimony (Sb)	0.0017	0.00018	0.00041	0.00011	0.00066	0.00017	0.00087	0.00015	0.00014	0.00014	0.00018	0.00023	0.00017	0.00013	0.00124	mg/L	0.00003	-
Selenium (Se)	<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	mg/L	0.0001	0.001
Strontium (Sr)	<0.0001	<0.0001	0.0319	0.0323	0.0245	0.0229	0.0236	0.0236	0.0175	0.0171	0.141	0.144	0.0502	0.0482	0.0701	mg/L	0.0001	-
Silicon (Si)	<0.1	<0.1	0.2	0.2	0.5	0.5	0.5	0.5	0.2	0.2	0.3	0.3	0.4	0.6	<0.1	mg/L	0.1	-
Tin (Sn)	<0.0001	<0.0001	<0.0001	<0.0001	0.0092	0.0130	0.0090	0.0012	0.0011	0.0020	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001	-
Uranium (U)	<0.00005	<0.00005	0.00008	0.00009	0.00010	0.00010	0.00009	0.00008	0.00005	0.00006	0.00076	0.00079	0.00009	0.00008	0.00009	mg/L	0.00005	-
Vanadium (V)	<0.00005	<0.00005	0.00009	0.00009	0.00007	0.00006	<0.00005	<0.00005	0.00006	0.00005	0.00020	0.00020	0.00014	0.00013	0.00024	mg/L	0.00005	-
Zinc (Zn)	0.0012	<0.0008	0.0020	0.0011	0.0014	<0.0008	<0.0008	0.0023	0.0020	<0.0008	0.0029	0.0041	0.0016	0.0021	0.0028	mg/L	0.0008	0.03

Canadian Council of Ministers of the Environment - Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (Dec. 2003).

Footnotes

[a] standard for nitrite [0.06mg/L(NO_2)] has been converted by a factor of 1/4.43 to reflect the results expressed as mg/l(N), then converted into ug/L.

[b] standard for ammonia [0.019mg/L(NH_4)] has been converted by a factor of 1/4.43 to reflect the results expressed as mg/l(N), then converted into ug/L.

[c] standard for inorganic Hg, (results expressed as total or dissolved Hg).

TABLE 12: Analytical Results For Surveyed Lakes – August 12 to 13, 2004

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Duplicate	Nicholas A-1	Nicholas A-1 Duplicate	Nicholas A-2	Nicholas A-2 Duplicate	Eclipse A-1	Eclipse A-1 Duplicate	Eclipse A-2	Eclipse A-2 Duplicate	Round A-1	Round A-1 Duplicate	Narrow A-1	Narrow A-1 Duplicate	Narrow A-2	Narrow A-2 Duplicate	Winter A-1	Winter A-1 Duplicate	UNITS	Detection Limits	CCME Guideline*
Major Ions, Nutrients and Inorganics																							
Chloride (Cl)	<1	<1	1	<1	2	1	1	1	<1	<1	<1	<1	2	2	2	2	2	2	2	2	mg/L	1	-
Fluoride (F)	<0.05	<0.05	0.08	0.08	0.08	0.06	0.08	0.08	0.06	0.06	0.94	0.06	0.14	0.14	0.09	0.09	0.08	0.08	0.12	0.11	mg/L	0.05	-
Calcium (Ca)	<0.5	<0.5	9.9	9.9	5.4	5.3	5.3	5.3	5.1	5.1	5.1	5.1	68.8	68.4	17.6	17.6	17.1	17.0	26.8	26.7	mg/L	0.5	-
Potassium (K)	<0.1	<0.1	1.4	1.4	1.1	1.2	1.2	1.2	1.2	1.0	1.0	1.1	8.4	8.3	2.8	2.8	2.7	2.6	3.8	4.1	mg/L	0.1	-
Magnesium (Mg)	<0.1	<0.1	3.4	3.4	2.5	2.5	2.4	2.4	2.5	2.4	2.4	2.4	25.7	25.8	6.0	5.8	5.8	5.6	8.7	8.7	mg/L	0.1	-
Sodium (Na)	<1	<1	2	2	2	2	2	2	2	2	2	2	15	15	5	5	4	4	6	7	mg/L	1	-
Ion Balance	Low TDS	Low TDS	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	104	105	109	109	107	106	107	105	%	-	-
TDS (Calculated)	<1	<1	45	44	32	31	32	31	28	28	27	28	390	385	89	89	85	85	137	139	mg/L	-	-
Hardness (as $CaCO_3$)	<1	<1	39	39	24	24	23	23	23	23	23	23	278	277	69	68	67	66	103	102	mg/L	-	-
Iron-Extractable	<0.005	<0.005	0.011	0.011	<0.005	<0.005	0.009	0.005	<0.005	<0.005	0.006	0.006	0.033	0.037	0.015	0.005	0.006	0.008	0.016	0.013	mg/L	0.005	0.3
Manganese-Extractable	<0.001	<0.001	0.006	0.007	0.001	0.001	0.002	0.001	0.001	0.001	0.001	0.001	0.039	0.045	0.011	0.013	0.014	0.017	0.038	0.038	mg/L	0.001	-
Nitrate+Nitrite-N	<0.006	<0.006	0.017	<0.006	0.092	0.062	0.040	<0.006	<0.006	0.051	0.073	0.083	<0.006	<0.006	0.010	0.182	0.053	0.032	0.252	0.024	mg/L	0.006	-
Nitrate-N	<0.006	<0.006	0.016	<0.006	0.090	0.061	0.039	<0.006	<0.006	0.051	0.073	0.081	<0.006	<0.006	0.009	0.181	0.052	0.030	0.251	0.023	mg/L	0.006	13
Nitrite-N	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/L	0.002	0.018[a]
Sulfate (SO_4)	<0.05	<0.05	7.63	7.64	7.56	7.54	7.58	7.49	6.91	7.03	7.00	7.03	230	225	30.8	30.9	29.5	29.6	60.8	59.8	mg/L	0.05	-
pH	5.8	5.9	7.9	7.9	7.7	7.7	7.5	7.9	7.7	7.7	7.5	7.5	8.1	8.1	8.0	8.0	7.7	7.7	7.9	8.1	pH	0.1	6.5-9
Conductivity (EC)	1.1	1.0	92.6	92.4	66.2	66.0	65.0	92.0	59.1	59.2	59.0	59.3	640	638	171	171	166	166	257	252	uS/cm	0.2	-
Bicarbonate (HCO_3)	<5	<5	41	40	22	22	24	21	20	21	20	20	82	83	50	49	49	48	56	63	mg/L	5	-
Carbonate (CO_3)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L	5	-
Hydroxide (OH)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L	5	-
Alkalinity, Total (as $CaCO_3$)	<5	<5	33	33	18	18	20	20	17	17	16	17	67	68	41	40	40	40	46	51	mg/L	5	-
Ammonia-N	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.009	0.009	0.027	0.028	<0.005	<0.005	<0.005	0.005	0.019	0.019	mg/L	0.005	0.015[b]
Cyanide-CN	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/L	0.002	0.005
Phosphorus, Total	<0.001	<0.001	0.005	0.007	0.004	0.003	0.007	0.008	0.002	0.002	0.003	0.004	0.012	0.013	0.009	0.007	0.012	0.011	0.009	0.009	mg/L	0.001	-
Total Organic Carbon	<0.2	<0.2	13.8	13.6	6.3	6.2	5.8	5.9	6.2	6.0	5.8	5.7	18.0	18.0	14.2	14.1	13.6	13.7	18.5	19.7	mg/L	0.2	-
Dissolved Organic Carbon	<0.5	<0.5	13.3	12.4	6.1	6.0	5.3	5.4	6.0	5.8	5.8	5.7	17.3	17.0	13.6	13.6	13.0	13.1	18.5	19.0	mg/L	0.5	-
Total Suspended Solids	<3	<3	4	<3	<3	<3	5	<3	7	7	5	8	3	<3	<3	3	5	<3	3	4	mg/L	3	-
Turbidity	<0.1	<0.1	0.45	0.40	0.40	0.40	0.50	0.50	0.30	N/A	0.20	N/A	0.65	N/A	0.60	0.60	0.70	0.70	1.1	1.1	NTU	0.1	-
Redox Potential	190	190	171	189	176	174	0.007	206	145	143	122	120	169	179	169	162	185	188	166	166	mV	1	-
Total Ultra-Low Level Metals																							
Silver (Ag)	<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	mg/L	0.0001	0.0001
Aluminum (Al)	<0.0003	0.0003	0.0183	0.0199	0.0111	0.0113	0.0100	0.0107	0.0189	0.0184	0.0164	0.0170	0.0181	0.0152	0.0136	0.0143	0.0189	0.0201	0.0215	0.0201	mg/L	0.0003	0.005
Arsenic (As)	<0.00003	<0.00003	0.00071	0.00072	0.00056	0.00057	0.00046	0.00047	0.00044	0.00043	0.00039	0.00040	0.00827	0.00793	0.00104	0.00102	0.00085	0.00083	0.00192	0.00191	mg/L	0.00003	0.005
Boron (B)	<0.001	<0.001	0.008	0.008	0.008	0.008	0.008	0.008	0.006	0.006	0.006	0.006	0.054	0.048	0.016	0.016	0.015	0.016	0.023	0.023	mg/L	0.001	-
Barium (Ba)	<0.00005	<0.00005	0.00630	0.00618	0.00357	0.00361	0.00385	0.00390	0.00290	0.00286	0.00301	0.00300	0.0286	0.0286	0.00957	0.00956	0.0115	0.0113	0.0171	0.0165	mg/L	0.00005	-
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002	-
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003	-
Calcium (Ca)	<0.02	<0.02	9.61	9.56	4.65	4.88	4.68	4.92	4.71	4.78	4.58	4.70	61.5	56.2	17.0	17.1	15.9	16.0	25.6	25.0	mg/L	0.02	-
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005	0.000017
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0009	0.0010	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0001	mg/L	0.0001	-
Chromium (Cr)	0.00006	<0.00006	0.00035	0.00034	0.00016	0.00029	0.00023	0.00010	0.00018	0.00031	0.00023	0.00024	0.00042	0.00041	0.00039	0.00033	0.00022	0.00031	0.00037	0.00038	mg/L	0.00006	0.001
Copper (Cu)	<0.0006	<0.0006	0.0025	0.0024	0.120	0.108	0.0023	0.0057	0.0068	0.0035	0.0013	0.0013	0.0048	0.0048	0.0019	0.0098	0.0016	0.0013	0.0014	0.0019	mg/L	0.0006	0.002
Iron (Fe)	<0.005	<0.005	0.021	0.019	0.008	0.008	0.011	0.020	0.008	0.007	0.011	0.011	0.063	0.063	0.010	0.009	0.014	0.014	0.027	0.027	mg/L	0.005	0.3
Lithium (Li)	<0.0001	<0.0001	0.0027	0.0028	0.0021	0.0022	0.0020	0.0020	0.0018	0.0018	0.0017	0.0017	0.0041	0.0035	0.0020	0.0021	0.0019	0.0019	0.0029	0.0028	mg/L	0.0001	-
Mercury (Hg)	<0.00002	<0.00002	0.00002	0.00002	0.00002	0.00003	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00003	<0.00002	<0.00002	<0.00002	0.00002	mg/L	0.00002	0.000026[c]
Potassium (K)	<0.02	<0.02	1.48	1.50	1.14	1.18	1.13	1.15	1.07	1.05	1.00	1.03	7.94	7.64	2.93	2.90	2.73	2.74	4.22	4.00	mg/L	0.005	-
Magnesium (Mg)	<0.004	<0.004	3.15	3.27	2.24	2.30	2.15	2.28	2.36	2.34	2.22	2.25	22.1	19.0	5.51	5.57	5.28	5.37	8.42	8.10	mg/L	0.004	-
Manganese (Mn)	<0.0001	<0.0001	0.0073	0.0074	0.0016	0.0016	0.0018	0.0019	0.0009	0.0009	0.0017	0.0017	0.0479	0.0487	0.0125	0.0125	0.0198	0.0202	0.0516	0.0495	mg/L	0.0001	-
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.00037	0.00036	0.00007	0.00008	<0.00006	<0.00006	0.00007	0.00007	mg/L	0.00006	0.073
Sodium (Na)	0.025	<0.005	2.30	2.39	2.25	2.32	2.16	2.30	1.72	1.65	1.57	1.62	13.6	11.7	4.61	4.53	4.30	4.40	6.55	6.29	mg/L	0.005	-
Nickel (Ni)	<0.00006	<0.00006	0.00018	0.00020	0.00020	0.00020	0.00017	0.00017	0.00029	0.00026	0.00029	0.00026	0.0101	0.0113	0.00014	0.00015	0.00043	0.00038	<0.00006	<0.00006	mg/L	0.00006	0.025
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00015	<0.00005	<0.00005	<0.00005	<0.00005	0.00027	0.00028	<0.00005	<0.00005	0.00007	<0.00005	<0.00005	<0.00005	mg/L	0.00005	0.001
Antimony (Sb)	0.00015	0.00016	0.00012	0.00010	0.00013	0.00011	0.00012	0.00011	0.00012	0.00009	0.00011	0.00009	0.00015	0.00016	0.00012	0.00013	0.00011	0.00011	0.00016	0.00013	mg/L	0.00003	-
Selenium (Se)	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	0.0001	0.0001	<0.0001	0.0001	0.0002	<0.0001	0.0001	0.0002	0.0002	0.0001	0.0001	0.0001	<0.0001	0.0001	0.0001	mg/L	0.0001	0.001
Strontium (Sr)	<0.0001	<0.0001	0.0322	0.0325	0.0232	0.0234	0.0226	0.0232	0.0180	0.0180	0.0178	0.0179	0.210	0.201	0.0645	0.0642	0.0615	0.0610	0.0949	0.0912	mg/L	0.0001	-
Silicon (Si)	<0.1	<0.1	0.2	0.2	0.5	0.5	0.5	0.5	0.2	0.2	0.3	0.3	<0.1	<0.1	0.3	0.3	0.6	0.6	0.1	0.1	mg/L	0.1	-
Tin (Sn)	<0.0001	<0.0001	0.0543	0.0058	0.0035	0.0352	0.0123	0.0022	0.0027	0.0248	0.0074	0.0289	<0.0001	<0.0001	0.0133	0.0057	0.0030	0.0250	0.0312	0.0074	mg/L	0.0001	-
Uranium (U)	<0.00005	<0.00005	0.00008	0.00008	0.00010	0.00010	0.00008	0.00008	0.00006	0.00006	0.00005	0.00005	0.00051	0.00052	0.00009	0.00009	0.00007	0.00007	0.00008	0.00007	mg/L	0.00005	-
Vanadium (V)	<0.00005	<0.00005	0.00010	0.00009	0.00007	0.00007	0.00006	0.00006	0.00009	0.00008	0.00007	0.00007	0.00018	0.00017	0.00016	0.00016	0.00015	0.00015	0.00025	0.00024	mg/L	0.00005	-
Zinc (Zn)	<0.0008	<0.0008	0.0010	0.0009	<0.0008	<0.0008	<0.0008	0.0061	<0.0008	<0.0008	<0.0008	<0.0008	0.0043	0.0056	0.0011	0.0016	<0.0008	<0.0008	<0.0008	<0.0008	mg/L	0.0008	0.03

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Duplicate	Nicholas A-1	Nicholas A-1 Duplicate	Nicholas A-2	Nicholas A-2 Duplicate	Eclipse A-1	Eclipse A-1 Duplicate	Eclipse A-2	Eclipse A-2 Duplicate	Round A-1	Round A-1 Duplicate	Narrow A-1	Narrow A-1 Duplicate	Narrow A-2	Narrow A-2 Duplicate	Winter A-1	Winter A-1 Duplicate	UNITS	Detection Limits	CCME Guideline*
Dissolved Ultra-Low Level Metals																							
Silver (Ag)	<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	mg/L	0.0001	0.0001
Aluminum (Al)	<0.0003	<0.0003	0.0146	0.0171	0.0098	0.0092	0.0077	0.0098	0.0172	0.0167	0.0137	0.0136	0.0128	0.0112	0.0101	0.0101	0.0137	0.0140	0.0146	0.0143	mg/L	0.0003	0.005
Arsenic (As)	<0.00003	<0.00003	0.00073	0.00066	0.00056	0.00056	0.00046	0.00047	0.00044	0.00042	0.00039	0.00038	0.00739	0.00721	0.00099	0.00103	0.00084	0.00084	0.00168	0.00173	mg/L	0.00003	0.005
Boron (B)	<0.001	<0.001	0.009	0.009	0.008	0.009	0.008	0.008	0.006	0.006	0.006	0.006	0.054	0.049	0.015	0.016	0.015	0.016	0.023	0.023	mg/L	0.001	-
Barium (Ba)	<0.00005	<0.00005	0.00640	0.00610	0.00359	0.00361	0.00383	0.00387	0.00281	0.00284	0.00294	0.00290	0.0277	0.0276	0.00922	0.00953	0.0114	0.0111	0.0159	0.0159	mg/L	0.00005	-
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002	-
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003	-
Calcium (Ca)	0.03	<0.02	9.50	9.44	4.83	4.76	4.92	5.07	4.80	4.74	4.74	4.72	62.7	57.5	16.8	16.8	15.8	16.1	24.9	24.7	mg/L	0.02	-
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005	0.000017
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	0.0007	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001	-
Chromium (Cr)	0.00009	<0.00006	0.00035	0.00023	0.00016	0.00017	0.00019	0.00018	0.00030	0.00023	0.00025	0.00028	0.00043	0.00043	0.00021	0.00026	0.00028	0.00030	0.00029	0.00037	mg/L	0.00006	0.001
Copper (Cu)	<0.0006	<0.0006	0.0019	0.0016	0.143	0.228	0.0158	0.0107	0.0034	0.0029	0.0014	0.0015	0.0042	0.0040	0.0115	0.0084	0.0017	0.0016	0.0016	0.0016	mg/L	0.0006	0.002
Iron (Fe)	<0.005	<0.005	0.010	0.011	<0.005	<0.005	<0.005	0.008	<0.005	<0.005	0.005	<0.005	0.013	0.014	<0.005	0.005	0.006	0.007	<0.005	<0.005	mg/L	0.005	0.3
Lithium (Li)	<0.0001	<0.0001	0.0026	0.0027	0.0020	0.0021	0.0019	0.0021	0.0018	0.0017	0.0016	0.0017	0.0040	0.0034	0.0021	0.0021	0.0020	0.0021	0.0029	0.0028	mg/L	0.0001	-
Mercury (Hg)	<0.00002	<0.00002	0.00002	0.00003	0.00005	0.00008	0.00003	0.00003	0.00002	0.00002	0.00003	0.00002	<0.00002	<0.00002	0.00004	0.00002	<0.00002	<0.00002	0.00004	0.00003	mg/L	0.00002	0.000026[c]
Potassium (K)	<0.02	<0.02	1.44	1.43	1.15	1.12	1.16	1.19	1.05	1.02	1.02	1.03	7.98	7.77	2.83	2.85	2.68	2.67	4.04	3.91	mg/L	0.005	-
Magnesium (Mg)	<0.004	<0.004	2.97	3.24	2.25	2.26	2.25	2.31	2.32	2.32	2.23	2.21	22.3	19.7	5.29	5.42	5.24	5.31	8.27	7.98	mg/L	0.004	-
Manganese (Mn)	<0.0001	<0.0001	0.0006	0.0006	0.0002	0.0002	0.0001	0.0009	0.0002	0.0002	0.0002	0.0002	0.0115	0.0120	0.0016	0.0017	0.0052	0.0054	0.0009	0.0009	mg/L	0.0001	-
Molybdenum (Mo)	<0.00006	<0.00006	0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.00038	0.00037	0.00008	0.00008	<0.00006	0.00006	0.00008	0.00008	mg/L	0.00006	0.073
Sodium (Na)	0.031	<0.005	2.17	2.37	2.31	2.30	2.25	2.33	1.70	1.64	1.61	1.60	13.9	12.0	4.41	4.52	4.21	4.37	6.36	6.32	mg/L	0.005	-
Nickel (Ni)	<0.00006	<0.00006	0.00030	0.00010	0.00024	0.00031	0.00021	0.00016	0.00026	0.00027	0.00030	0.00028	0.00956	0.0104	0.00013	0.00024	0.00040	0.00033	<0.00006	<0.00006	mg/L	0.00006	0.025
Lead (Pb)	<0.00005	<0.00005	<0.00005	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005	0.001
Antimony (Sb)	0.00011	0.00016	0.00012	0.00014	0.00013	0.00012	0.00011	0.00010	0.00010	0.00011	0.00010	0.00012	0.00018	0.00017	0.00011	0.00012	0.00011	0.00010	0.00013	0.00013	mg/L	0.00003	-
Selenium (Se)	<0.0001	<0.0001	0.0001	<0.0001	0.0001	0.0001	<0.0001	<0.0001	0.0001	0.0001	0.0002	<0.0001	0.0002	0.0002	<0.0001	0.0001	0.0001	<0.0001	<0.0001	0.0001	mg/L	0.0001	0.001
Strontium (Sr)	<0.0001	<0.0001	0.0331	0.0322	0.0234	0.0232	0.0234	0.0237	0.0181	0.0178	0.0180	0.0176	0.209	0.198	0.0619	0.0635	0.0614	0.0613	0.0920	0.0894	mg/L	0.0001	-
Silicon (Si)	<0.1	<0.1	0.2	0.2	0.5	0.7	0.5	0.5	0.2	0.2	0.4	0.4	<0.1	<0.1	0.3	0.3	0.6	0.6	0.2	0.1	mg/L	0.1	-
Tin (Sn)	<0.0001	<0.0001	0.0069	0.0057	0.0051	0.0028	0.0005	0.0028	0.0047	0.0019	0.0039	0.0030	<0.0001	<0.0001	0.0019	0.0046	0.0052	0.0005	0.0013	0.0060	mg/L	0.0001	-
Uranium (U)	<0.00005	<0.00005	0.00008	0.00007	0.00008	0.00009	0.00007	0.00007	<0.00005	<0.00005	<0.00005	<0.00005	0.00048	0.00049	0.00009	0.00008	0.00007	0.00007	0.00008	0.00008	mg/L	0.00005	-
Vanadium (V)	<0.00005	<0.00005	0.00010	0.00009	0.00007	0.00009	0.00006	0.00006	0.00008	0.00008	0.00006	0.00007	0.00014	0.00014	0.00014	0.00014	0.00013	0.00014	0.00019	0.00019	mg/L	0.00005	-
Zinc (Zn)	0.0010	<0.0008	0.0022	0.0038	0.0025	0.0036	0.0026	0.0046	0.0021	0.0021	0.0017	0.0019	0.0056	0.0049	0.0028	0.0033	0.0018	0.0021	0.0037	0.0023	mg/L	0.0008	0.03

Canadian Council of Ministers of the Environment - Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (Dec. 2003).

Footnotes

[a] standard for nitrite [0.06mg/L(NO_2)] has been converted by a factor of 1/4.43 to reflect the results expressed as mg/l(N), then converted into ug/L.

[b] standard for ammonia [0.019mg/L(NH_4)] has been converted by a factor of 1/4.43 to reflect the results expressed as mg/l(N), then converted into ug/L.

[c] standard for inorganic Hg, (resutls expressed as total or dissolved Hg).

TABLE 13: Analytical Results For Surveyed Lakes – September 29 to 30, 2004

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Duplicate	Nicholas A-1	Nicholas A-1 Duplicate	Nicholas A-2	Nicholas A-2 Duplicate	Eclipse A-1	Eclipse A-1 Duplicate	Eclipse A-2	Eclipse A-2 Duplicate	Round A-1	Round A-1 Duplicate	Narrow A-1	Narrow A-1 Duplicate	Narrow A-2	Narrow A-2 Duplicate	Winter A-1	Winter A-1 Duplicate	UNITS	Detection Limits	CCME Guideline *
Major Ions, Nutrients and Inorganics																							
Chloride (Cl)	<1	<1	2	1	2	2	2	1	2	2	2	2	3	3	3	3	3	3	2	2	mg/L	1	-
Fluoride (F)	<0.05	<0.05	0.09	0.09	0.10	0.09	0.09	0.09	0.07	0.07	0.07	0.07	0.16	0.16	0.10	0.10	0.10	0.10	0.12	0.12	mg/L	0.05	-
Calcium (Ca)	<0.5	<0.5	9.8	9.7	5.4	5.4	5.3	5.4	5.1	5.1	5.0	5.1	71.2	70.4	17.3	17.2	17.1	17.2	26.6	26.4	mg/L	0.5	-
Potassium (K)	<0.1	<0.1	1.5	1.5	1.2	1.3	1.3	1.2	1.1	1.1	1.0	1.1	8.3	8.6	2.6	2.7	3.0	2.8	4.0	4.1	mg/L	0.1	-
Magnesium (Mg)	<0.1	<0.1	3.3	3.3	2.5	2.5	2.4	2.4	2.4	2.4	2.3	2.3	26.5	26.2	5.7	5.7	5.7	5.7	8.7	8.7	mg/L	0.1	-
Sodium (Na)	<1	<1	2	2	2	2	2	2	2	2	2	2	16	17	4	5	4	5	7	7	mg/L	1	-
Ion Balance	Low TDS	Low TDS	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	108	98.6	103	105	103	106	108	108	%	-	-
TDS (Calculated)	<1	<1	46	45	34	32	33	32	29	30	30	29	394	422	87	88	87	88	135	136	mg/L	-	-
Hardness (as $CaCO_3$)	<1	<1	38	38	24	24	23	23	23	23	22	22	287	284	67	66	66	66	102	102	mg/L	-	-
Iron-Extractable	<0.005	<0.005	0.019	0.020	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.014	0.014	0.021	<0.005	<0.005	<0.005	<0.005	0.006	mg/L	0.005	0.3
Manganese-Extractable	<0.001	<0.001	0.026	0.028	0.001	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	0.016	0.015	0.039	0.034	0.035	0.035	0.017	0.017	mg/L	0.001	-
Nitrate+Nitrite-N	<0.006	<0.006	<0.006	0.011	0.246	0.044	0.008	0.021	0.038	0.029	0.030	0.027	0.054	0.050	<0.006	<0.006	<0.006	<0.006	0.044	0.042	mg/L	0.006	-
Nitrate-N	<0.006	<0.006	<0.006	0.009	0.245	0.043	0.008	0.021	0.036	0.029	0.029	0.026	0.048	0.045	<0.006	<0.006	<0.006	<0.006	0.042	0.041	mg/L	0.006	13
Nitrite-N	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.006	0.004	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	mg/L	0.002	0.018[a]
Sulfate (SO_4)	<0.05	<0.05	7.54	7.52	7.52	7.54	7.52	7.54	6.96	6.94	6.96	6.94	230	256	29.7	29.9	29.8	29.8	56.2	56.9	mg/L	0.05	-
pH	5.8	5.7	7.5	7.5	7.3	7.2	7.2	7.2	7.3	7.3	7.3	7.3	7.8	7.8	7.7	7.7	7.7	7.7	7.8	7.8	pH	0.1	6.5-9
Conductivity (EC)	1.1	1.0	89.0	89.0	64.4	63.6	63.5	63.7	57.2	57.4	57.2	57.2	623	617	160	161	161	161	239	238	uS/cm	0.2	-
Bicarbonate (HCO_3)	<5	<5	41	41	25	22	25	25	20	21	21	19	79	81	50	51	50	50	63	62	mg/L	5	-
Carbonate (CO_3)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L	5	-
Hydroxide (OH)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L	5	-
Alkalinity, Total (as $CaCO_3$)	<5	<5	33	33	20	18	20	20	16	17	17	16	65	67	41	41	41	41	51	51	mg/L	5	-
Ammonia-N	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.306	0.300	<0.005	<0.005	<0.005	<0.005	0.040	0.040	mg/L	0.005	0.015[b]
Cyanide-CN	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/L	0.002	0.005
Phosphorus, Total	0.001	<0.001	0.010	0.009	0.005	0.006	0.006	0.006	0.005	0.005	0.005	0.005	0.010	0.009	0.012	0.013	0.011	0.011	0.014	0.014	mg/L	0.001	-
Total Organic Carbon	0.5	<0.2	12.6	13.1	5.6	6.2	5.5	5.7	6.1	6.0	5.9	5.9	14.9	15.5	13.2	13.1	13.6	13.7	17.3	18.0	mg/L	0.2	-
Total Suspended Solids	<3	<3	<3	<3	<3	3	<3	<3	<3	<3	<3	<3	<3	<3	3	3	<3	<3	<3	<3	mg/L	3	-
Turbidity	<0.1	<0.1	0.45	0.45	0.50	0.45	0.35	0.35	0.35	0.35	0.35	0.30	0.50	0.45	0.80	0.60	0.65	0.60	0.75	0.75	NTU	0.1	-
Redox Potential	237	161	156	175	137	136	142	156	206	222	217	219	183	180	142	174	128	133	139	162	mV	1	-
Total Ultra-Low Level Metals																							
Silver (Ag)	<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	mg/L	0.0001	0.0001
Aluminum (Al)	<0.0003	<0.0003	0.0160	0.0164	0.0171	0.0107	0.0104	0.0104	0.0157	0.0157	0.0162	0.0282	0.0130	0.0137	0.0116	0.0112	0.0121	0.0120	0.0157	0.0162	mg/L	0.0003	0.005
Arsenic (As)	<0.00003	<0.00003	0.00065	0.00067	0.00052	0.00052	0.00051	0.00051	0.00038	0.00037	0.00040	0.00041	0.00433	0.00430	0.00099	0.00097	0.00101	0.00100	0.00154	0.00158	mg/L	0.00003	0.005
Boron (B)	<0.001	<0.001	0.009	0.009	0.009	0.009	0.009	0.008	0.006	0.006	0.006	0.007	0.059	0.058	0.016	0.016	0.017	0.017	0.023	0.024	mg/L	0.001	-
Barium (Ba)	<0.00005	<0.00005	0.00696	0.00697	0.00400	0.00367	0.00375	0.00370	0.00286	0.00282	0.00284	0.00290	0.0280	0.0286	0.00992	0.00996	0.00984	0.00982	0.0173	0.0174	mg/L	0.00005	-
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002	-
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003	-
Calcium (Ca)	0.03	<0.02	9.33	9.54	5.40	5.16	5.15	5.12	4.70	4.64	4.94	5.23	78.0	75.1	16.4	16.6	17.4	17.1	25.8	26.6	mg/L	0.02	-
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00008	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005	0.000017
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0009	0.0009	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	mg/L	0.0001	-
Chromium (Cr)	<0.00006	<0.00006	0.00030	0.00033	0.00010	0.00035	0.00033	0.00027	0.00044	0.00044	0.00044	0.00023	0.00046	0.00045	0.00036	0.00031	0.00033	0.00034	0.00040	0.00040	mg/L	0.00006	0.001
Copper (Cu)	<0.0006	<0.0006	0.0036	0.0034	0.0286	0.0015	0.0039	0.0011	0.0027	0.0013	0.0012	0.0014	0.0051	0.0050	0.0014	0.0014	0.0013	0.0014	0.0016	0.0016	mg/L	0.0006	0.002
Iron (Fe)	<0.005	<0.005	0.031	0.030	0.026	0.007	0.008	0.007	<0.005	0.005	<0.005	0.006	0.029	0.026	0.011	0.009	0.009	0.009	0.014	0.015	mg/L	0.005	0.3
Lithium (Li)	<0.0001	<0.0001	0.0025	0.0025	0.0021	0.0021	0.0021	0.0021	0.0016	0.0017	0.0017	0.0018	0.0042	0.0042	0.0020	0.0021	0.0021	0.0021	0.0026	0.0027	mg/L	0.0001	-
Mercury (Hg)	<0.00002	<0.00002	0.00002	<0.00002	0.00004	0.00002	0.00002	<0.00002	0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002	0.000026[c]
Potassium (K)	<0.02	<0.02	1.45	1.48	1.25	1.22	1.22	1.20	1.01	1.01	1.09	1.13	9.90	9.61	2.83	2.86	2.97	2.97	4.29	4.46	mg/L	0.02	-
Magnesium (Mg)	<0.004	<0.004	3.23	3.31	2.37	2.35	2.36	2.34	2.27	2.24	2.33	2.35	28.5	28.0	5.67	5.65	5.82	5.78	8.74	8.94	mg/L	0.004	-
Manganese (Mn)	<0.0001	<0.0001	0.0324	0.0343	0.0030	0.0022	0.0020	0.0021	0.0011	0.0011	0.0011	0.0014	0.0185	0.0182	0.0440	0.0442	0.0468	0.0452	0.0207	0.0216	mg/L	0.0001	-
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.00052	0.00054	<0.00006	<0.00006	<0.00006	<0.00006	0.00007	0.00006	mg/L	0.00006	0.073
Sodium (Na)	0.022	<0.005	2.39	2.44	2.47	2.43	2.43	2.39	1.60	1.58	1.70	1.75	18.3	18.0	4.69	4.67	4.86	4.81	6.90	7.09	mg/L	0.005	-
Nickel (Ni)	<0.00006	<0.00006	0.00133	0.00132	0.00094	0.00077	0.00075	0.00070	0.00081	0.00080	0.00083	0.00094	0.0327	0.0324	0.00212	0.00208	0.00219	0.00210	0.00317	0.00323	mg/L	0.00006	0.025
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	0.00013	<0.00005	<0.00005	0.00007	0.00007	<0.00005	<0.00005	0.00038	0.00016	0.00016	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005	0.001
Antimony (Sb)	0.00009	0.00007	0.00014	0.00015	0.00012	0.00019	0.00014	0.00010	0.00015	0.00012	0.00014	0.00024	0.00019	0.00015	0.00011	0.00011	0.00011	0.00014	0.00011	0.00009	mg/L	0.00003	-
Selenium (Se)	<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	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001	0.001
Strontium (Sr)	<0.0001	<0.0001	0.0322	0.0323	0.0249	0.0241	0.0240	0.0241	0.0177	0.0176	0.0180	0.0184	0.185	0.184	0.0521	0.0520	0.0533	0.0534	0.0722	0.0730	mg/L	0.0001	-
Silicon (Si)	<0.1	<0.1	0.2	0.2	0.5	0.5	0.5	0.5	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	0.3	<0.1	<0.1	mg/L	0.1	-
Tin (Sn)	<0.0001	<0.0001	0.0045	0.0320	0.0067	0.0100	0.0056	0.0044	0.0052	0.0092	0.0069	0.0159	<0.0001	<0.0001	0.0181	0.0035	0.0022	0.0021	0.0032	0.0164	mg/L	0.0001	-
Uranium (U)	<0.00005	<0.00005	0.00007	0.00008	0.00009	0.00009	0.00009	0.00010	0.00006	0.00005	0.00005	0.00005	0.00065	0.00062	0.00009	0.00009	0.00009	0.00009	0.00008	0.00008	mg/L	0.00005	-
Vanadium (V)	<0.00005	<0.00005	0.00007	0.00007	0.00006	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	0.00012	0.00011	0.00013	0.00012	0.00013	0.00013	0.00016	0.00016	mg/L	0.00005	-
Zinc (Zn)	<0.0008	<0.0008	0.0012	<0.0008	0.0093	0.0016	0.0011	0.0013	0.0025	<0.0008	<0.0008	0.0179	0.0153	0.0175	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	0.0012	mg/L	0.0008	0.03

TABLE 13: Analytical Results For Surveyed Lakes – September 29 to 30, 2004

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Duplicate	Nicholas A-1	Nicholas A-1 Duplicate	Nicholas A-2	Nicholas A-2 Duplicate	Eclipse A-1	Eclipse A-1 Duplicate	Eclipse A-2	Eclipse A-2 Duplicate	Round A-1	Round A-1 Duplicate	Narrow A-1	Narrow A-1 Duplicate	Narrow A-2	Narrow A-2 Duplicate	Winter A-1	Winter A-1 Duplicate	UNITS	Detection Limits	CCME Guideline *
Dissolved Ultra-Low Level Metals																							
Silver (Ag)	<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	mg/L	0.0001	0.0001
Aluminum (Al)	<0.0003	<0.0003	0.0104	0.0108	0.0073	0.0075	0.0074	0.0073	0.0129	0.0140	0.0136	0.0139	0.0070	0.0067	0.0061	0.0061	0.0063	-	0.0097	0.0101	mg/L	0.0003	0.005
Arsenic (As)	<0.00003	<0.00003	0.00061	0.00064	0.00051	0.00051	0.00050	0.00050	0.00038	0.00038	0.00040	0.00040	0.00380	0.00398	0.00095	0.00095	0.00098	-	0.00147	0.00152	mg/L	0.00003	0.005
Boron (B)	<0.001	<0.001	0.008	0.009	0.009	0.009	0.008	0.008	0.006	0.007	0.006	0.006	0.056	0.057	0.016	0.016	0.017	-	0.022	0.023	mg/L	0.001	-
Barium (Ba)	<0.00005	<0.00005	0.00637	0.00661	0.00366	0.00365	0.00365	0.00358	0.00281	0.00287	0.00274	0.00284	0.0272	0.0286	0.00957	0.00947	0.00954	-	0.0172	0.0171	mg/L	0.00005	-
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	-	<0.0002	<0.0002	mg/L	0.0002	-
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	-	<0.00003	<0.00003	mg/L	0.00003	-
Calcium (Ca)	0.03	<0.02	9.05	9.46	5.10	5.15	5.19	5.06	4.72	4.71	5.04	5.13	76.5	76.4	16.2	16.4	17.3	-	25.1	26.0	mg/L	0.02	-
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	0.00006	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00008	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	-	<0.00005	<0.00005	mg/L	0.00005	0.000017
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	0.0005	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	mg/L	0.0001	-
Chromium (Cr)	<0.00006	<0.00006	0.00037	0.00033	0.00019	0.00037	0.00024	0.00024	0.00049	0.00022	0.00020	0.00022	0.00043	0.00053	0.00039	0.00040	0.00037	-	0.00041	0.00041	mg/L	0.00006	0.001
Copper (Cu)	<0.0006	<0.0006	0.0042	0.0037	0.0368	0.0403	0.0047	0.0043	0.0032	0.0036	0.0014	0.0016	0.0044	0.0046	0.0015	0.0014	0.0014	-	0.0015	0.0015	mg/L	0.0006	0.002
Iron (Fe)	<0.005	<0.005	0.007	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.007	0.006	<0.005	<0.005	<0.005	-	<0.005	<0.005	mg/L	0.005	0.3
Lithium (Li)	<0.0001	<0.0001	0.0026	0.0026	0.0021	0.0021	0.0021	0.0021	0.0016	0.0016	0.0017	0.0018	0.0043	0.0043	0.0020	0.0021	0.0022	-	0.0026	0.0028	mg/L	0.0001	-
Mercury (Hg)	<0.00002	<0.00002	0.00003	0.00003	0.00007	0.00010	0.00004	0.00004	0.00004	0.00004	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	<0.00002	<0.00002	-	<0.00002	<0.00002	mg/L	0.00002	0.000026[c]
Potassium (K)	<0.02	<0.02	1.39	1.45	1.19	1.21	1.21	1.18	1.01	1.01	1.10	1.13	9.27	9.53	2.81	2.84	2.97	-	4.18	4.36	mg/L	0.02	-
Magnesium (Mg)	<0.004	<0.004	3.08	3.28	2.28	2.36	2.37	2.33	2.24	2.27	2.34	2.36	28.7	28.3	5.58	5.63	5.82	-	8.44	8.85	mg/L	0.004	-
Manganese (Mn)	<0.0001	<0.0001	0.0005	0.0006	0.0003	0.0004	0.0002	0.0002	0.0001	0.0002	0.0001	0.0001	0.0080	0.0086	0.0003	0.0003	0.0003	-	0.0010	0.0010	mg/L	0.0001	-
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.00050	0.00052	0.00006	<0.00006	<0.00006	-	0.00006	<0.00006	mg/L	0.00006	0.073
Sodium (Na)	0.028	<0.005	2.28	2.43	2.37	2.44	2.45	2.39	1.61	1.62	1.72	1.75	18.0	18.2	4.60	4.67	4.90	-	6.65	6.99	mg/L	0.005	-
Nickel (Ni)	<0.00006	<0.00006	0.00136	0.00153	0.00088	0.00089	0.00086	0.00074	0.00086	0.00090	0.00096	0.00101	0.0294	0.0305	0.00209	0.00211	0.00216	-	0.00300	0.00313	mg/L	0.00006	0.025
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00031	<0.00005	<0.00005	0.00006	<0.00005	<0.00005	<0.00005	<0.00005	-	<0.00005	<0.00005	mg/L	0.00005	0.001
Antimony (Sb)	0.00011	0.00008	0.00012	0.00017	0.00014	0.00017	0.00007	0.00014	0.00012	0.00015	0.00009	0.00013	0.00020	0.00018	0.00012	0.00012	0.00012	-	0.00017	0.00014	mg/L	0.00003	-
Selenium (Se)	<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	0.0002	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	mg/L	0.0001	0.001
Strontium (Sr)	<0.0001	<0.0001	0.0315	0.0325	0.0239	0.0243	0.0241	0.0239	0.0177	0.0178	0.0180	0.0182	0.185	0.187	0.0520	0.0518	0.0537	-	0.0706	0.0722	mg/L	0.0001	-
Silicon (Si)	<0.1	<0.1	0.2	0.2	0.5	0.5	0.5	0.5	0.2	0.2	0.2	0.2	0.2	0.1	0.3	0.3	0.2	-	<0.1	<0.1	mg/L	0.1	-
Tin (Sn)	<0.0001	<0.0001	0.0033	0.0032	0.0044	0.0013	0.0044	0.0014	0.0044	0.0015	0.0077	0.0042	<0.0001	<0.0001	0.0029	0.0023	0.0015	-	0.0042	0.0035	mg/L	0.0001	-
Uranium (U)	<0.00005	<0.00005	0.00007	0.00006	0.00008	0.00008	0.00008	0.00008	<0.00005	<0.00005	<0.00005	<0.00005	0.00078	0.00069	0.00008	0.00008	0.00009	-	0.00008	0.00008	mg/L	0.00005	-
Vanadium (V)	<0.00005	<0.00005	0.00005	0.00006	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00009	0.00009	0.00011	0.00010	0.00010	-	0.00012	0.00013	mg/L	0.00005	-
Zinc (Zn)	0.0016	<0.0008	0.0021	0.0031	0.0030	0.0034	0.0026	0.0022	0.0027	0.0105	0.0023	0.0023	0.0150	0.0152	0.0030	0.0021	0.0022	-	0.0026	0.0027	mg/L	0.0008	0.03

Canadian Council of Ministers of the Environment - Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (Dec. 2003).

Footnotes

[a] standard for nitrite [0.06mg/L(NO_2)] has been converted by a factor of 1/4.43 to reflect the results expressed as mg/l(N), then converted into ug/L.

[b] standard for ammonia [0.019mg/L(NH_4)] has been converted by a factor of 1/4.43 to reflect the results expressed as mg/l(N), then converted into ug/L.

[c] standard for inorganic Hg, (resutls expressed as total or dissolved Hg).

7.1 Physical Parameters

7.1.1 pH

A summary of the pH for all lakes can be found in Table 14. The pHs of the six lakes (Nicholas, Eclipse, Brien, Narrow, Winter, and Round lakes) were neutral to slightly basic. These results are comparable to the pH of lakes in the general area as summarized by NSMA and Gartner Lee (2002).

Table 14
Average pH

Lake	pH Range
Nicholas	7.2 to 7.6
Eclipse	7.3 to 7.6
Brien	7.3 to 7.9
Narrow	7.4 to 7.9
Winter	7.4 to 8.1
Round	7.6 to 8.1

7.1.2 Turbidity

The average turbidity levels were lowest at Eclipse Lake in the 2004 sampling program and the highest at Round Lake.

Turbidity values at Nicholas Lake, Eclipse Lake, and Brien Lake averaged 0.32 NTU, 0.21 NTU, and 0.36 NTU, respectively. Whereas, the average turbidity levels at Narrow, Winter, and Round Lakes were higher at 0.53 NTU, 1.05 NTU, and 13.25 NTU, respectively. Turbidity levels were generally the lowest in May and July, except at Winter Lake and Round Lake, with the highest values in May and July.

The turbidity levels at Nicholas Lake were the lowest in May (0.05 NTU) and the highest in August (0.45). Eclipse Lake was recorded as having the lowest turbidity levels of 0.00 NTU in May and 0.35 NTU in September. Turbidity levels ranged from 0.15 NTU in May to 0.45 NTU in August and September at Brien Lake. Narrow Lake also showed lower turbidity levels in May (0.23 NTU) and peaked in September (0.73 NTU). Results from Winter Lake indicate May had the highest turbidity levels of 1.6 NTU and July and September with the lowest (0.75 NTU). Round Lake also showed an opposite trend in turbidity levels, in comparison with the other lakes in May with the highest levels (51.0 NTU) and September having the lowest (0.50 NTU). The turbidity levels in Round Lake show the highest seasonal difference of 50.5 NTU (51.0 to 0.50 NTU).

Table 15 compares turbidity values for the six lakes.

Table 15
Average Turbidity (NTU) for all Sampling Dates and Locations (DL< 3NTU)

Trip	Brien Lake Average	Nicholas Lake Average	Eclipse Lake Average	Round Lake Average	Narrow Lake Average	Winter Lake Average
May	0.15	0.05	0.00	51.00	0.23	1.6
July	0.40	0.35	0.25	0.85	0.50	0.75
August	0.45	0.45	0.25	0.65	0.65	1.1
September	0.45	0.43	0.35	0.50	0.73	0.75

7.2 Nutrients

Nutrients include parameters such as ammonia, nitrate and phosphorous. These parameters were found to be within the expected range for lakes in this region.

7.2.1 Ammonia

The average ammonia concentration during the 2004 sampling program were below the CCME FAL Guidelines (0.015 mg/L) for all the six lakes, the only exceptions being, Winter and Round lakes.

As expected the larger and deeper lakes (Nicholas and Eclipse) had little or no ammonia for all sampling events. Brien Lake with a shallower depth smaller and with more vegetation was observed to have some ammonia but not above the CCME FAL Guideline Ammonia concentrations at Narrow Lake ranged from less than detection limit to 0.020 mg/L. The highest ammonia concentration at Narrow Lake (0.020 mg/L) was recorded during the July sampling event and was above the CCME FAL Guidelines (<0.015 mg/l). At Winter Lake, the ammonia concentrations ranged between 0.007 mg/L to 0.195 mg/L. Ammonia concentrations at Winter Lake for the three sampling events (May, August and September) were above CCME FAL Guidelines. In addition, results from all four sampling events at Round Lake were above CCME FAL Guidelines. The average ammonia concentration at Round Lake was recorded at 1.077 mg/L the range was 0.025 mg/L to 3.950 mg/L.

Ammonification is the production of ammonia from organic nitrogenous compounds through decomposition of dead material and the metabolism in living organisms (Cole, 1983). The expected cause of these elevated levels of ammonia is the ammonification of large quantities of coproprel or “loon ooze” on the bottom of the lake. Coproprel is a term used to describe a mixture of humus material, fine plant fragments, algae remains, grains of quartz and mica, diatom frustules, exoskeleton fragments from aquatic arthropods, and spore and pollen relics (Cole, 1983).

The average ammonia concentrations measured at the six lakes are presented in Table 16.

Table 16
Average Ammonia (DL <0.005 mg/l)

Trip	Brien Lake Average	Nicholas Lake Average	Eclipse Lake Average	Round Lake Average	Narrow Lake Average	Winter Lake Average
May	0.000	0.000	0.000	3.950	0.000	0.195
July	0.000	0.005	0.008	0.025	0.020	0.007
August	0.000	0.000	0.005	0.027	0.000	0.019
September	0.000	0.000	0.000	0.306	0.005	0.040

7.2.2 Nitrate

When compared to the CCME FAL Guideline, the average nitrate concentrations at all six study lakes were below criteria of 13 mg/L. The results are summarized in Table 17.

Table 17
Average Nitrate (DL <0.006 mg/l)

Trip	Brien Lake Average	Nicholas Lake Average	Eclipse Lake Average	Round Lake Average	Narrow Lake Average	Winter Lake Average
May	0.0870	0.1670	0.0835	0.0000	0.1090	0.270
July	0.0000	0.0220	0.0000	0.0000	0.0065	0.0000
August	0.0160	0.0645	0.0365	0.0000	0.0305	0.251
September	0.0000	0.1265	0.0325	0.0480	0.0000	0.042

7.2.3 Total Phosphorous

The average total phosphorus concentrations remained similar in May, July and August, but increased in September. Trip averages were 0.0073 mg/L in May, 0.0078 mg/L in July, 0.0074 mg/L in August, and 0.0093 mg/L in September.

The average total phosphorus concentration at Nicholas Lake was recorded at 0.0049 mg/L, with the May sampling event having the lowest concentration at 0.0030 mg/L and July, August and September with concentrations of 0.0055 mg/L. Eclipse Lake total phosphorus average was 0.0035 mg/L and ranged between 0.0025 mg/L and 0.0050 mg/L. At Brien Lake, the total phosphorus concentrations ranged between 0.0050 mg/L and 0.0100 mg/L, with an average of 0.0068 mg/L. Narrow Lake averaged 0.0099 mg/L of total phosphorus over the sampling program. The lowest total phosphorus concentration recorded at Narrow Lake was 0.0090 mg/L and the highest was 0.0115 mg/L. Winter Lake total phosphorus concentrations averaged

0.0103 mg/L and ranged between 0.008 mg/L and 0.014 mg/L. The highest average total phosphorus concentrations at all six lakes were observed at Round Lake (0.0125 mg/L). Round Lake phosphorus concentrations were the lowest in September (0.0100 mg/L) and the highest in July (0.0150 mg/L).

Average phosphorous concentrations measured at the six study lakes are presented in Table 18.

Table 18
Average Total Phosphorous (DL <0.001 mg/l)

Trip	Brien Lake Average	Nicholas Lake Average	Eclipse Lake Average	Round Lake Average	Narrow Lake Average	Winter Lake Average
May	0.0070	0.0030	0.0035	0.0130	0.0090	0.008
July	0.0050	0.0055	0.0030	0.0150	0.0085	0.010
August	0.0050	0.0055	0.0025	0.0120	0.0105	0.009
September	0.0100	0.0055	0.0050	0.0100	0.0115	0.014

7.2.4 Total Organic Carbon

Table 19 summarizes the average total Organic Carbon (TOC) analysis for the lakes over the sampling period. The lowest TOC can be found in Nicholas and eclipse Lakes, followed by Brien and Narrow and the highest TOC were recorded in Round and Winter Lakes.

Table 19
Average Total Organic Carbon (DL <0.2 mg/l)

Trip	Brien Lake Average	Nicholas Lake Average	Eclipse Lake Average	Round Lake Average	Narrow Lake Average	Winter Lake Average
May	12.20	5.20	5.30	38.70	13.20	20.1
July	13.80	6.05	6.30	16.90	14.25	19.9
August	13.80	6.05	6.00	18.00	13.90	18.5
September	12.60	5.55	6.00	14.90	13.40	17.3

7.2.5 Trophic State

Although there has been considerable literature produced on the prediction of the trophic state of lakes it is now generally accepted that the trophic state can generally be predicted based on the concentration of total phosphorus (USEPA, 1974) as follows:

Trophic State	Total Phosphorus (mg/L)
Oligotrophic	<0.010
Mesotrophic	0.010 to 0.020
Eutrophic	>0.020

These levels were generally supported by the work of Vollenweider (1976) and others. Subsequent work by Prepas and Trew (1983) and Ostrofsky and Reigler (1987) condirm that these relationships apply to Precambrian Shield lakes in both northern Alberta and the Yellowknife area of the NWT. Ostrofsky and Reigler (1987) also found that the concentration of total phosphorus in the spring (immediately after ice out) has a higher correlation to the concentration of summer chlorophyll a than the summer total phosphorus concentrations.

The data presented in Table 20 suggests Round and Winter Lakes could be classified as Mesotrophic; Narrow Lake is on the verge of a mesotrophic classification; and Brien, eclipse and Nicholas lakes could e classified as oligotrophic.

Although nitrogen (ammonia, and nitrate) is not taken into consideration when predicting the trophic states of lakes, McCauley et al (1986) conclude, "Variation in total nitrogen (TN) concentration in oligotrophic systems has little, if any, consequence to algal biomass. In hypertrophic conditions (TP >1,000 mg/l), lake management by phosphorus effluent abatement would have little or no affect on chlorophyll concentrations, whereas changes in nitrogen loading might bring about order of magnitude variation in algal biomass." It is therefore, critical to monitor the nitrogen changes in Round and Winter lakes to ensure the control of eutrophic swings.

TOC can be taken as an indication of biological production in the water of the lakes over the sampling period if; however, is not directly comparable to chlorophyll a.

7.3 Major Ions

Major ions include the anions calcium (Ca), potassium (K), magnesium (Mg), and sodium (Na), and the cations chloride (Cl), sulfate (SO_4), bicarbonate (HCO_3), carbonate (CO_3). These are the major components of Total Disolved Solids (TDS) in a water sample. The results for the major ion sampling for the study can be found in Table 10 to Table 13. In Nicholas, Eclipse, Narrow and Brien lakes had low hardness (calcium, magnesium and sodium) and low TDS. This is typical of the Canadian Shield lakes in the NWT.

The analysis from Nicholas Lake compares favourably with the results reported by Norelco (1990) for sampling conducted from 1989.

Round Lake had the highest major ion and hardness concentrations of all lakes sampled. Parameters measured in round were generally one order of magnitude higher that Winter

and Narrow lakes and two orders of magnitude higher than the other three lakes. This anomaly can be related to the past use of Round Lake for tailings disposal from the Discovery mine and the continued drainage of water from the old mine area into the Round Lake. This conclusion was supported by an examination of the sulphate concentrations found in the lake over the sampling period (Table 20).

Table 20
Average Sulphate Concentration (DL <0.05 mg/l)

Trip	Brien Lake Average	Nicholas Lake Average	Eclipse Lake Average	Round Lake Average	Narrow Lake Average	Winter Lake Average
May	8.310	7.950	7.253	680.000	33.433	73.100
July	7.4	7.6	6.9	204.0	29.4	55.3
August	7.6	7.5	7.0	639.0	30.2	60.3
September	7.5	7.5	7.0	620.0	29.8	56.55

7.3.1 Conductivity

During the 2004 sampling program, the electrical conductivity (EC) values varied between the six lakes. These variations are shown in Table 21 and Figure 7. Conductivity is a measure of the ability of water to conduct electricity and id directly related and often used as a surrogate for TDS.

The conductivity observed in Eclipse, Nicholas and Brien lakes are comparable to other lakes in the are reported by NSMA and Gartner Lee (2002). The values for Round, and Narrow lakes are higher than expected for northern shield lakes and suggest the lakes have experienced anthropogenic influences.

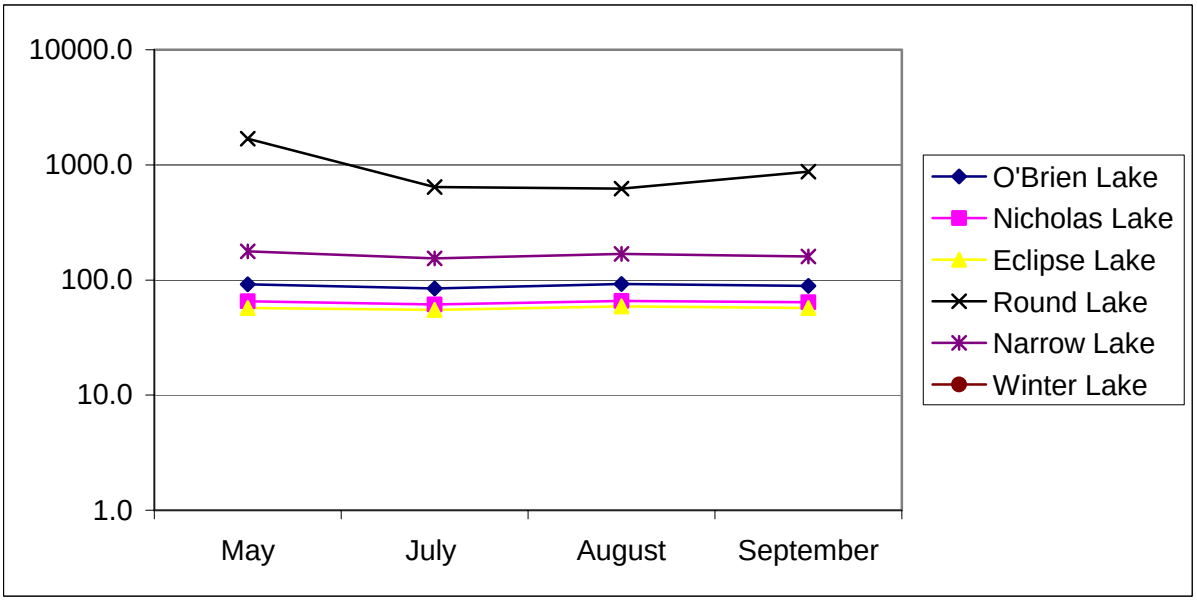
In the case of Round Lake, the increased conductivity would most like be related to the influence of the mill tailings that were deposited in the lake during the operation of the Discovery mine. It has also been observed that Round Lake is the initial destination for water pumped from a former DIAND clay pit. This water has been treated with alum before discharge. Although data was not available on the quality of the pumped water it may have contributed to the increased conductivity in Round Lake.

Round Lake flows into Winter Lake and it would follow that the above two influences were also being measured in Winter Lake.

Table 21
Average Conductivity (µS/cm) (DL <0.2 mg/l)

Trip	Brien Lake Average	Nicholas Lake Average	Eclipse Lake Average	Round Lake Average	Narrow Lake Average	Winter Lake Average
May	91.9	65.2	57.0	1690.0	177.5	308
July	84.6	61.5	54.8	640.0	154.0	218
August	92.6	65.6	59.1	623.0	168.5	257
September	89.0	64.0	57.2	875.5	160.5	239

Figure 7
Conductivity in YGP Lakes – 2004



7.4 Metals

Laboratory results of total and dissolved metals at the six lakes ranged from below the detection limit to above the CCME FAL Guideline for Aluminum, arsenic, copper, iron, mercury and nickel.

Table 22
Summary of Average Analytical Results over the CCME FAL Guidelines

Analyte	Brien				Nicholas				Eclipse				Round				Narrow				Winter			
	May	July	August	Sept	May	July	August	Sept	May	July	August	Sept	May	July	August	Sept	May	July	August	Sept	May	July	August	Sept
Major Ions, Nutrients and Inorganics																								
Iron-Extractable (0.3 mg/L)	-	-	-	-	-	-	-	-	-	-	-	-	0.319	-	-	-	-	-	-	-	-	-	-	-
Ammonia-N (*mg/L)	-	-	-	-	-	-	-	-	-	-	-	-	3.42	0.025	0.028	0.306	-	-	-	-	0.200	0.040	0.019	0.040
Cyanide-CN (0.005 mg/L)	-	-	-	-	-	-	-	-	-	-	-	-	0.017	-	-	-	-	-	-	-	-	-	-	-
Total Ultra-Low Level Metals																								
Aluminum 0.005 to 0.100mg/L)	0.0129	0.0228	0.0199	0.0164	0.0074	0.0121	0.0113	0.0171	0.0139	0.0178	0.0189	0.0282	0.04	0.0373	0.0181	0.0137	0.007	0.0203	0.021	0.0121	0.0077	0.0266	0.0215	0.0162
Arsenic (0.005 mg/L)	-	-	-	-	-	-	-	-	-	-	-	-	0.0164	0.0106	0.00827	-	-	-	-	-	-	-	-	-
Copper (0.002 to 0.004 mg/L)	-	-	0.0025	0.0036	0.0381	0.0633	0.12	0.0286	-	-	0.0068	0.0027	-	0.0055	0.0048	0.0051	-	-	0.0098	-	0.002	-	-	-
Mercury (0.000026mg/L)	-	-	-	-	-	0.00004	0.00003	0.00004	-	0.00003	-	-	-	-	-	-	-	-	0.00003	-	-	-	-	-
Nickel (0.025 –0.15mg/L)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0327		-	-	-	-	-	-	-
Dissolved Ultra-Low Level Metals																								
Aluminum (mg/L)	0.0124	0.0188	0.0171	0.0108	0.0067	0.0109	0.0098	0.0075	0.0131	0.0172	0.0172	0.014	0.04	0.0286	0.0128	0.007	0.0061	0.0152	0.0137	0.0063	0.0064	0.0232	0.0146	0.0101
Arsenic (0.005 mg/L)	-	-	-	-	-	-	-	-	-	-	-	-	0.0185	0.00956	0.00739	-	-	-	-	-	-	-	-	-
Cadmium (0.005mg/L)	-	-	-	-	-	-	-	-	-	-	-	0.00008	-	-	-	-	-	-	-	-	-	-	-	-
Copper (0.002 –0.004 mg/L)	-	-	-	0.0042	0.0424	0.0025	0.228	0.0403	-	-	0.0034	0.0036		0.0047	0.0042	0.0046	0.0021	-	0.0115	-	-	-	-	0.0022
Iron (0.300mg/L)	-	-	-	-	-	-	-	-	-	-	-	-	0.329	-	-	-	-	-	-	-	-	-	-	-
Mercury (0.000026mg/L)	-	-	0.00003	0.00003	-	0.00004	0.00008	0.00010	-	0.00007	0.00003	0.00004	-	-	-	-	-	-	0.00004	-	0.00003	-	0.00004	-
Nickel (0.025-0.15 mg/L)	-	-	-	-	-	-	-	-	-	-	-	-		-	-	0.0305	-	-	-	-	-	-	-	-

CCME FAL*Canadian Council of Ministers of the Environment – Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (Updated 2003).

7.4.1 Nicholas and Eclipse Lakes

Nicholas and Eclipse Lakes had exceedences for aluminum, copper and mercury . In addition Eclipse had an exceedence for cadmium. The results of the Norelco (1990) sampling showed similar results for Aluminum but not for copper and mercury. It should be noted that the detection limits and the analytical methods for the Norelco (1990) work differed from the present study.

7.4.2 Brien, Narrow and Winter Lakes

All these lakes showed exceedences in aluminum and copper while Narrow Lake had one exceedence in mercury. The exceedences in Winter and Narrow lakes may be related to the drainage from Round Lake. The exceedences in Brien Lake are thought to be natural occurrences.

7.4.3 Round Lake

The metal concentrations in Round Lake in 2004 exceeded the CCME FAL Guidelines for aluminium, arsenic, copper and nickel. This was a similar situation documented by Gartner Lee and NSMA (2003). Table 23 summarizes their data. These exceedences can be directly related to the influence of the mine tailings from the Discovery mine that has encroached on the lake. The high aluminium levels documented in this study and by Gartner Lee and NSMA (2003) may also be related to the disposal of water from the former DIAND clay pit. The pumped water had been treated with alum to assist with the flocculation of suspended solids.

Table 23
History of Select Parameters for Round Lake

Parameter	CCME[1]	September 1998	July 22, 1999	October 2000	October 2001	February 2003
Depth	-	Top	Top	top	Top	top
PH	6.5-9.0	7.71	7.80	7.92	8.04	7.84
TSS		4	5	4	7	31
NH3 mg/L	1.37-2.20	0.018	0.036	0.226	2.87	1.23
Al ug/L	5-100	<25.0	49	77	664	400
As ug/L	5	-	5.1	4.2	22.1	22
Be ug/L	-	<0.1	<2	<2	<1	<5
Cd ug/L	0.017	<0.1	<0.3	<0.3	<0.1	<3
Cr ug/L	1-8.9	<2.0	<3	<3	3	<5
Cu ug/L	2-4	4.8	6.0	5	8.2	<10
Hg ug/L	0.1	-	<0.01	<0.01	0.08	0.06
Ni ug/L	25-150	25.9	24	37	50	21
Pb ug/L	1-7	<2.0	1.0	<1	7.1	5
Sb ug/L	-	0.6	0.8	1.3	<0.2	<3
U ug/L	-	0.2	<0.3	0.4	0.65	<1
Zn ug/L	30	13.0	16	21	40	50

1. **CCME Guidelines for the Protection of Freshwater Aquatic Life (1999) can vary with sample pH, temperature, and hardness.**
2. **Shaded cells exceed the CCME, 1999, guideline.**

Source: NSMA et al, 2003.

8.0 CONCLUSION

The results of the 2004 sampling program can be summarized as follows:

Nicholas Lake

Nicholas Lake is a large oligotrophic lake with typical water quality for a Canadian Shield lake. It develops a thermocline in the open water season and has low DO levels near the bottom. The water is soft and has low major ion concentration with corresponding low TDS and conductivity. The pH of the water is above neutral (Nicholas pH= 7.2-7.6, Eclipse pH= 7.3-7.6). Some metals were elevated above the CCME FAL Guidelines, which is also typical of lake in mineralized zones similar to the area.

Eclipse Lake

Eclipse Lake is downstream from Nicholas Lake and has similar water quality characteristics. Eclipse Lake is deeper and larger than Nicholas Lake and is also oligotrophic.

Brien Lake

Brien Lake is a medium sized, shallow lake. It develops a thermocline in the summer and has some DO depression. The lake can be considered on the borderline between oligotrophic and mesotrophic. The hardness and TDS are slightly higher than Eclipse and Nicholas lakes. The pH of Brien Lake is slightly alkaline (pH=7.3-7.9) and CCME FAL exceedances are considered to be natural.

Narrow Lake

Narrow Lake is similar to Brien Lake in size and depth. It develops a thermocline in summer with some DO depression near the lake bottom. The hardness, and TDS are similar to Brien and higher than Eclipse and Nicholas lakes. The pH of Narrow Lake is slightly alkaline (pH=7.4-7.9). The lake may have, in the past, been influences by the tailings deposits upstream in Round Lake but these effects are not readily discernible in the present sampling.

Winter Lake

Winter Lake is a mesotrophic lake that exhibits low DO in winter. This is related to its shallow depth. There are indications that it has been impacted by the tailings discharges into Round Lake in the past. These are noted in the higher TDS, and conductivity and the more frequent exceedences of CCME FAL Guidelines noted for metals in the lake. The pH of the Winter Lake is slightly alkaline (ph= 7.4-8.1).

Round Lake

Round Lake is a shallow mesotrophic lake that historically had been impacted by the deposit of tailings from the Discovery Mine and the more recently from the disposal of treated water from the DIAND clay pit. Exceedances of the CCME FAL Guidelines for aluminium, arsenic and copper are common and the hardness, TDS and conductivity are high. The pH of Round Lake is alkaline (pH= 7.6-8.1).

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1.0 INTRODUCTION

1.1 GENERAL

Tyhee NWT Corp. (Tyhee) has retained EBA Engineering Consultants Ltd. (EBA) since 2003 to conduct water-quality sampling at its' Yellowknife Gold Project (YGP) site, Northwest Territories (NWT).

The objective of the water quality program has been to document the present state of water quality in the following YGP area lakes: Nicholas, Eclipse, Brien, Narrow, Winter, and Round. The Canadian Council of Ministers of the Environment (CCME) – Canadian Water Quality Guidelines (CWQG) for the Protection of Freshwater Aquatic Life (FAL) (December 2003) are used as the basis for comparison in this report.

Water quality data collection commenced in May 2004. Results of the 2004 water quality sampling program were reported in the EBA report documented entitled ***Appendix C: 2004 Water Quality Sampling Program***, which was incorporated into the YGP Description Report (Tyhee 2005).

As a follow-up to the 2004 program, this report presents the results of the 2005 water quality data collection program.

1.2 SITE DESCRIPTION

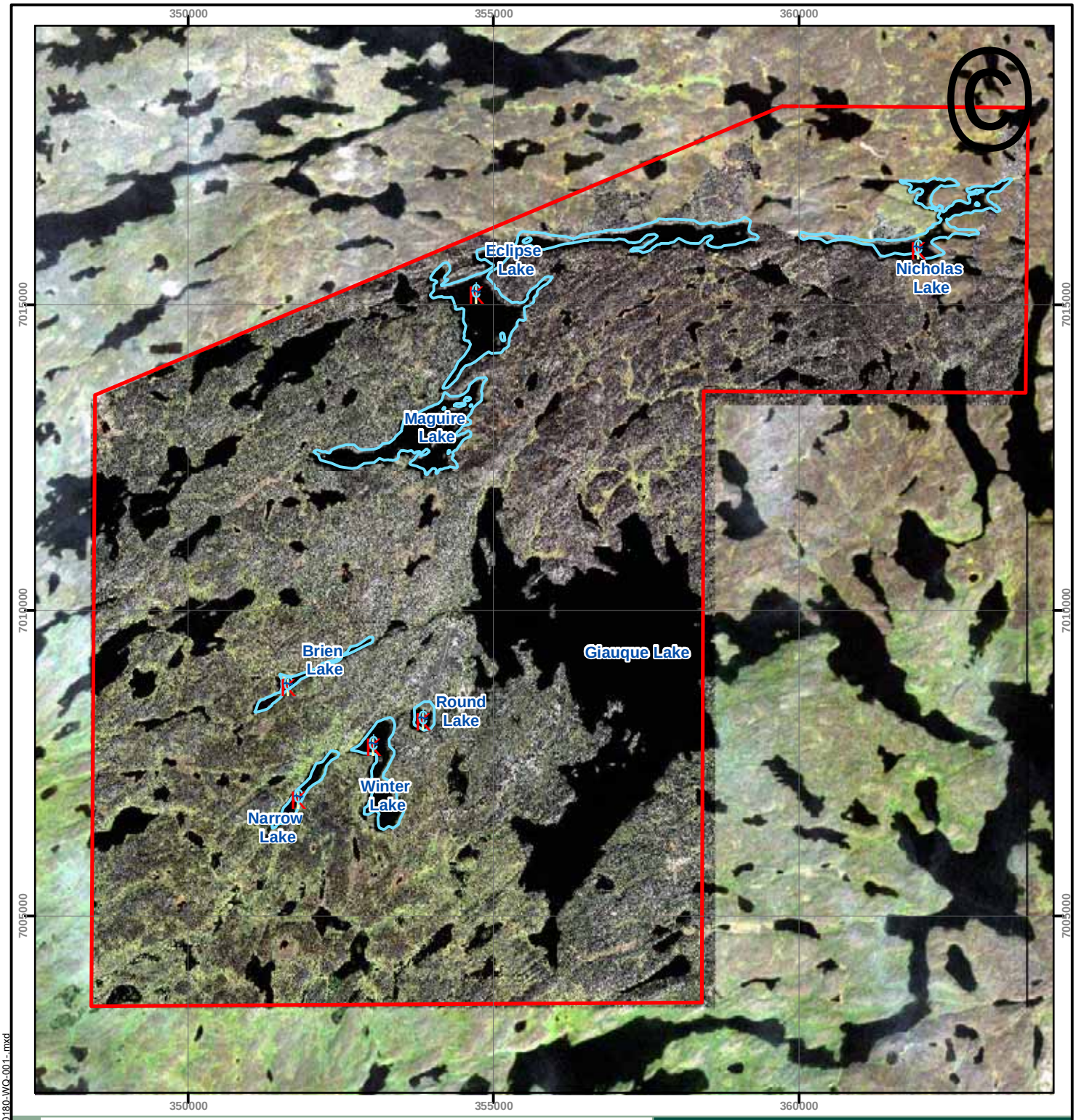
The YGP is located approximately 85 km north-northeast of Yellowknife, NWT at latitude 63° 10' North and longitude 113° 53' West.

To be consistent, the six water quality sampling locations sampled in 2004 (one on each of the six lakes) were sampled during the 2005 program (see Figure 1).

2.0 FIELD METHODS

Water quality samples in 2005 were collected at Nicholas, Eclipse, Brien, Narrow, Winter, and Round Lakes on April 21, 2005 and April 22, 2005, June 28, 2005 and June 29, 2005, July 14, 2005 and August 15, 2005 and August 16, 2005. The April trip occurred prior to ice melt. In 2004, water quality samples were collected on May 12, 2004 and May 13, 2004, July 14, 2004, August 12, 2004 and August 13, 2004, and September 29, 2004 and September 30, 2004, with the May trip occurring prior to ice melt.

A Global Positioning System (GPS) was used to locate the stations based on UTM coordinates as shown in Table 1. The April 2005 samples were collected through the ice. The June, July, and August samples were collected from a floatplane, the locations were replicated as accurately as possible.



LEGEND

- Study Area
- Water Sampling Station
- 2004 Study Lakes

NOTES

Base data source: IKONOS Imagery

YELLOWKNIFE GOLD PROJECT

2004 / 2005 Water Sampling Stations

PROJECTION: UTM Zone 12	DATUM: NAD83
Scale: 1:90,000 (1 0.5 0 1 2 Kilometres)	
FILE No: 1740180-WQ-001	DATE: March 29, 2006
JOB NO: 1740180	REVISION NO: 1
OFFICE: EBA-VANC	DRAWN: KMW / CHECK: CG

Tyhee NWT Corp

EBA Engineering Consultants Ltd.

Figure 1

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TABLE 1: UTM COORDINATES OF WATER SAMPLING STATIONS (UTM ZONE 12)

Lake	Station	Northing	Easting
Nicholas	A	7 015 752	361 949
Eclipse	A	7 015 020	354 702
Brien	A	7 008 600	351 623
Narrow	A	7 006 757	351 793
Winter	A	7 007 631	353 016
Round	A	7 008 046	353 835

Datum: NAD 1927, Zone 12V North.

The April 2005 sampling event occurred under winter conditions. Once the station was located with a GPS, an 8-inch diameter manual ice auger was used to drill through the ice. The ice auger was kept covered and clean prior to use. A clam tent was placed over the ice hole and a small propane heater was used inside the tent to keep equipment from freezing. The July, August and September 2005 sampling events occurred during ice free periods. To ensure that bottom sediments were not disturbed during sampling, an Eagle Fish Easy model fish-finder sonar was used to establish water depth prior to collecting the water samples and conducting the water column physical measurements.

A WTW ProfiLine Oxi 197 Model dissolved oxygen (DO) and temperature meter was used to measure DO and temperature profiles *in situ* at 1 m intervals. The meter was equipped with a 60 m cable attached to a TA 197 electrode. The cable was marked in 1 m intervals to identify the sampling depth. Calibration of the electrode in the field was completed prior to each use. The electrode was lowered to the desired depth and then raised and lowered approximately 0.3 m at the designated depth, until the DO readings stabilized. These readings were recorded on standard data sheets.

Water samples were collected using a 4.2 L capacity Kemmerer bottle Model 1540-C22 constructed of transparent acrylic with silicone seals. The Kemmerer bottle was acid- washed in Yellowknife prior to each sampling event. In the field, the Kemmerer bottle was lowered to the desired depth and held for two minutes, to allow the water at the targeted depth to flow around the sampling unit. Once the water had a chance to flow through the unit, a messenger was sent down, triggering both ends of the Kemmerer bottle to close, thereby, sealing in the water sample at that depth. The bottle was then raised to the surface and placed on a clean surface. A valve located at the bottom of the Kemmerer bottle allowed water to be removed from the bottle in a controlled manner.

The sampling program entailed collecting water samples from the top and bottom of the water column for Nicholas, Eclipse, and Narrow lakes. However, due to the shallow nature of Brien, Winter, and Round lakes, only one depth in the water column (middle) was sampled. In addition, duplicates for each station were also collected. The average measured

water depths at the sampling locations for Nicholas, Eclipse, Brien, Narrow, Winter, and Round lakes were 15.75 m, 49.25 m, 5.5 m, 7.38 m, 5.5 m, and 0.8 m, respectively.

Samples collected for dissolved metal analyses were filtered in the field using dedicated disposable Nalgene 45 µm filters. Water samples collected for both total and dissolved metals were preserved using 1 ml of ultra-pure 1:1 nitric acid. Samples collected for nutrients were preserved with 2 ml of 1:1 sulphuric acid. Water samples collected for total organic carbon were preserved with 1 ml of 1:1 sulphuric acid. Cyanide samples were preserved with 1 ml of 6 N Sodium Hydroxide. Redox samples required no preservatives.

3.0 QUALITY ASSURANCE/QUALITY (QA/QC) CONTROL PROGRAM

A certified laboratory, Enviro-Test Laboratories (ETL) of Edmonton, prepared the sample bottles. Total and dissolved ultra-low level metal bottles were acid-washed with ultra-trace grade 1:1 nitric acid by ETL in the laboratory. Powder-less latex gloves were worn during handling of bottles and equipment to minimize contamination. All bottles were rinsed three times with the source water (i.e., the same water the bottle was filled with) prior to water collection. To minimize trace metals contamination from the filters, the filters were rinsed three times with the source water prior to filling the bottles.

As part of the quality assurance/quality control (QA/QC) program, trip/travel blanks, field blanks, and duplicates were collected. Trip blanks and field blanks were utilized to assess contamination from sample containers or other equipment used in the collection and handling of samples, and to detect other systematic or random errors from sampling through to analysis. Duplicates were collected to test the accuracy of laboratory procedures and methodology.

Trip blanks, filled with de-ionized water and preserved in the laboratory by ETL and shipped with the sample bottles to the Tyhee camp. Trip blank bottles remained sealed until they were returned to ETL for analysis. Since it was important for the laboratory to use the same type of filter as the ones used in the field, a disposable 45 µm Nalgene filter was submitted to the laboratory along with each set of samples. This "Filter" sample represented the dissolved ultra-low level metals trip blank. One set of trip blanks was used for each sampling event.

Field blanks were prepared in the field in the same environment in which the water samples were collected. Once in the field, field blank sample bottles were filled with de-ionized water and preserved. One set of field blanks was prepared for each set of samples. One set of duplicates was collected in the field at each station.

4.0 ANALYTICAL PROGRAM

Water samples were submitted to ETL in Edmonton for analysis. ETL is accredited by the Canadian Association for Environmental Analytical Laboratories (CAEAL).

Water samples were analyzed for total and dissolved ultra-low metals, total organic carbon (TOC), low-level nutrients, low-level routine water chemistry (major ions and physical parameters), cyanide, and redox. The list of specific parameters analyzed and their respective detection limits are presented in Table 2.

TABLE 2: PARAMETER DETECTION LIMITS

Parameter	Detection Limits	Units
Major Ions/Nutrients/Inorganics		
Chloride	1	mg/L
Fluoride	0.05	mg/L
Calcium	0.5	mg/L
Potassium	0.1	mg/L
Magnesium	0.1	mg/L
Sodium	1	mg/L
Ion Balance	-	%
TDS (Calculated)	-	mg/L
Hardness (as $CaCO_3$)	-	mg/L
Iron-Extractable	0.005	mg/L
Manganese-Extractable	0.001	mg/L
Nitrate+Nitrite-N	0.006	mg/L
Nitrate-N	0.006	mg/L
Nitrite-N	0.002	mg/L
Sulfate	0.05	mg/L
pH	0.1	pH
Conductivity	0.2	µS/cm
Bicarbonate	5	mg/L
Carbonate	5	mg/L
Hydroxide	5	mg/L
Alkalinity, Total (as $CaCO_3$)	5	mg/L
Ammonia-N	0.005	mg/L
Cyanide	0.002	mg/L
Phosphorus, Total	0.001	mg/L
Total Organic Carbon	0.5	mg/L
Dissolved Organic Carbon	0.5	mg/L
Total Suspended Solids	3	mg/L

TABLE 2: PARAMETER DETECTION LIMITS		
Parameter	Detection Limits	Units
Turbidity	0.1	NTU
Redox Potential	1	MV
Ultra-Low Metals (Total and Dissolved)		
Aluminum	0.0003	mg/L
Antimony	0.00003	mg/L
Arsenic	0.00003	mg/L
Boron	0.001	mg/L
Barium	0.00005	mg/L
Beryllium	0.0002	mg/L
Bismuth	0.00003	mg/L
Calcium	0.02	mg/L
Cadmium	0.00005	mg/L
Cobalt	0.0001	mg/L
Chromium	0.00006	mg/L
Copper	0.0006	mg/L
Iron	0.005	mg/L
Lithium	0.0001	mg/L
Mercury	0.00002	mg/L
Potassium	0.1	mg/L
Magnesium	0.004	mg/L
Manganese	0.0001	mg/L
Molybdenum	0.00006	mg/L
Nickel	0.00006	mg/L
Lead	0.00005	mg/L
Selenium	0.0001	mg/L
Silicon	0.1	mg/L
Silver	0.0001	mg/L
Sodium	0.005	mg/L
Strontium	0.0001	mg/L
Tin	0.0001	mg/L
Uranium	0.00005	mg/L
Vanadium	0.00005	mg/L
Zinc	0.0008	mg/L

5.0 FIELD RESULTS AND DISCUSSION

5.1 GENERAL

DO and water temperatures were measured in the field during each sampling event. The results were graphed with depth on the vertical axis and DO and temperature on the horizontal axis. Water depth was measured in metres, DO was measured in milligrams per litre (mg/L) and temperature was measured in degrees Celsius (°C).

Seasonal changes in temperature and/or DO observed at the stations were within expected ranges for lakes in this region at the time of sampling. The trend of lower DO concentrations with depth reflect the more oxygen-reduced conditions recorded at the bottom of the lakes that is typical of water bodies in this region. DO is essential to the survival of fish and invertebrates in arctic lakes during the winter period. Welch (2000) completed a study on DO in Canadian arctic lakes. In his report, Welch found that after freeze-up, a lake has a fixed amount of oxygen available to support the steady respiration of aquatic life beneath the ice.

The shallower the lake, the less oxygen is available and the lower it becomes as winter progresses. Lakes shallower than about 4 m in depth simply run out of oxygen before spring and, assuming there are fish present, winterkill occurs. Welch also found that lakes in the 10 m to 20 m depth range typically have sufficient DO near the surface to support aquatic life, but even these can exhibit very low oxygen concentrations near the bottom. Welch attributed this occurrence to two factors, first, that respiration occurs mostly at the bottom of a lake and second, is that the water, made slightly heavier by warming from the bottom, slides downhill at the sides of the lake, carrying oxygen-depleted water with it (Welch 2000).

Temperature levels were typical for these lakes during all sampling periods.

5.2 NICHOLAS LAKE

Station A at Nicholas Lake is located approximately 11 km northeast of Tyhee's camp, near the center of the lake, in the lake's widest and deepest basin. DO concentration and temperature data recorded at Nicholas Lake during the four sampling events completed in 2005 are presented in Table 3 and illustrated on Figure 2 (sampling locations in April and June were in slightly different positions in shallower water).

TABLE 3: DISSOLVED OXYGEN (MG/L) AND TEMPERATURE FOR NICHOLAS LAKE, 2005

Depth (m)	April 21		June 28		July 14		Aug 15	
	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)
1	12.41	0.4	10.66	14.1	9.70	19.3	9.64	13.4
2	11.50	1.4	10.68	14.0	9.73	19.2	9.64	13.4
3	10.99	2.0	10.62	13.8	10.08	17.4	9.62	13.4
4	10.39	2.4	10.64	13.7	10.34	15.9	9.59	13.4
5	9.70	2.7	11.04	11.5	10.36	14.9	9.63	13.4
6	9.12	2.8	11.06	9.8	11.08	12.9	9.56	13.4
7	8.74	2.8	11.18	8.9	11.35	10.0	9.50	13.4
8	8.57	2.8	11.05	8.6	10.90	8.8	9.41	12.7
9	8.36	2.8	10.52	7.4	10.29	7.8	8.32	8.3
10	8.30	2.8	9.93	6.8	9.54	7.1	7.55	7.4
11	8.36	2.8	9.70	6.7	9.43	6.9	8.19	7.1
12	8.27	2.8	-	-	9.72	6.7	8.48	6.7
13	-	-	-	-	9.73	6.6	7.66	6.2
14	-	-	-	-	9.76	6.5	7.65	5.9
15	-	-	-	-	9.88	6.2	7.26	5.7
16	-	-	-	-	9.45	5.9	7.62	5.5
17	-	-	-	-	-	-	7.25	5.3
18	-	-	-	-	-	-	7.10	5.1
19	-	-	-	-	-	-	6.17	5.1
20	-		-	-	-	-	5.98	5.0
21	-	-	-	-	-	-	5.52	5.0
22	-	-	-	-	-	-	5.06	5.0
23	-	-	-	-	-	-	4.46	4.9
24	-	-	-	-	-	-	3.64	4.9

- = Not sampled due to insufficient depth.

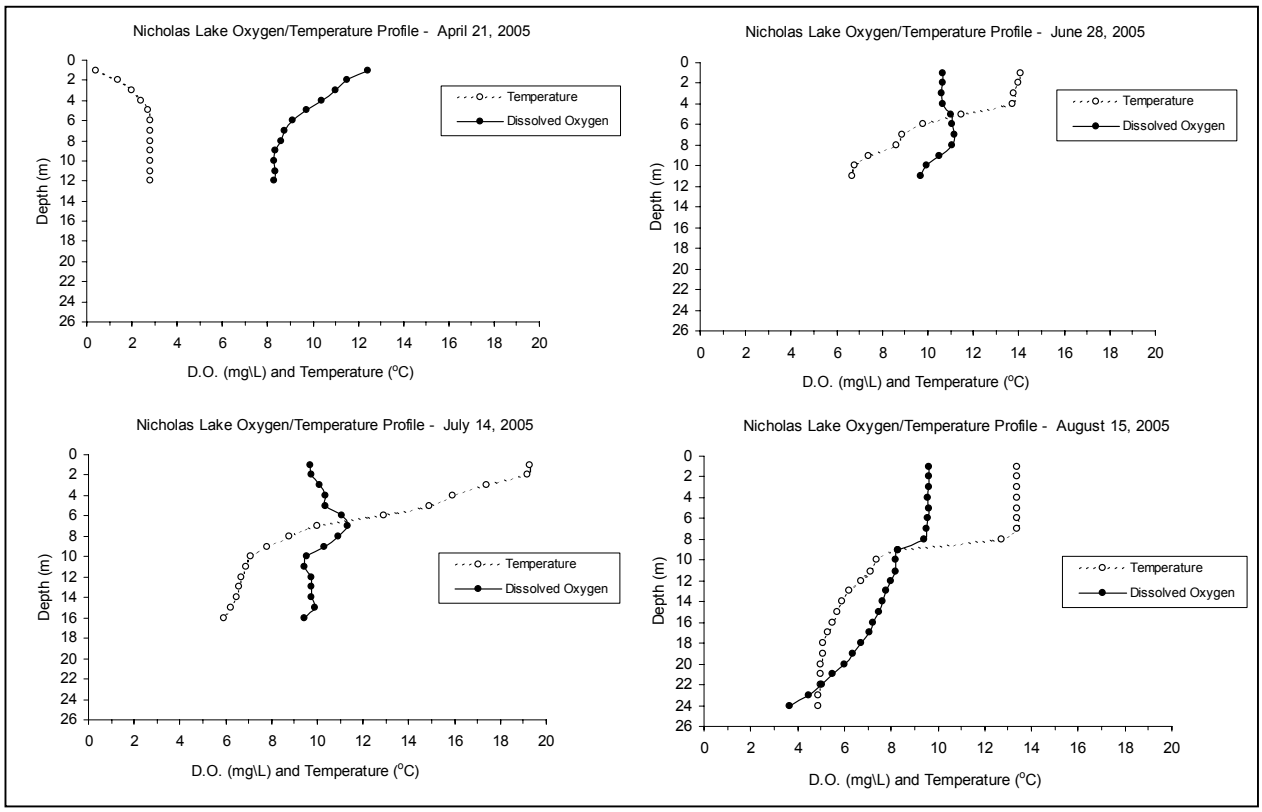

Figure 2: Dissolved Oxygen and Temperature Profiles for Nicholas Lake, 2005

Typical thermoclines were noted in Nicholas Lake in June, July, and August. In June 2005, the top of the thermocline occurred at 5 m, comparable to that observed in the 2004 sampling program. In July, the thermocline began to occur at 6 m and in August it occurred at 8 m (compared to 4 m and 7 m, respectively, in 2004). However, unlike the 2004 sampling effort, no significant DO depression was observed in July at the bottom of the water column and the DO reached critical levels (<6 mg/L) in August. Notably, water depth was significantly deeper in August 2005 versus August 2004 (24 m versus 16 m).

5.3 ECLIPSE LAKE

Station A at Eclipse Lake is located approximately 6.8 km north of Tyhee's camp, in the main body of the lake, the largest and deepest area. DO concentrations and temperature measurements recorded at Station A during the four sampling events are presented in Table 4. DO concentrations and temperature profiles for this station are illustrated on Figure 3.

TABLE 4: DISSOLVED OXYGEN (MG/L) AND TEMPERATURE (°C) MEASUREMENTS FOR ECLIPSE LAKE, 2005

Depth (m)	May 21		June 28		July 14		Aug 15	
	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)
1	13.09	0.4	11.02	14.8	9.11	20.3	9.87	13.1
2	11.89	1.5	11.52	14.2	9.20	19.7	9.88	13.0
3	11.40	2.1			9.53	18.3	9.86	12.9
4	11.32	2.4	12.09	13.0	9.73	16.7	9.86	12.9
5	11.01	2.6			9.89	15.4	9.86	12.9
6	10.87	2.7	12.34	11.0	10.73	12.8	9.85	12.9
7	10.79	2.8			10.89	11.1	9.75	12.9
8	10.77	2.8	12.21	9.9	10.76	9.5	9.70	12.8
9	10.58	2.9			10.62	8.5	9.58	12.4
10	10.44	2.9	11.74	7.6	10.47	7.4	9.55	8.4
11	10.43	3.0			10.20	6.4	9.25	7.1
12	10.20	3.0	11.43	6.2	10.25	6.2	9.10	6.6
13	10.34	3.1			10.08	6.1	9.05	6.4
14	10.33	3.2	11.35	5.8	10.09	5.9	9.10	6.1
15	10.34	3.2			10.10	5.8	9.10	5.9
16	10.32	3.2	11.24	5.5	10.26	5.7	9.28	5.7
17	10.17	3.2			10.12	5.5	9.08	5.5
18	9.89	3.2	11.21	5.2	10.03	5.3	9.15	5.4
19	9.81	3.3			10.00	5.2	9.15	5.2
20	9.84	3.3	11.04	5.1	10.05	5.1	8.96	5.1
21	9.67	3.3			10.11	5.0	8.93	5.1
22			11.03	5.0	9.89	4.9	8.95	5.0
23	0.01	3.3			10.03	4.9	9.01	5.0
24			11.00	4.9	9.95	4.9	8.85	4.9
25	0.01	3.3			9.75	4.9	8.93	4.9
26			10.95	4.9				
27	0.03	3.3			9.92	4.8	8.90	4.9
28			10.93	4.9				
29	0.02	3.3			9.94	4.8	8.83	4.8
30			10.85	4.7				
31	0	3.3			9.88	4.8	8.81	4.8

TABLE 4: DISSOLVED OXYGEN (MG/L) AND TEMPERATURE (°C) MEASUREMENTS FOR ECLIPSE LAKE, 2005

Depth (m)	May 21		June 28		July 14		Aug 15	
	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)
32			10.84	4.7				
33	0.02	3.3			9.91	4.7	8.80	4.7
34			10.86	4.7				
35	0.03	3.3			9.83	4.7	8.79	4.7
36			10.83	4.7				
37	0.02	3.3			9.75	4.7	8.68	4.7
38			10.81	4.6				
39	0.03	3.3			9.70	4.7	8.68	4.7
40			10.76	4.6				
41	0.03	3.3			9.69	4.7	8.61	4.7
42			10.75	4.6				
43	0.03	3.3			9.64	4.6	8.42	4.6
44			10.75	4.6				
45	0.03	3.3			9.62	4.6	8.18	4.6
46			10.72	4.6				
47	0.06	3.3			9.57	4.6	7.91	4.6
48			11.18	4.6				
49	0.07	3.3	-	-	9.35	4.6	7.79	4.6
50	-	-	-	-	-	-		
51	-	-	-	-	-	-	7.33	4.6

- = Not sampled due to insufficient depth.

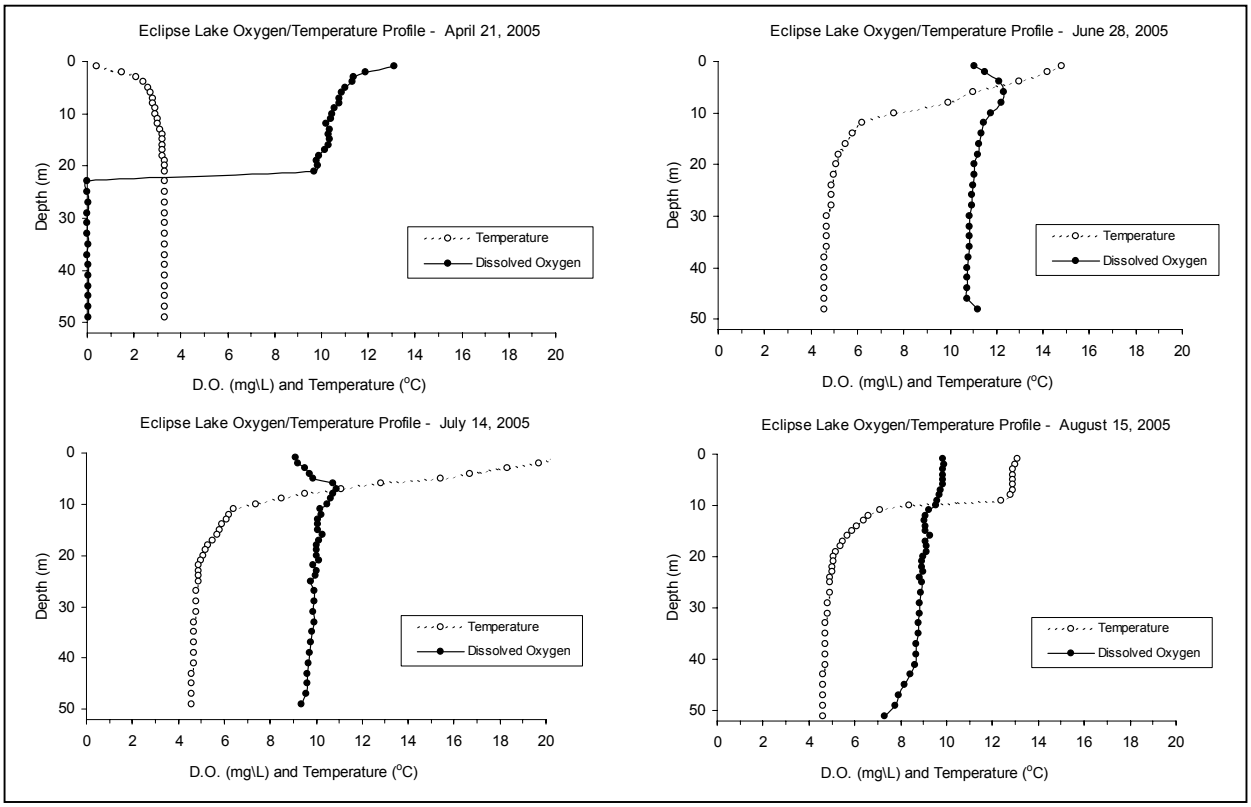

Figure 3: Dissolved Oxygen and Temperature Profiles for Eclipse Lake, 2005

In 2005, the tops of the thermoclines were noted at 6 m in June, at 6 m in July and 10 m in August. Overall, the temperature and DO profiles in Eclipse Lake, during all sampling periods, were similar to those observed in Nicholas Lake. Similarly, the temperature and DO profiles in Eclipse Lake in July and August were comparable to those observed in for the same period in 2004 (4 m and 8 m in July and August 2004). The depressed DO values recorded between depths of 23 m and 49 m in April 2005 were attributed to technical issues with the instrumentation and were not considered to be reflective of the prevailing lake conditions.

5.4 BRIEN LAKE

Station A at Brien Lake is located approximately 1.8 km west of Tyhee's camp, in the main body of the lake. DO concentration and temperature measurement data during the four sampling events in 2005 are presented in Table 5 while profiles are illustrated on Figure 4.

Brien Lake is much shallower than either Eclipse or Nicholas lakes. DO depressions were observed near the bottom during all sampling events in 2005, and reached critical levels (<6 mg/L) in April, June, and July. The top of the thermocline developed in Brien Lake at the 5 m, 4 m, and 4 m depths for April, June, and July, respectively.

TABLE 5: DISSOLVED OXYGEN (MG/L) AND TEMPERATURE (°C) MEASUREMENTS FOR BRIEN LAKE, 2005								
Depth (m)	April 22		June 29		July 14		Aug 15	
	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)
1	9.95	0.3	10.09	16.5	8.56	21.9	9.29	14.1
2	8.98	1.9	9.99	16.2	8.74	21.7	9.27	14.1
3	8.24	2.7	9.94	15.9	8.86	16.9	9.26	14.0
4	7.12	3.1	9.13	11.9	7.37	13.1	9.28	14.0
4.5							9.27	13.9
5	4.10	3.3	6.67	8.8	5.17	8.9	-	-
5.5			5.55	7.3	-	-	-	-
6	3.00	3.4	-	-	-	-	-	-
7	1.28	3.5	-	-	-	-	-	-

- = Not sampled due to insufficient depth.

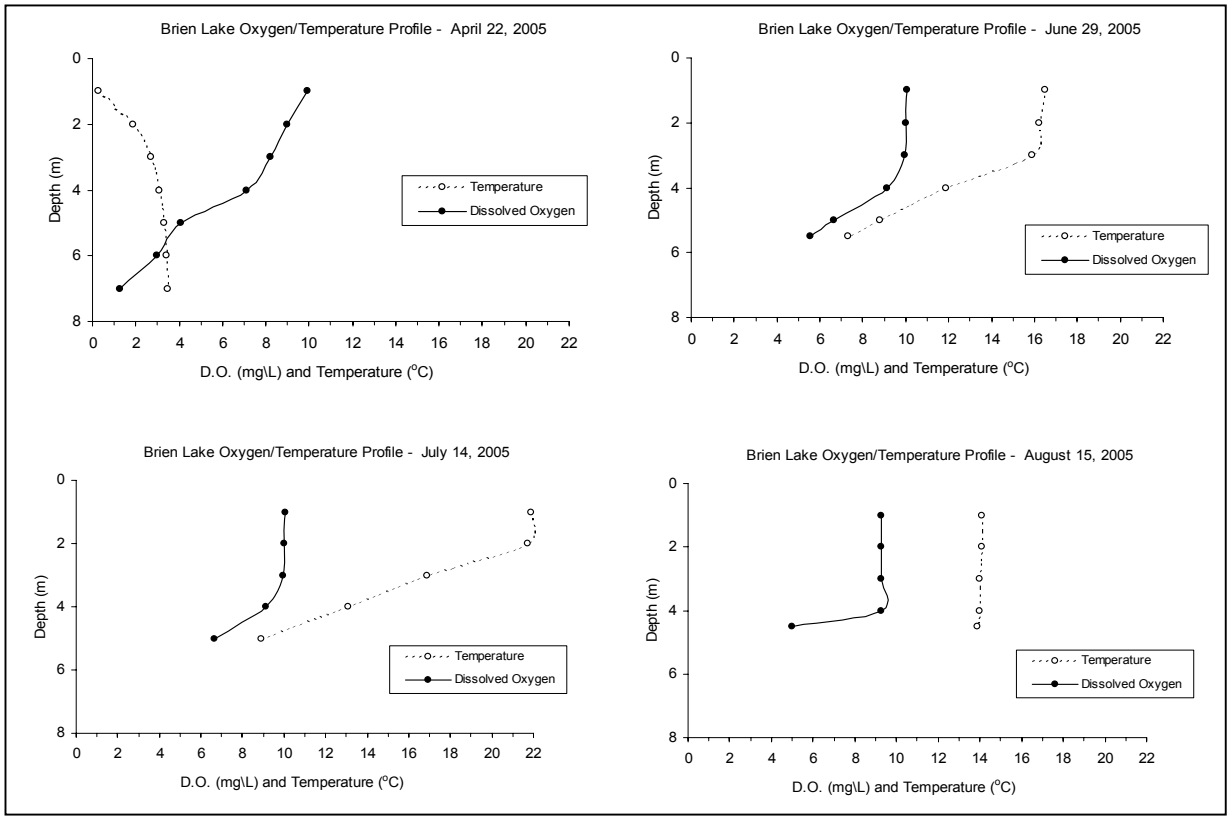

Figure 4: Dissolved Oxygen and Temperature Profiles for Brien Lake, 2005

5.5 NARROW LAKE

Station A at Narrow Lake is located approximately 2.3 km southwest of Tyhee's camp, in the main channel of the lake. DO concentration and temperature data recorded at Station A during the four sampling events are presented in Table 6 while profiles are illustrated on Figure 5.

Narrow Lake has a comparable depth and showed similar DO and temperature profiles over the sampling period to those recorded at Brien Lake during 2005. Depressed DO values were noted at the bottom for all sampling events, with DO values reaching critical (<6 mg/L) levels in April, July, and August. In 2005, the top of the thermocline developed at the 3 m depth in June and migrated down to the 7 m depth by August. Similarly, during the 2004 sampling program, a thermocline developed at the 3 m depth in July and migrated down to the 5 m depth by August.

TABLE 6: DISSOLVED OXYGEN (MG/L) AND TEMPERATURE (°C) MEASUREMENTS NARROW LAKE, 2005

Depth (m)	April 22		June 28		July 15		August 16	
	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)
1	8.82	0.4	10.75	16.6	8.78	20.6	9.68	13.7
2	7.96	2.0	11.18	15.8	8.81	20.6	9.59	13.6
3	7.51	2.7	11.15	15.5	9.03	19.6	9.73	13.6
4	7.04	3.1	11.06	12.9	8.88	16.6	9.58	13.6
5	5.08	3.2	10.17	11.6	8.17	13.5	9.43	13.5
6	4.90	3.3	9.23	10.2	6.87	9.5	9.03	13.2
7	4.22	3.3	-	-	5.48	7.9	6.33	11.4
7.5			-	-	4.41	7.5		
8	3.70	3.4	-	-	-	-	2.15	7.5

- = Not sampled due to insufficient depth.

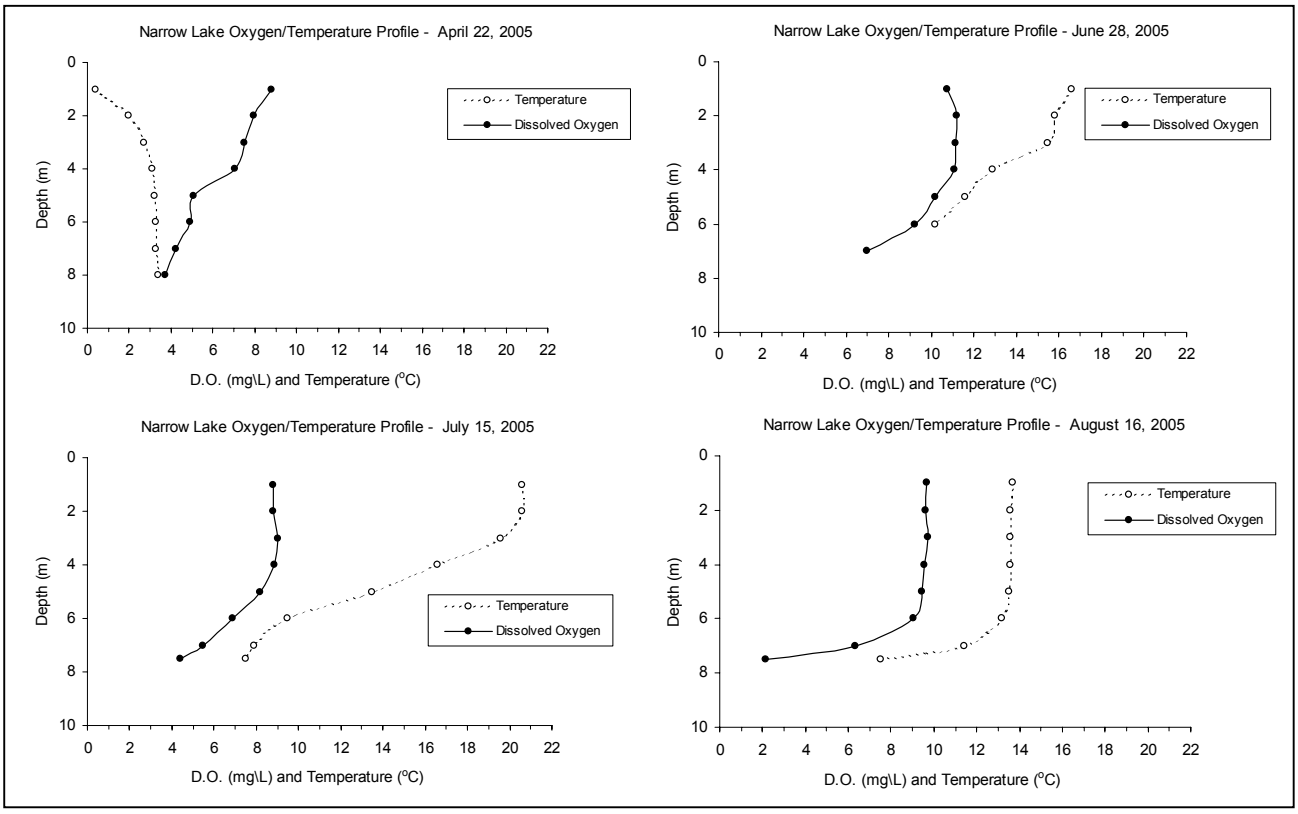

Figure 5: Dissolved Oxygen and Temperature Profiles for Narrow Lake, 2005

5.6 WINTER LAKE

Station A at Winter Lake is located approximately 0.8 km southwest of Tyhee's camp, in the main body of the lake. DO concentration and temperature data recorded at Station A during the four sampling events are presented in Table 7 while profiles are illustrated on Figure 6.

TABLE 7: DISSOLVED OXYGEN (MG/L) AND TEMPERATURE (°C) MEASUREMENTS WINTER LAKE, 2005

Depth (m)	April 21		June 29		July 15		Aug 16	
	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)
1	0.62	0.5	10.75	16.7	9.55	21.0	10.01	13.6
2	0.11	2.4	10.67	16.3	9.64	20.9	9.98	13.0
3	0.06	3.2	10.20	15.5	10.30	18.4	9.85	12.9
4	0.05	3.6	9.68	14.4	8.56	16.7	9.79	12.8
4.5							9.74	12.7
5	0.04	3.9	6.70	12.4	2.07	14.0	-	-

TABLE 7: DISSOLVED OXYGEN (MG/L) AND TEMPERATURE (°C) MEASUREMENTS WINTER LAKE, 2005								
Depth (m)	April 21		June 29		July 15		Aug 16	
	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)	DO (mg/L)	Temp (°C)
5.5					0.09	12.8	-	-
6	0.04	4.3	1.10	11.0	-	-	-	-

- = Not sampled due to insufficient depth.

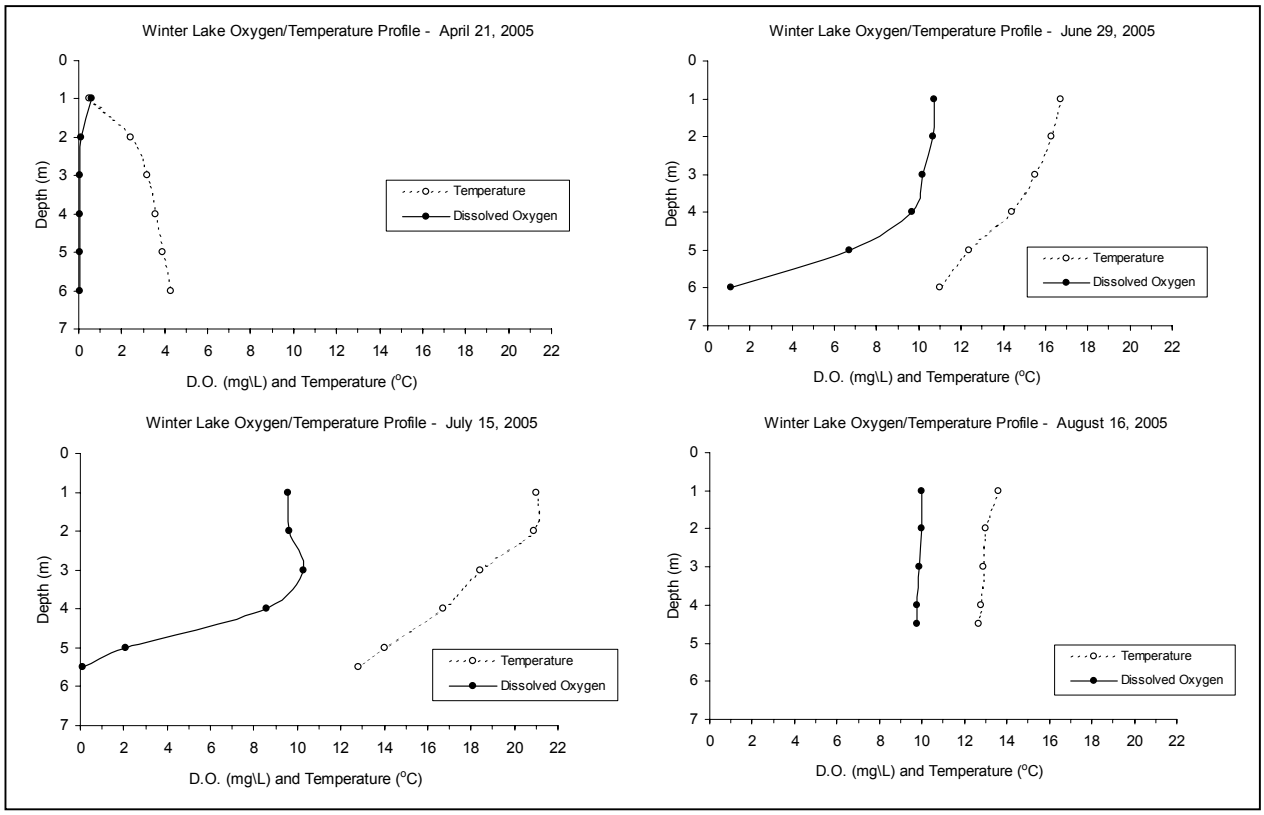

Figure 6: Dissolved Oxygen and Temperature Profiles for Winter Lake, 2005

Winter Lake exhibited anoxic conditions under ice, which would seriously limit the possibility for any fish population over wintering in this waterbody. DO and temperature profiles for Winter Lake in 2005 varied from those observed in 2004 in that the top of the thermoclines were observed to occur at 4 m in June and 3 m July 2005. The differences observed are likely due to the fact that slightly deeper depths were tested in 2005 (max of 3.5 m versus 6 m). Also, unlike the 2004 sampling results, DO values reached critical (<6 mg/L) levels in June and July 2005.

5.7 ROUND LAKE

Station A at Round Lake is located approximately 0.6 km southeast of Tyhee's camp, in the main body of the lake. Similar to the 2004 sampling program, DO concentration and temperature data were not recorded at this small lake during the four sampling events because of very low prevailing water levels.

6.0 RESULTS AND DISCUSSION

6.1 QUALITY ASSURANCE / QUALITY CONTROL

6.1.1 Trip Blanks

One set of trip blanks were collected during each sampling event. Trip blanks were analyzed for total and dissolved ultra-low level metals, total and dissolved organic carbon, low-level nutrients, cyanide, and low-level routine water chemistry. Results of the trip blanks collected for the 2005 sampling program are presented in Appendix A. Parameters, which had detectable concentrations, are presented in Table 8.

Results of the trip blanks indicated that there were detectable levels for aluminum, antimony, iron, and zinc in the ultra-low level total metals analysis. In the dissolved ultra-low level metals analysis, concentrations of antimony, boron, and iron were found to be above the detection limit. The contaminants found in the trip blanks can be attributed to one or a combination of five sources: laboratory errors, preservatives, de-ionized water, bottles/containers, and filters.

Since ETL is an accredited laboratory with high standards of QA/QC, the likelihood of laboratory errors is very small. In addition, all preservatives used during this program were used within the expiry date. ETL has indicated that occasionally, trace amounts of cations such as calcium, iron, potassium, magnesium, manganese, and sodium and trace metals such as aluminum, barium, and strontium can be present in the trip blanks.

An investigation by EBA for a similar project, which recorded comparable results, revealed that the de-ionized water used by the laboratory had trace amounts of sodium and antimony. In addition, blank filter analysis indicated that concentrations of aluminum, arsenic, boron, calcium, chromium, iron, mercury, potassium, sodium, nickel, antimony, strontium, and zinc were above the detection limits.

Therefore, based on these analyses, EBA believes that the integrity of the trip blanks were not compromised as the trace amounts of contamination found in the trip blanks can be attributed to the bottles/containers and the filters that were used. At this time, there are no alternatives for sample bottles or filters.

TABLE 8: TYHEE TRIP BLANKS – 2005

Analyte	April	June	July	August	Units	Detection Limit
Total Ultra-Low Level Metals						
Aluminum (Al)	-	-	0.0006	-	mg/L	0.0003
Iron (Fe)	-	0.005	-	-	mg/L	0.005
Antimony (Sb)	0.00019	0.00023	0.00038	0.00009	mg/L	0.00003
Zinc (Zn)	-	-	0.0014	0.0010	mg/L	0.0008
Dissolved Ultra-Low Level Metals						
Boron (B)	-	0.008	-	-	mg/L	0.001
Iron (Fe)	-	0.008	-	0.023	mg/L	0.005
Antimony (Sb)	0.00008	0.0009	0.00036	0.00007	mg/L	0.00003

6.1.2 Field Blanks

One set of field blanks was collected during each sampling event. The field blanks were analyzed for ultra-low level total and dissolved metals, total and dissolved organic carbon, low-level nutrients, cyanide, and low-level routine water chemistry. Results of the field blanks collected for the 2005 water sampling program are presented in Appendix B. Parameters which had detectable concentrations are presented in Table 9.

Results of the field blanks indicated that there were detectable levels of total phosphorus in the nutrient analyses and detectable levels of aluminum, arsenic, barium, calcium, cadmium, chromium, iron, sodium, nickel, silicon, tin, and zinc in the total ultra-low level total metals analysis were above detection limits. In the ultra-low level, dissolved metal analysis, concentrations for aluminum, boron, barium, calcium, cadmium, lithium, chromium, potassium, magnesium, manganese, sodium, nickel, antimony, strontium, silicon, and zinc were above the detection limit.

Since the main purpose of a field blank is to test for field contamination, all field blank results were compared to trip blank results. In the previous section, it was indicated that the de-ionized water used contained trace amounts of sodium and antimony. Furthermore, filters exhibited concentrations of aluminum, barium, calcium, iron, potassium, magnesium, manganese, sodium, nickel, antimony, strontium, and zinc that were above the detection limits. Given that aluminum, antimony, boron, iron, and zinc were detected in the trip blanks, it can be concluded that these parameters originated from the bottles/containers and filters rather than field contamination. An explanation for the remaining parameter detections is not available at this time.

TABLE 9: TYHEE FIELD BLANKS – 2005

Analyte	April	June	July	August	Units	Detection Limit
Major Ions, Nutrients and Inorganics						
Magnesium (Mg)	-	-	-	0.2	mg/L	0.1
Phosphorus, Total	0.001	-	-	0.001	mg/L	0.001
Total Ultra-Low Level Metals						
Aluminum (Al)	0.0018	0.0003	0.0033	0.0026	mg/L	0.0003
Arsenic (As)	0.00003	-	-	-	mg/L	0.00003
Barium (Ba)	-	-	0.00006	0.00008	mg/L	0.00005
Calcium (Ca)	0.03	0.06	0.04	0.03	mg/L	0.02
Cadmium (Cd)	-	-	0.00007	0.00008	mg/L	0.00005
Chromium (Cr)	0.00011	-	-	-	mg/L	0.00006
Iron (Fe)	-	-	0.005	-	mg/L	0.005
Sodium (Na)	0.049	0.023	0.177	0.180	mg/L	0.005
Nickel (Ni)	-	-	0.00006	-	mg/L	0.00006
Antimony (Sb)	0.00008	0.00008	0.00019	0.00011	mg/L	0.00003
Silicon (Si)	-	-	0.2	0.1	mg/L	0.1
Tin (Sn)	-	-	0.0024	0.0028	mg/L	0.0001
Zinc (Zn)	0.0015	0.0043	-	-	mg/L	0.0008
Dissolved Ultra-Low Level Metals						
Aluminum (Al)	-	-	-	0.0028	mg/L	0.0003
Boron (B)	0.013	0.002	-	-	mg/L	0.001
Barium (Ba)	0.0003	-	-	-	mg/L	0.00005
Calcium (Ca)	18.3	-	0.05	0.05	mg/L	0.02
Cadmium (Cd)	-	-	0.00006	0.00007	mg/L	0.00005
Chromium (Cr)	-	-	-	0.00006	mg/L	0.00006
Lithium (Li)	0.0003	-	-	-	mg/L	0.0001
Potassium (K)	2.9	0.1	-	-	mg/L	0.005
Magnesium (Mg)	6.02	0.01	-	-	mg/L	0.004
Manganese (Mn)	0.003	-	-	0.0001	mg/L	0.0001
Sodium (Na)	5.0	-	0.175	0.195	mg/L	0.005
Nickel (Ni)	-	-	0.00009	0.00008	mg/L	0.00006
Antimony (Sb)	-	0.0008	0.00017	-	mg/L	0.00003
Strontium (Sr)	0.0005	-	-	0.0001	mg/L	0.0001
Silicon (Si)	0.6	-	0.2	0.1	mg/L	0.1
Tin (Sn)	-	-	0.0022	0.0025	mg/L	0.0001
Zinc (Zn)	0.006	-	0.0016	0.0016	mg/L	0.0008

6.1.3 Duplicates

Duplicates were collected during each sampling event (one at each station) and analyzed for total and dissolved ultra-low level metals, total and dissolved organic carbon, low-level nutrients, cyanide, redox, and low-level routine water chemistry.

ETL performed a statistical analysis on the duplicate samples to determine if the duplicates were statistically the "same" as or "different" from the original samples. The results of the analysis indicated that the duplicates were the same as their original samples.

6.2 ANALYTICAL LABORATORY RESULTS

Complete analytical results for the 2005 water sampling program are presented in Tables 10, 11, 12, and 13.

TABLE 10: ANALYTICAL RESULTS OF TYHEE APRIL 2005

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Dup	Nicholas A-1	Nicholas A-2	Nicholas A-2 Dup	Eclipse A-1	Eclipse A-1 Dup	Eclipse A-2	Round A-1	Round A-1 Dup	Narrow A-1	Narrow A-1 Dup	Narrow A-2	Narrow A-2 Dup	Winter A-1	Winter A-1 Dup	UNITS	Detection Limits	CCME Guideline[a]
Major Ions, Nutrients and Inorganics																					
Chloride (Cl)	<1	<1	2	2	2	2	2	<1	1	1	6	6	3	3	3	3	2	2	mg/L	1	-
Fluoride (F)	0.07	<0.05	0.10	0.10	0.13	0.12	0.11	0.09	0.09	0.09	0.17	0.18	0.10	0.10	0.10	0.11	0.16	0.16	mg/L	0.05	-
Calcium (Ca)	<0.5	<0.5	11.0	11.0	5.9	5.6	5.6	5.3	5.4	5.2	132	140	19.0	19.1	19.3	19.2	37.5	36.7	mg/L	0.5	-
Potassium (K)	<0.1	<0.1	1.7	1.6	1.3	1.2	1.3	1.1	1.0	1.0	14.4	15.2	3.0	2.9	2.9	2.8	5.0	5.1	mg/L	0.1	-
Magnesium (Mg)	<0.1	<0.1	3.7	3.7	2.7	2.6	2.5	2.5	2.5	2.4	46.4	49.3	6.2	6.3	6.3	6.3	11.5	11.3	mg/L	0.1	-
Sodium (Na)	<1	<1	3	3	3	3	3	2	2	2	29	31	5	5	5	5	8	8	mg/L	1	-
Ion Balance	Low TDS	Low TDS	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	103	104	105	106	107	106	103	102	%	-	-
TDS (Calculated)	<1	<1	52	52	37	35	35	30	30	29	725	760	96	96	96	96	186	184	mg/L	-	-
Hardness (as CaCO3)	<1	<1	43	43	26	25	24	24	24	23	521	553	73	74	74	74	141	138	mg/L	-	-
Iron-Extractable	<0.005	<0.005	0.013	0.011	0.008	0.601	0.014	0.005	0.008	0.005	0.466	0.511	0.007	0.007	0.008	0.007	0.065	0.068	mg/L	0.005	-
Manganese-Extractable	<0.001	<0.001	0.003	0.003	0.001	0.503	0.001	<0.001	<0.001	<0.001	2.14	2.27	0.008	0.007	0.014	0.014	0.840	0.845	mg/L	0.001	-
Nitrate+Nitrite-N	<0.006	<0.006	0.076	0.076	0.123	0.076	0.113	0.073	0.078	0.067	0.055	0.051	0.078	0.086	0.093	0.098	0.121	0.109	mg/L	0.006	-
Nitrate-N	<0.006	<0.006	0.076	0.076	0.123	0.076	0.113	0.073	0.078	0.067	0.055	0.051	0.078	0.086	0.093	0.098	0.116	0.105	mg/L	0.006	13
Nitrite-N	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.005	0.005	mg/L	0.002	0.018[c]
Sulfate (SO4)	<0.05	<0.05	8.41	8.40	8.16	7.86	7.89	7.26	7.27	7.06	389	404	32.5	32.6	32.3	32.3	72.6	72.2	mg/L	0.05	-
pH	6.2	5.9	7.4	7.4	7.4	7.3	7.3	7.4	7.4	7.3	8.1	8.1	7.4	7.4	7.3	7.3	7.6	7.6	pH	0.1	6.5-9
Conductivity (EC)	1.2	1.1	98.3	97.1	69.2	66.9	66.5	59.6	59.6	57.2	1060	1110	177	179	178	178	324	326	uS/cm	0.2	-
Bicarbonate (HCO3)	<5	<5	45	45	27	25	25	25	21	21	219	232	55	55	55	55	99	99	mg/L	5	-
Carbonate (CO3)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L	5	-
Hydroxide (OH)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L	5	-
Alkalinity, Total (as CaCO3)	<5	<5	37	37	22	21	20	20	17	17	180	190	45	45	45	45	81	81	mg/L	5	-
Ammonia-N	<0.005	<0.005	0.007	0.007	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	1.79	2.01	0.007	0.007	0.008	0.008	0.579	0.606	mg/L	0.005	0.015[d]
Cyanide-CN	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.004	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/L	0.002	0.005
Phosphorus, Total	0.001	<0.001	0.011	0.011	0.006	0.005	0.006	0.004	0.004	0.004	0.010	0.010	0.008	0.008	0.009	0.009	0.011	0.012	mg/L	0.001	-
Total Organic Carbon	<0.5	<0.5	13.4	13.3	5.9	5.4	5.8	6.2	5.9	5.6	26.0	26.2	13.2	13.5	12.7	13.8	21.6	21.7	mg/L	0.2	-
Total Suspended Solids	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	mg/L	3	-
Turbidity	<0.1	<0.1	0.25	0.20	0.20	0.15	0.15	0.10	0.15	0.15	10.0	10.0	0.30	0.25	0.30	0.30	1.1	1.1	NTU	0.1	-
Redox Potential	152	187	137	144	151	151	156	162	156	160	173	168	147	153	159	165	187	183	mV	1	-
Total Ultra-Low Level Metals																					
Silver (Ag)	<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	mg/L	0.0001	0.0001
Aluminum (Al)	0.0018	<0.0003	0.0120	0.0119	0.0069	0.0074	0.0078	0.0140	0.0139	0.0128	0.0440	0.0343	0.0074	0.0086	0.0079	0.0065	0.0090	0.0090	mg/L	0.0003	0.005 @pH <6.5, Ca <4, DOC<2 0.1@ pH >6.5, Ca >4, DOC>2
Arsenic (As)	0.00003	<0.00003	0.00062	0.00062	0.00051	0.00044	0.00045	0.00037	0.00041	0.00036	0.0267	0.0249	0.00090	0.00091	0.00086	0.00083	0.00239	0.00238	mg/L	0.00003	0.005
Boron (B)	<0.001	<0.001	0.009	0.009	0.009	0.008	0.009	0.006	0.006	0.006	0.074	0.076	0.017	0.017	0.017	0.016	0.028	0.027	mg/L	0.001	-
Barium (Ba)	<0.00005	<0.00005	0.00701	0.00698	0.00381	0.00375	0.00382	0.00295	0.00319	0.00285	0.0724	0.0667	0.0105	0.0109	0.0112	0.0105	0.0360	0.0355	mg/L	0.00005	-
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002	-
Bismuth (Bi)	<0.00003	<0.00003	0.00003	0.00003	<0.00003	0.00003	0.00003	0.00003	0.00003	0.00003	<0.00003	<0.00003	<0.00003	0.00003	0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003	-
Calcium (Ca)	0.03	<0.02	10.3	10.3	5.31	5.12	5.18	5.00	5.39	4.79	137	122	18.0	18.0	18.1	16.8	37.0	36.9	mg/L	0.02	-
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005	$10^{\{0.86\{\log(\text{hardness})\}-3.2\}}$
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0023	0.0021	<0.0001	<0.0001	<0.0001	<0.0001	0.0005	0.0005	mg/L	0.0001	-
Chromium (Cr)	0.00011	<0.00006	0.00012	0.00008	0.00057	0.00017	0.00019	<0.00006	<0.00006	<0.00006	0.00081	0.00111	<0.00006	<0.00006	<0.00006	0.00016	<0.00006	0.00048	mg/L	0.00006	Cr (VI) = 0.001 Cr (III) = 0.0089

TABLE 10: ANALYTICAL RESULTS OF TYHEE APRIL 2005

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Dup	Nicholas A-1	Nicholas A-2	Nicholas A-2 Dup	Eclipse A-1	Eclipse A-1 Dup	Eclipse A-2	Round A-1	Round A-1 Dup	Narrow A-1	Narrow A-1 Dup	Narrow A-2	Narrow A-2 Dup	Winter A-1	Winter A-1 Dup	UNITS	Detection Limits	CCME Guideline[a]
Copper (Cu)	<0.0006	<0.0006	0.0371	0.0265	0.0542	0.0007	0.0063	0.0025	0.0032	0.0007	0.0013	0.0010	0.0013	0.0027	0.0016	0.0016	0.0033	0.0026	mg/L	0.0006	0.002 @ 0-120 $CaCO^3$ 0.003 @ 120-180 $CaCO^3$ 0.004 @ >180 $CaCO^3$
Iron (Fe)	<0.005	<0.005	0.013	0.011	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	0.045	0.054	0.006	0.007	0.008	0.009	0.075	0.078	mg/L	0.005	0.3
Lithium (Li)	<0.0001	<0.0001	0.0027	0.0028	0.0021	0.0021	0.0020	0.0017	0.0017	0.0016	0.0027	0.0029	0.0021	0.0022	0.0020	0.0020	0.0029	0.0029	mg/L	0.0001	-
Mercury (Hg)	<0.00002	<0.00002	0.00002	0.00004	<0.00002	<0.00002	0.00004	<0.00002	<0.00002	<0.00002	0.00007	0.00006	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002	0.000004 methylmercury[b] 0.000026 Inorganic mercury
Potassium (K)	<0.02	<0.02	1.59	1.60	1.21	1.15	1.16	1.01	1.12	1.01	15.9	13.9	2.92	2.95	2.88	2.70	5.28	5.30	mg/L	0.005	-
Magnesium (Mg)	<0.004	<0.004	3.55	3.56	2.41	2.27	2.38	2.34	2.49	2.22	49.2	43.4	5.93	6.03	5.95	5.59	11.1	11.0	mg/L	0.004	-
Manganese (Mn)	<0.0001	<0.0001	0.0032	0.0031	0.0007	0.0010	0.0011	0.0006	0.0006	0.0006	2.34	2.20	0.0073	0.0074	0.0144	0.0132	0.939	0.938	mg/L	0.0001	-
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.00010	0.00009	0.00006	0.00007	<0.00006	<0.00006	0.00008	0.00008	mg/L	0.00006	0.073
Sodium (Na)	0.049	<0.005	2.57	2.59	2.42	2.29	2.41	1.64	1.77	1.58	29.4	26.0	4.86	4.94	4.77	4.44	8.46	8.46	mg/L	0.005	-
Nickel (Ni)	<0.00006	<0.00006	0.00131	0.00127	0.00072	0.00064	0.00065	0.00075	0.00081	0.00072	0.00938	0.00844	0.00192	0.00192	0.00190	0.00173	0.00420	0.00420	mg/L	0.00006	0.025 @ 0-60 $CaCO_3$ 0.065 @ 60-120 $CaCO_3$ 0.11 @ 120-180 $CaCO_3$ 0.15 @ >180 $CaCO_3$
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00013	0.00010	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005	0.001 @ 0-60 $CaCO_3$ 0.002 @ 60-120 $CaCO_3$ 0.004 @ 120-180 $CaCO_3$
Antimony (Sb)	0.00008	0.00019	0.00013	0.00017	0.00007	0.00008	0.00013	0.00009	0.00010	0.00007	0.00017	0.00019	0.00011	0.00013	0.00011	0.00014	0.00009	0.00008	mg/L	0.00003	-
Selenium (Se)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0002	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	0.0004	mg/L	0.0001	0.001
Strontium (Sr)	<0.0001	<0.0001	0.0344	0.0341	0.0241	0.0232	0.0236	0.0179	0.0191	0.0174	0.365	0.344	0.0557	0.0567	0.0550	0.0525	0.112	0.112	mg/L	0.0001	-
Silicon (Si)	<0.1	<0.1	0.2	0.2	0.6	0.6	0.6	0.3	0.3	0.3	-	1.1	0.5	0.5	0.7	0.6	0.3	0.3	mg/L	0.1	-
Tin (Sn)	<0.0001	<0.0001	0.0029	0.0027	0.0029	0.0003	0.0009	0.0031	0.0038	0.0004	<0.0001	<0.0001	0.0005	0.0193	0.0016	0.0019	0.0048	0.0036	mg/L	0.0001	-
Uranium (U)	<0.00005	<0.00005	0.00008	0.00008	0.00009	0.00008	0.00008	0.00005	0.00005	0.00005	0.00113	0.00108	0.00008	0.00008	0.00007	0.00007	0.00010	0.00010	mg/L	0.00005	-
Vanadium (V)	<0.00005	<0.00005	<0.00005	<0.00005	0.00018	0.00006	<0.00005	<0.00005	<0.00005	<0.00005	0.00047	0.00045	0.00008	0.00010	0.00007	0.00008	0.00013	0.00014	mg/L	0.00005	-
Zinc (Zn)	0.0015	<0.0008	0.0049	0.0022	0.0010	0.0010	0.0092	0.0020	0.0010	0.0010	0.0093	**0.0125**	<0.0008	0.0011	0.0010	<0.0008	0.0022	0.0020	mg/L	0.0008	0.03
Dissolved Ultra-Low Level Metals[e]																					
Silver (Ag)	<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	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	mg/L	0.0001	0.0001
Aluminum (Al)	<0.01	<0.0003	0.0110	0.0139	0.0064	0.0067	0.0070	0.0116	0.0126	0.0124	0.0115	0.0343	0.0050	0.0051	0.0055	0.01	0.0075	0.0076	mg/L	0.0003	0.005 @pH <6.5, Ca <4, DOC<2 0.1@ pH >6.5, Ca >4, DOC>2
Arsenic (As)	<0.0004	<0.00003	0.00060	0.00060	0.00058	0.00044	0.00045	0.00038	0.00039	0.00038	0.0208	0.0249	0.00086	0.00085	0.00083	0.0007	0.00220	0.00227	mg/L	0.00003	0.005
Boron (B)	0.013	<0.001	0.009	0.009	0.009	0.009	0.009	0.006	0.006	0.006	0.074	0.076	0.016	0.016	0.016	0.033	0.026	0.027	mg/L	0.001	-
Barium (Ba)	0.0003	<0.00005	0.00639	0.00663	0.00386	0.00383	0.00381	0.00302	0.00313	0.00287	0.0689	0.0667	0.0102	0.0101	0.0107	0.0111	0.0346	0.0350	mg/L	0.00005	-
Beryllium (Be)	<0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	mg/L	0.0002	-
Bismuth (Bi)	<0.00005	<0.00003	0.00004	0.00003	<0.00003	<0.00003	0.00003	<0.00003	0.00003	0.00003	0.00005	<0.00003	<0.00003	<0.00003	<0.00003	0.00006	0.00003	0.00003	mg/L	0.00003	-
Calcium (Ca)	18.3	<0.02	10.1	10.2	5.36	5.21	5.33	5.12	5.26	5.02	133	122	17.4	17.2	17.7	18.3	35.4	36.5	mg/L	0.02	-
Cadmium (Cd)	<0.0001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.0001	<0.00005	<0.00005	mg/L	0.00005	10 {0.86{log(hardness)}-3.2}
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0017	0.0021	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	0.0005	mg/L	0.0001	-
Chromium (Cr)	<0.0004	<0.00006	0.00007	0.00021	0.00089	0.00024	0.00024	0.00015	<0.00006	<0.00006	0.00014	0.00111	<0.00006	<0.00006	<0.00006	<0.0004	<0.00006	0.00040	mg/L	0.00006	Cr (VI) = 0.001 Cr (III) = 0.0089

TABLE 10: ANALYTICAL RESULTS OF TYHEE APRIL 2005

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Dup	Nicholas A-1	Nicholas A-2	Nicholas A-2 Dup	Eclipse A-1	Eclipse A-1 Dup	Eclipse A-2	Round A-1	Round A-1 Dup	Narrow A-1	Narrow A-1 Dup	Narrow A-2	Narrow A-2 Dup	Winter A-1	Winter A-1 Dup	UNITS	Detection Limits	CCME Guideline[a]
Copper (Cu)	<0.0006	<0.0006	0.0131	0.0173	0.0667	0.0039	0.0033	0.0020	0.0017	0.0011	0.0009	0.0010	0.0028	0.0025	0.0015	0.0012	0.0011	0.0010	mg/L	0.0006	0.002 @ 0-120 CaCO3 0.003 @ 120-180 CaCO3 0.004 @ >180 CaCO3
Iron (Fe)	<0.005	<0.005	0.007	0.015	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.046	0.054	<0.005	<0.005	<0.005	<0.005	0.063	0.061	mg/L	0.005	0.3
Lithium (Li)	0.0003	<0.0001	0.0028	0.0028	0.0022	0.0021	0.0020	0.0017	0.0017	0.0017	0.0029	0.0029	0.0021	0.0020	0.0020	0.0026	0.0029	0.0029	mg/L	0.0001	-
Mercury (Hg)	-	<0.00002	0.00004	0.00008	0.00003	0.00003	<0.00002	<0.00002	<0.00002	<0.00002	0.00007	0.00006	0.00004	0.00003	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002	0.000004 methylmercuryb 0.000026 Inorganic mercury
Potassium (K)	2.9	<0.02	1.55	1.56	1.20	1.15	1.19	1.05	1.10	1.06	15.2	13.9	2.79	2.80	2.81	2.9	4.99	5.26	mg/L	0.005	-
Magnesium (Mg)	6.02	<0.004	3.45	3.49	2.38	2.33	2.45	2.39	2.41	2.31	46.0	43.4	5.71	5.74	5.77	5.94	10.4	10.9	mg/L	0.004	-
Manganese (Mn)	0.003	<0.0001	0.0008	0.0009	0.0003	0.0003	0.0003	0.0002	0.0002	0.0001	2.12	2.20	0.0007	0.0007	0.0004	0.003	0.855	0.887	mg/L	0.0001	-
Molybdenum (Mo)	<0.0001	<0.00006	<0.00006	0.00006	0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.00010	0.00009	0.00007	0.00007	<0.00006	0.0003	0.00009	0.00009	mg/L	0.00006	0.073
Sodium (Na)	5.0	<0.005	2.50	2.52	2.63	2.34	2.46	1.72	1.72	1.65	27.6	26.0	4.67	4.70	4.72	5.0	8.02	8.28	mg/L	0.005	-
Nickel (Ni)	<0.0001	<0.00006	0.00126	0.00126	0.00078	0.00069	0.00074	0.00081	0.00078	0.00075	0.00854	0.00844	0.00189	0.00188	0.00175	0.0018	0.00404	0.00423	mg/L	0.00006	0.025 @ 0-60 CaCO3 0.065 @ 60-120 CaCO3 0.11 @ 120-180 CaCO3 0.15 @ >180 CaCO3
Lead (Pb)	<0.0001	<0.00005	<0.00005	0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00010	<0.00005	<0.00005	<0.00005	<0.0001	<0.00005	<0.00005	mg/L	0.00005	0.001 @ 0-60 CaCO3 0.002 @ 60-120 CaCO3 0.004 @ 120-180 CaCO3
Antimony (Sb)	<0.0004	0.00008	0.00013	0.00010	0.00010	0.00010	0.00008	0.00008	0.00010	0.00009	0.00016	0.00019	0.00011	0.00010	0.00010	0.0008	0.00010	0.00010	mg/L	0.00003	-
Selenium (Se)	<0.0004	<0.0001	<0.0001	<0.0001	0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0003	<0.0001	<0.0001	<0.0001	<0.0004	0.0002	0.0002	mg/L	0.0001	0.001
Strontium (Sr)	0.0005	<0.0001	0.0336	0.0334	0.0246	0.0240	0.0243	0.0186	0.0190	0.0178	0.353	0.344	0.0548	0.0536	0.0540	0.0609	0.106	0.110	mg/L	0.0001	-
Silicon (Si)	0.6	<0.1	0.2	0.2	0.6	0.6	0.6	0.3	0.3	0.3	1.1	1.1	0.5	0.5	0.6	0.6	0.3	0.3	mg/L	0.1	-
Tin (Sn)	<0.0002	<0.0001	0.0033	0.0045	0.0041	0.0007	0.0015	0.0038	0.0013	0.0025	<0.0001	<0.0001	0.0131	0.0207	0.0030	0.0005	0.0024	0.0049	mg/L	0.0001	-
Uranium (U)	<0.0001	<0.00005	0.00007	0.00007	0.00008	0.00007	0.00007	<0.00005	<0.00005	<0.00005	0.00113	0.00108	0.00007	0.00007	0.00007	<0.0001	0.00010	0.00009	mg/L	0.00005	-
Vanadium (V)	0.0004	<0.00005	<0.00005	<0.00005	0.00030	0.00007	0.00006	<0.00005	<0.00005	<0.00005	0.00016	0.00045	0.00008	0.00008	0.00005	0.0005	0.00012	0.00012	mg/L	0.00005	-
Zinc (Zn)	0.006	<0.0008	0.0024	0.0144	0.0027	0.0071	0.0051	0.0017	0.0021	0.0024	0.0068	0.0125	0.0019	0.0023	0.0015	0.005	0.0035	0.0037	mg/L	0.0008	0.03

Notes:

Results are expressed in milligrams per litre (mg/L) unless otherwise indicated.

[a]Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the Protection of Freshwater Aquatic Life, 2003

[b]Indicates the applicable standard is lower than the detection limit.

[c]Guideline for nitrite [0.06mg/L(NO_2)] has been converted by a factor of 1/4.43 to reflect the results expressed as mg/L(N).

[d]Ammonia guideline pH and temperature dependent. Guideline quoted is minimum value [0.019mg/L(NH4)] converted by a factor of 1/4.43 to reflect the results expressed as mg/L(N).

[e]No Guidelines for dissolved metals exist. Total metals guidelines are cited for comparison purposes.

"-" Indicates no analysis conducted or no applicable standard available.

"<" Indicates less than the detection limit.

Indicates parameter exceeds Canadian Environmental Quality Guidelines

TABLE 11: ANALYTICAL RESULTS OF TYHEE JUNE 2005

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Dup	Narrow A-1	Narrow A-1 Dup	Narrow A-2	Narrow A-2 Dup	Round A-1	Round A-1 Dup	Eclipse A-1	Eclipse A-1 Dup	Eclipse A-2	Eclipse A-2 Dup	Winter A-1	Winter A-1 Dup	Nicholas A-1	Nicholas A-1 Dup	Nicholas A-2	Nicholas A-2 Dup	UNITS	Detection Limits	CCME Guideline[a]
Major Ions, Nutrients and Inorganic																							
Chloride (Cl)	<1	<1	1	1	2	2	2	2	3	2	1	1	1	1	2	2	2	2	2	2	mg/L	1	-
Fluoride (F)	<0.05	<0.05	0.06	0.06	0.07	0.07	0.07	0.07	0.10	0.10	0.05	0.05	0.05	0.05	0.08	0.08	0.07	0.07	0.07	0.07	mg/L	0.05	-
Calcium (Ca)	<0.5	<0.5	9.8	9.8	18.0	17.7	17.4	18.0	61.1	60.7	5.3	5.3	5.3	5.3	25.7	26.0	5.4	5.4	5.4	5.6	mg/L	0.5	-
Potassium (K)	<0.1	<0.1	1.4	1.4	2.8	2.7	2.8	2.7	6.6	6.6	1.1	1.0	1.0	1.1	3.3	3.7	1.2	1.2	1.1	1.2	mg/L	0.1	-
Magnesium (Mg)	<0.1	<0.1	3.2	3.2	5.8	5.8	5.7	5.8	25.6	25.7	2.4	2.4	2.4	2.4	7.9	8.3	2.4	2.4	2.4	2.5	mg/L	0.1	-
Sodium (Na)	<1	<1	2	2	5	5	5	5	14	15	2	2	2	2	6	6	2	3	2	3	mg/L	1	-
Ion Balance	Low TDS	Low TDS	Low EC	Low EC	111	108	108	112	110	110	Low EC	Low EC	Low EC	Low EC	107	108	Low EC	Low EC	Low EC	Low EC	mg/L	-	-
TDS (Calculated)	<1	<1	43	42	90	89	89	89	344	348	28	29	28	29	128	130	31	32	31	34	mg/L	-	-
Hardness (as CaCO3)	<1	<1	38	38	69	68	67	69	258	257	23	23	23	23	97	99	23	23	23	24	mg/L	-	-
Iron-Extractable	<0.005	<0.005	0.043	0.039	0.022	0.023	0.026	0.026	0.083	0.082	0.013	0.021	0.012	0.013	0.033	0.032	0.028	0.024	0.023	0.019	mg/L	0.005	-
Manganese-Extractable	<0.001	<0.001	0.010	0.010	0.015	0.015	0.024	0.021	0.032	0.032	0.002	0.002	0.002	0.002	0.051	0.051	0.003	0.003	0.004	0.004	mg/L	0.001	-
Nitrate+Nitrite-N	<0.006	<0.006	<0.006	0.015	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.044	0.045	0.190	0.215	0.202	0.053	<0.006	<0.006	mg/L	0.006	-
Nitrate-N	<0.006	<0.006	<0.006	0.015	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	0.044	0.045	0.187	0.212	0.202	0.053	<0.006	<0.006	mg/L	0.006	13
Nitrite-N	<0.002	<0.002	<0.002	<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	<0.002	<0.002	<0.002	<0.002	mg/L	0.002	0.018[c]
Sulfate (SO4)	<0.05	<0.05	6.88	6.86	32.5	33.3	32.7	31.7	201	205	6.72	6.74	6.76	6.76	54.7	55.5	7.32	7.33	7.40	7.40	mg/L	0.05	-
pH	6.1	5.7	6.6	7.2	7.4	7.4	7.3	7.3	7.7	7.7	7.0	7.0	6.9	6.9	7.5	7.6	6.9	7.0	6.9	6.9	mg/L	0.1	6.5-9
Conductivity (EC)	1.1	0.8	80.2	80.6	157	156	155	155	536	538	55.1	54.9	55.4	55.2	227	225	61.2	61.1	61.5	61.6	mg/L	0.2	-
Bicarbonate (HCO3)	<5	<5	39	37	47	47	47	47	68	67	20	20	19	21	56	57	21	21	22	24	mg/L	5	-
Carbonate (CO3)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L	5	-
Hydroxide (OH)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L	5	-
Alkalinity, Total (CaCO3)	<5	<5	32	30	39	38	39	39	55	55	16	17	16	17	46	46	17	17	18	20	mg/L	5	-
Ammonia-N	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.073	0.074	<0.005	<0.005	<0.005	<0.005	mg/L	0.005	0.015[d]
Cyanide-CN	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/L	0.002	0.005
Phosphorus, Total	<0.001	<0.001	0.014	0.008	0.011	0.011	0.011	0.011	0.015	0.013	0.006	0.006	0.004	0.004	0.011	0.011	0.005	0.007	0.007	0.006	mg/L	0.001	-
Total Organic Carbon	<0.5	<0.5	14.4	14.4	14.7	14.6	13.9	14.5	17.6	17.5	6.1	6.1	5.7	5.6	18.5	18.5	5.8	7.1	5.4	5.7	mg/L	0.2	-
Dissolved Organic Carbon	<0.5	<0.5	12.9	12.8	13.0	13.6	12.9	12.9	15.6	15.6	5.4	5.3	5.1	5.2	16.0	15.9	5.1	4.9	4.7	4.9	mg/L	0.5	-
Total Suspended Solids	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	3	<3	<3	<3	<3	<3	mg/L	3	-
Turbidity	<0.1	-	0.60	0.55	0.75	0.85	1.0	0.95	2.9	2.5	0.45	0.40	0.30	0.30	1.2	1.1	0.30	0.40	0.55	0.45	mg/L	0.1	-
Redox Potential	176	-	179	171	183	180	179	181	188	178	180	177	176	173	184	173	196	182	191	177	mg/L	1	-
Total Ultra-Low Level Metals																							
Silver (Ag)	<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	mg/L	0.0001	0.0001
Aluminum (Al)	0.0003	<0.0003	0.0413	0.0418	0.0302	0.0286	0.0352	0.0292	0.213	0.208	0.0189	0.0199	0.0186	0.0190	0.0341	0.0344	0.0140	0.0140	0.0132	0.0136	mg/L	0.0003	0.005 @pH <6.5, Ca <4, DOC<2 0.1@ pH >6.5, Ca >4, DOC>2
Arsenic (As)	<0.00003	<0.00003	0.00066	0.00068	0.00098	0.00098	0.00097	0.00089	0.00680	0.00691	0.00039	0.00038	0.00039	0.00038	0.00154	0.00160	0.00056	0.00056	0.00050	0.00050	mg/L	0.00003	0.005
Boron (B)	<0.001	<0.001	0.007	0.007	0.014	0.014	0.014	0.013	0.035	0.035	0.005	0.005	0.005	0.006	0.018	0.018	0.007	0.007	0.007	0.007	mg/L	0.001	-
Barium (Ba)	<0.00005	<0.00005	0.00750	0.00764	0.0118	0.0120	0.0125	0.0114	0.0255	0.0260	0.00313	0.00308	0.00321	0.00312	0.0173	0.0179	0.00381	0.00381	0.00419	0.00424	mg/L	0.00005	-
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002	-
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003	-
Calcium (Ca)	0.06	<0.02	9.60	9.75	18.1	18.6	18.3	17.1	56.8	58.2	5.05	4.97	5.34	5.21	25.5	26.1	5.18	5.21	5.30	5.32	mg/L	0.02	-

TABLE 11: ANALYTICAL RESULTS OF TYHEE JUNE 2005

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Dup	Narrow A-1	Narrow A-1 Dup	Narrow A-2	Narrow A-2 Dup	Round A-1	Round A-1 Dup	Eclipse A-1	Eclipse A-1 Dup	Eclipse A-2	Eclipse A-2 Dup	Winter A-1	Winter A-1 Dup	Nicholas A-1	Nicholas A-1 Dup	Nicholas A-2	Nicholas A-2 Dup	UNITS	Detection Limits	CCME Guideline[a]
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	0.00022	<0.00005	0.00010	<0.00005	0.00007	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00011	<0.00005	0.00006	<0.00005	0.00008	mg/L	0.00005	$10^{\{0.86\{\log(\text{hardness})\}-3.2\}}$
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0011	0.0011	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001	-
Chromium (Cr)	<0.00006	<0.00006	0.00015	0.00016	0.00013	0.00013	0.00017	0.00014	0.00030	0.00031	0.00028	0.00028	0.00031	0.00030	0.00009	0.00009	0.00024	0.00024	0.00024	0.00025	mg/L	0.00006	Cr (VI) = 0.001 Cr (III) = 0.0089
Copper (Cu)	<0.0006	<0.0006	0.0011	0.0058	0.0015	0.0017	0.0015	0.0015	0.0055	0.0056	0.0008	0.0009	0.0008	0.0011	0.0017	0.0021	0.0013	0.0027	<0.0006	0.0011	mg/L	0.0006	0.002 @ 0-120 $CaCO^3$ 0.003 @ 120-180 $CaCO^3$ 0.004 @ >180 $CaCO^3$
Iron (Fe)	<0.005	0.005	0.039	0.038	0.023	0.023	0.030	0.025	0.122	0.123	0.016	0.015	0.014	0.015	0.035	0.039	0.023	0.021	0.031	0.025	mg/L	0.005	0.3
Lithium (Li)	<0.0001	<0.0001	0.0022	0.0022	0.0018	0.0018	0.0018	0.0018	0.0036	0.0037	0.0015	0.0015	0.0016	0.0015	0.0021	0.0021	0.0019	0.0019	0.0019	0.0019	mg/L	0.0001	-
Mercury (Hg)	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002	0.000004 methylmercury[b] 0.000026 Inorganic mercury
Potassium (K)	<0.02	<0.02	1.42	1.45	2.87	2.94	2.92	2.65	6.58	6.66	1.05	1.02	1.09	1.06	3.79	3.88	1.15	1.16	1.18	1.19	mg/L	0.02	-
Magnesium (Mg)	<0.004	<0.004	3.14	3.23	5.82	5.95	5.88	5.47	22.8	23.0	2.22	2.21	2.36	2.34	8.02	8.22	2.22	2.23	2.29	2.29	mg/L	0.004	-
Manganese (Mn)	<0.0001	<0.0001	0.0091	0.0090	0.0146	0.0145	0.0225	0.0208	0.0314	0.0317	0.0020	0.0019	0.0027	0.0027	0.0500	0.0508	0.0028	0.0028	0.0036	0.0036	mg/L	0.0001	-
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.00029	0.00032	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	mg/L	0.00006	0.073
Sodium (Na)	0.023	<0.005	2.23	2.26	4.75	4.82	4.82	4.44	12.7	12.7	1.59	1.59	1.67	1.66	6.01	6.14	2.26	2.29	2.32	2.31	mg/L	0.005	-
Nickel (Ni)	<0.00006	<0.00006	0.00179	0.00191	0.00287	0.00294	0.00295	0.00447	0.0194	0.0197	0.00092	0.00091	0.00094	0.00097	0.00403	0.00410	0.00081	0.00083	0.00081	0.00081	mg/L	0.00006	0.025 @ 0-60 $CaCO_3$ 0.065 @ 60-120 $CaCO_3$ 0.11 @ 120-180 $CaCO_3$ 0.15 @ >180 $CaCO_3$
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00023	0.00023	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00007	mg/L	0.00005	0.001 @ 0-60 $CaCO_3$ 0.002 @ 60-120 $CaCO_3$ 0.004 @ 120-180 $CaCO_3$
Antimony (Sb)	0.00008	0.00023	0.00012	0.00018	0.00028	0.00037	0.00026	0.00027	0.00027	0.00027	0.00027	0.00021	0.00014	0.00017	0.00031	0.00033	0.00015	0.00016	0.00017	0.00020	mg/L	0.00003	-
Selenium (Se)	<0.0001	<0.0001	<0.0001	0.0002	0.0003	0.0002	0.0003	0.0002	0.0005	0.0005	0.0002	0.0001	0.0001	0.0001	0.0002	0.0003	0.0001	0.0001	0.0001	0.0002	mg/L	0.0001	0.001
Strontium (Sr)	0.0001	<0.0001	0.0315	0.0321	0.0554	0.0564	0.0565	0.0521	0.157	0.159	0.0183	0.0180	0.0192	0.0187	0.0754	0.0774	0.0237	0.0237	0.0242	0.0243	mg/L	0.0001	-
Silicon (Si)	<0.1	<0.1	0.2	0.3	0.3	0.3	0.5	0.5	0.8	0.8	0.3	0.3	0.4	0.4	<0.1	0.2	0.6	0.6	0.6	0.6	mg/L	0.1	-
Tin (Sn)	<0.0001	<0.0001	0.0012	0.0073	0.0006	0.0035	0.0004	0.0024	<0.0001	<0.0001	0.0004	0.0014	0.0002	0.0015	0.0009	0.0039	0.0005	0.0021	0.0002	0.0028	mg/L	0.0001	-
Uranium (U)	<0.00005	<0.00005	0.00009	0.00009	0.00010	0.00010	0.00010	0.00008	0.00138	0.00141	0.00005	0.00005	0.00005	0.00005	0.00009	0.00009	0.00009	0.00010	0.00009	0.00009	mg/L	0.00005	-
Vanadium (V)	<0.00005	<0.00005	0.00010	0.00011	0.00014	0.00014	0.00015	0.00014	0.00039	0.00039	0.00005	0.00005	0.00005	0.00005	0.00025	0.00025	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005	-
Zinc (Zn)	0.0043	<0.0008	0.0010	0.0011	0.0009	0.0015	0.0009	<0.0008	0.0049	0.0046	<0.0008	0.0018	<0.0008	0.0008	0.0019	0.0021	<0.0008	0.0009	<0.0008	<0.0008	mg/L	0.0008	0.03
Dissolved Ultra-Low Level Metals[e]																							
Silver (Ag)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0001	0.0001
Aluminum (Al)	<0.01	<0.01	0.04	0.04	0.03	0.03	0.03	0.03	0.17	0.14	0.02	0.02	0.02	0.02	0.03	0.03	0.01	0.02	0.01	0.01	mg/L	0.0003	0.005 @pH <6.5, Ca <4, DOC<2 0.1@ pH >6.5, Ca >4, DOC>2
Arsenic (As)	<0.0004	<0.0004	0.0005	0.0005	0.0007	0.0007	0.0007	0.0007	0.0053	0.0054	<0.0004	<0.0004	<0.0004	<0.0004	0.0012	0.0013	0.0004	0.0005	<0.0004	0.0004	mg/L	0.00003	0.005
Boron (B)	0.002	0.008	0.010	0.010	0.016	0.017	0.016	0.016	0.041	0.042	0.009	0.004	0.008	0.013	0.022	0.022	0.007	0.006	0.007	0.006	mg/L	0.001	-
Barium (Ba)	<0.0001	<0.0001	0.0065	0.0067	0.0104	0.0102	0.0100	0.0101	0.0224	0.0219	0.0031	0.0029	0.0027	0.0029	0.0159	0.0155	0.0033	0.0038	0.0037	0.0037	mg/L	0.00005	-
Beryllium (Be)	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	mg/L	0.0002	-
Bismuth (Bi)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00003	-
Calcium (Ca)	<0.5	<0.5	9.2	9.1	17.0	16.9	16.8	16.8	49.1	57.1	4.9	4.9	4.9	5.0	25.7	24.7	5.1	5.2	5.3	5.3	mg/L	0.02	-
Cadmium (Cd)	<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	mg/L	0.00005	$10^{\{0.86\{\log(\text{hardness})\}-3.2\}}$

TABLE 11: ANALYTICAL RESULTS OF TYHEE JUNE 2005

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Dup	Narrow A-1	Narrow A-1 Dup	Narrow A-2	Narrow A-2 Dup	Round A-1	Round A-1 Dup	Eclipse A-1	Eclipse A-1 Dup	Eclipse A-2	Eclipse A-2 Dup	Winter A-1	Winter A-1 Dup	Nicholas A-1	Nicholas A-1 Dup	Nicholas A-2	Nicholas A-2 Dup	UNITS	Detection Limits	CCME Guideline[a]
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0008	0.0008	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001	-
Chromium (Cr)	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	mg/L	0.00006	Cr (VI) = 0.001 Cr (III) = 0.0089
Copper (Cu)	<0.0006	<0.0006	0.0010	0.0011	0.0014	<0.0006	0.0015	<0.0006	0.0025	0.0025	0.0007	0.0010	0.0008	0.0008	<0.0006	<0.0006	0.0014	0.0040	<0.0006	0.0012	mg/L	0.0006	0.002 @ 0-120 $CaCO^3$ 0.003 @ 120-180 $CaCO^3$ 0.004 @ >180 $CaCO^3$
Iron (Fe)	<0.005	0.008	0.035	0.031	0.036	0.018	0.035	0.024	0.065	0.071	0.015	0.013	0.010	0.023	0.032	0.043	0.014	0.012	0.014	0.013	mg/L	0.005	0.3
Lithium (Li)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	mg/L	0.0001	-
Mercury (Hg)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	mg/L	0.00002	0.000004 methylmercury[b] 0.000026 Inorganic mercury
Potassium (K)	0.1	<0.1	1.3	1.3	2.5	2.4	2.4	2.3	5.1	5.8	0.9	0.9	1.0	1.0	3.3	3.3	1.1	1.1	1.2	1.1	mg/L	0.02	-
Magnesium (Mg)	0.01	<0.01	3.04	3.00	5.48	5.43	5.38	5.30	20.2	23.4	2.27	2.24	2.30	2.29	7.88	7.73	2.25	2.34	2.37	2.39	mg/L	0.004	-
Manganese (Mn)	<0.001	<0.001	0.008	0.006	0.009	0.010	0.023	0.016	0.012	0.022	0.001	0.001	0.001	0.002	0.052	0.042	0.002	0.002	0.002	0.002	mg/L	0.0001	-
Molybdenum (Mo)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	0.0004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.00006	0.073
Sodium (Na)	<0.5	<0.5	2.2	2.2	4.4	4.2	4.3	4.2	11.1	12.7	1.6	1.6	1.5	1.6	5.7	5.8	2.3	2.3	2.4	2.4	mg/L	0.005	-
Nickel (Ni)	<0.0001	<0.0001	0.0012	0.0014	0.0021	0.0020	0.0025	0.0022	0.0174	0.0180	0.0005	0.0006	0.0005	0.0007	0.0032	0.0032	0.0004	0.0005	0.0005	0.0003	mg/L	0.00006	0.025 @ 0-60 $CaCO_3$ 0.065 @ 60-120 $CaCO_3$ 0.11 @ 120-180 $CaCO_3$ 0.15 @ >180 $CaCO_3$
Lead (Pb)	<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	mg/L	0.00005	0.001 @ 0-60 $CaCO_3$ 0.002 @ 60-120 $CaCO_3$ 0.004 @ 120-180 $CaCO_3$
Antimony (Sb)	0.0008	0.0009	0.0008	0.0007	0.0006	0.0006	0.0008	0.0006	0.0008	0.0007	0.0008	0.0009	0.0008	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0009	mg/L	0.00003	-
Selenium (Se)	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	mg/L	0.0001	0.001
Strontium (Sr)	<0.0001	<0.0001	0.0286	0.0293	0.0490	0.0494	0.0493	0.0496	0.140	0.142	0.0172	0.0173	0.0170	0.0173	0.0685	0.0670	0.0230	0.0231	0.0232	0.0232	mg/L	0.0001	-
Silicon (Si)	<0.1	<0.1	0.3	0.2	0.3	0.3	0.5	0.4	0.5	0.5	0.2	0.2	0.3	0.3	<0.1	0.1	0.5	0.5	0.5	0.5	mg/L	0.1	-
Tin (Sn)	<0.0002	<0.0002	0.0010	0.0047	0.0005	0.0026	0.0003	0.0021	<0.0002	<0.0002	0.0003	0.0024	0.0002	0.0005	0.0006	0.0034	0.0005	0.0047	0.0003	0.0032	mg/L	0.0001	-
Uranium (U)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0014	0.0014	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.00005	-
Vanadium (V)	<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	mg/L	0.00005	-
Zinc (Zn)	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.004	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	0.005	<0.002	<0.002	mg/L	0.0008	0.03

Notes:

Results are expressed in milligrams per litre (mg/L) unless otherwise indicated.

[a]Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the Protection of Freshwater Aquatic Life, 2003

[b]Indicates the applicable standard is lower than the detection limit.

[c]Guideline for nitrite [0.06mg/L(NO_2)] has been converted by a factor of 1/4.43 to reflect the results expressed as mg/L(N).

[d]Ammonia guideline pH and temperature dependent. Guideline quoted is minimum value [0.019mg/L(NH4)] converted by a factor of 1/4.43 to reflect the results expressed as mg/L(N).

[e]No Guidelines for dissolved metals exist. Total metals guidelines are cited for comparison purposes.

"-" Indicates no analysis conducted or no applicable standard available.

"<" Indicates less than the detection limit.

Indicates parameter exceeds Canadian Environmental Quality Guidelines

TABLE 12: ANALYTICAL RESULTS OF TYHEE JULY 2005

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Dup	Nicholas A-1	Nicholas A-1 Dup	Nicholas A-2	Nicholas A-2 Dup	Eclipse A-1	Eclipse A-1 Dup	Eclipse A-2	Eclipse A-2 Dup	Round A-1	Round A-1 Dup	Narrow A-1	Narrow A-1 Dup	Narrow A-2	Narrow A-2 Dup	Winter A-1	Winter A1-Dup	UNITS	Detection Limits	Guideline[a]
Major Ions, Nutrients and Inorganic																							
Chloride (Cl)	<1	<1	1	2	2	2	2	2	2	2	2	1	2	2	3	3	3	3	3	3	mg/L	1	-
Fluoride (F)	<0.05	<0.05	0.08	0.08	0.08	0.08	0.08	0.08	0.06	0.06	0.06	0.06	0.10	0.10	0.08	0.08	0.08	0.08	0.12	0.12	mg/L	0.05	-
Calcium (Ca)	<0.5	<0.5	9.3	9.3	5.2	5.3	5.4	5.3	4.9	5.2	5.0	5.0	25.6	25.5	17.5	17.5	16.9	16.9	55.8	54.9	mg/L	0.5	-
Potassium (K)	<0.1	<0.1	1.4	1.3	1.0	1.1	1.1	1.1	0.9	1.0	0.9	0.9	3.6	3.6	2.7	2.6	2.6	2.6	6.3	6.4	mg/L	0.1	-
Magnesium (Mg)	<0.1	<0.1	2.9	3.0	2.2	2.2	2.2	2.2	2.1	2.2	2.2	2.2	8.2	8.2	5.6	5.6	5.3	5.4	22.9	23.5	mg/L	0.1	-
Sodium (Na)	<1	<1	3	3	2	2	2	2	2	2	2	2	6	6	5	5	5	5	13	13	mg/L	1	-
Ion Balance	Low TDS	Low TDS	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	102	102	104	105	103	104	110	107	mg/L	-	-
TDS (Calculated)	<1	<1	44	45	32	34	34	33	29	31	29	29	134	134	90	89	87	87	312	319	mg/L	-	-
Hardness (as CaCO3)	<1	<1	35	36	22	22	23	22	21	22	22	22	98	97	67	67	64	64	234	234	mg/L	-	-
Iron-Extractable	<0.005	<0.005	0.025	0.025	0.019	0.012	0.014	0.013	0.009	0.009	0.024	0.012	0.023	0.022	0.017	0.018	0.018	0.019	0.075	0.082	mg/L	0.005	-
Manganese-Extractable	<0.001	<0.001	0.006	0.007	0.002	0.002	0.002	0.002	0.001	0.001	0.002	0.002	0.036	0.035	0.018	0.018	0.019	0.021	0.087	0.093	mg/L	0.001	
Nitrate+Nitrite-N	<0.006	<0.006	<0.006	<0.006	0.319	0.229	0.012	0.009	<0.006	<0.006	0.047	0.050	0.083	0.122	0.051	<0.006	0.038	0.045	<0.006	<0.006	mg/L	0.006	-
Nitrate-N	<0.006	<0.006	<0.006	<0.006	0.319	0.229	0.012	0.009	<0.006	<0.006	0.047	0.050	0.083	0.122	0.051	<0.006	0.035	0.042	<0.006	<0.006	mg/L	0.006	13
Nitrite-N	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.002	<0.002	<0.002	mg/L	0.002	0.018[c]
Sulfate (SO4)	<0.05	<0.05	7.04	7.02	7.53	7.49	7.58	7.56	6.89	6.89	6.88	6.87	59.6	60.0	31.4	31.3	29.5	29.2	179	185	mg/L	0.05	-
pH	6.2	5.8	6.8	6.8	6.7	6.8	6.5	6.5	6.6	6.6	6.5	6.5	7.2	7.3	6.9	6.9	6.7	6.7	7.1	7.1	mg/L	0.1	6.5-9
Conductivity (EC)	1.4	0.8	80.9	80.6	60.3	61.1	62.1	62.0	55.1	55.2	55.5	55.7	234	234	162	161	157	157	517	521	mg/L	0.2	-
Bicarbonate (HCO3)	<5	<5	40	39	21	25	27	26	21	25	21	22	58	57	50	49	50	50	66	69	mg/L	5	-
Carbonate (CO3)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L	5	-
Hydroxide (OH)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L	5	-
Alkalinity, Total (as CaCO3)	<5	<5	33	32	17	21	22	22	17	20	17	18	47	47	41	40	41	41	54	56	mg/L	5	-
Ammonia-N	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005	0.018	0.021	0.014	0.013	mg/L	0.005	0.015[d]
Cyanide-CN	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/L	0.002	0.005
Phosphorus, Total	<0.001	<0.001	0.007	0.008	0.005	0.005	0.008	0.007	0.005	0.004	0.004	0.005	0.011	0.011	0.009	0.008	0.014	0.014	0.013	0.013	mg/L	0.001	-
Total Organic Carbon	<0.5	<0.5	14.9	14.6	6.2	8.7	7.6	6.1	6.3	8.5	6.1	7.1	18.6	19.3	15.4	15.6	14.6	14.2	19.9	20.1	mg/L	0.2	-
Dissolved Organic Carbon	<0.5	<0.5	13.4	13.9	5.4	5.9	5.2	5.0	6.1	6.2	5.9	5.8	15.5	16.1	13.8	13.9	13.3	12.9	16.6	17.0	mg/L	0.5	-
Total Suspended Solids	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	3	3	<3	3	<3	<3	<3	<3	mg/L	3	-
Turbidity	0.10	<0.1	0.50	0.50	0.30	0.35	0.55	0.50	0.35	0.35	0.25	0.40	1.2	1.2	0.80	0.80	0.85	0.90	1.6	1.7	mg/L	0.1	-
Redox Potential	171	200	198	204	182	226	188	228	218	216	215	206	177	175	198	218	227	213	205	207	mg/L	1	-
Total Ultra-Low Level Metals																							
Silver (Ag)	<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	mg/L	0.0001	0.0001
Aluminum (Al)	0.0033	0.0006	0.0313	0.0324	0.0135	0.0124	0.0125	0.0121	0.0190	0.0182	0.0178	0.0175	0.0291	0.0293	0.0206	0.0360	0.0261	0.0266	0.0700	0.0758	mg/L	0.0003	0.005 @pH <6.5, Ca <4, DOC<2 0.1@ pH >6.5, Ca >4, DOC>2
Arsenic (As)	<0.00003	<0.00003	0.00059	0.00060	0.00059	0.00057	0.00045	0.00045	0.00039	0.00036	0.00036	0.00036	0.00152	0.00153	0.00092	0.00096	0.00076	0.00079	0.00859	0.00863	mg/L	0.00003	0.005
Boron (B)	<0.001	<0.001	0.007	0.007	0.008	0.007	0.008	0.007	0.005	0.005	0.005	0.005	0.019	0.019	0.013	0.014	0.013	0.013	0.037	0.037	mg/L	0.001	-
Barium (Ba)	0.00006	<0.00005	0.00621	0.00643	0.00363	0.00359	0.00398	0.00389	0.00282	0.00278	0.00285	0.00287	0.0154	0.0154	0.0101	0.0114	0.0104	0.0107	0.0242	0.0241	mg/L	0.00005	-
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002	-
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003	-
Calcium (Ca)	0.04	<0.02	7.89	8.13	5.15	5.04	5.23	5.14	4.87	4.85	4.92	4.88	23.6	23.6	15.9	17.3	14.7	15.3	49.0	49.3	mg/L	0.02	-

TABLE 12: ANALYTICAL RESULTS OF TYHEE JULY 2005

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Dup	Nicholas A-1	Nicholas A-1 Dup	Nicholas A-2	Nicholas A-2 Dup	Eclipse A-1	Eclipse A-1 Dup	Eclipse A-2	Eclipse A-2 Dup	Round A-1	Round A-1 Dup	Narrow A-1	Narrow A-1 Dup	Narrow A-2	Narrow A-2 Dup	Winter A-1	Winter A1-Dup	UNITS	Detection Limits	Guideline[a]
Cadmium (Cd)	0.00007	<0.00005	0.00014	<0.00005	0.00011	0.00033	0.00014	<0.00005	<0.00005	0.00005	<0.00005	<0.00005	<0.00005	0.00016	0.00009	<0.00005	0.00009	<0.00005	<0.00005	<0.00005	mg/L	0.00005	10 {0.86{log(hardness)}-3.2}
Cobalt (Co)	<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	0.0002	<0.0001	0.0001	<0.0001	<0.0001	0.0014	0.0015	mg/L	0.0001	-
Chromium (Cr)	<0.00006	<0.00006	0.00018	0.00019	0.00014	0.00014	0.00014	0.00011	0.00015	0.00016	0.00016	0.00016	0.00034	0.00014	0.00017	0.00027	0.00026	0.00027	0.00024	0.00024	mg/L	0.00006	Cr (VI) = 0.001 Cr (III) = 0.0089
Copper (Cu)	<0.0006	<0.0006	0.0019	0.0009	0.0022	0.0645	0.0019	<0.0006	0.0008	0.0012	0.0007	0.0009	0.0017	0.0019	0.0043	0.0017	0.0013	0.0012	0.0045	0.0045	mg/L	0.0006	0.002 @ 0-120 $CaCO^3$ 0.003 @ 120-180 $CaCO^3$ 0.004 @ >180 $CaCO^3$
Iron (Fe)	0.005	<0.005	0.027	0.027	0.012	0.060	0.013	0.013	0.009	0.008	0.011	0.012	0.027	0.026	0.015	0.039	0.019	0.018	0.107	0.267	mg/L	0.005	0.3
Lithium (Li)	<0.0001	<0.0001	0.0021	0.0022	0.0019	0.0019	0.0019	0.0019	0.0015	0.0015	0.0015	0.0015	0.0022	0.0023	0.0018	0.0019	0.0016	0.0018	0.0035	0.0035	mg/L	0.0001	-
Mercury (Hg)	<0.00002	<0.00002	0.00008	<0.00002	<0.00002	0.00008	<0.00002	<0.00002	<0.00002	0.00003	<0.00002	<0.00002	<0.00002	0.00006	0.00003	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002	0.000004 methylmercury[b] 0.000026 Inorganic mercury
Potassium (K)	<0.02	<0.02	1.15	1.21	1.07	1.05	1.10	1.08	0.93	0.95	0.93	0.94	3.45	3.43	2.50	2.52	2.29	2.38	5.64	5.76	mg/L	0.02	-
Magnesium (Mg)	<0.004	<0.004	2.70	2.80	2.23	2.20	2.24	2.20	2.15	2.10	2.19	2.16	7.95	7.88	5.27	5.92	4.75	4.96	20.2	20.3	mg/L	0.004	-
Manganese (Mn)	<0.0001	<0.0001	0.0058	0.0061	0.0019	0.0018	0.0023	0.0023	0.0012	0.0012	0.0023	0.0024	0.0352	0.0333	0.0164	0.0180	0.0175	0.0181	0.0845	0.0821	mg/L	0.0001	-
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.00019	0.00018	mg/L	0.00006	0.073
Sodium (Na)	0.177	<0.005	1.96	2.02	2.29	2.29	2.26	2.20	1.55	1.51	1.53	1.54	5.77	5.74	4.22	4.81	3.85	4.04	11.3	11.4	mg/L	0.005	-
Nickel (Ni)	0.00006	<0.00006	0.00170	0.00168	0.00085	0.00094	0.00084	0.00081	0.00091	0.00091	0.00092	0.00091	0.00401	0.00401	0.00278	0.00316	0.00259	0.00268	0.0172	0.0174	mg/L	0.00006	0.025 @ 0-60 $CaCO_3$ 0.065 @ 60-120 $CaCO_3$ 0.11 @ 120-180 $CaCO_3$ 0.15 @ >180 $CaCO_3$
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00011	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00014	<0.00005	<0.00005	0.00019	0.00019	mg/L	0.00005	0.001 @ 0-60 $CaCO_3$ 0.002 @ 60-120 $CaCO_3$ 0.004 @ 120-180 $CaCO_3$
Antimony (Sb)	0.00019	0.00038	0.00020	0.00043	0.00016	0.00013	0.00019	0.00017	0.00029	0.00015	0.00015	0.00016	0.00030	0.00023	0.00027	0.00074	0.00019	0.00015	0.00042	0.00016	mg/L	0.00003	-
Selenium (Se)	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	mg/L	0.0001	0.001
Strontium (Sr)	<0.0001	<0.0001	0.0276	0.0279	0.0230	0.0225	0.0231	0.0225	0.0170	0.0170	0.0170	0.0174	0.0700	0.0703	0.0509	0.0520	0.0466	0.0482	0.135	0.135	mg/L	0.0001	-
Silicon (Si)	0.2	<0.1	0.2	0.2	0.5	0.6	0.5	0.5	0.2	0.2	0.4	0.3	0.1	0.1	0.2	<0.1	0.5	0.5	0.5	0.5	mg/L	0.1	-
Tin (Sn)	0.0024	<0.0001	0.0046	0.0003	0.0039	0.0118	0.0045	0.0001	0.0003	0.0019	0.0001	0.0014	0.0011	0.0054	0.0031	0.0012	0.0031	<0.0001	<0.0001	<0.0001	mg/L	0.0001	-
Uranium (U)	<0.00005	<0.00005	0.00007	0.00007	0.00010	0.00009	0.00008	0.00008	0.00005	0.00005	<0.00005	<0.00005	0.00008	0.00007	0.00007	0.00008	0.00007	0.00006	0.00074	0.00073	mg/L	0.00005	-
Vanadium (V)	<0.00005	<0.00005	0.00009	0.00009	0.00005	0.00005	<0.00005	<0.00005	0.00006	0.00006	0.00006	0.00005	0.00028	0.00028	0.00014	0.00018	0.00012	0.00013	0.00029	0.00029	mg/L	0.00005	-
Zinc (Zn)	<0.0008	0.0014	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	0.0036	0.0010	0.0018	0.0133	<0.0008	<0.0008	0.0032	0.0031	mg/L	0.0008	0.03
Dissolved Ultra-Low Level Metals[e]																							
Silver (Ag)	<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	mg/L	0.0001	0.0001
Aluminum (Al)	0.0033	<0.0001	0.0286	0.0281	0.0083	-	0.0085	0.0082	0.0166	0.0165	0.0128	0.0137	0.0253	0.0238	0.0146	0.0137	0.0193	0.0201	0.0405	0.0405	mg/L	0.0003	0.005 @pH <6.5, Ca <4, DOC<2 0.1@ pH >6.5, Ca >4, DOC>2
Arsenic (As)	<0.00003	<0.0001	0.00060	0.00059	0.00059	-	0.00045	0.00044	0.00038	0.00038	0.00031	0.00035	0.00151	0.00143	0.00088	0.00087	0.00072	0.00073	0.00795	0.00783	mg/L	0.00003	0.005
Boron (B)	<0.001	<0.0001	0.007	0.007	0.007	-	0.008	0.007	0.006	0.005	0.005	0.005	0.019	0.017	0.014	0.013	0.013	0.013	0.036	0.036	mg/L	0.001	-
Barium (Ba)	<0.00005	<0.0001	0.00620	0.00627	0.00373	-	0.00385	0.00374	0.00281	0.00279	0.00264	0.00283	0.0152	0.0145	0.00975	0.00968	0.0102	0.0103	0.0240	0.0234	mg/L	0.00005	-
Beryllium (Be)	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	-	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002	-
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	-	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003	-
Calcium (Ca)	0.05	<0.02	8.01	8.09	5.26	-	5.27	5.03	4.94	4.96	4.31	4.92	23.5	22.2	15.5	16.3	14.5	14.9	48.2	48.0	mg/L	0.02	-
Cadmium (Cd)	0.00006	<0.00005	0.00044	0.00044	0.00007	-	0.00031	0.00029	0.00054	0.00053	0.00025	0.00027	0.00142	0.00135	0.00023	0.00023	0.00040	0.00041	<0.00005	<0.00005	mg/L	0.00005	10 {0.86{log(hardness)}-3.2}

TABLE 12: ANALYTICAL RESULTS OF TYHEE JULY 2005

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Dup	Nicholas A-1	Nicholas A-1 Dup	Nicholas A-2	Nicholas A-2 Dup	Eclipse A-1	Eclipse A-1 Dup	Eclipse A-2	Eclipse A-2 Dup	Round A-1	Round A-1 Dup	Narrow A-1	Narrow A-1 Dup	Narrow A-2	Narrow A-2 Dup	Winter A-1	Winter A1-Dup	UNITS	Detection Limits	Guideline[a]
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	0.0013	0.0013	mg/L	0.0001	-
Chromium (Cr)	<0.00006	<0.00006	0.00035	0.00034	0.00025	-	0.00015	0.00011	0.00017	0.00018	0.00015	0.00017	0.00014	0.00026	0.00017	0.00023	0.00027	0.00026	0.00018	0.00018	mg/L	0.00006	Cr (VI) = 0.001 Cr (III) = 0.0089
Copper (Cu)	<0.0006	<0.0006	0.0016	0.0016	0.0013	-	0.0031	0.0030	0.0012	0.0012	0.0009	0.0010	0.0025	0.0024	0.0028	0.0027	0.0015	0.0015	0.0038	0.0038	mg/L	0.0006	0.002 @ 0-120 $CaCO^3$ 0.003 @ 120-180 $CaCO^3$ 0.004 @ >180 $CaCO^3$
Iron (Fe)	<0.005	<0.005	0.017	0.016	<0.005	-	<0.005	0.011	<0.005	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	<0.005	0.007	0.008	0.030	0.065	mg/L	0.005	0.3
Lithium (Li)	<0.0001	<0.0001	0.0022	0.0022	0.002	-	0.0019	0.0019	0.0015	0.0015	0.0014	0.0015	0.0022	0.0022	0.0018	0.0018	0.0016	0.0017	0.0035	0.0034	mg/L	0.0001	-
Mercury (Hg)	<0.00002	<0.00002	0.00005	0.00005	<0.00002	-	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	0.00005	0.00004	0.00003	0.00003	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002	0.000004 methylmercury[b] 0.000026 Inorganic mercury
Potassium (K)	<0.02	<0.02	1.16	1.16	1.13	-	1.10	1.02	0.93	0.94	0.85	0.94	3.37	3.17	2.36	2.34	2.25	2.33	5.52	5.50	mg/L	0.02	-
Magnesium (Mg)	<0.004	<0.004	2.76	2.74	2.29	-	2.25	2.16	2.16	2.18	1.98	2.15	7.77	7.32	5.13	5.54	4.71	4.88	19.7	19.7	mg/L	0.004	-
Manganese (Mn)	<0.0001	<0.0001	0.0016	0.0016	0.0004	-	0.0001	0.0001	0.0001	0.0001	0.0003	0.0004	0.0006	0.0006	0.0013	0.0013	0.0036	0.0037	0.0712	0.0700	mg/L	0.0001	-
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	0.00008	-	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.00018	0.00021	mg/L	0.00006	0.073
Sodium (Na)	0.175	<0.005	1.99	1.97	2.38	-	2.30	2.18	1.58	1.56	1.41	1.52	5.74	5.38	4.16	4.43	3.83	3.94	10.9	10.9	mg/L	0.005	-
Nickel (Ni)	0.00009	<0.00006	0.00171	0.00173	0.00080	-	0.00089	0.00085	0.00097	0.00094	0.00087	0.00093	0.00379	0.00357	0.00276	0.00269	0.00257	0.00264	0.0163	0.0163	mg/L	0.00006	0.025 @ 0-60 $CaCO_3$ 0.065 @ 60-120 $CaCO_3$ 0.11 @ 120-180 $CaCO_3$ 0.15 @ >180 $CaCO_3$
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	-	0.00006	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	<0.00005	mg/L	0.00005	0.001 @ 0-60 $CaCO_3$ 0.002 @ 60-120 $CaCO_3$ 0.004 @ 120-180 $CaCO_3$
Antimony (Sb)	0.00017	0.00036	0.00013	0.00014	0.00015	-	0.00017	0.00022	0.00020	0.00016	0.00020	0.00015	0.00021	0.00022	0.00012	0.00031	0.00024	0.00032	0.00020	0.00022	mg/L	0.00003	-
Selenium (Se)	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	0.0003	0.0002	0.0001	0.0002	0.0002	0.0001	0.0001	mg/L	0.0001	0.001
Strontium (Sr)	<0.0001	<0.0001	0.0279	0.0279	0.0238	-	0.0234	0.0225	0.0174	0.0173	0.0159	0.0172	0.0706	0.0665	0.0490	0.0482	0.0462	0.0471	0.134	0.130	mg/L	0.0001	-
Silicon (Si)	0.2	<0.1	0.1	0.2	0.5	-	0.6	0.6	0.2	0.2	0.3	0.4	0.1	0.1	0.1	0.1	0.6	0.5	0.5	0.5	mg/L	0.1	-
Tin (Sn)	0.0022	<0.0001	0.0154	0.0156	0.0023	-	0.0108	0.0104	0.0192	0.0189	0.0089	0.0093	0.0480	0.0460	0.0082	0.0082	0.0143	0.0145	<0.0001	<0.0001	mg/L	0.0001	-
Uranium (U)	<0.00005	<0.00005	0.00007	0.00007	0.00008	-	0.00007	0.00007	<0.00005	<0.00005	<0.00005	<0.00005	0.00008	0.00007	0.00007	0.00007	0.00006	0.00006	0.00069	0.00072	mg/L	0.00005	-
Vanadium (V)	<0.00005	<0.00005	0.00009	0.00009	<0.00005	-	<0.00005	<0.00005	0.00007	0.00006	<0.00005	<0.00005	0.00028	0.00027	0.00011	0.00012	0.00011	0.00012	0.00021	0.00021	mg/L	0.00005	-
Zinc (Zn)	0.0016	0.0010	0.0017	0.0017	<0.0008	-	0.0019	0.0021	0.0017	0.0017	0.0016	0.0019	0.0034	0.0020	0.0020	0.0016	0.0021	0.0022	0.0055	0.0054	mg/L	0.0008	0.03

Notes:

Results are expressed in milligrams per litre (mg/L) unless otherwise indicated.

[a]Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the Protection of Freshwater Aquatic Life, 2003

[b]Indicates the applicable standard is lower than the detection limit.

[c]Guideline for nitrite [0.06mg/L(NO_2)] has been converted by a factor of 1/4.43 to reflect the results expressed as mg/L(N).

[d]Ammonia guideline pH and temperature dependent. Guideline quoted is minimum value [0.019mg/L(NH4)] converted by a factor of 1/4.43 to reflect the results expressed as mg/L(N).

[e]No Guidelines for dissolved metals exist. Total metals guidelines are cited for comparison purposes.

"-" Indicates no analysis conducted or no applicable standard available.

"<" Indicates less than the detection limit.

Indicates parameter exceeds Canadian Environmental Quality Guidelines

TABLE 13: ANALYTICAL RESULTS OF TYHEE AUGUST 2005

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Dup	Nicholas A-1	Nicholas A-1 Dup	Nicholas A-2	Nicholas A-2 Dup	Eclipse A-1	Eclipse A-1 Dup	Eclipse A-2	Eclipse A-2 Dup	Narrow A-1	Narrow A-1 Dup	Narrow A-2	Narrow A-2 Dup	Winter A-1	Winter A-1 Dup	Round A-1	Round A-1 Dup	UNITS	**Detection Limits**	Guideline[a]
Major Ions, Nutrients and Inorganics																							
Chloride (Cl)	<1	<1	2	2	2	2	2	2	2	1	1	1	3	3	3	3	2	2	3	3	mg/L	1	-
Fluoride (F)	<0.05	<0.05	0.07	0.07	0.08	0.08	0.08	0.08	0.06	0.06	0.05	0.05	0.08	0.08	0.08	0.08	0.10	0.10	0.13	0.13	mg/L	0.05	-
Calcium (Ca)	<0.5	<0.5	9.2	9.3	5.1	5.3	5.1	5.2	5.1	5.0	5.0	4.9	17.6	17.7	17.7	17.7	26.3	26.3	60.0	59.6	mg/L	0.5	-
Potassium (K)	<0.1	<0.1	1.7	1.3	1.1	1.4	1.2	1.1	1.2	1.0	0.8	1.1	2.6	2.4	2.7	2.5	3.7	3.8	6.9	7.1	mg/L	0.1	-
Magnesium (Mg)	0.2	<0.1	3.0	3.1	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	5.5	5.5	5.5	5.5	8.4	8.3	25.0	24.3	mg/L	0.1	-
Sodium (Na)	<1	<1	3	3	3	3	2	3	2	2	2	2	5	5	5	5	7	7	15	15	mg/L	1	-
Ion Balance	Low TDS	Low TDS	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	Low EC	102	102	103	102	104	104	109	105	mg/L	-	-
TDS (Calculated)	<1	<1	46	47	35	41	33	34	33	30	31	30	91	90	91	90	138	138	347	351	mg/L	-	-
Hardness (as CaCO3)	<1	<1	35	36	22	23	22	22	22	22	22	22	67	67	67	67	100	100	253	249	mg/L	-	-
Iron-Extractable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	mg/L	0.005	-
Manganese-Extractable	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	mg/L	0.001	
Nitrate+Nitrite-N	<0.006	<0.006	<0.006	0.017	0.161	3.42	0.030	0.030	0.008	0.034	0.063	0.061	0.013	<0.006	<0.006	0.015	0.025	0.026	<0.006	<0.006	mg/L	0.006	-
Nitrate-N	<0.006	<0.006	<0.006	0.017	0.161	3.42	0.030	0.030	0.008	0.034	0.063	0.061	0.013	<0.006	<0.006	0.015	0.025	0.026	<0.006	<0.006	mg/L	0.006	13
Nitrite-N	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/L	0.002	0.018[c]
Sulfate (SO4)	<0.05	<0.05	7.01	6.97	7.42	7.37	7.41	7.47	6.75	6.82	6.76	6.75	31.2	31.0	30.9	30.9	60.2	60.1	205	210	mg/L	0.05	-
pH	9.3	6.9	6.8	6.8	6.7	6.2	6.5	6.5	6.6	6.6	6.5	6.5	6.9	6.9	6.9	6.8	7.0	7.1	7.1	7.1	mg/L	0.1	6.5-9
Conductivity (EC)	1.6	0.9	83.7	83.4	63.8	70.4	63.5	63.0	56.6	56.5	56.3	56.5	168	168	168	169	248	249	568	569	mg/L	0.2	-
Bicarbonate (HCO3)	<5	<5	41	42	28	9	27	26	27	25	26	24	52	52	52	52	61	61	65	65	mg/L	5	-
Carbonate (CO3)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L	5	-
Hydroxide (OH)	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/L	5	-
Alkalinity, Total (as CaCO3)	<5	<5	34	35	23	7	22	21	22	20	21	20	43	43	43	42	50	50	53	54	mg/L	5	-
Ammonia-N	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	0.006	<0.005	<0.005	<0.005	<0.005	0.020	0.008	0.050	0.048	mg/L	0.005	0.015[d]
Cyanide-CN	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/L	0.002	0.005
Phosphorus, Total	0.001	<0.001	0.010	0.010	0.005	0.005	0.008	0.008	0.004	0.005	0.005	0.005	0.012	0.009	0.009	0.010	0.014	0.015	0.014	0.013	mg/L	0.001	-
Total Organic Carbon	0.5	<0.5	14.0	13.8	6.3	6.1	5.9	5.8	6.5	6.5	5.9	5.8	15.1	14.8	14.7	14.7	17.4	19.6	17.0	15.7	mg/L	0.2	-
Dissolved Organic Carbon	<0.5	<0.5	12.8	12.9	10.8	8.2	9.9	10.0	11.1	5.8	5.5	5.5	13.2	13.4	13.4	13.3	16.8	16.7	15.9	16.9	mg/L	0.5	-
Total Suspended Solids	<3	<3	<3	<3	<3	<3	<3	3	<3	<3	<3	<3	<3	<3	<3	<3	<3	3	<3	<3	mg/L	3	-
Turbidity	<0.1	<0.1	0.55	0.55	0.35	0.35	0.45	0.45	0.30	0.30	0.20	0.25	0.75	0.80	0.80	0.80	1.5	1.5	0.60	0.60	mg/L	0.1	-
Redox Potential	160	166	213	212	189	204	187	212	200	198	213	216	197	183	184	191	186	185	192	194	mg/L	1	-
Total Ultra-Low Level Metals																							
Silver (Ag)	<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	mg/L	0.0001	0.0001
Aluminum (Al)	0.0026	<0.0003	0.0293	0.0299	0.0112	0.0110	0.0102	0.0099	0.0164	0.0167	0.0154	0.0153	0.0168	0.0173	0.0191	0.0179	0.0246	0.0248	0.0165	0.0180	mg/L	0.0003	0.005 @pH <6.5, Ca <4, DOC<2 0.1@ pH >6.5, Ca >4, DOC>2
Arsenic (As)	<0.00003	<0.00003	0.00070	0.00069	0.00055	0.00054	0.00042	0.00040	0.00037	0.00036	0.00030	0.00033	0.00102	0.00102	0.00105	0.00102	0.00176	0.00174	0.00602	0.00637	mg/L	0.00003	0.005
Boron (B)	<0.001	<0.001	0.008	0.008	0.008	0.008	0.008	0.007	0.005	0.006	0.005	0.006	0.015	0.015	0.015	0.015	0.021	0.022	0.045	0.046	mg/L	0.001	-
Barium (Ba)	0.00008	<0.00005	0.00681	0.00688	0.00353	0.00344	0.00370	0.00369	0.00269	0.00272	0.00250	0.00279	0.0109	0.0109	0.0112	0.0112	0.0171	0.0171	0.0254	0.0269	mg/L	0.00005	-
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002	-
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003	-
Calcium (Ca)	0.03	<0.02	9.16	9.26	4.58	4.56	4.55	4.45	4.37	4.34	4.01	4.37	17.0	17.4	17.6	17.3	25.6	26.0	54.6	57.0	mg/L	0.02	-
Cadmium (Cd)	0.00008	<0.00005	0.00005	0.00012	<0.00005	<0.00005	0.00006	0.00026	0.00006	0.00020	<0.00005	<0.00005	0.00009	<0.00005	<0.00005	0.00014	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005	10 {0.86{log(hardness)}-3.2}
Cobalt (Co)	<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	0.0002	0.0002	0.0002	0.0003	0.0003	0.0015	0.0017	mg/L	0.0001	-

TABLE 13: ANALYTICAL RESULTS OF TYHEE AUGUST 2005

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Dup	Nicholas A-1	Nicholas A-1 Dup	Nicholas A-2	Nicholas A-2 Dup	Eclipse A-1	Eclipse A-1 Dup	Eclipse A-2	Eclipse A-2 Dup	Narrow A-1	Narrow A-1 Dup	Narrow A-2	Narrow A-2 Dup	Winter A-1	Winter A-1 Dup	Round A-1	Round A-1 Dup	UNITS	**Detection Limits**	Guideline[a]
Chromium (Cr)	<0.00006	<0.00006	0.00022	0.00024	0.00010	0.00008	0.00010	0.00009	0.00010	0.00011	0.00010	0.00011	0.00024	0.00025	0.00024	0.00027	0.00017	0.00018	0.00017	0.00023	mg/L	0.00006	Cr (VI) = 0.001 Cr (III) = 0.0089
Copper (Cu)	<0.0006	<0.0006	0.0009	0.0012	0.0183	<0.0006	0.0010	<0.0006	0.0007	0.0015	0.0008	0.0007	0.0037	0.0015	0.0015	0.0016	0.0018	0.0017	0.0041	0.0043	mg/L	0.0006	0.002 @ 0-120 $CaCO^3$ 0.003 @ 120-180 $CaCO^3$ 0.004 @ >180 $CaCO^3$
Iron (Fe)	<0.005	<0.005	0.026	0.025	0.012	0.009	0.013	0.010	0.008	0.009	0.011	0.011	0.016	0.015	0.021	0.018	0.026	0.031	0.072	0.071	mg/L	0.005	0.3
Lithium (Li)	<0.0001	<0.0001	0.0022	0.0023	0.0018	0.0018	0.0018	0.0017	0.0015	0.0015	0.0012	0.0014	0.0017	0.0017	0.0018	0.0017	0.0023	0.0024	0.0038	0.0038	mg/L	0.0001	-
Mercury (Hg)	<0.00002	<0.00002	<0.00002	<0.00002	0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002	0.000004 methylmercury[b] 0.000026 Inorganic mercury
Potassium (K)	<0.02	<0.02	1.29	1.31	1.05	1.04	1.07	1.01	0.92	0.93	0.84	0.89	2.57	2.61	2.68	2.67	3.84	3.90	6.52	6.25	mg/L	0.02	-
Magnesium (Mg)	<0.004	<0.004	3.22	3.28	2.15	2.13	2.14	2.04	2.10	2.11	1.87	2.07	5.96	5.98	6.05	6.02	8.85	9.10	23.2	24.6	mg/L	0.004	-
Manganese (Mn)	<0.0001	<0.0001	0.0138	0.0138	0.0013	0.0013	0.0015	0.0015	0.0009	0.0009	0.0013	0.0014	0.0276	0.0279	0.0298	0.0299	0.0499	0.0502	0.0280	0.0303	mg/L	0.0001	-
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.00013	0.00014	mg/L	0.00006	0.073
Sodium (Na)	0.180	<0.005	2.27	2.32	2.19	2.13	2.17	2.08	1.53	1.53	1.36	1.48	4.67	4.70	4.90	4.86	6.68	6.77	13.5	14.1	mg/L	0.005	-
Nickel (Ni)	<0.00006	<0.00006	0.00205	0.00217	0.00089	0.00076	0.00090	0.00077	0.00089	0.00094	0.00079	0.00085	0.00350	0.00355	0.00366	0.00365	0.00492	0.00498	0.0273	0.0293	mg/L	0.00006	0.025 @ 0-60 $CaCO_3$ 0.065 @ 60-120 $CaCO_3$ 0.11 @ 120-180 $CaCO_3$ 0.15 @ >180 $CaCO_3$
Lead (Pb)	<0.00005	<0.00005	<0.00005	0.00011	0.00005	<0.00005	0.00008	<0.00005	0.00025	0.00043	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00007	0.00007	0.00023	0.00025	mg/L	0.00005	0.001 @ 0-60 $CaCO_3$ 0.002 @ 60-120 $CaCO_3$ 0.004 @ 120-180 $CaCO_3$
Antimony (Sb)	0.00011	0.00009	0.00016	0.00010	0.00006	0.00010	0.00005	0.00016	0.00006	0.00010	0.00007	0.00012	0.00010	0.00009	0.00015	0.00009	0.00018	0.00009	0.00013	0.00020	mg/L	0.00003	-
Selenium (Se)	<0.0001	<0.0001	0.0002	0.0002	<0.0001	0.0001	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0006	0.0005	mg/L	0.0001	0.001
Strontium (Sr)	<0.0001	<0.0001	0.0307	0.0310	0.0221	0.0223	0.0220	0.0215	0.0164	0.0167	0.0145	0.0161	0.0539	0.0544	0.0561	0.0564	0.0766	0.0776	0.152	0.160	mg/L	0.0001	-
Silicon (Si)	0.1	<0.1	0.1	0.1	0.5	0.5	0.5	0.5	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	<0.1	<0.1	<0.1	<0.1	mg/L	0.1	-
Tin (Sn)	0.0028	<0.0001	0.0014	0.0027	0.0012	0.0003	0.0016	0.0089	0.0018	0.0068	0.0004	<0.0001	0.0026	0.0004	0.0003	0.0042	0.0009	0.0001	<0.0001	<0.0001	mg/L	0.0001	-
Uranium (U)	<0.00005	<0.00005	0.00009	0.00009	0.00009	0.00009	0.00008	0.00007	0.00005	0.00005	<0.00005	<0.00005	0.00009	0.00009	0.00009	0.00009	0.00008	0.00008	0.00039	0.00042	mg/L	0.00005	-
Vanadium (V)	<0.00005	<0.00005	0.00009	0.00009	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	0.00005	<0.00005	<0.00005	0.00015	0.00015	0.00015	0.00015	0.00027	0.00028	0.00023	0.00024	mg/L	0.00005	-
Zinc (Zn)	<0.0008	0.0010	0.0009	0.0014	<0.0008	<0.0008	0.0017	<0.0008	<0.0008	0.0009	<0.0008	<0.0008	0.0016	0.0010	<0.0008	<0.0008	0.0010	0.0010	0.0067	0.0071	mg/L	0.0008	0.03
Dissolved Ultra-Low Level Metals[e]																							
Silver (Ag)	<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	0.006	<0.0001	<0.0001	<0.0001	mg/L	0.0001	0.0001
Aluminum (Al)	0.0028	0.0003	0.0242	0.0242	0.0094	0.0091	0.0075	0.0076	0.0140	0.0149	0.0112	0.0164	0.0110	0.0112	0.0119	0.0116	<0.0001	0.0188	0.0121	0.0133	mg/L	0.0003	0.005 @pH <6.5, Ca <4, DOC<2 0.1@ pH >6.5, Ca >4, DOC>2
Arsenic (As)	<0.00003	<0.00003	0.00068	0.00067	0.00054	0.00054	0.00039	0.00040	0.00037	0.00037	0.00029	0.00040	0.00099	0.00099	0.00104	0.00104	0.0194	0.00169	0.00554	0.0057	mg/L	0.00003	0.005
Boron (B)	<0.001	<0.001	0.008	0.008	0.008	0.007	0.008	0.007	0.005	0.006	0.005	0.007	0.015	0.015	0.016	0.016	0.00171	0.022	0.048	0.049	mg/L	0.001	-
Barium (Ba)	0.00006	<0.00005	0.00663	0.00668	0.00334	0.00336	0.00349	0.00348	0.00258	0.00262	0.00238	0.00317	0.0105	0.0106	0.0111	0.0112	0.022	0.0169	0.0260	0.0275	mg/L	0.00005	-
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0168	<0.0002	<0.0002	<0.0002	mg/L	0.0002	-
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.00003	<0.0002	<0.00003	<0.00003	<0.00003	mg/L	0.00003	-
Calcium (Ca)	0.05	<0.02	9.28	9.03	4.45	4.44	4.42	4.53	4.33	4.41	3.91	5.24	16.9	17.0	17.9	17.6	26.3	26.0	56.2	58.3	mg/L	0.02	-
Cadmium (Cd)	0.00007	<0.00005	0.00021	0.00020	<0.00005	<0.00005	0.00012	0.00014	0.00109	0.00110	0.00012	0.00016	0.00010	0.00011	0.00049	0.00049	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005	$10^{\{0.86\{\log(\text{hardness})\}-3.2\}}$
Cobalt (Co)	<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	<0.00005	0.0002	0.0014	0.0015	mg/L	0.0001	-
Chromium (Cr)	0.00006	<0.00006	0.00023	0.00025	0.00011	0.00011	0.00010	0.00012	0.00012	0.00012	0.00011	0.00017	0.00022	0.00021	0.00027	0.00026	0.0002	0.00021	0.00027	0.00022	mg/L	0.00006	Cr (VI) = 0.001 Cr (III) = 0.0089

TABLE 13: ANALYTICAL RESULTS OF TYHEE AUGUST 2005

Analyte	Field Blank	Trip Blank	Brien A-1	Brien A-1 Dup	Nicholas A-1	Nicholas A-1 Dup	Nicholas A-2	Nicholas A-2 Dup	Eclipse A-1	Eclipse A-1 Dup	Eclipse A-2	Eclipse A-2 Dup	Narrow A-1	Narrow A-1 Dup	Narrow A-2	Narrow A-2 Dup	Winter A-1	Winter A-1 Dup	Round A-1	Round A-1 Dup	UNITS	**Detection Limits**	Guideline[a]
Copper (Cu)	<0.0006	<0.0006	0.0013	0.0013	0.0228	0.0228	0.0017	0.0018	0.0027	0.0031	0.0008	0.0012	0.0029	0.0029	0.0021	0.0021	0.00019	0.0019	0.0038	0.0041	mg/L	0.0006	0.002 @ 0-120 $CaCO^3$ 0.003 @ 120-180 $CaCO^3$ 0.004 @ >180 $CaCO^3$
Iron (Fe)	<0.005	0.023	0.013	0.015	0.006	0.006	<0.005	<0.005	0.006	0.014	0.007	<0.005	0.005	<0.005	<0.005	0.005	0.0019	<0.005	0.024	0.022	mg/L	0.005	0.3
Lithium (Li)	<0.0001	<0.0001	0.0023	0.0023	0.0017	0.0018	0.0017	0.0017	0.0014	0.0015	0.0012	0.0015	0.0017	0.0017	0.0018	0.0018	0.0023	0.0024	0.0039	0.0038	mg/L	0.0001	-
Mercury (Hg)	<0.00002	<0.00002	<0.00002	<0.00002	0.00005	0.00004	<0.00002	<0.00002	0.00003	0.00003	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002	0.000004 methylmercury[b] 0.000026 Inorganic mercury
Potassium (K)	<0.02	<0.02	1.30	1.26	1.00	1.00	0.99	1.02	0.89	0.92	0.80	1.02	2.52	2.54	2.72	2.73	3.93	3.77	6.67	6.24	mg/L	0.02	-
Magnesium (Mg)	<0.004	<0.004	3.29	3.21	2.09	2.11	2.07	2.09	2.03	2.11	1.82	2.52	5.84	5.94	6.12	6.14	9.01	9.15	24.0	25.1	mg/L	0.004	-
Manganese (Mn)	0.0001	<0.0001	0.0009	0.0009	0.0002	0.0002	0.0001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0006	0.0005	0.0005	0.0005	0.0005	0.0210	0.0217	mg/L	0.0001	-
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	<0.00006	0.00011	0.00014	mg/L	0.00006	0.073
Sodium (Na)	0.195	<0.005	2.37	2.26	2.12	2.15	2.10	2.14	1.49	1.53	1.32	1.74	4.62	4.71	5.09	5.03	6.90	6.83	14.1	14.7	mg/L	0.005	-
Nickel (Ni)	0.00008	<0.00006	0.00217	0.00217	0.00104	0.00105	0.00084	0.00087	0.00096	0.00120	0.00080	0.00133	0.00339	0.00348	0.00369	0.00372	0.00492	0.00485	0.0276	0.0292	mg/L	0.00006	0.025 @ 0-60 $CaCO_3$ 0.065 @ 60-120 $CaCO_3$ 0.11 @ 120-180 $CaCO_3$ 0.15 @ >180 $CaCO_3$
Lead (Pb)	<0.00005	<0.00005	0.00008	0.00009	0.00013	0.00013	<0.00005	<0.00005	0.00005	0.00008	0.00008	0.00011	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00007	0.00007	mg/L	0.00005	0.001 @ 0-60 $CaCO_3$ 0.002 @ 60-120 $CaCO_3$ 0.004 @ 120-180 $CaCO_3$
Antimony (Sb)	<0.00003	0.00007	0.00016	0.00012	0.00005	0.00005	0.00008	0.00015	0.00008	0.00006	0.00006	0.00011	0.00010	0.00008	0.00010	0.00010	0.00011	0.00009	0.00017	0.00020	mg/L	0.00003	-
Selenium (Se)	<0.0001	<0.0001	0.0001	0.0002	<0.0001	0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0006	0.0006	mg/L	0.0001	0.001
Strontium (Sr)	0.0001	<0.0001	0.0312	0.0310	0.0216	0.0219	0.0217	0.0216	0.0160	0.0163	0.0142	0.0192	0.0528	0.0535	0.0568	0.0569	0.0789	0.0781	0.156	0.163	mg/L	0.0001	-
Silicon (Si)	0.1	<0.1	0.1	0.1	0.5	0.5	0.5	0.5	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	<0.1	<0.1	<0.1	mg/L	0.1	-
Tin (Sn)	0.0025	<0.0001	0.0059	0.0059	0.0015	0.0015	0.0042	0.0042	0.0388	0.0399	0.0044	0.0049	0.0032	0.0033	0.0158	0.0158	0.0014	0.0014	<0.0001	<0.0001	mg/L	0.0001	-
Uranium (U)	<0.00005	<0.00005	0.00008	0.00008	0.00008	0.00008	0.00006	0.00006	<0.00005	<0.00005	<0.00005	<0.00005	0.00008	0.00008	0.00008	0.00008	0.00008	0.00007	0.00037	0.00040	mg/L	0.00005	-
Vanadium (V)	<0.00005	<0.00005	0.00009	0.00009	<0.00005	<0.00005	<0.00005	<0.00005	0.00005	0.00005	<0.00005	0.00005	0.00013	0.00013	0.00014	0.00014	0.00022	0.00022	0.00020	0.00020	mg/L	0.00005	-
Zinc (Zn)	0.0016	<0.0008	0.0025	0.0026	0.0022	0.0022	0.0017	0.0024	0.0020	0.0033	0.0017	0.0028	0.0021	0.0022	0.0021	0.0020	0.0024	0.0023	0.0071	0.0073	mg/L	0.0008	0.03

Notes:

Results are expressed in milligrams per litre (mg/L) unless otherwise indicated.

[a]Canadian Council of Ministers of the Environment (CCME) Canadian Environmental Quality Guidelines for the Protection of Freshwater Aquatic Life, 2003

[b]Indicates the applicable standard is lower than the detection limit.

[c]Guideline for nitrite [0.06mg/L(NO_2)] has been converted by a factor of 1/4.43 to reflect the results expressed as mg/L(N).

[d]Ammonia guideline pH and temperature dependent. Guideline quoted is minimum value [0.019mg/L(NH4)] converted by a factor of 1/4.43 to reflect the results expressed as mg/L(N).

[e]No Guidelines for dissolved metals exist. Total metals guidelines are cited for comparison purposes.

"-" Indicates no analysis conducted or no applicable standard available.

"<" Indicates less than the detection limit.

Indicates parameter exceeds Canadian Environmental Quality Guidelines

6.2.1 Physical Parameters

6.2.1.1 pH

The pH results for the six lakes (Nicholas, Eclipse, Brien, Narrow, Winter, and Round lakes) sampled in 2005 are presented in Table 14. pH values ranged from neutral to slightly basic. These results are comparable to the pH values observed in these lakes in 2004 and in the general region as reported by NSMA and Gartner Lee (2002).

TABLE 14: AVERAGE PH

Lake	pH Range
Nicholas	6.9 to 7.6
Eclipse	6.9 to 7.4
Brien	6.6 to 7.4
Narrow	6.7 to 7.4
Winter	7.0 to 7.6
Round	7.1 to 8.1

6.2.1.2 Turbidity

Consistent with the results reported during the 2004 sampling program, the average turbidity levels measured were lowest at Eclipse Lake during the 2005 sampling program and highest at Round Lake.

Eclipse Lake exhibited the lowest average turbidity for all lakes sampled (0.27 NTU). Turbidity values at Brien Lake and Nicholas Lake were very similar, with turbidity values averaging 0.46, and 0.42 NTUs, respectively. In comparison, the average turbidity values at Narrow, Winter, and Round Lakes were higher at 0.70, 1.35, and 3.6 NTUs, respectively. Turbidity values were generally the lowest in April, with the exception of Winter Lake, which had its highest value (10.0 NTU) in April and its lowest (1.60 NTU) in August. The turbidity results for Round Lake exhibited the highest seasonal variations.

Table 15 presents the average turbidity values recorded for the six lakes.

TABLE 15: AVERAGE TURBIDITY (NTU) FOR ALL SAMPLING DATES AND LOCATIONS (DL< 3NTU)

Sampling Event	Brien Lake Average	Nicholas Lake Average	Eclipse Lake Average	Round Lake Average	Narrow Lake Average	Winter Lake Average
April	0.23	0.43	0.13	10.0	0.29	1.10
June	0.58	0.43	0.36	2.70	0.89	1.15
July	0.50	0.43	0.34	1.20	0.84	1.65
August	0.55	0.40	0.26	0.60	0.79	1.50

6.2.1.3 Ammonia

The average ammonia concentrations measured during the 2005 sampling program were below the CCME FAL Guidelines (0.015 mg/L) for all six lakes, with the exception of Round Lake in April.

Consistent with the 2004 sampling program results, the larger and deeper lakes (Nicholas and Eclipse) measured little or no ammonia for all sampling events. Brien Lake, a smaller, shallower water body with more nearshore and emergent vegetation, was observed to have trace ammonia concentrations well below CCME FAL Guidelines. Ammonia concentrations at Narrow Lake ranged from less than detection limit to 0.012 mg/L. The highest ammonia concentration at Narrow Lake (0.012 mg/L), was recorded during the July sampling event. At Winter Lake, ammonia concentrations ranged from 0.014 mg/L to 0.593 mg/L. Ammonia concentrations at Round Lake ranged from below the detection limit in June to 3.8 mg/L in April. The latter value exceeded the minimum CCME FAL Guideline value of 0.256 mg/L for ammonia at a pH of 8.0. Ammonia exceedances were also recorded in Round Lake during the 2004 sampling program.

Ammonification is the process leading to the production of ammonia from organic nitrogenous compounds resulting from the decomposition of dead material and the metabolism in living organisms (Cole 1983). The most likely cause of the elevated level of ammonia observed in water samples from Round Lake is the ammonification of large quantities of coprorel or "loon ooze" on the bottom of the lake. Coproprel is a term used to describe a mixture of humus material, fine plant fragments, algae remains, grains of quartz and mica, diatom frustules, exoskeleton fragments from aquatic arthropods, and spore and pollen relics (Cole 1983).

The average ammonia concentrations measured at the six lakes are presented in Table 16.

TABLE 16: AVERAGE AMMONIA (DL <0.005 MG/L)

Sampling Event	Brien Lake Average	Nicholas Lake Average	Eclipse Lake Average	Round Lake Average	Narrow Lake Average	Winter Lake Average
April	0.007	<0.005	<0.005	3.8	0.008	0.593
June	0.007	<0.005	<0.005	<0.005	<0.005	0.074
July	<0.005	<0.005	<0.005	0.006	0.012	0.014
August	<0.005	<0.005	0.006	0.049	<0.005	0.014

6.2.1.4 Nitrate

Nitrate concentrations recorded for all six study lakes were well below the CCME FAL Guideline criterion of 13 mg/L. The results are summarized in Table 17.

TABLE 17: AVERAGE NITRATE (DL <0.006 MG/L)						
Sampling Event	Brien Lake Average	Nicholas Lake Average	Eclipse Lake Average	Round Lake Average	Narrow Lake Average	Winter Lake Average
April	0.076	0.104	0.076	0.053	0.089	0.111
June	0.011	0.067	0.025	<0.006	<0.006	0.200
July	<0.006	0.142	0.027	0.103	0.034	<0.006
August	0.012	0.910	0.042	<0.006	0.013	0.026

6.2.1.5 Total Phosphorous

The average total phosphorus concentrations measured in 2005 were generally similar for all sampling events, and were generally consistent with results observed during the 2004 water quality sampling program.

The average total phosphorus concentration measured at Brien Lake during 2005 was 0.010 mg/L, with the July sampling event exhibiting the lowest concentration at 0.008 mg/L and April and June sampling events reporting the highest concentrations of 0.011 mg/L. Nicholas Lake phosphorus concentrations ranged from 0.006 mg/L to 0.007 mg/L with an average of 0.006 mg/L. At Eclipse Lake, total phosphorus concentrations ranged from 0.004 mg/L to 0.005 mg/L, with an average of 0.005 mg/L. Round Lake phosphorus concentrations ranged from 0.009 mg/L to 0.011 mg/L, with an average of 0.012 mg/L. Narrow Lake phosphorus concentrations ranged from 0.010 mg/L to 0.014 mg/L with an average of 0.010 mg/L. Winter Lake phosphorus concentrations ranged from 0.011 mg/L to 0.015 mg/L with an average of 0.013 mg/L. The highest average total phosphorus concentration for all six lakes was observed at Winter Lake (0.015 mg/L), followed closely by Round Lake (0.014 mg/L).

Average phosphorous concentrations measured at the six study lakes are presented in Table 18.

TABLE 18: AVERAGE TOTAL PHOSPHOROUS (DL <0.001 MG/L)						
Sampling Event	Brien Lake Average	Nicholas Lake Average	Eclipse Lake Average	Round Lake Average	Narrow Lake Average	Winter Lake Average
April	0.011	0.006	0.004	0.010	0.009	0.012
June	0.011	0.006	0.005	0.014	0.011	0.011
July	0.008	0.006	0.005	0.011	0.011	0.013
August	0.010	0.007	0.005	0.014	0.010	0.015

6.2.1.6 Total Organic Carbon

Table 19 presents the average TOC results for the six lakes sampled during 2005. Consistent with the results of the 2004 water quality sampling program, the lowest TOC

concentrations were at Nicholas and Eclipse lakes (5.7 mg/L and 5.9 mg/L, respectively), followed by Narrow and Brien lakes. The highest TOC concentrations were recorded in Winter and Round lakes (21.7 mg/L and 26.1 mg/L, respectively).

TABLE 19: AVERAGETOTAL ORGANIC CARBON (DL <0.2 MG/L)

Sampling Event	Brien Lake Average	Nicholas Lake Average	Eclipse Lake Average	Round Lake Average	Narrow Lake Average	Winter Lake Average
April	13.4	5.7	5.9	26.1	13.3	21.7
June	14.4	6.0	6.0	17.6	14.43	18.5
July	14.8	7.2	7.0	19.0	15.0	20.0
August	13.9	6.0	6.2	16.4	14.8	18.5

6.2.1.7 Trophic State

Although considerable literature has been produced on the prediction of the trophic state of lakes, it is now generally accepted that the trophic state can generally be predicted based on the concentration of total phosphorus (USEPA 1974) as follows:

- Oligotrophic: <0.010 Total Phosphorus (mg/L);
- Mesotrophic: 0.010 to 0.020 Total Phosphorus (mg/L); and
- Eutrophic: >0.020 Total Phosphorus (mg/L).

As previously discussed by EBA (2005), these levels were generally supported by the work of Vollenweider (1976) and others. Subsequent work by Prepas and Trew (1983) and Ostrofsky and Reigler (1987) confirm that these relationships apply to Precambrian Shield lakes in both northern Alberta and the Yellowknife area of the NWT.

The data presented in Table 20 suggests that Round and Winter Lakes could be classified as Mesotrophic; Narrow Lake is approaching the mesotrophic classification; and Nicholas and Eclipse lakes could be classified as oligotrophic. In 2004, Brien Lake was interpreted to be oligotrophic; however, the 2005 total phosphorus results for Brien Lake are more indicative of a mesotrophic classification.

Although nitrogen (ammonia and nitrate) are not taken into consideration when predicting the trophic states of lakes, McCauley *et al* (1986) concluded that "Variation in total nitrogen (TN) concentration in oligotrophic systems has little, if any, consequence to algal biomass. In hypertrophic conditions (TP >1,000 mg/L), lake management by phosphorus effluent abatement would have little or no effect on chlorophyll concentrations, whereas changes in nitrogen loading might bring about an order of magnitude variation in algal biomass." It is therefore, critical to monitor nitrogen changes in Round and Winter Lakes to ensure the control of eutrophic swings.

TOC can be taken as an indication of biological production in the water of the lakes over the sampling period if; however, is not directly comparable to chlorophyll *a*.

6.2.2 Major Ions

Major ions include the anions calcium (Ca), potassium (K), magnesium (Mg), and sodium (Na), and the cations chloride (Cl), sulfate (SO_4), bicarbonate (HCO_3), carbonate (CO_3). These are the major components of Total Dissolved Solids (TDS) in a water sample. The results for the major ion sampling during the 2005 program are presented in Tables 10 to 13. Brien, Nicholas, Eclipse, and Narrow lakes had low hardness (calcium, magnesium and sodium) and low TDS. This is typical of the Canadian Shield lakes in the NWT.

Round Lake recorded the highest major ion and hardness concentrations for all lakes sampled in 2005. Parameters measured in Round Lake were generally one order of magnitude higher than those measured in Winter and Narrow lakes and two orders of magnitude higher than results for the other three lakes. As discussed in the 2004 water quality report, this anomaly can be attributed to the impact on Round Lake of tailings disposal from the historic Discovery mine. This conclusion is supported by the sulphate concentrations measured in the lake over the sampling period (Table 20).

TABLE 20: AVERAGE SULPHATE CONCENTRATION (DL <0.05 MG/L)

Sampling Event	Brien Lake Average	Nicholas Lake Average	Eclipse Lake Average	Round Lake Average	Narrow Lake Average	Winter Lake Average
April	8.41	7.97	7.20	396.5	32.43	72.40
June	6.87	7.36	6.75	203.0	32.55	55.10
July	7.03	7.54	6.88	59.8	30.5	182
August	6.99	7.41	6.77	207.5	31.0	60.15

6.2.2.1 Conductivity

During the 2005 sampling program, electrical conductivity (EC) values in lake water varied between the six lakes. These variations are presented in Table 21 and illustrated in Figure 7. Conductivity is a measure of the ability of water to conduct electricity and is directly related and often used as a surrogate for TDS.

Conductivity values observed in Eclipse, Nicholas, and Brien lakes in both 2004 and 2005 were comparable to other lakes in the area as reported by NSMA and Gartner Lee (2002). The values for Round and Narrow lakes remain higher than expected for northern shield lakes and suggest that these lakes have experienced anthropogenic influences.

As discussed, in the case of Round Lake, the increased conductivity would most likely be related to the influence of the mill tailings that were deposited in the lake during the operation of the former Discovery mine. It has also been observed that Round Lake is the initial discharge point for water pumped from a former Department of Indian Affairs and

Northern Development (DIAND) clay treatment pit. This water was formerly treated with alum before discharge. Although data were not available on the quality of the pumped water, it may have contributed to the increased conductivity values measured in Round Lake.

The above conclusion also be a reason for the elevated conductivity in Winter and Narrow lakes.

TABLE 21: AVERAGE CONDUCTIVITY (µS/CM) (DL <0.2 MG/L)

Sampling Event	Brien Lake Average	Nicholas Lake Average	Eclipse Lake Average	Round Lake Average	Narrow Lake Average	Winter Lake Average
April	97.7	67.5	58.8	1085.0	178.0	325.0
June	80.4	61.4	55.2	535.0	155.0	226.0
July	80.8	61.4	55.4	234.0	159.3	519.0
August	83.6	65.2	57.5	568.5	168.3	248.5

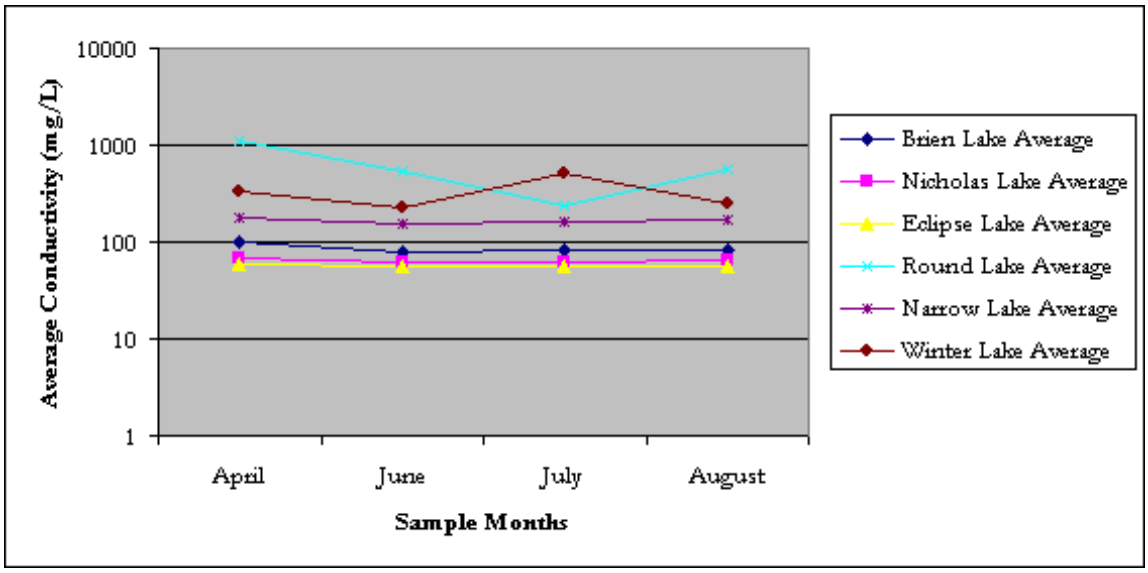

Figure 7: Average Conductivity Values Measured in YGP Lakes – 2005

6.2.3 Metals

Laboratory results of total and dissolved metals at the six lakes ranged from below the detection limit to above the CCME FAL Guideline for aluminum, ammonia, arsenic, copper, iron, nickel, silver, and inorganic mercury.

TABLE 22: SUMMARY OF ANALYTICAL RESULTS OVER THE CCME FAL GUIDELINES

Analyte and Guideline (mg/L)*	Brien				Nicholas				Eclipse				Round				Narrow				Winter			
	April	June	July	August	April	June	July	August	April	June	July	August	April	June	July	August	April	June	July	August	April	June	July	August
Major Ions, Nutrients and Inorganics																								
Iron-Extractable (0.3)	-	-	-	-	A2-0.601	-	-	-	-	-	-	-	A1-0.466 A1Dup-0.511	-	-	-	-	-	-	-	-	-	-	-
Ammonia-N (0.015)**	-	-	-	-	-	-	-	-	-	-	-	-	A1-1.79 A1Dup-2.01	-	-	-	-	-	-	-	-	-	-	-
Total Ultra-Low Level Metals																								
Arsenic (0.005)	-	-	-	-	-	-	-	-	-	-	-	-	A1-0.0267 A1Dup-0.0249	-	-	A1-0.00602A A1Dup-0.00637	-	-	-	-	-	-	-	-
Copper (0.002 to 0.004)	A1-0.0371 A1Dup-0.0265	-	-	-	A1-0.0542 A2Dup-0.0063	A1Dup-0.0027	A1-0.0022 A2Dup-0.0645	A1-0.0183	A1-0.0025 A1Dup-0.0032	-	-	-	-	A1-0.0055 A1Dup-0.0056	-	A1-0.0041 A1Dup-0.0043	A1Dup-0.0027	-	A1-0.0043	A1-0.0037	A1-0.0033	A1Dup-0.0021	A1-0.0045 A1Dup-0.0045	-
Methylmercury (0.000004) Inorganic mercury (0.000026)	A1Dup-0.00004	-	A1-0.00008	-	A2Dup-0.00004	-	A1Dup-0.00008	-	-	-	A1Dup-0.00003	-	A1-0.00007 A1Dup-0.00006	-	A1Dup-0.00006	-	-	-	A1-0.00003	-	-	-	-	-
Nickel (0.025 to 0.15)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A1-0.0273 A1Dup-0.0293		-	-	-	-	-	-	-
Dissolved Ultra-Low Level Metals* **																								
Aluminum (0.005 to 0.1)	-	-	-	-	-	-	-	-	-	-	-	-	-	A1-0.17 A1Dup-0.14	-	-	-	-	-	-	-	-	-	-
Arsenic (0.005)	-	-	-	-	-	-	-	-	-	-	-	-	-	A1-0.0053 A1Dup-0.0054	-	-	-	-	-	-	-	-	-	A1-0.0194
Copper (0.002 to 0.004)	-	-	-	-	A1-0.0667 A2-0.0039 A2Dup-0.0033	A1Dup-0.004	A1-0.0031 A2Dup-0.0030	A1-0.0228 A1Dup-0.0228	A1-0.002	-	-	A1-0.0027 A1Dup-0.0031	-	-	A1-0.0025 A1Dup-0.0024	A1Dup-0.0041	A1-0.0028 A1Dup-0.0025	-	A1-0.0028 A1Dup-0.0027	A1-0.0029 A2-0.0029 A1Dup-0.0021 A2Dup-0.0021	-	-	-	-

TABLE 22: SUMMARY OF ANALYTICAL RESULTS OVER THE CCME FAL GUIDELINES

Analyte and Guideline (mg/L)*	Brien				Nicholas				Eclipse				Round				Narrow				Winter			
	April	June	July	August	April	June	July	August	April	June	July	August	April	June	July	August	April	June	July	August	April	June	July	August
Dissolved Ultra-Low Level Metals***																								
Methylmercury (0.000004) Inorganic mercury (0.000026)	A1-0.00004 A1Dup-0.00008	-	A1-0.00005 A1 Dup-0.00005	-	A1-0.00003 A1 Dup-0.00003	-	-	A1-0.00005 A1Dup-0.00004	-	-	-	A1-0.00003 A1Dup-0.00003	A1-0.00007 A1Dup-0.00006	-	A1-0.00005 A1Dup-0.00004	-	A1-0.00004 A1 Dup-0.00003	-	A1-0.00003 A1 Dup-0.00003	-	-	-	-	-
Nickel (0.025 to 0.15)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A1-0.0276 A1Dup-0.0292	-	-	-	-	-	-	-	-
Silver (0.0001)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	A1-0.00554 A1Dup-0.00570	-	-	-	-	-	-	-	A1-0.006

*CCME FALCanadian Council of Ministers of the Environment – Canadian Water Quality Guidelines for the Protection of Freshwater Aquatic Life (Updated 2003).
** Ammonia guideline pH and temperature dependent. Guideline quoted is minimum value [0.019 mg/L (NH_4)] converted by a factor of 1/4.43 to reflect the results expressed as mg/L(N).
***No Guidelines for dissolved metals exists. Total metals guidelines are cited for comparison purposes.

6.2.3.1 Nicholas and Eclipse Lakes

In 2005, Nicolas Lake had a CCME FAL Guideline exceedance for iron. In the ultra-low level total metals analysis, Nicholas and Eclipse lakes recorded exceedances for copper and potentially inorganic mercury, although, as stated, this cannot be confirmed without further speciation. In the dissolved ultra-low level metals analysis, Nicholas and Eclipse lakes recorded exceedances for copper, and potentially, inorganic mercury. During the 2004 water quality investigation, Nicholas and Eclipse lakes had guideline exceedances for aluminum, copper, and mercury. In addition, Eclipse had an exceedance for cadmium. The results of the Norelco (1990) sampling showed similar results for aluminum but not for the other parameters. It should be noted that the detection limits and the analytical methods for the Norelco (1990) work differed from those used in the current sampling program.

6.2.3.2 Brien, Narrow and Winter Lakes

In2005, the ultra-low level total metals analysis, Brien, Narrow, and Winter lakes recorded CCME FAL Guideline exceedances for copper, and potential exceedances for inorganic mercury. In the dissolved ultra-low level metals analysis, Brien and Narrow lakes recorded potential exceedances for inorganic mercury. Narrow Lake also recorded copper exceedances, and Winter Lake saw arsenic and silver exceedances.

In comparison, the 2004 water quality investigation, all three lakes showed CCME FAL Guideline exceedances for aluminum and copper while Narrow Lake had one exceedance for mercury. The exceedances in Winter and Narrow lakes may be attributable to the drainage from Round Lake. The exceedances in Brien Lake are considered to be due to natural occurrences.

6.2.3.3 Round Lake

In 2005, Round Lake recorded CCME FAL Guideline exceedances for iron and ammonia. In the total ultra-low level metals analysis, Round Lake recorded exceedances for arsenic, copper, nickel, and potentially, inorganic mercury. In the dissolved ultra-low level metals analysis, Round Lake recorded exceedances for aluminum, arsenic, copper, nickel, silver, and potentially, inorganic mercury.

By comparison, in 2004, metal concentrations recorded in Round Lake exceeded CCME Guidelines for aluminum, arsenic, copper, and nickel. Similar results had been previously documented by NSMA and Gartner Lee (2003). Table 23 summarizes this data (note: silver was not analyzed in NSMA and Gartner Lee's study, and guidelines are potentially exceeded for inorganic mercury). These exceedances can be directly attributed to the influence of mine tailings from the Historic Discovery mine that has encroached on the lake. The high aluminum levels documented in the 2004 and 2005 study and by NSMA and Gartner Lee (2003) may also be related to the disposal of water from the former DIAND clay quarry pit. Water pumped from the clay quarry was treated with alum to assist with the flocculation of suspended solids prior to discharge.

TABLE 23: HISTORY OF SELECTED PARAMETERS FOR ROUND LAKE

Parameter	CCME[1]	September 1998	July 22, 1999	October 2000	October 2001	February 2003
Depth	-	Top	Top	top	Top	top
PH	6.5-9.0	7.71	7.80	7.92	8.04	7.84
TSS		4	5	4	7	31
NH3 mg/L	1.37-2.20	0.018	0.036	0.226	2.87	1.23
Al ug/L	5-100	<25.0	49	77	664	400
As ug/L	5	-	5.1	4.2	22.1	22
Be ug/L	-	<0.1	<2	<2	<1	<5
Cd ug/L	0.017	<0.1	<0.3	<0.3	<0.1	<3
Cr ug/L	1-8.9	<2.0	<3	<3	3	<5
Cu ug/L	2-4	4.8	6.0	5	8.2	<10
Hg ug/L	0.1	-	<0.01	<0.01	0.08	0.06
Ni ug/L	25-150	25.9	24	37	50	21
Pb ug/L	1-7	<2.0	1.0	<1	7.1	5
Sb ug/L	-	0.6	0.8	1.3	<0.2	<3
U ug/L	-	0.2	<0.3	0.4	0.65	<1
Zn ug/L	30	13.0	16	21	40	50

1. **CCME Guidelines for the Protection of Freshwater Aquatic Life (1999) can vary with sample pH, temperature, and hardness.**
2. **Shaded cells exceed the CCME, 1999, guideline.**

NSMA and Gartner Lee, 2003.

7.0 CONCLUSION

The results of the 2005 water quality sampling program were generally consistent with the results reported for the 2004 sampling program and can be summarized as follows.

7.1 NICHOLAS LAKE

Nicholas Lake is a large oligotrophic lake with water quality conditions typical for a Canadian Shield lake. The lake typically develops a thermocline in the open water season and has low DO levels near the bottom. The water is soft and is characterized by low major ion concentrations with corresponding low TDS and conductivity. The pH of the water ranges from 6.9 to 7.6. Some metals were found to be in concentrations above the CCME FAL Guideline values, which is typical of many lakes located in near mineralized zones similar to the YGP area.

7.2 ECLIPSE LAKE

Eclipse Lake is located downstream of Nicholas Lake and exhibited similar water quality characteristics. Eclipse Lake is deeper and larger than Nicholas Lake and is also oligotrophic.

7.3 BRIEN LAKE

In the YGP study area**,** Brien Lake is a medium-sized, shallow lake that developed a thermocline in the spring/summer period and exhibits some DO depression. The lake approaches the mesotrophic classification for productivity. Hardness and TDS values are

slightly higher than those reported for Eclipse and Nicholas lakes. The pH of Brien Lake ranges from pH = 6.6 to 7.4.

7.4 NARROW LAKE

Narrow Lake is similar to Brien Lake in size and depth. This lake typically develops a thermocline in the summer and exhibits some DO depression near the lake bottom. Hardness and TDS values in Narrow Lake are typically higher than those reported for Brien, Eclipse, and Nicholas lakes. The pH of Narrow Lake ranges pH=6.7 to 7.4. The CCME FAL Guideline exceedances observed in Narrow Lake may be the result of historic operations at the historic Discovery site.

7.5 WINTER LAKE

Winter Lake is a mesotrophic lake that exhibits low DO in winter. This is primarily related to its shallow depth and the highly organic nature of the sediments. Water quality results indicate that Winter Lake may have been impacted by runoff from Round Lake, which was impacted by tailings discharges from the historic Discovery Mine. These are noted in the higher TDS and conductivity and the more frequent exceedances of CCME FAL Guidelines identified for various metals in the lake. The pH of Winter Lake water ranges ph= 7.0 to 7.6.

7.6 ROUND LAKE

Round Lake is a shallow mesotrophic lake that has historically been impacted by of the tailings disposal practices from the historic Discovery Mine and more recently from the disposal of treated water from the DIAND clay quarry pit. Exceedances of the CCME FAL Guidelines for aluminum, arsenic, and copper are a common occurrence and hardness, TDS, and conductivity values are elevated. The pH of Round Lake water ranges pH = 7.1 to 8.1.

8.0 CLOSURE

EBA is pleased to present Tyhee NWT Corp. with this 2005 Water Quality Sampling Program Data report for the Yellowknife Gold Project. We hope everything is found to be satisfactory. If there are questions or if EBA can be of further assistance, please do not hesitate to contact us.

Respectfully submitted,
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APPENDIX

APPENDIX A RESULTS OF TYHEE TRIP BLANKS – 2005

TABLE 8: TYHEE TRIP BLANKS – 2005

Analyte	April	June	July	August	Units	Detection Limit
Major Ions, Nutrients, and Inorganics						
Chloride (Cl)	<1	<1	<1	<1	mg/L	1
Fluoride (F)	<0.05	<0.05	<0.05	<0.05	mg/L	0.05
Calcium (Ca)	<0.5	<0.5	<0.5	<0.5	mg/L	0.5
Potassium (K)	<0.1	<0.1	<0.1	<0.1	mg/L	0.1
Magnesium (Mg)	<0.1	<0.1	<0.1	<0.1	mg/L	0.1
Sodium (Na)	<1	<1	<1	<1	mg/L	1
Ion Balance	Low TDS	Low TDS	Low TDS	Low TDS	%	-
TDS (Calculated)	<1	<1	<1	<1	mg/L	1
Hardness (as $CaCO_3$)	<1	<1	<1	<1	mg/L	1
Iron-Extractable	<0.005	<0.005	<0.005	-	mg/L	0.005
Manganese-Extractable	<0.001	<0.001	<0.001	-	mg/L	0.001
Nitrate+Nitrite-N	<0.006	<0.006	<0.006	<0.006	mg/L	0.006
Nitrate-N	<0.006	<0.006	<0.006	<0.006	mg/L	0.006
Nitrite-N	<0.002	<0.002	<0.002	<0.002	mg/L	0.002
Sulfate (SO_4)	<0.05	<0.05	<0.05	<0.05	mg/L	0.05
pH	5.9	5.7	5.8	6.9	-	0.1
Conductivity (EC)	1.1	0.8	0.8	0.9	uS/cm	0.2
Bicarbonate (HCO_3)	<5	<5	<5	<5	mg/L	5
Carbonate (CO_3)	<5	<5	<5	<5	mg/L	5
Hydroxide (OH)	<5	<5	<5	<5	mg/L	5
Alkalinity, Total (as $CaCO_3$)	<5	<5	<5	<5	mg/L	5
Ammonia-N	<0.005	<0.005	<0.005	<0.005	mg/L	0.005
Cyanide-CN	<0.002	<0.002	<0.002	<0.002	mg/L	0.002
Phosphorus, Total	<0.001	<0.001	<0.001	<0.001	mg/L	0.001
Total Organic Carbon	<0.5	<0.5	<0.5	<0.5	mg/L	0.5
Dissolved Organic Carbon	-	<0.5	<0.5	<0.5	mg/L	0.5
Total Suspended Solids	<3	<3	<3	<3	mg/L	3
Turbidity	<0.1	-	<0.1	<0.1	NTU	0.1
Redox Potential	187	-	200	166	mV	1
Total Ultra-Low Level Metals						
Silver (Ag)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Aluminum (Al)	<0.0003	<0.0003	**0.0006**	<0.0003	mg/L	0.0003
Arsenic (As)	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003
Boron (B)	<0.001	<0.001	<0.001	<0.001	mg/L	0.001
Barium (Ba)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002

TABLE 8: TYHEE TRIP BLANKS – 2005

Analyte	April	June	July	August	Units	Detection Limit
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003
Calcium (Ca)	<0.02	<0.02	<0.02	<0.02	mg/L	0.02
Cadmium (Cd)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Chromium (Cr)	<0.00006	<0.00006	<0.00006	<0.00006	mg/L	0.00006
Copper (Cu)	<0.0006	<0.0006	<0.0006	<0.0006	mg/L	0.0006
Iron (Fe)	<0.005	**0.005**	<0.005	<0.005	mg/L	0.005
Lithium (Li)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Mercury (Hg)	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002
Potassium (K)	<0.02	<0.02	<0.02	<0.02	mg/L	0.02
Magnesium (Mg)	<0.004	<0.004	<0.004	<0.004	mg/L	0.004
Manganese (Mn)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	mg/L	0.00006
Sodium (Na)	<0.005	<0.005	<0.005	<0.005	mg/L	0.005
Nickel (Ni)	<0.00006	<0.00006	<0.00006	<0.00006	mg/L	0.00006
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Antimony (Sb)	**0.00019**	**0.00023**	**0.00038**	**0.00009**	mg/L	0.00003
Selenium (Se)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Strontium (Sr)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Silicon (Si)	<0.1	<0.1	<0.1	<0.1	mg/L	0.1
Tin (Sn)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Uranium (U)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Vanadium (V)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Zinc (Zn)	<0.0008	<0.0008	**0.0014**	**0.0010**	mg/L	0.0008
Dissolved Ultra-Low Level Metals						
Silver (Ag)	<0.0001	<0.0002	<0.0001	<0.0001	mg/L	0.0001
Aluminum (Al)	<0.0003	<0.01	<0.0001	0.0003	mg/L	0.0003
Arsenic (As)	<0.00003	<0.0004	<0.0001	<0.00003	mg/L	0.00003
Boron (B)	<0.001	**0.008**	<0.0001	<0.001	mg/L	0.001
Barium (Ba)	<0.00005	<0.0001	<0.0001	<0.00005	mg/L	0.00005
Beryllium (Be)	<0.0002	<0.0005	<0.0001	<0.0002	mg/L	0.0002
Bismuth (Bi)	<0.00003	<0.00005	<0.00003	<0.00003	mg/L	0.00003
Calcium (Ca)	<0.02	<0.5	<0.02	<0.02	mg/L	0.02
Cadmium (Cd)	<0.00005	<0.0001	<0.00005	<0.00005	mg/L	0.00005
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Chromium (Cr)	<0.00006	<0.0004	<0.00006	<0.00006	mg/L	0.00006

TABLE 8: TYHEE TRIP BLANKS – 2005

Analyte	April	June	July	August	Units	Detection Limit
Copper (Cu)	<0.0006	<0.0006	<0.0006	<0.0006	mg/L	0.0006
Iron (Fe)	<0.005	**0.008**	<0.005	**0.023**	mg/L	0.005
Lithium (Li)	<0.0001	-	<0.0001	<0.0001	mg/L	0.0001
Mercury (Hg)	<0.00002	-	<0.00002	<0.00002	mg/L	0.00002
Potassium (K)	<0.02	<0.1	<0.02	<0.02	mg/L	0.02
Magnesium (Mg)	<0.004	<0.01	<0.004	<0.004	mg/L	0.004
Manganese (Mn)	<0.0001	<0.001	<0.0001	<0.0001	mg/L	0.0001
Molybdenum (Mo)	<0.00006	<0.0001	<0.00006	<0.00006	mg/L	0.00006
Sodium (Na)	<0.005	<0.5	<0.005	<0.005	mg/L	0.005
Nickel (Ni)	<0.00006	<0.0001	<0.00006	<0.00006	mg/L	0.00006
Lead (Pb)	<0.00005	<0.0001	<0.00005	<0.00005	mg/L	0.00005
Antimony (Sb)	**0.00008**	**0.0009**	**0.00036**	**0.00007**	mg/L	0.00003
Selenium (Se)	<0.0001	<0.0004	<0.0001	<0.0001	mg/L	0.0001
Strontium (Sr)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Silicon (Si)	<0.1	<0.1	<0.1	<0.1	mg/L	0.1
Tin (Sn)	<0.0001	<0.0002	<0.0001	<0.0001	mg/L	0.0001
Uranium (U)	<0.00005	<0.0001	<0.00005	<0.00005	mg/L	0.00005
Vanadium (V)	<0.00005	<0.0001	<0.00005	<0.00005	mg/L	0.00005
Zinc (Zn)	<0.0008	<0.002	0.0010	<0.0008	mg/L	0.0008

BOLD = Parameter above detection limit

APPENDIX

APPENDIX B RESULTS OF TYHEE FIELD BLANKS – 2005

TABLE 9: TYHEE FIELD BLANKS - 2005

Analyte	April	June	July	August	Units	Detection Limit
Major Ions, Nutrients and Inorganics						
Chloride (Cl)	<1	<1	<1	<1	mg/L	1
Fluoride (F)	0.07	<0.05	<0.05	<0.05	mg/L	0.05
Calcium (Ca)	<0.5	<0.5	<0.5	<0.5	mg/L	0.5
Potassium (K)	<0.1	<0.1	<0.1	<0.1	mg/L	0.1
Magnesium (Mg)	<0.1	<0.1	<0.1	**0.2**	mg/L	0.1
Sodium (Na)	<1	<1	<1	<1	mg/L	1
Ion Balance	Low TDS	Low TDS	Low TDS	Low TDS	%	-
TDS (Calculated)	<1	<1	<1	<1	mg/L	1
Hardness (as $CaCO_3$)	<1	<1	<1	<1	mg/L	1
Iron-Extractable	<0.005	<0.005	<0.005	-	mg/L	0.005
Manganese-Extractable	<0.001	<0.001	<0.001	-	mg/L	0.001
Nitrate+Nitrite-N	<0.006	<0.006	<0.006	<0.006	mg/L	0.006
Nitrate-N	<0.006	<0.006	<0.006	<0.006	mg/L	0.006
Nitrite-N	<0.002	<0.002	<0.002	<0.002	mg/L	0.002
Sulfate (SO_4)	<0.05	<0.05	<0.05	<0.05	mg/L	0.05
pH	6.2	6.1	6.2	9.3	-	0.1
Conductivity (EC)	1.2	1.1	1.4	1.6	µS/cm	0.2
Bicarbonate (HCO_3)	<5	<5	<5	<5	mg/L	5
Carbonate (CO_3)	<5	<5	<5	<5	mg/L	5
Hydroxide (OH)	<5	<5	<5	<5	mg/L	5
Alkalinity, Total (as $CaCO_3$)	<5	<5	<5	<5	mg/L	5
Ammonia-N	<0.005	<0.005	<0.005	<0.005	mg/L	0.005
Cyanide-CN	<0.002	<0.002	<0.002	<0.002	mg/L	0.002
Phosphorus, Total	**0.001**	<0.001	<0.001	**0.001**	mg/L	0.001
Total Organic Carbon	<0.5	<0.5	<0.5	0.5	mg/L	0.5
Dissolved Organic Carbon	-	<0.5	<0.5	<0.5	mg/L	0.5
Total Suspended Solids	<3	<3	<3	<3	mg/L	3
Turbidity	<0.1	<0.1	0.10	<0.1	NTU	0.1
Redox Potential	152	176	171	160	mV	1
Total Ultra-Low Level Metals						
Silver (Ag)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Aluminum (Al)	**0.0018**	**0.0003**	**0.0033**	**0.0026**	mg/L	0.0003
Arsenic (As)	**0.00003**	<0.00003	<0.00003	<0.00003	mg/L	0.00003
Boron (B)	<0.001	<0.001	<0.001	<0.001	mg/L	0.001

TABLE 9: TYHEE FIELD BLANKS - 2005

Analyte	April	June	July	August	Units	Detection Limit
Barium (Ba)	<0.00005	<0.00005	**0.00006**	**0.00008**	mg/L	0.00005
Beryllium (Be)	<0.0002	<0.0002	<0.0002	<0.0002	mg/L	0.0002
Bismuth (Bi)	<0.00003	<0.00003	<0.00003	<0.00003	mg/L	0.00003
Calcium (Ca)	**0.03**	**0.06**	**0.04**	**0.03**	mg/L	0.02
Cadmium (Cd)	<0.00005	<0.00005	**0.00007**	**0.00008**	mg/L	0.00005
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Chromium (Cr)	**0.00011**	<0.00006	<0.00006	<0.00006	mg/L	0.00006
Copper (Cu)	<0.0006	<0.0006	<0.0006	<0.0006	mg/L	0.0006
Iron (Fe)	<0.005	<0.005	**0.005**	<0.005	mg/L	0.005
Lithium (Li)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Mercury (Hg)	<0.00002	<0.00002	<0.00002	<0.00002	mg/L	0.00002
Potassium (K)	<0.02	<0.02	<0.02	<0.02	mg/L	0.005
Magnesium (Mg)	<0.004	<0.004	<0.004	<0.004	mg/L	0.004
Manganese (Mn)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Molybdenum (Mo)	<0.00006	<0.00006	<0.00006	<0.00006	mg/L	0.00006
Sodium (Na)	**0.049**	**0.023**	**0.177**	**0.180**	mg/L	0.005
Nickel (Ni)	<0.00006	<0.00006	**0.00006**	<0.00006	mg/L	0.00006
Lead (Pb)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Antimony (Sb)	**0.00008**	**0.00008**	**0.00019**	**0.00011**	mg/L	0.00003
Selenium (Se)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Strontium (Sr)	<0.0001	0.0001	<0.0001	<0.0001	mg/L	0.0001
Silicon (Si)	<0.1	<0.1	**0.2**	**0.1**	mg/L	0.1
Tin (Sn)	<0.0001	<0.0001	**0.0024**	**0.0028**	mg/L	0.0001
Uranium (U)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Vanadium (V)	<0.00005	<0.00005	<0.00005	<0.00005	mg/L	0.00005
Zinc (Zn)	**0.0015**	**0.0043**	<0.0008	<0.0008	mg/L	0.0008
Dissolved Ultra-Low Level Metals						
Silver (Ag)	<0.0002	<0.0002	<0.0001	<0.0001	mg/L	0.0001
Aluminum (Al)	<0.01	<0.01	0.0033	**0.0028**	mg/L	0.0003
Arsenic (As)	<0.0004	<0.0004	<0.00003	<0.00003	mg/L	0.00003
Boron (B)	**0.013**	**0.002**	<0.001	<0.001	mg/L	0.001
Barium (Ba)	**0.0003**	<0.0001	<0.00005	0.00006	mg/L	0.00005
Beryllium (Be)	<0.0005	<0.0005	<0.0002	<0.0002	mg/L	0.0002
Bismuth (Bi)	<0.00005	<0.00005	<0.00003	<0.00003	mg/L	0.00003
Calcium (Ca)	**18.3**	<0.5	**0.05**	**0.05**	mg/L	0.02
Cadmium (Cd)	<0.0001	<0.0001	**0.00006**	**0.00007**	mg/L	0.00005

TABLE 9: TYHEE FIELD BLANKS - 2005

Analyte	April	June	July	August	Units	Detection Limit
Cobalt (Co)	<0.0001	<0.0001	<0.0001	<0.0001	mg/L	0.0001
Chromium (Cr)	<0.0004	<0.0004	<0.00006	**0.00006**	mg/L	0.00006
Copper (Cu)	<0.0006	<0.0006	<0.0006	<0.0006	mg/L	0.0006
Iron (Fe)	<0.005	<0.005	<0.005	<0.005	mg/L	0.005
Lithium (Li)	**0.0003**	-	<0.0001	<0.0001	mg/L	0.0001
Mercury (Hg)	-	-	<0.00002	<0.00002	mg/L	0.00002
Potassium (K)	**2.9**	**0.1**	<0.02	<0.02	mg/L	0.005
Magnesium (Mg)	**6.02**	**0.01**	<0.004	<0.004	mg/L	0.004
Manganese (Mn)	**0.003**	<0.001	<0.0001	**0.0001**	mg/L	0.0001
Molybdenum (Mo)	<0.0001	<0.0001	<0.00006	<0.00006	mg/L	0.00006
Sodium (Na)	**5.0**	<0.5	**0.175**	**0.195**	mg/L	0.005
Nickel (Ni)	<0.0001	<0.0001	**0.00009**	**0.00008**	mg/L	0.00006
Lead (Pb)	<0.0001	<0.0001	<0.00005	<0.00005	mg/L	0.00005
Antimony (Sb)	<0.0004	**0.0008**	**0.00017**	<0.00003	mg/L	0.00003
Selenium (Se)	<0.0004	<0.0004	<0.0001	<0.0001	mg/L	0.0001
Strontium (Sr)	**0.0005**	<0.0001	<0.0001	**0.0001**	mg/L	0.0001
Silicon (Si)	**0.6**	<0.1	**0.2**	**0.1**	mg/L	0.1
Tin (Sn)	<0.0002	<0.0002	**0.0022**	**0.0025**	mg/L	0.0001
Uranium (U)	<0.0001	<0.0001	<0.00005	<0.00005	mg/L	0.00005
Vanadium (V)	0.0004	<0.0001	<0.00005	<0.00005	mg/L	0.00005
Zinc (Zn)	**0.006**	<0.002	**0.0016**	**0.0016**	mg/L	0.0008

BOLD = Parameter above detection limit