

Appendix 11-B

Limnology and Water Quality of Amazay (Duncan) Lake

KEMESS UNDERGROUND PROJECT

Application for an Environmental Assessment Certificate

Date: May 5, 2015
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Subject: **Limnology and Water Quality of Amazay (Duncan) Lake**

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1.0 INTRODUCTION

This report summarizes baseline limnology and water quality in Amazay (Duncan) Lake, based on extensive field studies undertaken in the lake from 2003 to 2006 to support environmental assessment of the previously proposed Kemess North open-pit mining project.

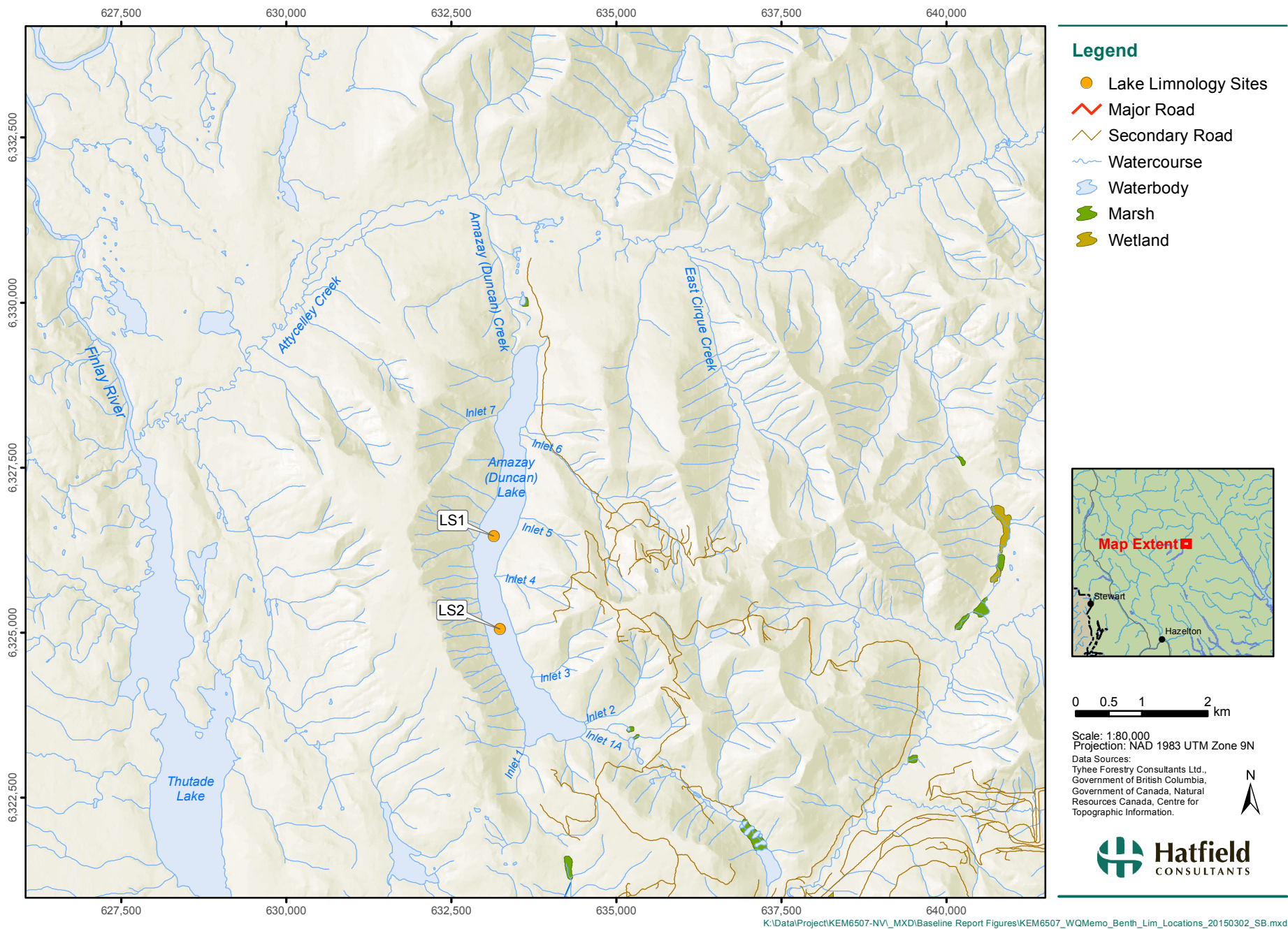
Results presented below were previously reported in baseline reports presented to and technically reviewed by the Kemess North Joint Review Panel, most notably in the 2004 Hatfield Consultants report, *Aquatic Resources in the Vicinity of the Kemess Mine Expansion Project*, which reported limnology and water quality of the lake from field studies in 2003 and 2004. During supplemental field studies undertaken in 2006 (Hatfield 2006) in small tributaries of the lake to address supplemental information requests by the Review Panel, an additional set of lake chemistry samples also were collected, following methods presented in Hatfield (2004).

Readers are referred to this previous document (i.e., Hatfield 2004) for detailed methodologies, and other related data, such as: bathymetry and other biophysical data; sediment quality data; studies of planktonic, benthic invertebrate, and fish communities of the lake; and quality control/assurance activities and data. Summarized planktonic, benthic invertebrate and fish community information for Amazay Lake is also provided in the *Kemess Underground Fish and Aquatics Baseline Report* (Hatfield and Bustard and Associates 2015). Information presented below omits methods for brevity, but compiles all water chemistry data collected from 2003 to 2006, and compares them with current (2015) BC and CCME water quality guidelines for the protection of aquatic life.

Limnological and water quality sampling in Amazay Lake included two stations (LS1 and LS2) located at the deepest point of each of the two basins of the lake (Figure 1). Water quality samples were collected in all seasons (most in summer; i.e., July to September), from three depths at each station: surface; mid-water; and near-bottom. The interpretation below focuses on surface and near-bottom samples, which best represent seasonal chemical processes in the lake.

Generally, Amazay Lake water is characterized by very low nutrient levels and moderate buffering capacity. Total and dissolved copper concentrations exceed relevant water quality guidelines.

Figure 1 Lake limnology sampling locations on Amazay Lake, 2003 and 2006.



2.0 LIMNOLOGY

2.1 THERMAL STRATIFICATION

Stratification in a lake is the separation of warm, low density surface water (epilimnion) from a bottom, higher density cool layer (hypolimnion) by a transition zone having a wide temperature gradient (metalimnion). Interactions between heating, cooling, and wind determine internal mixing and the timing and magnitude of thermal stratification. Stratification can influence vertical diffusion gradients, and thus determine the availability of various forms of nutrients for production of algae, aquatic vascular plants, and the availability of fish habitat and food resources.

Temperature profiles indicated that Amazay Lake was density-stratified in summer and that isothermal conditions prevailed at other times of the year (Figure 2). When measurements were first collected in September 2003, density stratification was present with a surface temperature of 10 °C and a thermocline established at approximately 18 m (maximum depth of Amazay Lake is 52 m in the south basin). The thermocline gradient was small and deep, indicating weakening resistance to mixing at that time. Hypolimnion temperature was 5 °C to 7 °C. By November 2003, the lake was isothermal at 4.5 °C to 5 °C. Surface ice formed by the middle of November. Under ice in February 2004, temperature increased with depth, reaching approximately 4 °C near the bottom, which is the temperature at which water attains highest density. Ice broke up at the end of May; no thermocline was apparent well into June when the surface temperature was 5.6 °C, declining to 4 °C at the bottom. Surface heating greatly increased resistance to mixing in July, leading to a strong thermocline over a depth range of 9 to 13 m. Epilimnetic temperature at that time was 14 °C to 15 °C and hypolimnetic temperature was 4 °C to 5 °C. This density stratification continued into August, although increased surface cooling was evident with a surface temperature that was approximately 1 °C cooler than in July. Near-shore temperatures in northern and southern Amazay Lake from November 2003 to August 2004 appear in Figure 3.

2.2 DISSOLVED OXYGEN

Amazay Lake was well oxygenated from surface to bottom in 2003 and 2004 (Figure 4 and Figure 5). In fall 2003 and spring 2004, dissolved oxygen (DO) concentrations were 10 to 11 mg/L, or 76% to 85% saturated with respect to temperature and elevation. September concentrations were somewhat lower at 8 to 9 mg/L and 66 to 72% saturated, indicating some oxygen demand. There was evidence of oxygen demand from sediments in September, given the decline in dissolved oxygen concentrations over the bottom 10 m of the water profile. In winter under ice, the water column was 72 to 81% saturated with oxygen over the top 34 m, but oxygen demand from sediments caused a drop in DO concentrations to 7.6 mg/L (56% saturated) over the bottom 12 m. Epilimnetic DO concentrations were approximately 8 mg/L (78% saturated) in July 2004, and approximately 9 mg/L (90% saturated) in August 2004. With the drop in temperature over the thermocline, DO concentrations in the hypolimnion increased to 9.5 to 10 mg/L (74 to 80% saturation) in July and 10.5 to 11 mg/L (82 to 94% saturated) in August.

Figure 2 Temperature profiles at station LS1 on Amazay Lake, 2003 to 2004.

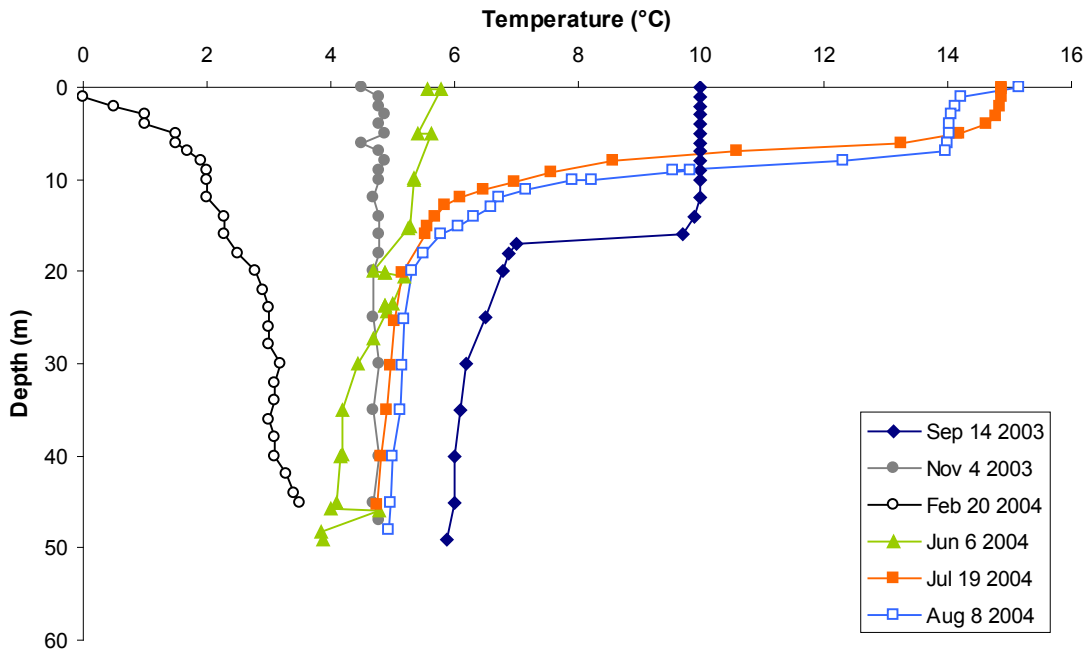
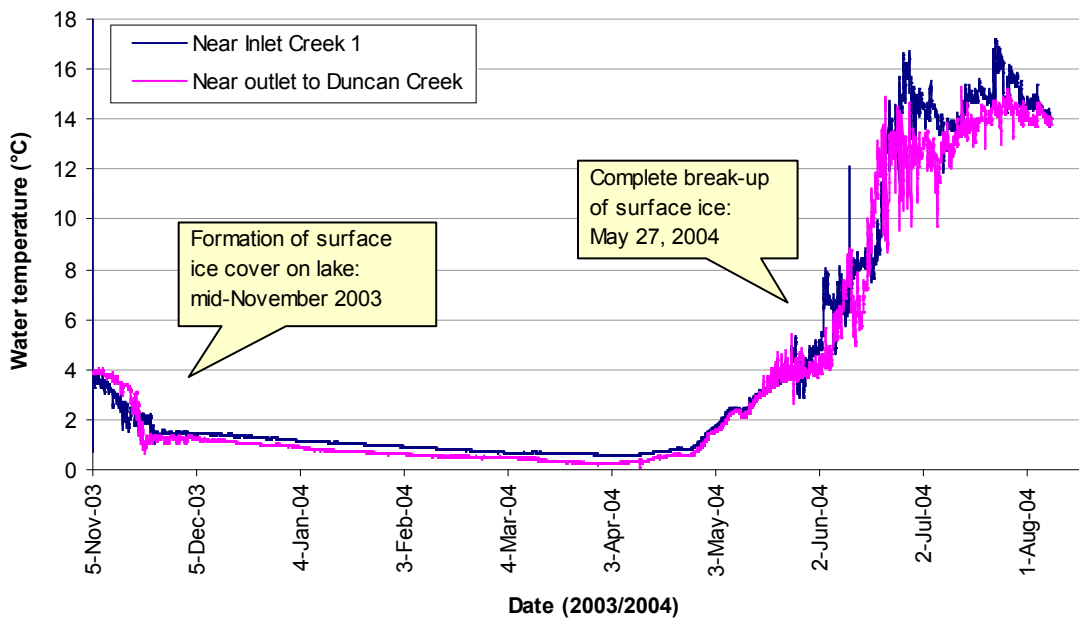


Figure 3 Near-surface temperatures at two locations in Amazay Lake, November 2003 to August 2004.¹



¹ Thermographs set in approximately 2 m of water in near-shore areas in northern and southern Amazay Lake.

Figure 4 Dissolved oxygen profiles at station LS1 on Amazay Lake, 2003 to 2004.

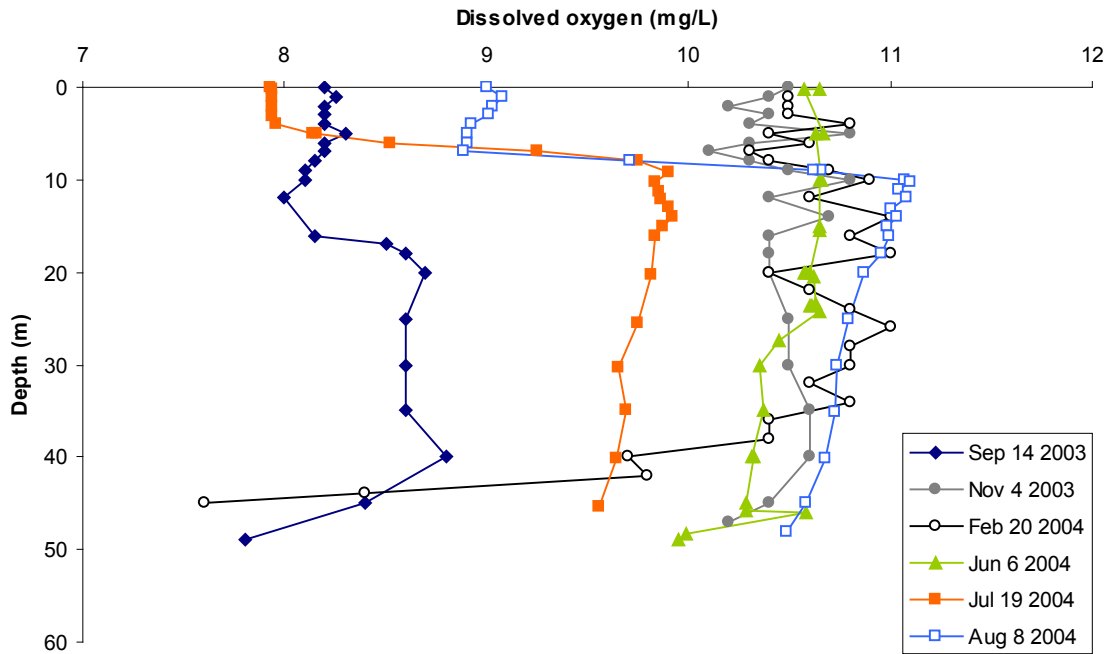
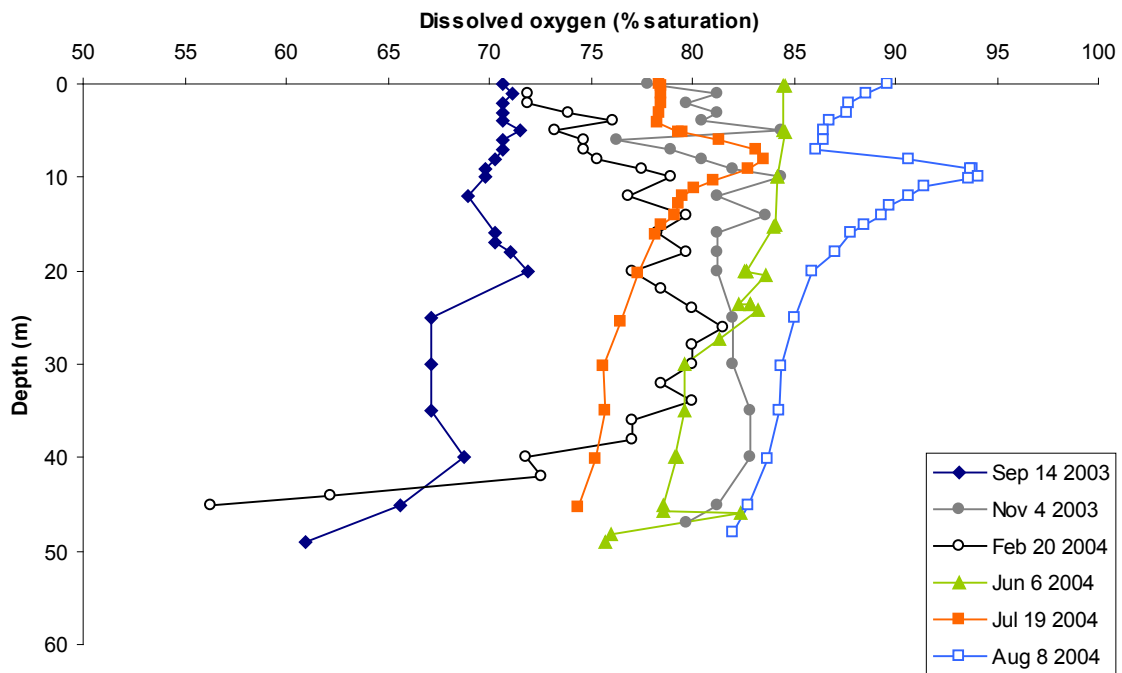


Figure 5 Profiles of percent saturation of dissolved oxygen at Station LS1 on Amazay Lake, 2003 to 2004.



3.0 WATER CHEMISTRY

3.1 BUFFERING CAPACITY AND PH

Amazay Lake water is slightly alkaline, exhibiting pH values over a narrow range between 7.4 and 7.8 (Table 1). This range of values indicates carbonate buffering (i.e., $\text{CO}_2\text{-HCO}_3^-\text{-CO}_3^{2-}$), with the dominant anion being HCO_3^- . Little or no shift in pH was found across seasons or with depth within seasons, indicating no influence of photosynthesis in surface waters and respiration in bottom sediments on carbonate equilibria.

Alkalinity is an approximate measure of acid-neutralizing capacity (ANC) and is measured as the amount of acid required to neutralize bases (mainly OH^- , CO_3^{2-} and HCO_3^- , but also including borate, silicate and phosphate). Low to moderate alkalinity is present in Amazay Lake, and there was little or no variation between seasons and over depth within seasons, indicating no net demand for bases over time and depth. Conductivity (129 to 143 $\mu\text{S/cm}$) and dissolved solids (60 to 98 mg/L) were moderate, with lowest values occurring in fall (i.e., 129 $\mu\text{S/cm}$ and 60 mg/L respectively). These concentrations did not vary with depth, indicating no release of dissolved compounds from lake sediments. This finding is consistent with the well-oxygenated conditions observed, which would favour complexation of cations and nutrients in sediments. Moderate conductivity and dissolved solids concentrations originated from the presence of major inorganic cations including calcium and magnesium, and their respective anions, including HCO_3^- , CO_3^{2-} , Cl^- , and SO_4^{2-} to form the major dissolved salts in Amazay Lake. Concentrations of the cations would be expected to be mainly derived from weathering processes upstream of the lake, and did not change over time and water depth.

Sulphate (SO_4) concentrations were moderate, indicating some influence from weathering of sulphide-bearing rock. Waters not affected by weathering of sulphides typically have SO_4 concentrations <5 mg/L, but this can increase to over 100 mg/L where there is drainage from weathering of sulphide-bearing rock (Perrin et al. 1992), and rise to several thousand mg/L in untreated acidic mine drainage (Perrin 1992). Sulphate concentrations in Amazay Lake of 33 to 34 mg/L suggest an influence of the sulphide-bearing material that naturally occurs in the Amazay Lake catchment.

Table 1 Mean concentration or measurement of chemical variables in Amazay Lake, 2003 to 2006.

Variable (units)	Mean Concentration or Measurement by Season and Depth							
	Fall		Winter		Spring		Summer	
	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom
Secchi depth (m)	17.5	-	-	-	10.6	-	16.3	-
Conductivity ($\mu\text{S}/\text{cm}$)	129	129	-	-	140	143	136	136
Total dissolved solids (mg/L)	60	60	98	83	85	87	80	80
pH	7.59	7.66	7.80	7.78	7.44	7.51	7.63	7.50
Alkalinity (mg/L)	30	30	31	30	30	31	33	34
Hardness (mg/L)	-	-	64	62	-	-	68	69
True colour (TCU)	<5	<5	<5	<5	<5	<5	<5	<5
Total phosphorous ($\mu\text{g}/\text{L}$)	<2	2.3	<2	<2	<2	<2	2.2	2.1
Nutrients								
Soluble Reactive P ($\mu\text{g}/\text{L}$)	<1	<1	<1	<1	<1	<1	<1	<1
Ammonia ($\text{NH}_4\text{-N}$) ($\mu\text{g}/\text{L}$) ¹	<20	<20	10.0	10.0	<5	<5	<5	<5
Nitrate ($\text{NO}_3\text{-N}$) ($\mu\text{g}/\text{L}$)	<5	<5	<5	9.0	<5	5.7	<5	5.3
Total nitrogen (TN) ($\mu\text{g}/\text{L}$)	56.0	79.5	56.0	56.0	58.5	58.8	57.9	63.9
Calcium (mg/L)	22	22	23	22	22	22	22	23
Magnesium (mg/L)	1.6	1.5	1.8	1.8	1.6	1.6	1.6	1.6
Sulphate (mg/L)	-	-	34	33	-	-	-	-
Selected Metals								
Total cadmium ($\mu\text{g}/\text{L}$)	0.071	0.071	0.075	0.079	0.076	0.079	0.080	0.075
Dissolved cadmium ($\mu\text{g}/\text{L}$)	0.069	0.066	0.074	0.077	0.069	0.072	0.081	0.068
Total copper ($\mu\text{g}/\text{L}$)	4.01	3.65	3.31	3.33	3.90	3.94	4.70	3.77
Dissolved copper ($\mu\text{g}/\text{L}$)	2.93	2.78	2.78	2.88	3.23	3.23	3.90	2.93
Total lead ($\mu\text{g}/\text{L}$)	0.99	0.48	0.08	0.05	1.00	0.25	0.16	0.19
Dissolved lead ($\mu\text{g}/\text{L}$)	0.26	0.13	0.07	0.05	0.33	0.09	0.06	0.11
Total zinc ($\mu\text{g}/\text{L}$)	3.40	3.35	3.70	3.10	5.73	5.80	4.20	4.73
Dissolved zinc ($\mu\text{g}/\text{L}$)	3.10	3.30	*	*	2.98	3.25	3.74	3.74
Sample size	2	2	2	2	4	4	16	16

¹ The lab reported a change in detection limit for $\text{NH}_4\text{-N}$ during the course of the project, from 20 $\mu\text{g}/\text{L}$ in fall sampling to 5 $\mu\text{g}/\text{L}$ in spring and summer sampling.

* Not reported because lab reports showed higher concentrations of dissolved zinc than total zinc in 3 of the 4 replicate samples.

3.2 NUTRIENTS

Mean total phosphorous (TP) concentrations in Amazay Lake were 2.0 to 2.3 $\mu\text{g/L}$; soluble reactive phosphorous (SRP), the most biologically available form of phosphorous, was consistently $<1 \mu\text{g/L}$ (Table 1). These values were among the lowest observed for any lake in British Columbia, and are consistent with ultra-oligotrophic conditions often associated with coastal lakes (Stockner and MacIsaac 1996). There was no change in TP or SRP concentration with season, or with depth within a season, indicating no release of phosphorous from sediments that is typical of nutrient-rich lakes in the volcanic belt of the BC interior (e.g., Perrin 1997). Little or no release of phosphorous from sediments is caused by relatively high oxygen concentrations in the hypolimnion, which prevents solubilization of phosphorus.

Concentrations of all forms of nitrogen were equally low in all samples analyzed. Nitrate concentration was less than or close to the analytical detection limit of 5 $\mu\text{g/L}$, with slightly higher concentrations found in profundal waters relative to surface waters in all seasons except fall. This vertical gradient may be caused by a combination of uptake of epilimnetic nitrate by phytoplankton, which lowers nitrate concentration in surface water, and by mineralization of plankton and other organic matter that is settling to bottom sediments, which increases nitrate concentration in deeper water. The lack of this gradient in the fall suggests that wind-driven mixing exceeded the effect of biological demand and release in different parts of the water column, resulting in similar nitrate concentrations over the water column.

Low overall concentrations of nitrate also were related to very low concentrations of ammonia, which typically supplies a pool of reduced nitrogen that can be nitrified to nitrate. Ammonia essentially was absent in Amazay Lake, which also indicated very low input of organic matter to the lake either from forested allochthonous sources or from internal (autochthonous) production. Further evidence of the lack of available organic matter was low concentrations of total nitrogen (TN) (i.e., 56 to 80 $\mu\text{g/L}$), which were about half of those typically found in oligotrophic lakes at lower elevations. Most of this TN would be in organic structures, given the negligible concentrations of nitrate and ammonia. The absence of colour in the water corroborated the low TN concentrations. Colour can be released from wetlands as a byproduct of decomposition of organic matter, and often is linked to the transport of metallic ions, particularly iron, which also was found at extremely low concentrations (i.e., $<0.03 \text{ mg/L}$) in Amazay Lake. Organic matter in the form of humates (e.g., humic and fulvic acids) form complexes with iron to impart, at varying degrees, a yellow or brown colour to water. None of this was apparent in Amazay Lake, clearly indicating little or no transport of dissolved organic matter to the lake. This comparison suggests there was little transport of nutrients and organic matter from the drainage upstream and low production within the lake itself. This suggests that the subalpine forest surrounding Amazay Lake has extremely tight nutrient cycling that effectively retains macronutrients and dissolved organic matter. Low amounts of organic matter and extremely low concentrations of macronutrients suggest that Amazay Lake may not support high plankton densities.

Secchi depths in the ice-free season of 11 to 18 m indicated high transparency that is associated with low particle density. Lakes having Secchi depths in this range often are oligotrophic or

ultra-oligotrophic and typically support low rates of internal production. Secchi depths were lower in spring (i.e., 11 m) than they were at other ice-free times (i.e., 16 to 18 m). This difference suggests that particle density increased in spring, either in association with increased plankton production or due to influx of very fine inorganic material in the inflow streams that may occur in association with erosion during the spring snowmelt.

The molar ratio of bioavailable N:P in water at the beginning of the growing season can provide an index to determine which nutrient may potentially limit algal growth. This supply N:P can be difficult to measure accurately, because of uncertainty about actual bio-availability of P in the SRP analysis, and the inability to detect SRP or inorganic N (the bioavailable forms of N and P) where concentrations are low. The potential availability of N and P in organic compounds for biological use introduces more uncertainty. Organically bound nutrients may be important where organic N and P occurring in the water column at the beginning of the growing season may be mineralized and made available over the growing season. For this reason, potential N and P limitation in lakes may be best determined using the ratio of total N: total P.

Using the ratio of TN:TP in the spring, the molar N:P in Amazay Lake was 63:1, which is in a range that indicates potential phosphorus deficiency for growth of most algal species. However, inorganic nitrogen concentrations were so low that for practical purposes, biological production in the lake can be considered co-limited by nitrogen and phosphorous.

3.3 TOTAL AND DISSOLVED METALS

Full results of ICP metals scans are presented in Table A1 (appended). Concentrations of most metals tested were below analytical detection limits and are not discussed further. Mean concentrations of those detected and known to be potentially toxic in aquatic ecosystems included cadmium (Cd), copper (Cu), lead (Pb) and zinc (Zn), which are presented in Table 2 and discussed below.

Both dissolved and particulate forms of these metals occurred at all times and depths. Total cadmium concentrations were found over a narrow range of 0.071 to 0.095 $\mu\text{g/L}$, with the dissolved fraction comprising nearly all of the total concentration. Total copper was found at 3.3 to 4.4 $\mu\text{g/L}$, with the dissolved fraction comprising 82% of the total concentration. Total lead ranged from 0.05 to 1 $\mu\text{g/L}$; the dissolved fraction was only 34% of these concentrations. Total zinc occurred at 3.1 to 5.8 $\mu\text{g/L}$, with 80% occurring in dissolved form.

Copper concentrations in Amazay Lake exceeded BC and Canadian Council of Ministers of the Environment (CCME) guidelines for protection of aquatic life at all times and depths, while cadmium, lead and zinc concentrations did not (Table 2). It should be noted these cadmium concentrations were judged to be potentially toxic to aquatic life in the original Kemess North baseline assessment, previous to recent reassessment and increase of CCME and BC cadmium guidelines to their current values.

Table 2 Comparison of selected metals mean concentrations found in Amazay Lake water samples, 2003 to 2006, with BC and CCME guidelines for protection of aquatic life.

Metal	Mean Concentration by Season and Depth in Amazay Lake ($\mu\text{g/L}$)								Guideline ($\mu\text{g/L}$)		
	Fall		Winter		Spring		Summer		BC	BC	CCME
	Surface	Bottom	Surface	Bottom	Surface	Bottom	Surface	Bottom	30-day	Max	Max
Total cadmium	0.071	0.071	0.075	0.079	0.076	0.079	0.080	0.075	0.159 ¹	0.393 ¹	1.140 ¹
Total copper	4.01	3.65	3.31	3.33	3.90	3.94	4.70	3.77	2.70 ¹	8.35 ¹	2
Total lead	0.99	0.48	0.08	0.05	1.00	0.25	0.09	0.19	5.24 ¹	45.6 ¹	2
Total zinc	3.40	3.35	3.70	3.10	5.73	5.80	3.66	4.50	7.5	33	30

¹ Hardness-adjusted guideline (based on hardness 69 mg/L), following equations presented by BC (2015) and CCME (2015).

Bold values indicate concentrations exceeding one or more guidelines.

4.0 REFERENCES

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APPENDICES

Appendix A1
Water Quality Results

Table A1 Water quality measured in Amazay Lake, 2003 to 2006.

Location in Lake	Units	Det. Limit	Water Quality Guidelines for Protection of Aquatic Life (2015)		North Basin						South Basin						North Basin		
					Surface		Mid		Bottom		Surface		Mid		Bottom		Surface	Mid	
Location in Water Column					14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	20-Feb-04	20-Feb-04
Date	-	-			LS1	LS1	LS1	LS1	LS1	LS1	LS2	LS2	LS2	LS2	LS2	LS2	LS2	LS1-S	LS1-L
Station ID	-	-			1	2	1	2	1	2	1	2	1	2	1	2	1	1	1
Replicate	-	-			633183	633183	633183	633183	633183	633183	633234	633234	633234	633234	633234	633234	633234	633049	633049
UTM Easting	-	-	BC	CCME	6326250	6326250	6326250	6326250	6326250	6326250	6325063	6325063	6325063	6325063	6325063	6325063	6325063	6336179	6336179
UTM Northing	-	-	30-Day Avg	Max	6326250	6326250	6326250	6326250	6326250	6326250	6325063	6325063	6325063	6325063	6325063	6325063	6325063	6336179	6336179
Field Measurements																			
Depth (m)	m	-	-	-	0	0	17	17	40	40	0	0	12	12	40	40	2	40	
Temperature	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	3.2	
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.1	8.8	
Secchi (m) down	m	-	-	-	15.5	-	-	-	-	-	15.3	-	-	-	-	-	-	-	
Secchi (m) up	m	-	-	-	15.2	-	-	-	-	-	15.3	-	-	-	-	-	-	-	
Conductivity (field)	µS/cm	-	-	-	128	128.4	128.8	128.7	129.3	129.2	128	128	128.5	128.3	129.7	129	83.2	-	
Total Dissolved Solids (field)	mg/L	1	-	-	60	59	60	60	60	60	59	60	60	60	60	60	-	-	
pH (field)	pH units	-	-	-	7.48	7.74	7.69	7.66	7.59	7.57	7.76	7.79	7.68	7.66	7.59	7.55	-	-	
Physical Tests																			
Colour, Apparent	CU	5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Colour, True	CU	5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Conductivity	µS/cm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Total Dissolved Solids	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	97	84	
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	63.3	62.5	
pH	pH units	-	-	6.5 – 9.0	6.5 – 9.0	7.75	7.76	7.8	7.81	7.83	7.82	7.82	7.86	7.87	7.86	7.79	7.77	7.76	
Dissolved Anions																			
Alkalinity-Total	mg/L	1	-	-	30	31	31	32	31	31	31	31	31	31	31	31	30.7	29.9	
Sulphate	mg/L	1	218	-	-	-	-	-	-	-	-	-	-	-	-	-	34.5	33.3	
Nutrients																			
Ammonia Nitrogen	µg/L	5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	10	<5	<5	10	10	
Total Kjeldahl Nitrogen	µg/L	50	-	-	70	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	
Total Nitrogen	µg/L	60	-	-	70	<60	<60	<60	<60	<60	<60	<60	<60	<60	<60	<60	<56	<56	
Nitrite/Nitrate Nitrogen	µg/L	5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	19.1	
Dissolved orthophosphate	µg/L	1	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Total Dissolved Phosphate	µg/L	2	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
Total Phosphate	µg/L	2	-	-	<2	<2	2	<2	<2	<2	<2	<2	<2	<2	2	<2	<2	<2	
Total Metals																			
Aluminum	µg/L	1	-	-	100	48	47	-	-	28	29	42	43	-	-	28	27	26.8	23.1
Antimony	µg/L	0.1	-	-	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1
Arsenic	µg/L	0.1	-	5	5	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1
Barium	µg/L	0.05	-	-	-	8.2	7.91	-	-	7.87	7.92	7.87	7.74	-	-	8.05	7.89	7.74	7.52
Beryllium	µg/L	0.5	-	-	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
Bismuth	µg/L	0.5	-	-	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
Boron	µg/L	10	-	1200	1500	<10	<10	-	-	<10	<10	<10	<10	-	-	<10	<10	-	-
Cadmium	µg/L	0.050	0.159	0.393	1.410	0.07	0.08	-	-	0.07	0.07	0.07	0.07	-	-	0.09	0.09	0.079	0.084
Calcium	mg/L	0.05	-	-	-	21.7	22	-	-	22	21.4	21.8	21.3	-	-	22	22.3	-	-
Chromium	µg/L	0.5	-	9	1	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
Cobalt	µg/L	0.1	4	110	-	0.1	0.1	-	-	0.1	0.1	<0.1	<0.1	-	-	0.1	0.1	<0.1	0.11
Copper	µg/L	0.1	2.70	8.35	2	4.3	4.2	-	-	3.7	3.8	3.9	4	-	-	3.9	4.7	3.37	3.36
Iron	µg/L	30	-	1000	300	<30	<30	-	-	<30	<30	<30	<30	-	-	<30	<30	<30	<30
Lead	µg/L	0.05	5.24	45.62	1.93	<0.05	<0.05	-	-	<0.05	0.15	<0.05	<0.05	-	-	0.31	0.67	0.052	<0.05
Lithium	µg/L	5	-	14	-	<5	<5	-	-	<5	<5	<5	<5	-	-	<5	<5	-	-
Magnesium	mg/L	0.1	-	-	-	1.6	1.6	-	-	1.6	1.6	1.6	1.6	-	-	1.7	1.7	-	-
Manganese	µg/L	0.05	902	1285	-	1.75	1.69	-	-	1.82	1.89	1.31	1.28	-	-	1.86	1.92	0.899	1.06
Molybdenum	µg/L	1	-	2000	73	3	3	-	-	3	3	3	3	-	-	3	3	2.6	2.6
Nickel	µg/L	0.5	-	65	71	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
Phosphorous	mg/L	0.3	-	-	-	<0.3	<0.3	-	-	<0.3	<0.3	<0.3	<0.3	-	-	<0.3	<0.3	-	-
Potassium	mg/L	2	-	-	-	<2	<2	-	-	<2	<2	<2	<2	-	-	<2	<2	<2	<2
Selenium	µg/L	0.5	-	2	1	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
Silicon	mg/L	0.05	-	-	-	3.62	3.7	-	-	3.63	3.54	3.62	3.58	-	-	3.62	3.67	-	-
Silver	µg/L	0.01	0.05	0.1	0.1	<0.01	<0.01	-	-	<0.01	<0.01	<0.01	<0.01	-	-	<0.01	<0.01	<0.01	<0.01

¹ Excludes water quality data collected routinely by Kemess Mines Ltd.; these data are reported and discussed in detail elsewhere in the EAC Application.

Table A1 Water quality measured in Amazay Lake, 2003 to 2006.

Location in Lake Location in Water Column	Units	Det. Limit	Water Quality Guidelines for Protection of Aquatic Life (2015)		North Basin						South Basin						North Basin	
					Surface		Mid		Bottom		Surface		Mid		Bottom		Surface	Mid
Date	-	-	BC	CCME	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	14-Sep-03	20-Feb-04	20-Feb-04
Station ID	-	-			LS1	LS1	LS1	LS1	LS1	LS1	LS2	LS2	LS2	LS2	LS2	LS2	LS1-S	LS1-L
Replicate	-	-			1	2	1	2	1	2	1	2	1	2	1	2	1	1
UTM Easting	-	-			633183	633183	633183	633183	633183	633183	633234	633234	633234	633234	633234	633234	633049	633049
UTM Northing	-	-	30-Day Avg	Max	6326250	6326250	6326250	6326250	6326250	6326250	6325063	6325063	6325063	6325063	6325063	6325063	6336179	6336179
Total Metals Cont'd.																		
Sodium	mg/L	2	-	-	<2	<2	-	-	<2	<2	<2	<2	-	-	<2	<2	<2	<2
Strontium	µg/L	0.1	-	-	58	55.9	-	-	56.3	56.6	55.7	55.4	-	-	57.2	55.7	-	-
Thallium	µg/L	0.1	0.3	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	-	-
Tin	µg/L	0.1	-	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	-	-
Titanium	µg/L	10	-	-	<10	<10	-	-	<10	<10	<10	<10	-	-	<10	<10	-	-
Uranium	µg/L	0.01	-	300	0.18	0.17	-	-	0.17	0.17	0.17	0.17	-	-	0.17	0.16	0.168	0.155
Vanadium	µg/L	1	-	6	<1	<1	-	-	<1	<1	<1	<1	-	-	<1	<1	<1	<1
Zinc	µg/L	1	7.5	33	3	3	-	-	4	4	3	3	-	-	9	9	3.8	3.5
Dissolved Metals																		
Aluminum	µg/L	1	50	100	37	36	-	-	23	22	34	36	-	-	20	21	24	19.1
Antimony	µg/L	0.1	-	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1
Arsenic	µg/L	0.1	-	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1
Barium	µg/L	0.05	-	-	8.02	7.79	-	-	7.87	7.8	7.69	8.01	-	-	7.62	7.73	7.87	7.78
Beryllium	µg/L	0.5	-	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
Bismuth	µg/L	0.5	-	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	-	-
Boron	µg/L	10	-	-	<10	<10	-	-	<10	<10	<10	<10	-	-	<10	<10	-	-
Cadmium	µg/L	0.05	-	-	0.08	0.07	-	-	0.07	0.07	0.07	0.07	-	-	0.07	0.08	0.083	0.077
Calcium	mg/L	0.05	-	-	22.2	21.5	-	-	21.8	21.8	21.7	21.9	-	-	22	22.1	22.4	22.1
Chromium	µg/L	0.5	-	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
Cobalt	µg/L	0.1	-	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1
Copper	µg/L	0.1	-	-	3.7	3.3	-	-	3	2.9	3.1	3.3	-	-	3	3.2	3.12	2.92
Iron	µg/L	30	-	-	<30	<30	-	-	<30	<30	<30	<30	-	-	<30	<30	<30	<30
Lead	µg/L	0.05	-	-	<0.05	<0.05	-	-	<0.05	0.13	<0.05	<0.05	-	-	0.19	0.23	0.052	<0.05
Lithium	µg/L	5	-	-	<5	<5	-	-	<5	<5	<5	<5	-	-	<5	<5	-	-
Magnesium	mg/L	0.1	-	-	1.6	1.6	-	-	1.6	1.6	1.6	1.6	-	-	1.6	1.7	1.81	1.77
Manganese	µg/L	0.05	-	-	0.79	0.74	-	-	0.15	0.17	0.55	0.58	-	-	0.23	0.2	0.227	0.279
Molybdenum	µg/L	1	-	-	3	3	-	-	3	3	3	3	-	-	3	3	2.6	2.5
Nickel	µg/L	0.5	-	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
Phosphorous	mg/L	0.3	-	-	<0.3	<0.3	-	-	<0.3	<0.3	<0.3	<0.3	-	-	<0.3	<0.3	-	-
Potassium	mg/L	2	-	-	<2	<2	-	-	<2	<2	<2	<2	-	-	<2	<2	<2	<2
Selenium	µg/L	0.5	-	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	<0.5
Silicon	mg/L	0.05	-	-	3.69	3.61	-	-	3.6	3.59	3.61	3.62	-	-	3.63	3.64	-	-
Silver	µg/L	0.01	-	-	<0.01	<0.01	-	-	<0.01	<0.01	<0.01	<0.01	-	-	<0.01	<0.01	<0.01	<0.01
Sodium	mg/L	2	-	-	<2	<2	-	-	<2	<2	<2	<2	-	-	<2	<2	<2	<2
Strontium	µg/L	0.1	-	-	56.6	55.7	-	-	56.5	55.8	54.9	57.3	-	-	54.6	55.2	-	-
Thallium	µg/L	0.1	-	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	-	-
Tin	µg/L	0.1	-	-	<0.1	<0.1	-	-	<0.1	<0.1	<0.1	<0.1	-	-	<0.1	<0.1	-	-
Titanium	µg/L	10	-	-	<10	<10	-	-	<10	<10	<10	<10	-	-	<10	<10	-	-
Uranium	µg/L	0.01	-	-	0.17	0.17	-	-	0.17	0.17	0.17	0.17	-	-	0.16	0.16	0.17	0.156
Vanadium	µg/L	1	-	-	<1	<1	-	-	<1	<1	<1	<1	-	-	<1	<1	<1	<1
Zinc	µg/L	1	-	-	3	3	-	-	3	4	3	4	-	-	7	7	4.9	4

¹ Excludes water quality data collected routinely by Kerness Mines Ltd.; these data are reported and discussed in detail elsewhere in the EAC Application.

Table A1 Water quality measured in Amazay Lake, 2003 to 2006.

Location in Lake	Units	Det. Limit	Water Quality Guidelines for Protection of Aquatic Life (2015)				South Basin						North Basin				South Basin			
			BC 30-Day Avg	Max	CCME Max	Surface 20-Feb-04	Mid 20-Feb-04	Surface 6-Jun-04	Surface 6-Jun-04	Mid 6-Jun-04	Mid 6-Jun-04	Bottom 6-Jun-04	Bottom 6-Jun-04	Surface 6-Jun-04	Surface 6-Jun-04	Mid 6-Jun-04	Mid 6-Jun-04			
Field Measurements																				
Depth (m)	m	-	-	-	-	2	40	0	0	25	25	45	45	0	0	25	25			
Temperature	C	-	-	-	-	0	3.1	-	-	-	-	-	-	-	-	-	-	-	-	
Dissolved Oxygen	mg/L	-	-	-	-	10	9.7	-	-	-	-	-	-	-	-	-	-	-	-	
Secchi (m) down	m	-	-	-	-	-	-	10.8	-	-	-	-	-	11.2	-	-	-	-	-	
Secchi (m) up	m	-	-	-	-	-	-	10.2	-	-	-	-	-	11	-	-	-	-	-	
Conductivity (field)	µS/cm	-	-	-	-	82.8	-	141	-	142	-	142	-	141	-	143	-	-	-	
Total Dissolved Solids (field)	mg/L	1	-	-	-	-	-	91	-	92	-	92	-	91	-	93	-	-	-	
pH (field)	pH units	-	-	-	-	-	-	7.74	-	7.71	-	7.7	-	7.71	-	7.72	-	-	-	
Physical Tests																				
Colour, Apparent	CU	5	-	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Colour, True	CU	5	-	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Conductivity	µS/cm	-	-	-	-	-	-	136	138	138	141	146	143	139	139	140	140	140	140	
Total Dissolved Solids	mg/L	-	-	-	-	98	82	74	68	76	78	60	70	73	89	74	86	86	86	
Hardness	mg/L	-	-	-	-	64.3	62.2	-	-	-	-	-	-	-	-	-	-	-	-	
pH	pH units	-	-	6.5 – 9.0	6.5 – 9.0	7.82	7.8	6.75	6.97	7.1	7.18	7.25	7.33	7.35	7.35	7.38	7.41	7.41	7.41	
Dissolved Anions																				
Alkalinity-Total	mg/L	1	-	-	-	31.2	31	29.7	29.7	29.6	30.4	30.7	30.3	30.1	29.8	30.6	30.1	30.1	30.1	
Sulphate	mg/L	1	218	-	-	34.3	33.2	-	-	-	-	-	-	-	-	-	-	-	-	
Nutrients																				
Ammonia Nitrogen	µg/L	5	-	-	-	10	10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Total Kjeldahl Nitrogen	µg/L	50	-	-	-	<50	<50	50	<50	<50	<50	55	80	53	81	58	56	56	56	
Total Nitrogen	µg/L	60	-	-	-	<56	<56	50	<50	<50	<50	55	80	53	81	58	56	56	56	
Nitrite/Nitrate Nitrogen	µg/L	5	-	-	-	<5	9	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Dissolved orthophosphate	µg/L	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Total Dissolved Phosphate	µg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
Total Phosphate	µg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
Total Metals																				
Aluminum	µg/L	1	-	-	100	26	23.9	37.3	37.1	36.7	32.9	34.8	32.8	32.1	32.3	30.8	29	29	29	
Antimony	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Arsenic	µg/L	0.1	-	5	5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Barium	µg/L	0.05	-	-	-	7.74	7.9	7.72	7.69	7.92	7.87	8.01	8.31	8.22	8.13	8.34	8.29	8.29	8.29	
Beryllium	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Bismuth	µg/L	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Boron	µg/L	10	-	1200	1500	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
Cadmium	µg/L	0.050	0.159	0.393	1.410	0.071	0.074	0.068	0.074	0.076	0.081	0.091	0.07	0.074	0.087	0.077	0.08	0.08	0.08	
Calcium	mg/L	0.05	-	-	-	-	-	21.6	21.2	21.6	21.8	23	22.3	21.3	21.7	21.9	22.2	22.2	22.2	
Chromium	µg/L	0.5	-	9	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Cobalt	µg/L	0.1	4	110	-	<0.1	<0.1	0.15	0.15	0.14	0.13	0.15	0.14	0.14	0.14	0.12	0.12	0.12	0.12	
Copper	µg/L	0.1	2.70	8.35	2	3.25	3.3	3.86	3.95	3.98	3.89	4.11	3.98	3.93	3.86	3.75	3.68	3.68	3.68	
Iron	µg/L	30	-	1000	300	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	
Lead	µg/L	0.05	5.24	45.62	1.93	0.116	<0.05	1.12	0.736	0.198	0.458	0.369	0.316	0.328	1.8	0.096	<0.05	<0.05	<0.05	
Lithium	µg/L	5	-	14	-	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Magnesium	mg/L	0.1	-	-	-	-	-	1.65	1.54	1.63	1.58	1.68	1.61	1.53	1.52	1.61	1.62	1.62	1.62	
Manganese	µg/L	0.05	902	1285	-	0.667	1.07	2.05	2.05	2.06	2.03	2.15	2.05	1.84	1.83	1.64	1.62	1.62	1.62	
Molybdenum	µg/L	1	-	2000	73	2.6	2.6	2.5	2.3	2.6	2.5	2.5	2.6	2.6	2.6	2.7	2.4	2.4	2.4	
Nickel	µg/L	0.5	-	65	71	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Phosphorous	mg/L	0.3	-	-	-	-	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	
Potassium	mg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
Selenium	µg/L	0.5	-	2	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Silicon	mg/L	0.05	-	-	-	-	-	3.64	3.61	3.67	3.65	3.84	3.68	3.56	3.58	3.64	3.69	3.69	3.69	
Silver	µg/L	0.01	0.05	0.1	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	

¹ Excludes water quality data collected routinely by Kemess Mines Ltd.; these data are reported and discussed in detail elsewhere in the EAC Application.

Table A1 Water quality measured in Amazay Lake, 2003 to 2006.

Location in Lake	Units	Det. Limit	Water Quality Guidelines for Protection of Aquatic Life (2015)				South Basin		North Basin						South Basin				
			BC		CCME		Surface	Mid	Surface		Mid		Bottom		Surface		Mid		
Location in Water Column			30-Day Avg	Max	Max	20-Feb-04	20-Feb-04	6-Jun-04	6-Jun-04	6-Jun-04	6-Jun-04	6-Jun-04	6-Jun-04	6-Jun-04	6-Jun-04	6-Jun-04	6-Jun-04	6-Jun-04	
Date	-					LS2-S	LS2-L	LS1	LS1	LS1	LS1	LS1	LS1	LS1	LS1	LS2	LS2	LS2	LS2
Station ID	-					1	1	1	2	1	2	1	2	1	2	1	2	1	2
Replicate	-					633403	633403	633077	633077	633077	633077	633077	633077	633077	633077	633421	633421	633421	633421
UTM Easting	-					6324470	6324470	6326214	6326214	6326214	6326214	6326214	6326214	6326214	6326214	6324470	6324470	6324470	6324470
UTM Northing	-																		
Total Metals Cont'd.																			
Sodium	mg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Strontium	µg/L	0.1	-	-	-	-	-	52	51.3	52.7	53.5	53.5	54	53.9	52.2	54.3	53.5		
Thallium	µg/L	0.1	0.3	-	0.8	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	µg/L	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Titanium	µg/L	10	-	-	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Uranium	µg/L	0.01	-	300	15	0.164	0.159	0.173	0.171	0.17	0.177	0.181	0.167	0.171	0.171	0.161	0.161		
Vanadium	µg/L	1	-	6	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	µg/L	1	7.5	33	30	3.6	2.7	7.3	7.2	9.9	3.8	5.2	4.2	4.2	4.2	8.4	3.1		
Dissolved Metals																			
Aluminum	µg/L	1	50	100	-	20.6	20.9	25.6	23.6	23.3	22.5	22.1	20.9	22.6	22.3	22.5	22.2		
Antimony	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.12	<0.1		
Arsenic	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Barium	µg/L	0.05	-	-	-	7.79	7.88	7.75	7.63	7.77	7.68	8.3	8.2	8.16	8.02	8.29	8.12		
Beryllium	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bismuth	µg/L	0.5	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Boron	µg/L	10	-	-	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cadmium	µg/L	0.05	-	-	-	0.064	0.077	0.072	0.069	0.072	0.084	0.06	0.082	0.067	0.066	0.081	0.067		
Calcium	mg/L	0.05	-	-	-	22.7	22	21.1	22.2	21.8	22.4	22.5	22.4	21.5	21.8	21.5	22.2		
Chromium	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	µg/L	0.1	-	-	-	<0.1	<0.1	0.12	0.12	0.13	0.12	0.11	0.12	0.11	0.11	0.1	<0.1		
Copper	µg/L	0.1	-	-	-	2.44	2.83	3.23	3.22	3.23	3.17	3.28	3.31	3.29	3.19	3.17	3.17		
Iron	µg/L	30	-	-	-	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
Lead	µg/L	0.05	-	-	-	0.091	<0.05	0.128	0.214	<0.05	0.15	<0.05	0.195	0.13	0.866	<0.05	<0.05		
Lithium	µg/L	5	-	-	-	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Magnesium	mg/L	0.1	-	-	-	1.87	1.77	1.56	1.64	1.61	1.63	1.62	1.63	1.5	1.56	1.54	1.62		
Manganese	µg/L	0.05	-	-	-	<0.05	0.244	1.64	1.25	1.23	1.05	0.964	0.861	1.09	1.12	0.741	0.739		
Molybdenum	µg/L	1	-	-	-	2.8	2.6	2.4	2.5	2.5	2.5	2.5	2.5	2.7	2.4	2.7	2.5		
Nickel	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phosphorous	mg/L	0.3	-	-	-	-	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium	mg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Selenium	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silicon	mg/L	0.05	-	-	-	-	-	3.58	3.7	3.68	3.72	3.76	3.69	3.57	3.62	3.6	3.65		
Silver	µg/L	0.01	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	mg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Strontium	µg/L	0.1	-	-	-	-	-	51.6	51.8	53	53.2	53.7	53.4	54.3	51.9	54.4	53.4		
Thallium	µg/L	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	µg/L	0.1	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Titanium	µg/L	10	-	-	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Uranium	µg/L	0.01	-	-	-	0.136	0.161	0.17	0.168	0.165	0.175	0.182	0.172	0.166	0.168	0.165	0.159		
Vanadium	µg/L	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	µg/L	1	-	-	-	3.3	2.8	3	3.1	2.8	3.1	3	3.8	2.9	2.9	3	2.8		

¹ Excludes water quality data collected routinely by Kemess Mines Ltd.; these data are reported and discussed in detail elsewhere in the EAC Application.

Table A1 Water quality measured in Amazay Lake, 2003 to 2006.

Location in Lake Location in Water Column Date Station ID Replicate UTM Easting UTM Northing	Units	Det. Limit	Water Quality Guidelines for Protection of Aquatic Life (2015)				South Basin		North Basin						South Basin					
			BC		CCME Max	Bottom		Surface		Mid		Bottom		Surface		Mid		Bottom		
			30-Day Avg	Max		6-Jun-04	6-Jun-04	19-Jul-04	19-Jul-04	19-Jul-04	19-Jul-04	19-Jul-04	19-Jul-04	19-Jul-04	19-Jul-04	19-Jul-04	19-Jul-04	19-Jul-04	19-Jul-04	19-Jul-04
					LS2	LS2	LS1	LS1	LS1	LS1	LS1	LS1	LS1	LS1	LS2	LS2	LS2	LS2	LS2	LS2
					633421	633421	633473	633473	633473	633473	633473	633473	633431	633431	633431	633431	633431	633431		
					6324470	6324470	6327912	6327912	6327912	6327912	6327912	6327912	6324465	6324465	6324465	6324465	6324465	6324465		
Field Measurements																				
Depth (m)	m	-	-	-	45	45	0	0	8	8	45	45	0	0	8	8	48	48		
Temperature	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Secchi (m) down	m	-	-	-	-	-	7	-	-	-	-	-	15	-	-	-	-	-		
Secchi (m) up	m	-	-	-	-	-	6.5	-	-	-	-	-	14.5	-	-	-	-	-		
Conductivity (field)	µS/cm	-	-	-	144	-	137	-	137	-	139	-	137	-	137	-	139	-		
Total Dissolved Solids (field)	mg/L	1	-	-	94	-	89	-	89	-	90	-	89	-	89	-	90	-		
pH (field)	pH units	-	-	-	7.59	-	7.87	-	7.73	-	7.55	-	7.91	-	7.76	-	7.57	-		
Physical Tests																				
Colour, Apparent	CU	5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		
Colour, True	CU	5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		
Conductivity	µS/cm	-	-	-	142	142	143	140	141	141	142	142	140	143	142	140	144	143		
Total Dissolved Solids	mg/L	-	-	-	88	90	88	75	80	84	60	100	81	93	82	74	86	84		
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
pH	pH units	-	-	6.5 – 9.0	6.5 – 9.0	7.41	7.42	7	7.01	7.02	7.02	7.03	7.03	7.06	7.05	7.03	7.06	7.05		
Dissolved Anions																				
Alkalinity-Total	mg/L	1	-	-	30.7	30.4	37	36.8	37	37.3	38.5	37.9	36.1	37.2	37.2	37.7	39	37.6		
Sulphate	mg/L	1	218	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Nutrients																				
Ammonia Nitrogen	µg/L	5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5.3		
Total Kjeldahl Nitrogen	µg/L	50	-	-	<50	<50	52	<50	<50	<50	<50	80	<50	50	<50	<50	102	74		
Total Nitrogen	µg/L	60	-	-	<50	<50	52	<50	<50	<50	<50	80	<50	50	<50	<50	102	83		
Nitrite/Nitrate Nitrogen	µg/L	5	-	-	6.8	5.8	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	9.4		
Dissolved orthophosphate	µg/L	1	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
Total Dissolved Phosphate	µg/L	2	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
Total Phosphate	µg/L	2	-	-	<2	<2	<2	<2	<2	<2	<2	<2	4.2	<2	<2	<2	<2	<2		
Total Metals																				
Aluminum	µg/L	1	-	-	29.8	30.1	50.8	50.1	38.3	37.6	65.3	30.5	47.4	45.7	63.6	38.6	29.1	26.9		
Antimony	µg/L	0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Arsenic	µg/L	0.1	-	5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Barium	µg/L	0.05	-	-	8.44	8.04	7.57	7.44	7.76	7.45	7.41	7.55	7.6	7.33	7.63	7.56	7.12	6.92		
Beryllium	µg/L	0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Bismuth	µg/L	0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Boron	µg/L	10	-	1200	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Cadmium	µg/L	0.050	0.159	0.393	0.07	0.084	0.074	0.082	0.081	0.088	0.079	0.073	0.083	0.081	0.079	0.072	0.068	0.068		
Calcium	mg/L	0.05	-	-	21.7	22.6	21.4	21.4	21.8	21.5	21.4	21.7	22	20.8	21.1	21	21.2	20.7		
Chromium	µg/L	0.5	-	9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Cobalt	µg/L	0.1	4	110	0.13	0.12	0.28	0.29	0.17	0.15	0.12	0.12	0.28	0.27	0.32	0.16	0.13	0.11		
Copper	µg/L	0.1	2.70	8.35	3.9	3.75	4.78	4.78	4.27	3.89	3.37	3.51	4.52	4.26	4.84	3.92	3.42	3.36		
Iron	µg/L	30	-	1000	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30		
Lead	µg/L	0.05	5.24	45.62	0.057	0.139	<0.05	0.072	0.653	0.497	0.213	0.195	0.115	0.075	0.252	<0.05	0.086	0.125		
Lithium	µg/L	5	-	14	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		
Magnesium	mg/L	0.1	-	-	1.59	1.66	1.61	1.63	1.63	1.63	1.58	1.61	1.66	1.55	1.55	1.52	1.57	1.52		
Manganese	µg/L	0.05	902	1285	2.37	2.17	5.76	5.67	2.4	2.31	1.63	1.86	5.15	4.94	6.46	2.37	1.89	1.51		
Molybdenum	µg/L	1	-	2000	2.6	2.6	2.5	2.5	2.6	2.5	2.5	2.5	2.4	2.4	2.5	2.6	2.4	2.4		
Nickel	µg/L	0.5	-	65	<0.5	<0.5	0.53	<0.5	5.53	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Phosphorous	mg/L	0.3	-	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3		
Potassium	mg/L	2	-	-	<2	<2	<2	2.1	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
Selenium	µg/L	0.5	-	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Silicon	mg/L	0.05	-	-	3.65	3.76	3.57	3.56	3.58	3.5	3.48	3.56	3.62	3.45	3.47	3.45	3.47	3.44		
Silver	µg/L	0.01	0.05	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		

¹ Excludes water quality data collected routinely by Kerness Mines Ltd.; these data are reported and discussed in detail elsewhere in the EAC Application.

Table A1 Water quality measured in Amazay Lake, 2003 to 2006.

Location in Lake Location in Water Column	Units	Det. Limit	Water Quality Guidelines for Protection of Aquatic Life (2015)					South Basin						North Basin						South Basin					
			BC		CCME Max	Bottom		Surface		Mid		Bottom		Surface		Mid		Bottom							
			30-Day Avg	Max		6-Jun-04 LS2	6-Jun-04 LS2	19-Jul-04 LS1	19-Jul-04 LS1	19-Jul-04 LS1	19-Jul-04 LS1	19-Jul-04 LS1	19-Jul-04 LS1	19-Jul-04 LS2	19-Jul-04 LS2	19-Jul-04 LS2	19-Jul-04 LS2	19-Jul-04 LS2	19-Jul-04 LS2						
Date	Station ID	Replicate	UTM Easting	UTM Northing	6-Jun-04 1	6-Jun-04 2	19-Jul-04 1	19-Jul-04 2	19-Jul-04 1	19-Jul-04 2	19-Jul-04 1	19-Jul-04 2	19-Jul-04 1	19-Jul-04 2	19-Jul-04 1	19-Jul-04 2	19-Jul-04 1	19-Jul-04 2							
Total Metals Cont'd.																									
Sodium	mg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2						
Strontium	µg/L	0.1	-	-	-	54.6	53.4	63.6	63.2	67.7	55.7	64.9	65.7	64.8	63	64	65.1	62.1	61						
Thallium	µg/L	0.1	0.3	-	0.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
Tin	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
Titanium	µg/L	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10						
Uranium	µg/L	0.01	-	300	15	0.17	0.163	0.168	0.162	0.162	0.157	0.157	0.15	0.16	0.149	0.15	0.156	0.151	0.147						
Vanadium	µg/L	1	-	6	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1						
Zinc	µg/L	1	7.5	33	30	7.5	6.3	3.9	4.7	7.8	3.9	3.2	3.6	4.1	3.7	3.6	3.1	3	3.4						
Dissolved Metals																									
Aluminum	µg/L	1	50	100	-	21.4	21.1	39.6	39.4	28.3	27.3	20.9	20.5	38.2	36.3	36.2	27.7	20.7	18.8						
Antimony	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
Arsenic	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
Barium	µg/L	0.05	-	-	-	8.25	7.88	7.56	7.54	7.49	7.31	7.46	7.51	7.61	7.18	7.67	7.5	7.02	7.11						
Beryllium	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5						
Bismuth	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5						
Boron	µg/L	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10						
Cadmium	µg/L	0.05	-	-	-	0.07	0.076	0.079	0.086	0.08	0.06	0.071	0.072	0.082	0.084	0.088	0.067	0.063	0.06						
Calcium	mg/L	0.05	-	-	-	22.5	21.5	21.3	21.3	22	21.3	21.4	21.6	21.5	20.6	21.7	21.6	20.9	20.8						
Chromium	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5						
Cobalt	µg/L	0.1	-	-	-	<0.1	<0.1	0.27	0.27	<0.1	<0.1	<0.1	<0.1	0.25	0.24	0.22	<0.1	<0.1	<0.1						
Copper	µg/L	0.1	-	-	-	3.17	3.15	4.07	4.07	3.05	2.92	2.74	2.75	3.79	3.6	3.7	3.09	2.7	2.66						
Iron	µg/L	30	-	-	-	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30						
Lead	µg/L	0.05	-	-	-	<0.05	<0.05	<0.05	<0.05	0.271	0.106	0.154	0.189	<0.05	0.061	0.063	<0.05	<0.05	<0.05						
Lithium	µg/L	5	-	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5						
Magnesium	mg/L	0.1	-	-	-	1.68	1.58	1.58	1.62	1.64	1.61	1.62	1.59	1.58	1.53	1.61	1.58	1.54	1.52						
Manganese	µg/L	0.05	-	-	-	1.17	0.967	5.29	5.31	1.05	1.02	0.407	0.483	4.77	4.46	4.3	0.959	0.646	0.268						
Molybdenum	µg/L	1	-	-	-	2.7	2.7	2.5	2.5	2.5	2.5	2.6	2.5	2.5	2.3	2.5	2.5	2.4	2.4						
Nickel	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5						
Phosphorous	mg/L	0.3	-	-	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3						
Potassium	mg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2						
Selenium	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5						
Silicon	mg/L	0.05	-	-	-	3.73	3.58	3.54	3.56	3.61	3.56	3.53	3.5	3.53	3.43	3.54	3.5	3.42	3.42						
Silver	µg/L	0.01	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01						
Sodium	mg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2						
Strontium	µg/L	0.1	-	-	-	55	53.9	63.4	63.9	65	55.3	65.3	65.6	65.3	62	64.8	64.9	61.3	62.2						
Thallium	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
Tin	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1						
Titanium	µg/L	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10						
Uranium	µg/L	0.01	-	-	-	0.166	0.159	0.162	0.16	0.16	0.155	0.148	0.153	0.159	0.152	0.153	0.153	0.153	0.147						
Vanadium	µg/L	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1						
Zinc	µg/L	1	-	-	-	3.2	3	3.6	3.7	2.9	2.7	2.7	3.4	3.7	3.6	3.6	2.8	2.4	3.3						

¹ Excludes water quality data collected routinely by Kerness Mines Ltd.; these data are reported and discussed in detail elsewhere in the EAC Application.

Table A1 Water quality measured in Amazay Lake, 2003 to 2006.

Location in Lake Location in Water Column	Units	Det. Limit	Water Quality Guidelines for Protection of Aquatic Life (2015)		North Basin						South Basin						
					Surface		Mid		Bottom		Surface		Mid		Bottom		
Date	-	-	BC	CCME	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04		
Station ID	-	-	30-Day Avg	Max	LS1	LS1	LS1	LS1	LS1	LS1	LS2	LS2	LS2	LS2	LS2		
Replicate	-	-			1	2	1	2	1	2	1	2	1	2	1	2	
UTM Easting	-	-			633473	633473	633473	633473	633473	633473	633407	633407	633407	633407	633407	633407	
UTM Northing	-	-			6327912	6327912	6327912	6327912	6327912	6327912	6324432	6324432	6324432	6324432	6324432	6324432	
Field Measurements																	
Depth (m)	m	-	-	-	0	0	8	8	47	47	0	0	8	8	43	43	
Temperature	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Secchi (m) down	m	-	-	-	20.5	-	-	-	-	-	17.2	-	-	-	-	-	
Secchi (m) up	m	-	-	-	19.3	-	-	-	-	-	16.9	-	-	-	-	-	
Conductivity (field)	µS/cm	-	-	-	139	-	139	-	139	-	139	-	139	-	139	-	
Total Dissolved Solids (field)	mg/L	1	-	-	91	-	91	-	91	-	90	-	90	-	86	-	
pH (field)	pH units	-	-	-	7.81	-	7.9	-	7.7	-	7.9	-	7.9	-	7.7	-	
Physical Tests																	
Colour, Apparent	CU	5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Colour, True	CU	5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Conductivity	µS/cm	-	-	-	138	139	144	141	139	138	138	138	138	139	143	141	
Total Dissolved Solids	mg/L	-	-	-	90	90	90	88	90	88	86	86	91	86	90	89	
Hardness	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
pH	pH units	-	-	6.5 – 9.0	6.5 – 9.0	7.82	7.68	7.65	7.66	7.58	7.56	7.6	7.6	7.59	7.59	7.58	7.56
Dissolved Anions																	
Alkalinity-Total	mg/L	1	-	-	30	31.1	30.2	30.3	32	32.1	30.5	31.5	31.6	31.3	31.6	31.9	
Sulphate	mg/L	1	218	-	-	-	-	-	-	-	-	-	-	-	-	-	
Nutrients																	
Ammonia Nitrogen	µg/L	5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Total Kjeldahl Nitrogen	µg/L	50	-	-	<50	<50	<50	<50	51	54	54	61	54	51	56	74	
Total Nitrogen	µg/L	60	-	-	<50	<50	<50	<50	51	54	54	61	54	51	56	74	
Nitrite/Nitrate Nitrogen	µg/L	5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Dissolved orthophosphate	µg/L	1	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Total Dissolved Phosphate	µg/L	2	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
Total Phosphate	µg/L	2	-	-	<2	<2	<2	<2	<2	2.9	<2	<2	<2	<2	<2	<2	
Total Metals																	
Aluminum	µg/L	1	-	-	100	67.9	49.9	45.9	45.1	39	30.7	46.5	46.4	45.2	44.5	32.4	27.6
Antimony	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Arsenic	µg/L	0.1	-	5	5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Barium	µg/L	0.05	-	-	-	7.81	7.72	7.58	7.47	7.61	7.72	7.99	7.95	7.85	7.77	8.23	7.42
Beryllium	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Bismuth	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Boron	µg/L	10	-	1200	1500	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
Cadmium	µg/L	0.050	0.159	0.393	1.410	0.067	0.075	0.07	0.074	0.064	0.094	0.083	0.084	0.085	0.08	0.073	0.063
Calcium	mg/L	0.05	-	-	-	22	22.1	22.1	21.8	21.4	22.1	21.4	21.5	21.5	21.1	22.2	21.9
Chromium	µg/L	0.5	-	9	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Cobalt	µg/L	0.1	4	110	-	0.28	0.27	0.28	0.27	0.15	0.15	0.27	0.28	0.25	0.25	0.18	0.14
Copper	µg/L	0.1	2.70	8.35	2	4.65	4.48	4.39	4.38	3.64	3.72	4.69	4.65	4.46	4.4	3.82	3.49
Iron	µg/L	30	-	1000	300	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	
Lead	µg/L	0.05	5.24	45.62	1.93	0.142	0.093	0.08	0.094	0.099	0.278	0.111	0.167	0.102	0.132	0.096	<0.05
Lithium	µg/L	5	-	14	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Magnesium	mg/L	0.1	-	-	-	1.62	1.61	1.6	1.61	1.58	1.56	1.53	1.54	1.53	1.49	1.52	1.52
Manganese	µg/L	0.05	902	1285	-	4.85	4.64	4.74	4.65	1.83	1.88	4.81	4.88	4.33	4.35	1.92	1.72
Molybdenum	µg/L	1	-	2000	73	2.6	2.6	2.6	2.5	2.6	2.7	2.7	2.7	2.7	2.6	2.8	2.6
Nickel	µg/L	0.5	-	65	71	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Phosphorous	mg/L	0.3	-	-	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	
Potassium	mg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
Selenium	µg/L	0.5	-	2	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Silicon	mg/L	0.05	-	-	-	3.58	3.57	3.6	3.6	3.57	3.61	3.56	3.56	3.53	3.47	3.56	3.52
Silver	µg/L	0.01	0.05	0.1	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	

¹ Excludes water quality data collected routinely by Kemess Mines Ltd.; these data are reported and discussed in detail elsewhere in the EAC Application.

Table A1 Water quality measured in Amazay Lake, 2003 to 2006.

Location in Lake Location in Water Column	Units	Det. Limit	Water Quality Guidelines for Protection of Aquatic Life (2015)		North Basin						South Basin						
					Surface		Mid		Bottom		Surface		Mid		Bottom		
Date	-	-	BC	CCME	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	8-Aug-04	
Station ID	-	-	30-Day Avg	Max	LS1	LS1	LS1	LS1	LS1	LS1	LS2	LS2	LS2	LS2	LS2	LS2	
Replicate	-	-			1	2	1	2	1	2	1	2	1	2	1	2	
UTM Easting	-	-			633473	633473	633473	633473	633473	633473	633407	633407	633407	633407	633407	633407	
UTM Northing	-	-			6327912	6327912	6327912	6327912	6327912	6327912	6324432	6324432	6324432	6324432	6324432	6324432	
Total Metals Cont'd.																	
Sodium	mg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
Strontium	µg/L	0.1	-	-	-	55.4	55.1	53.3	53.2	54.8	55.5	55.8	56	55	54.5	58.7	52.2
Thallium	µg/L	0.1	0.3	-	0.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Titanium	µg/L	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Uranium	µg/L	0.01	-	300	15	0.169	0.167	0.158	0.163	0.165	0.164	0.178	0.176	0.162	0.165	0.182	0.162
Vanadium	µg/L	1	-	6	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	µg/L	1	7.5	33	30	3.9	3.9	4.2	3.6	4	4.2	3.9	3.8	3.7	3.6	3.1	3.5
Dissolved Metals																	
Aluminum	µg/L	1	50	100	-	39.8	40	38.7	39.8	20.5	22	40.9	40.7	38.3	42.8	24.5	18.8
Antimony	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Barium	µg/L	0.05	-	-	-	7.82	7.61	7.51	7.51	7.5	7.94	7.88	7.96	7.7	8.31	8.17	7.14
Beryllium	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bismuth	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Boron	µg/L	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cadmium	µg/L	0.05	-	-	-	0.083	0.064	0.076	0.073	0.066	0.066	0.084	0.078	0.086	0.082	0.073	0.051
Calcium	mg/L	0.05	-	-	-	21.5	22.1	21.6	21.6	22.1	21.4	21.2	21.8	20.9	21.9	22.1	21.7
Chromium	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	µg/L	0.1	-	-	-	0.25	0.24	0.24	0.24	<0.1	0.1	0.25	0.24	0.2	0.24	0.1	<0.1
Copper	µg/L	0.1	-	-	-	3.88	3.68	3.62	3.68	2.8	2.92	3.87	3.9	3.68	4.01	3.02	2.6
Iron	µg/L	30	-	-	-	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
Lead	µg/L	0.05	-	-	-	<0.05	0.056	<0.05	<0.05	<0.05	0.055	<0.05	<0.05	0.066	0.082	<0.05	<0.05
Lithium	µg/L	5	-	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Magnesium	mg/L	0.1	-	-	-	1.58	1.61	1.59	1.61	1.59	1.51	1.54	1.55	1.49	1.51	1.53	1.54
Manganese	µg/L	0.05	-	-	-	4.33	4.23	4.14	4.12	0.362	0.409	4.26	4.32	3.67	4.02	0.341	0.307
Molybdenum	µg/L	1	-	-	-	2.6	2.6	2.5	2.7	2.7	2.8	2.7	2.7	2.6	2.9	2.9	2.5
Nickel	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phosphorous	mg/L	0.3	-	-	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium	mg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Selenium	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silicon	mg/L	0.05	-	-	-	3.5	3.54	3.51	3.55	3.59	3.52	3.56	3.56	3.45	3.54	3.55	3.51
Silver	µg/L	0.01	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	mg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Strontium	µg/L	0.1	-	-	-	55.5	53.5	53.3	53.3	53.9	56.6	55.5	56.3	54.6	58.4	58.5	50.9
Thallium	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Titanium	µg/L	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Uranium	µg/L	0.01	-	-	-	0.165	0.164	0.169	0.168	0.163	0.172	0.171	0.171	0.168	0.185	0.179	0.154
Vanadium	µg/L	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	µg/L	1	-	-	-	3.6	3.6	3.4	3.5	2.9	3.7	3.7	3.5	3.4	3.9	3	2.5

¹ Excludes water quality data collected routinely by Kerness Mines Ltd.; these data are reported and discussed in detail elsewhere in the EAC Application.

Table A1 Water quality measured in Amazay Lake, 2003 to 2006.

Location in Lake	Units	Det.	North Basin										South Basin					
			Water Quality Guidelines		Surface		Mid		Bottom		Surface		Mid		Bottom			
Location in Water Column		Limit			23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06		
Date	-		for Protection of Aquatic Life		LS1	LS1	LS1	LS1	LS1	LS1	LS2	LS2	LS2	LS2	LS2	LS2		
Station ID	-		(2015)		1	2	1	2	1	2	1	2	1	2	1	2		
Replicate	-				633473	633473	633473	633473	633473	633473	633407	633407	633407	633407	633407	633407		
UTM Easting	-		BC	CCME	633473	633473	633473	633473	633473	633473	633407	633407	633407	633407	633407	633407		
UTM Northing	-		30-Day Avg	Max	6327912	6327912	6327912	6327912	6327912	6327912	6324432	6324432	6324432	6324432	6324432	6324432		
Field Measurements																		
Depth (m)	m	-	-	-	surface	surface	mid	mid	bottom	bottom	surface	surface	mid	mid	bottom	bottom		
Temperature	C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Dissolved Oxygen	mg/L	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Secchi (m) down	m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Secchi (m) up	m	-	-	-	13.9	-	-	-	-	-	11.2	-	-	-	-	-		
Conductivity (field)	µS/cm	-	-	-	140	-	142	-	142	-	140	-	142	-	143	-		
Total Dissolved Solids (field)	mg/L	1	-	-	91	-	92	-	92	-	91	-	92	-	93	-		
pH (field)	pH units	-	-	-	7.51	-	7.53	-	7.55	-	7.64	-	7.55	-	7.49	-		
Physical Tests																		
Colour, Apparent	CU	5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	5.4	<5		
Colour, True	CU	5	-	-	<5	<5	<5	<5	<5	14.7	<5	<5	<5	<5	<5	<5		
Conductivity	µS/cm	-	-	-	138	138	140	140	140	140	138	139	141	141	141	138		
Total Dissolved Solids	mg/L	-	-	-	86	81	79	94	90	90	95	86	93	93	94	94		
Hardness	mg/L	-	-	-	68.2	66.6	69.7	68.5	70.2	69.4	69.4	69.6	69.6	69.5	70.1	68.2		
pH	pH units	-	-	6.5 – 9.0	7.84	7.86	7.86	7.86	7.85	7.86	7.88	7.88	7.88	7.87	7.86	7.65		
Dissolved Anions																		
Alkalinity-Total	mg/L	1	-	-	2	4.9	4.9	<2	<2	97.1	40	<2	2	<2	2.2	12		
Sulphate	mg/L	1	218	-	34.3	34.1	34.3	34.1	34.3	34	33.9	34.1	34	34	34.4	34.2		
Nutrients																		
Ammonia Nitrogen	µg/L	5	-	-	<5	<5	<5	<5	<5	<5	17	<5	<5	<5	<5	<5		
Total Kjeldahl Nitrogen	µg/L	50	-	-	90	55	62	65	62	59	<50	57	65	51	54	<50		
Total Nitrogen	µg/L	60	-	-	90	<56	62	65	62	59	<56	57	65	<56	<56	<56		
Nitrite/Nitrate Nitrogen	µg/L	5	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		
Dissolved orthophosphate	µg/L	1	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		
Total Dissolved Phosphate	µg/L	2	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	2.5		
Total Phosphate	µg/L	2	-	-	<2	<2	<2	<2	<2	2.6	<2	3.5	7.5	<2	<2	<2		
Total Metals																		
Aluminum	µg/L	1	-	-	63.1	65.4	37.9	38.1	37.2	38.4	59.1	60.1	36.8	38.8	36.3	37.4		
Antimony	µg/L	0.1	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Arsenic	µg/L	0.1	-	5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
Barium	µg/L	0.05	-	-	7.95	7.97	7.99	7.92	7.82	8.08	7.88	8.2	7.95	8.14	8.17	8.25		
Beryllium	µg/L	0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Bismuth	µg/L	0.5	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Boron	µg/L	10	-	1200	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10		
Cadmium	µg/L	0.050	0.159	0.393	0.083	0.086	0.062	0.067	0.081	0.077	0.072	0.095	0.09	0.061	0.072	0.072		
Calcium	mg/L	0.05	-	-	23.6	24.6	24.5	25.2	24.9	24.7	24.6	25	25.3	25.4	24.9	24.8		
Chromium	µg/L	0.5	-	9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Cobalt	µg/L	0.1	4	110	0.35	0.36	0.16	0.15	0.16	0.16	0.3	0.31	0.16	0.16	0.15	0.16		
Copper	µg/L	0.1	2.70	8.35	2	5.69	5.69	4.13	4.05	3.83	5.22	5.36	3.89	4.13	3.98	4.15		
Iron	µg/L	30	-	1000	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30		
Lead	µg/L	0.05	5.24	45.62	0.637	0.521	0.118	0.302	0.459	0.112	0.235	0.109	<0.05	0.092	0.066	<0.05		
Lithium	µg/L	5	-	14	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5		
Magnesium	mg/L	0.1	-	-	1.7	1.76	1.71	1.78	1.75	1.74	1.75	1.79	1.78	1.8	1.75	1.75		
Manganese	µg/L	0.05	902	1285	6.27	6.37	2.21	2.23	2.17	2.19	5.44	5.56	2.14	2.26	2.07	2.22		
Molybdenum	µg/L	1	-	2000	2.6	2.6	2.6	2.6	2.6	2.7	2.6	2.7	2.7	2.7	2.8	2.9		
Nickel	µg/L	0.5	-	65	0.63	0.59	0.51	0.52	<0.5	0.52	0.56	0.58	<0.5	<0.5	<0.5	0.53		
Phosphorous	mg/L	0.3	-	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3		
Potassium	mg/L	2	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2		
Selenium	µg/L	0.5	-	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Silicon	mg/L	0.05	-	-	3.36	3.51	3.37	3.49	3.4	3.41	3.39	3.5	3.41	3.43	3.37	3.35		
Silver	µg/L	0.01	0.05	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		

¹ Excludes water quality data collected routinely by Kemess Mines Ltd.; these data are reported and discussed in detail elsewhere in the EAC Application.

Table A1 Water quality measured in Amazay Lake, 2003 to 2006.

Location in Lake	Units	Det.	North Basin								South Basin						
Location in Water Column		Limit	Water Quality Guidelines		Surface		Mid		Bottom		Surface		Mid		Bottom		
Date	-		for Protection of Aquatic Life			23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06	23-Jul-06
Station ID	-		(2015)			LS1	LS1	LS1	LS1	LS1	LS1	LS2	LS2	LS2	LS2	LS2	LS2
Replicate	-					1	2	1	2	1	2	1	2	1	2	1	2
UTM Easting	-		BC		CCME	633473	633473	633473	633473	633473	633473	633407	633407	633407	633407	633407	633407
UTM Northing	-		30-Day Avg	Max	Max	6327912	6327912	6327912	6327912	6327912	6327912	6324432	6324432	6324432	6324432	6324432	6324432
Total Metals Cont'd.																	
Sodium	mg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Strontium	µg/L	0.1	-	-	-	54.6	54.9	56.9	55.7	55	56.3	54.8	57.3	56.4	58	57.5	59.8
Thallium	µg/L	0.1	0.3	-	0.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Titanium	µg/L	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Uranium	µg/L	0.01	-	300	15	0.181	0.173	0.172	0.174	0.168	0.178	0.176	0.173	0.174	0.173	0.167	0.178
Vanadium	µg/L	1	-	6	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	µg/L	1	7.5	33	30	5.7	6.3	4	4.7	4.6	4.1	5.1	6.2	3.4	5	4.7	8.2
Dissolved Metals																	
Aluminum	µg/L	1	50	100	-	39.9	39.6	25.2	23.8	24.1	25.5	38.4	39.6	26.3	26.3	23.7	24.3
Antimony	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Barium	µg/L	0.05	-	-	-	8	7.81	8.02	7.59	7.67	8.06	7.99	8.1	7.99	8.23	8.12	8.34
Beryllium	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bismuth	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Boron	µg/L	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cadmium	µg/L	0.05	-	-	-	0.102	0.097	0.072	0.066	0.068	0.07	0.073	0.086	0.069	0.073	0.068	0.073
Calcium	mg/L	0.05	-	-	-	24.5	23.9	25	24.6	25.2	24.9	24.8	24.9	25	24.9	25.1	24.5
Chromium	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	µg/L	0.1	-	-	-	0.33	0.31	<0.1	<0.1	<0.1	<0.1	0.29	0.28	<0.1	<0.1	<0.1	<0.1
Copper	µg/L	0.1	-	-	-	4.67	4.6	3.17	3.03	2.95	3.11	4.33	4.45	3.18	3.28	3.21	3.21
Iron	µg/L	30	-	-	-	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
Lead	µg/L	0.05	-	-	-	0.08	0.115	<0.05	0.283	0.371	<0.05	<0.05	<0.05	<0.05	0.094	0.055	<0.05
Lithium	µg/L	5	-	-	-	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Magnesium	mg/L	0.1	-	-	-	1.75	1.71	1.75	1.74	1.79	1.75	1.78	1.77	1.76	1.76	1.79	1.71
Manganese	µg/L	0.05	-	-	-	5.77	5.73	0.35	0.343	0.366	0.355	4.82	4.97	0.518	0.518	0.18	0.187
Molybdenum	µg/L	1	-	-	-	2.6	2.5	2.6	2.5	2.5	2.7	2.6	2.7	2.6	2.7	2.9	2.9
Nickel	µg/L	0.5	-	-	-	0.67	0.55	0.52	<0.5	<0.5	0.51	0.57	0.54	<0.5	<0.5	<0.5	0.51
Phosphorous	mg/L	0.3	-	-	-	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Potassium	mg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Selenium	µg/L	0.5	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Silicon	mg/L	0.05	-	-	-	3.44	3.37	3.43	3.37	3.43	3.35	3.42	3.46	3.37	3.39	3.43	3.31
Silver	µg/L	0.01	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sodium	mg/L	2	-	-	-	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Strontium	µg/L	0.1	-	-	-	55.6	55	56.7	54	53.3	57.2	55.6	56.7	56.9	59	58.2	59.5
Thallium	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Tin	µg/L	0.1	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Titanium	µg/L	10	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Uranium	µg/L	0.01	-	-	-	0.181	0.172	0.175	0.169	0.167	0.175	0.174	0.175	0.174	0.184	0.173	0.179
Vanadium	µg/L	1	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Zinc	µg/L	1	-	-	-	5	4.4	3.1	3.5	4.2	3.6	4.3	4.1	2.9	3.7	3.6	3.5

¹ Excludes water quality data collected routinely by Kerness Mines Ltd.; these data are reported and discussed in detail elsewhere in the EAC Application.