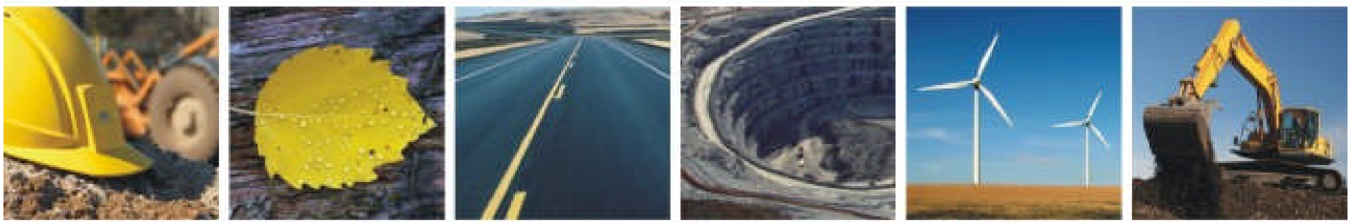
NORTH AMERICAN TUNGSTEN CORPORATION LTD.

APPENDIX B: MACTUNG GEOCHEMICAL CHARACTERIZATION AND PREDICTIVE WATER QUALITY MODELING REPORT



REPORT

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1.0 INTRODUCTION

This report has been prepared by EBA, A Tetra Tech Company (EBA), on behalf of North American Tungsten Corporation Ltd. (NATC). NATC has undertaken additional geochemical characterization work for the proposed Mactung underground mine to augment the information previously submitted to the Yukon Environmental and Socio-economic Assessment Board (YESAB). Since 2008, two rounds of sampling and analysis have been performed on the waste rock, ore, and tailings materials. There have also been multiple sampling events for surface water and groundwater at the Mactung property since 2006 (EBA 2008, EBA 2009). This report summarizes previous sampling results, and presents the results and interpretation of additional geochemical sampling completed in 2011, as required to meet sampling and testing requirements suggested in the Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials (MEND 2009).

The current mine plan proposes an underground mine, with an operational mine life of 11 years. The mine workings will intersect geological Units 1, 2B, and 3C. Unit 2B is the primary ore-body, while Units 1 and 3C are considered waste rock. Samples collected in 2008 and 2011 were selected from various drill core stored on and off site. Samples were selected across the proposed mine workings and represent the spatial and lithological variability of waste rock from Units 1 and 3C as shown in Figure 1. Sampling data from the 2011 analysis has been combined with 2008 sampling data to generate a representative data set that provides a thorough geochemical characterization and assessment of the variability of the waste rock generated during mine operations.

The geochemical data were used as input data for PHREEQCI, a geochemical modeling program, to predict the water quality of the proposed freshwater reservoir. The geochemical modeling was based on anticipated site runoff water contributions to the reservoir during operation and current baseline conditions. The modeling outputs were compared to applicable water quality standards, specifically the Metal Mining Effluent Regulations (MMER) and Canadian Council of Ministers of the Environment (CCME) Environmental Quality Guidelines.

1.1 Standards and Regulations

The existing Acid Rock Drainage (ARD) and Metal Leaching (ML) testing is based on the requirements for the project outlined in YESAB's Proponent's Guide to Information Requirements for Executive Committee Project Proposal Submissions, which states:

"Present and describe all geochemical results of all lithologies in the project area. Data and results from acid-base accounting (ABA), kinetic testing, slaking, freeze thaw, and metals leaching tests should be presented and discussed. The acid-neutralization capability of the different rock types should also be provided."

Classification of the acid-generating capacity of the material is based on the Neutralization Potential Ratio (NPR) classification as per the Guidelines and Recommendations for Assessment of Acid Mine Drainage (MEND, 2009). The NPR classification system is used as a guideline, where an NPR of less than 2.0 is used to identify materials that are potentially acid generating. Materials with an NPR of less than 1.0 are often referred to as being acid generating due to a lack of available neutralization potential.

Total inorganic carbon and total sulphur were calculated from analytical results, and used to determine the sample neutralization potential (NP) and maximum potential acidity (MPA), respectively. The neutralization potential ratio (NPR) is calculated by dividing the NP by the MPA.

Table 1 outlines the ARD classification system as presented in the Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials (MEND, 2009).

Table 1. ARD CLASSIFICATION SYSTEM

NPR	ARD Potential	Classification
NPR <1	Possibly	Likely acid generating unless sulphides are non-reactive.
1< NPR <2	Uncertain	Possibly acid generating if NP insufficiently reactive or is depleted faster than sulphides.
NPR > 2	None	No ARD concern

In the absence of site specific guidelines for water quality, the Canadian Council of Ministers of the Environment (CCME) guidelines for the protection of aquatic life and Metal Mining Effluent Regulations (MMER) have been used as comparative values. Acceptable metal concentrations are element-specific and are determined by the relative toxicity of the metal in the aquatic environment. Aqueous metal concentrations are determined by shake-flask metal leaching analysis, and generally represent the "worst-case" scenario for short-term metal leaching behavior. In addition, humidity test cells (HTC) are used to determine the oxidation rate of sulphide-containing lithologies, as well as the long-term metals leaching behaviour. A combined analysis of the shake-flask and HTC results yields a comprehensive predictive measure of the metal leaching potential of various lithologies.

2.0 SITE LITHOLOGY AND SAMPLE COLLECTION

Bedrock geology associated with the Mactung deposit comprises scheelite skarn, hornfels, schist, phyllite, and pelite with variable levels of sulphidic minerals, particularly pyrrhotite. The composition and waste quantities generated from the site geology model for Units 1 and 3C are included in Table 2. The MEND guidelines were used to estimate the recommended number of samples required for preliminary static testing. The recommended samples are based on the predicted waste rock volumes for each unit and are included in Table 2. As of June 2011, a total of 27 samples from Unit 1 and 39 samples from Unit 3C have been submitted for analyses, thus exceeding the suggested minimum sampling requirement of 13 and 34, respectively. The samples have been selected from drill cores from across the spatial and vertical extent of the planned workings and planned infrastructure. Figure 1a and 1b illustrate the location of each boring with respect to the planned mine footprint and the samples collected for testing.

3.0 WASTE ROCK AND TAILINGS OPERATIONAL PLAN

The Mactung Mine Plan includes specifications with respect to the handling of waste rock and the operational plan for the Dry-Stacked Tailings Facility (DSTF) which has been designed to prevent the onset of pyrite oxidation and, therefore, the formation of ARD.

The waste rock will be removed during the development phase of the underground mining operations and temporarily stored on the surface. The waste rock and approximately 50% of the generated tailings will be placed into the workings and sealed in place with a bulkhead to limit the flow of air into the closed stopes. The waste rock will be placed underground within five (5) years of initial excavation. The lower stopes are below groundwater and are expected to flood after dewatering ceases. Therefore, the waste rock and buried tailings exposure to atmospheric oxygen will be limited and the subaqueous emplacement will aid in preventing future oxidation reactions.

The remaining 50% of the tailings will be placed as the DSTF, which will be compacted during placement. The continual burial of older tailings by layers of fresh tailings, and the installation of a synthetic liner and vegetative cover layer at closure of the DSTF will limit the permeation of atmospheric oxygen and the infiltration of precipitation into the stacked tailings. Without oxygen and water, the chemical reactions which generate ARD are greatly limited.

Furthermore, the extended freezing period at the site prevents the exposure of material stored at surface from oxygen and liquid water via the formation of a frozen layer on all surfaces, thus preventing oxidation processes from occurring during the winter months from October to May. In combination these operational and closure activities serve to prevent ARD formation within the lifetime of the mine and post closure.

The geochemical model effectively considers a “worst case” scenario whereby the waste rock was allowed to become acid generating while at the surface. This provides a conservative estimate in the absence of site-specific waste rock kinetic data (humidity cells). The tailings will be continually buried in low permeability material (i.e. additional tailings) thereby limiting the potential formation of acidic drainage from the tailings due to the lack of exposure to air. All tailings run-off/leachate was modeled in PHREEQCI using results from humidity cell testwork and based on the Modeling Assumptions presented in Section 6.3.1.

4.0 GEOCHEMICAL CHARACTERIZATION

Standard geochemical evaluation methods were used to characterize the acid generation and metals leaching potential of the proposed mine waste rock. Testing was conducted in accordance with Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials (MEND, 2009). The results of this testing were used to assess the potential of the waste rock to generate ARD and leach metals to the receiving environment.

4.1 Acid Base Accounting

Acid Base Accounting (ABA) testing was completed on a total of 66 waste rock samples, 27 from Unit 1 and 39 from Unit 3C, using the modified Sobek method (Sobek et al, 1978) to evaluate the acid generating and acid neutralizing potential of each rock type. Analysis was carried out in 2008 by ALS laboratories and in 2011 by SGS Laboratories. For both years parameters assessed include paste pH, total sulphur, sulphate sulphur, total carbon and Sobek Neutralization potential (NP). In 2008 testwork at ALS included inorganic carbon and fizz rating. In 2011, testwork included sulphide sulphur analysis. In 2008, sulphide sulphur was calculated based on total sulphur less sulphate sulphur to provide a maximum potential value of sulphide sulphur. In 2011, the additional analysis of sulphide sulphur was included and insoluble sulphur was reported as total sulphur less sulphate sulphur and sulphide sulphur. This difference in methodology has resulted in a distinct difference in MPA values within the sample data and is discussed below.

Sulphide sulphur was used to calculate the maximum potential acidity (MPA) of the sample noting, that for 2008 data, this is a calculated value and for 2011 this is a measured value. Table 3 presents the results of the ABA testing.

The MPA and NP values are compared in a ratio to evaluate the amount of neutralizing components to the amount of acid producing components in the rock and is evaluated based upon the standards set out in MEND 2009.

Unit 1 waste rock includes data from 27 individual samples with 13 samples analysed in 2008 and 14 samples analysed in 2011. Paste pH of all samples is neutral to basic with a range from pH of 7.0 to 9.71. Total sulphur values range from 0.6 to 4.0 % and data show that the dominant source of sulphur is contributed by sulphide sulphur for the 13 samples analysed in 2008 and that insoluble sulphur is the dominant source of sulphur for the 14 samples analysed in 2011. MPA values have been calculated based on the content of sulphide sulphur in the samples (as per MEND 2009), and range from 0.15 to 123.75 t CaCO3/1,000t.

Total carbon in Waste Rock Unit 1 ranges from 0.01% to 0.25%. In 2008, inorganic carbon was reported at % Carbon or % CO2 (where 12/44 % CO2 = %C). Inorganic carbon values were not reported in 2011, and the assumption was made that all available carbon is inorganic carbon. A carbonate neutralization potential was calculated from inorganic carbon values and from total carbon values where no inorganic carbon data were available. Sobek NP was analysed according to standard lab procedures. With the exception of sample MS 170-177.7-1 all samples have a higher Sobek NP than Carbonate NP values. This indicates that neutralization potential from non-carbonate minerals is available.

Sobek NPR values are used to assess and classify materials for ARD. For Unit 1 samples, the Sobek NPR value ranges from 0.15 to 69.33 with 10 of the 27 samples with an NPR of less than 1 and classified as PAG. Three samples have an NPR value between 1 and 2 indicating that they have an uncertain acid generating potential and 14 samples have an NPR greater than 2 and are classified as NAG. All but one of the PAG samples is from the 2008 data set where non soluble sulphur was not included in the analysis. Data from 2011 indicates there are lower sulphide sulphur values than those assumed in 2008, and it is reasonable to assume that the 2008 data includes an overestimation of MPA, and thus an overestimation of PAG classified samples.

Unit 3C waste rock includes data from 39 individual samples with test data from 22 samples analysed in 2008 and test data from 17 samples analysed in 2011. Paste pH of all samples is neutral to basic with a range from pH of 6.9 to 9.57. Total sulphur values range from 0.2 to 5.51 % and data show that the dominant source of sulphur is contributed by sulphide sulphur for the 22 samples from the 2008 sample program. Insoluble sulphur is the dominant source of sulphur for the 17 samples from the 2011 program. MPA values have been calculated based on the content of sulphide sulphur in the samples (as per MEND 2009) and range from 0.15 to 170.31 t CaCO3/1,000 t.

Total carbon in waste rock Unit 3C ranges from 0.01% to 3.74 %. In 2008, inorganic carbon units were reported as % Carbon or % CO2. Inorganic carbon values were not reported in 2011. A carbonate neutralization potential was calculated from inorganic carbon values and from total carbon values where no inorganic carbon data were available. Sobek NP was analysed according to standard lab procedures. With the exception of sample B348092 and B348344 all samples have a higher Sobek NP than Carbonate NP values. This indicates that neutralization potential from non-carbonate minerals is available. Sobek NP values range from 5.9 to 622.0 t CaCo3/1,000t.

Sobek NPR values are used to assess and classify materials for ARD. For Unit 3C samples, the Sobek NPR value ranges from 0.06 to 995.20 with 12 of the 39 samples with an NPR of less than 1 and classified as PAG. Five samples have NPR value between 1 and 2 indicating that they have an uncertain acid generating potential. 22 samples have an NPR greater than 2 and are classified as NAG. Four of the PAG samples are from the 2011 data set where non-soluble sulphur was included in the analysis. Data from 2011 indicate lower sulphide sulphur values than those assumed in 2008, and it is reasonable to assume that the 2008 data include an overestimation of MPA, and thus an overestimation of PAG classified samples.

Tailings material has not been submitted for ABA analysis. However, the mineralogy indicates that there is a high concentration of pyrite (approximately 15%), and an absence of carbonate-containing mineral phases. Therefore, if the tailings were exposed to air and water it is likely they would be potentially acid generating (PAG). The mine plan includes a tailings design in which the tailings will be compacted during construction and capped at closure. This will limit the reactions that could produce acid drainage (See Section 3 above).

4.2 Leaching Studies

In addition to ABA analysis, samples of Unit 1 and 3C materials underwent shake flask analysis to determine the concentration of soluble metals. A total of 14 samples were subjected to acidic leaching and neutral leaching shake flask analysis. Standard shake flask analysis uses a neutral de-ionized water to extract leachate and estimates the initial concentrations of metals generated prior to the onset of sulphide oxidation. The acidic leaching shake flask analysis provides leachate prediction for acidic conditions. These analyses provide information as to what soluble elements are present in the material and potentially available to leach after closure of the facility. Tables 4 and 5 present the leaching analysis results for acidic and neutral leachate solutions, respectively (shake flask tests).

The shake flask analyses show consistant results for both Units 1 and 3C waste rock units, and indicate that arsenic and selenium are present in neutral waste rock leachate solutions with concentrations greater than CCME guidelines for the protection of aquatic life. Arsenic, chromium, copper, iron, lead, selenium, and zinc may be present in acidic conditions in concentrations greater than the CCME guidelines. Baseline water quality data from the Mactung site indicate that there is naturally occurring concentrations of aluminum, cadmium, copper, and selenium greater than the CCME guideline values. Baseline water quality data are presented in Table 6 and surface water sampling locations are shown in Figure 2. Sample locations WQ-C0 and WQ-C1 are nearest to the proposed workings and have been used as the most representative initial receiving water for the leachate solutions.

4.3 Elemental Analysis

Samples of ore and waste rock materials were submitted for bulk elemental (whole rock) analysis. A summary of the results is presented in Table 7.

These results indicate that concentrations of silicates and aluminum oxide account for approximately 90% of the whole rock mineralogy in both Unit 1 and 3c waste rocks. In addition, approximately 4.00 ± 1.01% and 2.75 ± 0.97% of Units 1 and 3C, respectively, comprise iron. Under acidic conditions and in the presence of oxygen, ferrous iron can be oxidized to ferric iron (Fe (III)), which can, in turn, lead to the formation of sulphuric acid in the presence of pyrite.

Elemental analyses of ore grade materials and, subsequently, tailings materials, were provided in a preliminary geochemical characterization report (EBA, 2009). Visual observations of ore materials submitted for analysis are described as containing approximately 11% sulphidic minerals. Elemental analysis for sulphur was not completed during the 2005 laboratory program. However, analytical lab results report values of 5.57 ± 5.08% sulphur in the 2008 ore samples (EBA, 2009).

4.4 Kinetic Studies

Two tailings samples generated from metallurgical testing on composite ore materials were submitted for humidity cell testing in June 2009. The elemental analyses of the samples have been included in Table 8 (2008 samples) and Table 9 (2005 samples). Figures 3 through 5 present the results of the humidity cell testwork and the changes in leachate chemistry over time. As of June 2011, the cells had been in operation for a total of 105 weeks. During that time, the cell containing tailings generated from 2008 core material became acid generating after approximately 86 weeks. The cell containing tailings generated from 2005 core material has not yet become acid generating after 105 weeks of operation. Initial flushing of the supernatant solution from the tailings appears to be complete after week 15, at which time the leachate water quality parameters stabilize after a sharp initial decline in the cell leachate alkalinity over the first 14 weeks of operation, as indicated in Figure 4.

4.5 Surface Water and Groundwater Studies

Water quality analysis was completed on the surface water and groundwater laboratory analytical results available for the Mactung site, including Tributary C to the Hess River Tributary, which will receive all discharged and runoff waters from the reservoir. Analysis shows that natural background concentrations of multiple metals, including selenium and cadmium, are greater than the CCME aquatic life guideline limits as a result of natural leaching from rock outcrops in the surrounding area. Table 6 presents a summary of the water quality data.

Groundwater monitoring results from well MW-MT-08-08D are presented in Table 10 and provide the most representative data on the baseline groundwater quality for the proposed underground workings. During operation, groundwater will be pumped from the proposed mine workings to the reservoir during year 6 to year 11 (mine dewatering).

5.0 GEOCHEMISTRY BACKGROUND

The geochemical reactions of mined rock and water-rock interactions will govern the effect of mining projects on surface and groundwater quality. Understanding the chemistry of the site is a valuable tool in predicting water quality effects on the receiving environment.

1. Alkaline rock drainage, which is generally characterized as having elevated total dissolved solids (TDS), Oxy-anions, including complexes of arsenic and selenium (i.e., arsenate and selenate), and metals soluble at neutral pH, including zinc, nickel, and copper.

2. Acid rock drainage (ARD), which is generally characterized as having elevated total dissolved solids (TDS), Low pH water; and metals soluble at acidic pH, including aluminum, iron, manganese, and copper.

5.1 Alkaline Rock Drainage

Alkaline rock drainage is common in skarn deposits and high carbonate environments. Due to the presence of carbonate minerals alkaline conditions are established, as measured by the ability of the solution to neutralize acids to the equivalence point of carbonate and bicarbonate (pH = 10.3). Arsenic and selenium are naturally occurring elements that are typically associated with sulphide ore deposits, including the Mactung deposit. In an alkaline environment arsenic will exist in aqueous solutions as an oxy-anion, which under oxidizing conditions (presence of oxygen), is present predominantly as arsenate ($HAsO_4^{2-}$ and $H_2AsO_4^{1-}$). Under reducing conditions (lack of available oxygen), arsenite ($HAsO_3^{2-}$) is the dominant species.

The dominant forms of selenium are selenate (SeO_4^{2-}) and hydrogen selenide (HSe^{-}) in oxidizing and reducing waters, respectively. As with arsenic, selenium is mobile at alkaline pH, and exhibits decreasing mobility with decreasing pH due to adsorption onto amorphous ferric hydroxide surfaces.

5.2 Acid Rock Drainage Geochemistry

Acid rock drainage, or ARD, commonly occurs in sulphide-enriched mine wastes via the oxidation of pyrite and other sulphidic minerals as they are exposed to oxygen and water from mining activities. ARD affected waters tend to have pH levels in the range of 2 to 4, and often contain higher than average metal concentrations.

The following chemical reactions describe the generation of ARD due to classic oxidation of pyrite (FeS_2) and the resulting formation of sulphate (SO_4^{2-}), amorphous ferric hydroxide ($Fe(OH)_{3(s)}$) and acidity (H^+).

1. $4FeS_2 + 15O_2 + 14H_2O \leftrightarrow 4Fe(OH)_{3(s)} + 8SO_4^{2-} + 16H^+$ where pH > 5
2. $FeS_2 + 14Fe^{3+} + 8H_2O \leftrightarrow 15Fe^{2+} + 2SO_4^{2-} + 16H^+$ where pH < 5
3. $Fe^{2+} + {}^{1}/_{4}O_2 + H^+ \leftrightarrow Fe^{3+} + {}^{1}/_{2}H_2O$ where pH < 5

From: Bethke, 1996; Deutsch, 1997; Drever, 2002; Mills, 1995; and Office of Surface Mining, 2005

Reactions 2 and 3 are kinetically faster than Reaction 1 due to the self-catalyzing effect of ferric iron (Fe^{3+}) versus ferrous iron (Fe^{2+}). Even in environments with limited oxygen, the ARD reaction can continue as shown in Reaction 2 if there is sufficient ferric iron available in the system. Under limited oxygen/high ferric iron conditions, ARD generation is four-times greater due to the production of sixteen moles of acidity per mole of pyrite versus four moles of acidity for each mole of pyrite under highly oxygenated conditions.

Oxidation of ferrous to ferric iron in Reaction 3 requires bacterial activity to promote rapid acid generation, which typically occurs in low pH waters. The critical bacteria are usually site-specific strains of *Acidi-Thiobaccillus ferrooxidans* that utilize the ferrous iron as a metabolic electron acceptor instead of oxygen. These bacteria do not require organic carbon as an energy source and obtain their nutritional needs from atmospheric gases (nitrogen, oxygen, carbon dioxide, and water) and from minerals (sulphur and phosphorus). While the bacteria are not catalysts by true definition, they do act as accelerating agents in the generation of ARD. In addition, *thiobaccillus* are psychrotrophic, meaning that they are capable of growth at temperatures below 10° C, but generally cease growth at temperatures at or below 0° C unless in brine solutions. The ability for these bacteria to thrive in conditions similar to those encountered at the site indicates that the oxidation of ferrous to ferric iron, which can accelerate the production of ARD, will likely occur even in limited oxygen environments.

Acidity formed by either Reaction 1 or coupled Reactions 2 and 3 is often neutralized by other mined rock minerals. For example, calcite or dolomite (Reactions 4 and 5) rapidly neutralize acidity and buffer the mine water at a pH of around 6.5 to 8.0. Many other minerals, such as anorthite, plagioclase, and other feldspar minerals (Reaction 6), may neutralize acidity, but reactions are often kinetically slow and the pH may be buffered at lower levels (e.g. 5.5 or less).

4. $CaCO_3 + 2H^{+1} \rightarrow Ca^{+2} + CO_2 + H_2O$ below a pH of 6
5. $CaCO_3 + H^{+1} \rightarrow Ca^{+2} + HCO_3^{-1}$ above a pH of 6
6. $CaAl_2Si_2O_8 + 2H^{+1} + H_2O \rightarrow Ca^{+2} + Al_2Si_2O_5(OH)_4$

ARD can be mitigated by controlling the availability of water to the pyrite; without water, ARD can neither form nor migrate. ARD can also be mitigated by controlling the oxygen available to the pyrite. As can be seen from Reactions 1 and 2, oxygen is the necessary oxidizing agent, transforming sulphide into sulphate. Removing this component will cause the reactions to end.

To accurately predict the geochemical behavior of oxygen-limited ARD reactions, the following kinetic rate equation is considered to calculate the rate of pyrite oxidation based on available oxygen concentrations:

$$R = 10^{-10.19}\left[O_{2(aq)}\right]^{0.5}\left[H^{+}\right]^{-0.11}$$

Where:

R = Rate of pyrite oxidation (mol/dm^3/sec)

[$O_{2(aq)}$] = Concentration of dissolved oxygen available to pyrite (molality)

[H^+] = Concentration of hydrogen ions/acidity (molality)

From: Williamson and Rimstidt (1994) (Modified for PHREEQC units)

It is evident from the equation above that reducing available oxygen will significantly reduce the rate of pyrite weathering and acid formation in the mine facilities. As long as the pH can be maintained above a threshold of about 3, additional oxidation of other sulphide minerals by ferric iron can be prevented (Reaction 3). Preventing the oxidation of pyrite by ferric iron lowers the total acidity of the leachate and reduces the concentrations of dissolved heavy metals.

6.0 GEOCHEMICAL MODELING

The geochemical modeling was conducted using the computer code PHREEQCI Version 2.17.4799 (Parkhurst and Appelo, 1999), a reaction path chemical equilibrium model supplied by the U.S. Geological Survey (USGS). PHREEQCI is able to process multiple geochemical equilibria and mixing reactions to produce a final prediction of chemical speciation at the end-point of a system. This program is able to do the following:

- Simulate the ARD and neutralization reactions;
- Account for precipitation of solids from solution;
- Simulate the mixing chemistry of multiple waters;
- Simulate the kinetics of pyrite oxidation; and
- Estimate the chemical make-up of the effluent discharged over time.

The following sections presents the methodology used to construct the Mactung geochemical models.

6.1 Database

Geochemical modeling requires a database of the thermodynamic and kinetic parameters of elements, compounds and metals. The database is maintained as a separate file to allow for additions, deletions, and updates to the information without affecting the model code. No database is fully comprehensive, and it is often necessary to include relevant updates to the database (Zhu and Anderson, 2002).

For this project, the WATEQ4F database (Ball and Nordstrom, 1991) was chosen and updated using the PHREEQ database published with the computer code (Parkhurst and Appelo, 1999). The combination of the two databases provided the broad range of metals needed to accurately model the ARD at the Mactung property.

6.2 Conceptual Model

The geochemical conceptual model for the waste rock dump and DSTF combines the physical components and chemical components that are the basis of the geochemical computer modeling. The material composition of the waste rock and the DSTF is expected to remain constant over time. However, the potential generation of acidic conditions will necessitate additional model outputs. For the Mactung project, six separate geochemical models were built based on the mine plan, the water balance, and other available information. These are:

1. Neutral waste rock drainage and tailings run-off and seepage inputs to the reservoir, Year 1, under:

- Average precipitation
- A "wet" year with above average precipitation
- A "dry" year with below average precipitation

2. Acidic waste rock drainage and tailings run-off and seepage inputs to the reservoir, late operation (Year 10), under:

- Average precipitation
- A "wet" year with above average precipitation
- A "dry" year with below average precipitation

These models correspond to the six flow models which estimate the physical behavior of the waste rock and DSTF deposition areas. In the case of acidic leachate inputs, a conservative scenario was constructed where the waste rock remains exposed to oxidation reactions at year 10 of operations. The current mine plan includes placement of the excavated waste rock material into the workings within five years of excavation and the tailings impoundment will be lined and capped at the end of the mine life. These operational and closure activities will greatly minimize the exposure of the waste rock and tailings materials to oxygen, and thereby minimize oxidation reactions and acid generating conditions. The six models provide a conservative estimation of the changes in the fresh water reservoir chemistry during the proposed mine life.

6.3 Modeling Methods

The following sections describe the modeling technique that was used in the construction of the geochemical models.

6.3.1 Modeling Assumptions

Some general assumptions were used in the geochemical modeling of the waste rock dump and DSTF. To capture the geochemical behavior of the leachate at downstream monitoring points, assumptions were made regarding waste material mixing, reaction times, sulphide oxidation rates, and ARD-contributing materials.

The waste rock pile is assumed to be a uniform mixture of materials from Unit 1 and 3C in representative proportions to the planned excavated volumes. The current mine plan assumes a total of 560,676 tonnes of waste rock will be generated; 63,508 tonnes from Unit 1 (11.3% of total) and 497,168 tonnes from Unit 3C (88.7% of total). Therefore, the leachate/runoff solutions are assumed to be a mixture of 11.3% Unit 1 leachate and 88.7% Unit 3C leachate. The tailings composition is assumed to be constant throughout the operational lifetime of the mine.

The rate of sulphide oxidation at the site has been approximated based on several observations. Only the humidity cell containing 2008 Mactung tailings became acid generating after 86 weeks of operation (Table 11). Table 12 presents the humidity cell test results for the 2005 composite tailings. Site investigations at older workings and waste rock within the Mactung site indicate acid generating conditions were established within the last 25 years (EBA 2008). Therefore, initial water quality is calculated via mixing of shake flask leachate solutions with natural background water quality data. Late operations waste rock leachate is calculated via mixing of acidic shake flask solutions in contact with fully oxidized sulphide mineral surfaces, and later mixed with natural background water quality data. Although the exposed tailings materials will be continually buried under new, compacted tailings within two years of deposition, thus preventing oxidation reactions, a conservative estimate of tailings leachate late in the mine life has been approximated by the 2008 tailings humidity test cell leachate at week 105 (the most recent data available).

Because the 2008 humidity cell became acid generating after 86 weeks, the conservative time required to generate ARD from any on-site facility, including the waste rock storage areas, was set at 86 weeks. Therefore, the year 10 operations models assumed that the waste rock would be exposed at the surface sufficiently long to become acid generating. Metals concentrations in the waste rock leachate solutions after the onset of pyrite oxidation have been approximated using the acidic shake flask leachate solutions. In order to yield meaningful model results, the pH of the leachate has been set to 7.6, thus affecting the net charge balance of the solutions. However, the charge balance of the oxidized solutions is re-established once the pH is allowed to equilibrate with the reactive surfaces. The year 10 tailings leachate has been approximated by using the most recent 2008 tailings humidity cell leachate water quality.

A conservative approach was used for assumptions related to reaction times; it was assumed that all solutions are in contact with surfaces sufficiently long for all reactions to progress to completion (i.e. no kinetic limitations). Particle tracking was not performed as part of the water balance modeling.

It was assumed for this modeling that the only material that would contribute to the generation of ARD impacted water was the sulphide pyrrhotite, approximated by the pyrite reaction kinetics. Because both waste rock units and the tailings materials contain pyrite in the presence of various aluminosilicates, all materials were subjected to the ARD generation processes.

6.3.2 Input Parameters

The parameters used as the starting point for the geochemical modeling were obtained from the analytical data from Mactung site samples. A basic precipitation composition of dissolved oxygen and carbon dioxide was used along with an average precipitation pH value of 5.8. The initial waste rock and tailings pore water compositions were calculated using an average of the metals concentrations in leachate and humidity cell leachate data. The waste rock ARD solutions were calculated by exposing the acidic pore water solutions to the pyrite oxidation reaction in molar concentrations equivalent to those measured in the bulk materials (approximately 2%). The tailings ARD solutions were calculated by exposing the 2008 tailings leachate to the pyrite oxidation reaction. The values used in the modeling are presented in Table 13.

6.3.3 Model Construction

The geochemical models were constructed as a series of mixing and reaction steps. As described above, six scenarios were modeled, three for the early mine conditions and three for late operations (year 10) conditions, with each scenario using data for average, high, and low precipitation years.

7.0 MODEL RESULTS

The results of the modeling scenarios have been summarized to represent the predicted chemical composition of the water exiting the waste rock and the DSTF, and potentially affecting the reservoir water quality. The detailed results of the modeling are presented in Table 13. The data are presented for the input solutions and each of the six models performed. The MMER and CCME water quality values are also presented in Table 13 for comparison. The parameter concentrations in bold italics indicate an exceedance of the CCME guideline concentrations. None of the MMER regulated metals exceed the maximum authorized monthly mean concentration. These values do not take into account any dilution effects that may occur by mixing with surface waters, and are estimated for the point of discharge at the reservoir.

Prior to the onset of pyrite oxidation, in Year 1, the pH in the reservoir is expected to range from 7.92 to 7.93, depending on the annual precipitation. Reservoir water quality is expected to exceed the CCME limits for cadmium regardless of precipitation totals. Cadmium does not have an applicable MMER limit. It should be noted that natural background cadmium concentrations in Tributary C already exceed the relevant CCME guidelines.

If acid generating conditions are allowed to form, the predictive model shows in Year 10+ that the pH in the reservoir is expected to range from 4.50 to 6.09, depending on the annual precipitation. Aluminum, cadmium, copper, selenium, and zinc are predicted to reach concentrations exceeding the minimum CCME guideline concentration. Unlike cadmium, the other metals do not currently exceed the CCME guideline concentration in Tributary C. All MMER-regulated metals are below the maximum authorized monthly mean concentrations.

8.0 IMPLICATIONS FOR PROPOSED MINE OPERATIONS

The current mine plan, including the limited exposure of waste materials at the surface and the placement of the tailings either within the closed stopes or within the DSTF, is sufficient to prevent acid generating conditions. If ARD conditions are allowed to develop the pH of the reservoir is anticipated to decrease to approximately 4.50. Concentrations of dissolved metals, already naturally elevated above the CCME limits in the waters on site, may increase within the reservoir but remain below the MMER limits.

9.0 CONCLUSIONS

Geochemical sampling and characterization of the Mactung property, as recommended by the MEND guidelines and requested by YESAB, has been completed. Reference to specific geochemical results from the Cantung report are no longer required to meet the sampling requirements at the Mactung property. Therefore, no comparisons to the Cantung property or its geochemical analyses have been presented. ABA analysis was used to classify unit 1 and 3C waste rock as PAG, NAG or Uncertain with respect to ARD. In 2008 analysis included total sulphur and sulphate sulphur and all other sulphur was assumed to be sulphides. In 2011, sulphide sulphur analysis was added to the laboratory program and results show that there is relatively little sulphide sulphur in the waste rock and the majority of sulphur is insoluble and would not contribute to the MPA. It is therefore likely that PAG classifications from the 2008 data are overestimated and a neutral drainage condition may be more likely than an acidic drainage condition.

As of June 2011, a total of 27 samples from Unit 1 and 39 samples from Unit 3C have been analyzed for ABA and metal leaching behaviour, exceeding the minimum required sample count of 13 and 34, respectively. Unit 1 materials are expected to be moderately acid generating, with concentrations of aluminum and copper exceeding the CCME limits in the neutral leachate, and concentrations of aluminum, arsenic, cadmium, chromium, copper, iron, lead, selenium, and zinc exceeding the CCME concentration limits in the acidic leachate. Unit 3C materials are expected to be mildly acid generating, with concentrations of aluminum, arsenic, and selenium exceeding the CCME limits in the neutral leachate, and concentrations of aluminum, arsenic, cadmium, chromium, copper, iron, lead, nickel, selenium, silver, uranium, and zinc exceeding the CCME limits in the acidic leachate. Concentrations in the leachates are not expected to exceed the applicable MMER limits. The minimum time required to establish acid generating conditions of approximately 86 weeks was determined by reviewing the analytical results for the 2008 tailings humidity cell currently in operation (discussed in Section 6.3.1.).

Although ABA analyses indicate that the tailings material is moderately acid generating, compaction during placement and the placement of an impermeable barrier after closure will prevent the flow of oxygen and water into the tailings and, therefore, the formation of ARD. Initial runoff solutions may contain concentrations of aluminum, arsenic, copper, iron, lead, and selenium above the CCME limits but below the applicable MMER limits. The runoff will report to the proposed reservoir.

Because the 2008 tailings humidity cell became acid generating in approximately 86 weeks of testing, the kinetics of the ARD reaction in waste rock could only be approximated at greater than 1.6 years and less than 25 years.

Until the onset of sulphide oxidation, the results of the mixing and equilibration of the neutral leachate solutions from the waste rock and DSTF indicate that water quality in the reservoir will not be affected with pH changes or be subjected to elevated metal concentrations beyond natural background concentrations. In the event that sulphide oxidation occurs in the waste rock and tailings, modeling results indicate that concentrations of metals found in the reservoir will not exceed MMER limits.

10.0 CLOSURE

We trust this report meets your present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

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REFERENCES

Ball, J. W., and Nordstrom, D. K., 1991, User's manual for WATEQ4F with revised data base: U.S. Geological Survey Open-File Report 91-183, 189 p.

Canadian Council of Ministers of the Environment (CCME), Environmental Quality Guidelines, 2003. Accessible on line: http://www.ccme.ca/publications/ceqg_rcqe.html

EBA Engineering Consultants Ltd. (EBA). 2009. Supplementary Geochemical Information for Waste Rock and Mineralized Rocks. Mactung Deposit, Yukon Territory (YESAB Project Number 2008-0304)

Energy, Mines and Resources (EMR) Assessment – Regulatory Guide: A guide to explain how EMR's regulatory regime works with the assessment process under the Yukon Environmental and Socio-economic Assessment Act (YESAA), March 2006. Accessible on line: http://www.emr.gov.yk.ca/pdf/yesaa_guide_final_web.pdf

Metal Mining Effuent Regulations (MMER) and Environmental Effects Monitoring (EEM), 2009. http://www.mining.ca/www/media_lib/TSM_Publications/2009_Annual_Report/Technical_Data/10_Metal_Mining_E.pdf

Parkhurst, D.L., and Appelo, C.A.J., 1999. User's guide to PHREEQC (Version 2.17.4799) — A computer program for speciation, batch-reaction, one-dimensional transport, and inverse geochemical calculations: U.S. Geological Survey Water-Resources Investigations Report 99-4259.

Price, W. A., 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials, MEND Report 1.20.1, CANMET – Mining and Mineral Sciences Laboratories, Smithers, British Columbia.

Sobek, A.A., W.A Schuller, J.R. Freeman, and R.M. Smith, 1978. Field and laboratory methods applicable to overburden and minesoils. U.S.E.P.A Report EPA-600/2-78-054.

Zhu, C. and Greg Anderson (2002), Environmental Applications of Geochemical Modeling. Cambridge University Press, London, ISBN 0-521-80907-X; 0-521-00577-9 (pb), 304 p.

TABLES

TABLE 2: WASTE ROCK LITHOLOGIES BY UNIT

			UNIT 1			UNIT 3C			TOTAL		
LITHOLOGIES	**% sulphide**	**ROCK CODE***	**LENGTH m**	**VOLUME**	**TONNES**	**LENGTH m**	**VOLUME**	**TONNES**	**LENGTH m**	**VOLUME**	**TONNES**
Semi massive pyrrhotite skarn + calc silicates	20-40	1/-	0	0	0	0.3	1,837	5,767	0.3	1,837	5,767
Calc silicate skarn with pyrrhotite	15-20	-/1	0.78	3,450	10,835	0	0	0	0.78	3,450	10,835
Calc silicate skarn minor sulphides	1-5	2R	0	0	0	1.56	9,550	25,785	1.56	9,550	25,785
Hornfels minor sulphides	<1	3	1.03	4,556	12,302	14.8	90,602	244,626	15.83	95,159	256,929
Hornfels +/- trace sulphides	1-5	3R	0	0	0	7.53	46,097	124,462	7.53	46,097	124,462
Pelite +/- trace sulphides	<1	6	3.38	14,952	40,371	4.63	28,344	76,528	8.01	43,296	116,899
Dyke +/- trace sulphides	<1	12	0	0	0	0.3	1,837	4,959	0.3	1,837	4,959
Acid intrusive minor sulphides	1-5	14R	0	0	0	0.61	3,734	10,083	0.61	3,734	10,083
Fault +/- trace sulphides	<1	15	0	0	0	0.3	1,837	4,959	0.3	1,837	4,959
15 CATEGORIES		TOTAL	5.19	22,959	63,508	30	183,837	497,168	35	206,796	560,675
MEND (2009) Recommended Sample Count				13			34			47	

TABLE 3: SUMMARY OF MACTUNG CORE SAMPLE ACID BASE ACCOUNTING ANALYTICAL RESULTS

SAMPLE ID	C - Total	C- Inorg as C	C - Inorg as CO2	Carb-NP	NP (Sobek)	MPA	NPR - Sobek	NPR - Carb	NNP	Fizz Test
	%	%	%	t CaCO3/1000 t	t CaCO3/1000 t	t CaCO3/1000 t				
36025	0.05		0.2	4.59	11	44.4	0.25	0.1	-33	
36026	0.05		0.2	4.59	32	24.1	1.33	0.19	8	
36027	0.05		0.2	4.59	23	7.5	3.07	0.61	16	
36028	0.05		0.2	4.59	23	16.9	1.36	0.27	6	
36029	0.05		0.2	4.59	25	30	0.83	0.15	-5	
36030	0.05		0.2	4.59	28	15.9	1.76	0.29	12	
36034	0.05		0.2	4.59	20	62.2	0.32	0.07	-42	
36035	2.09		7.7	176.53	622	0.6	995.2	294.22	621	
B348052	0.57	0.53		44.17	48.97	3.75	13.06	11.78	45.22	
B348092	0.78	0.71		59.17	58.88	28.13	2.09	2.1	30.75	
B348157	0.07	0.05		4.17	18.8	41.88	0.45	0.1	-23.08	
B348264	0.5	0.22		18.33	35.46	24.38	1.45	0.75	11.09	
B348302	0.49	0.45		37.5	46.51	20.63	2.25	1.82	25.89	
B348344	1.84	1.23		102.51	85.2	18.44	4.62	5.56	66.77	
B348402	0.18	0.16		13.33	25.55	83.44	0.31	0.16	-57.89	
B348403	0.14	0.13		10.83	30.05	13.44	2.24	0.81	16.61	
B348426	0.24	0.23		19.17	40.36	22.81	1.77	0.84	17.55	
B348472	0.22	0.2		16.67	33.22	80.63	0.41	0.21	-47.41	
B348473	0.17	0.17		14.17	30.57	76.25	0.4	0.19	-45.68	
B348500	0.22	0.2		16.67	24.76	170.31	0.15	0.1	-145.56	
B348505	0.17	0.16		13.33	34.81	9.06	3.84	1.47	25.74	
B348517	3.74	3.55		295.85	336.92	8.13	41.44	36.39	328.79	
MS142-185-3C/3D	0.1			8.3	29.3	12.5	0.7	2.3	16.8	Slight
MS143-275.2-3C	0.07			5.8	19.1	9.7	0.6	2.0	9.4	Slight
MS144-269.8-3C	0.01			0.8	5.9	15.0	0.1	0.4	-9.1	Slight
MS149-285.9-3C	0.01			0.8	17.0	1.3	13.6	0.7	15.8	None
MS155-234.1-3C	0.02			1.7	15.3	0.3	49.0	5.3	15.0	None
MS157-112.2-3C	0.04			3.3	33.5	0.15	223.3	22.2	33.5	Slight
MS160-182.1-3C	0.03			2.5	9.9	0.9	10.6	2.7	9.0	None
MS160-183.5-3C	0.02			1.7	7.8	0.15	52.0	11.1	7.8	None
MS163-35.3-3H	<0.01			0.4	8.9	2.5	3.6	0.2	6.4	None
MS170-106.8-3C	0.06			5.0	9.3	0.9	9.9	5.3	8.4	Slight
MS181-50.9-3C	0.05			4.2	40.5	3.1	13.0	1.3	37.4	None
MS206-259-3C	0.11			9.2	29.1	3.8	7.8	2.4	25.4	Slight
MS206-278.6-3C	0.06			5.0	11.8	13.1	0.9	0.4	-1.3	Slight
MS212-160.9-3C	<0.01			0.4	21.9	0.6	35.0	0.6	21.3	Slight
MS229-107.2-3C	0.08			6.7	28.0	2.5	11.2	2.7	25.5	Slight
MWMT09-10-185.1-3C	0.21			17.5	31.9	2.8	11.3	6.2	29.1	Slight
MWMT09-10-197-3C	0.06			5.0	17.8	0.15	118.7	33.3	17.8	Slight
MINIMUM	0.01			0.40	5.90	0.15	0.06	0.07	-145.56	
MAXIMUM	3.74			295.85	622.00	170.31	995.20	294.22	621.00	

TABLE 4: SHAKE FLASK ANALYTICAL RESULTS FOR ACIDIC CONDITIONS

Unit	Parameter	Wt. of Sample Used	Volume of DI Water Used	Final pH (24h)	Conductivity (24h)	Acidity (to pH 8.3)	Total Alkalinity (to pH 4.5)	Dissolved Sulphate SO4	Hardness CaCO3	Dissolved Aluminum Al	Dissolved Antimony Sb	Dissolved Arsenic As	Dissolved Barium Ba	Dissolved Beryllium Be	Dissolved Bismuth Bi	Dissolved Boron B	Dissolved Cadmium Cd	Dissolved Calcium Ca	Dissolved Chromium Cr	Dissolved Cobalt Co	Dissolved Copper Cu	Dissolved Iron Fe	Dissolved Lead Pb
	Units	g	ml	pH Units	µS/cm	mg CaCO3/L	mg CaCO3/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Method	Weighing Scale	Graduated Cylinder	pH Meter	Conductivity Meter	Titration/ Calculation	Titration/ Calculation	Auto Turbidity	Calculation from Ca & Mg	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
Unit	Detection Limit	0.01	5	0.5	0.5	1	1	1		0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.00001	0.00004	0.00001	0.0002	0.0002	0.0002	0.00001	0.0002
1	Sample ID B348381	250	750	1.5	23900	3710	#N/A	17	1109	168	< 0.001	0.027	0.37	0.027	0.11	0.08	0.0014	433	0.037	0.043	0.42	58	0.014
1	B348383	250	750	1.3	28400	4050	#N/A	23	503	94.3	< 0.001	0.002	0.49	0.019	0.42	< 0.05	0.0005	188	0.059	0.035	0.35	68	0.017
1	B348184	250	750	1.3	27700	4030	#N/A	9	643	135	< 0.001	0.001	0.42	0.028	0.034	< 0.05	0.0006	240	0.077	0.02	0.13	67.2	0.033
1	B348220	250	750	1.3	27100	3550	#N/A	9	1117	66	< 0.001	0.001	0.5	0.009	0.004	< 0.05	0.0006	429	0.11	0.011	0.1	34.8	0.029
3C	B348157	250	750	1.3	27800	3880	#N/A	6	828	97.5	< 0.001	0.002	0.4	0.011	< 0.001	0.06	0.002	323	0.28	0.007	0.05	30.4	0.02
3C	B348402	250	750	1.4	25700	3050	#N/A	8	1653	30.7	< 0.001	0.003	0.24	0.016	0.011	< 0.05	0.0047	656	0.021	0.011	0.031	21.5	0.03
3C	B348472	250	750	1.4	23200	2860	#N/A	19	1979	31.7	< 0.001	0.013	0.19	0.036	0.022	< 0.05	0.0007	778	0.12	0.023	0.5	70.6	0.029
3C	B348344	250	750	1.7	17870	1510	#N/A	19	3223	18.5	< 0.001	0.011	0.22	0.039	0.002	< 0.05	0.0028	1280	0.01	0.033	0.029	9.06	0.023
3C	B348500	250	750	1.4	27400	3620	#N/A	15	1097	53.2	< 0.001	0.001	0.012	0.036	0.006	< 0.05	0.0006	434	0.041	0.009	0.33	69.3	0.004
3C/2B	B348426	250	750	1.5	22200	2700	#N/A	6	2077	63.9	< 0.001	0.007	0.24	0.024	0.001	0.05	0.004	824	0.14	0.006	0.18	22.8	0.014
3C	B348264	250	750	1.5	23700	3070	#N/A	4	1804	81	< 0.001	0.009	0.14	0.018	0.01	< 0.05	0.008	717	0.082	0.01	0.058	25.2	0.023
3C	B348403	250	750	1.4	24800	3150	#N/A	7	1423	63.6	< 0.001	0.016	0.85	0.036	0.002	< 0.05	0.0046	560	0.077	0.012	0.079	18	0.015
3C	B348517	250	750	5.3	10720	165	66	13	4842	2.82	0.001	0.001	0.1	0.016	< 0.001	< 0.05	0.0036	1920	0.001	0.024	0.23	0.08	< 0.001
3C/2B	B348473	250	750	1.4	25100	3250	#N/A	13	1493	34.2	0.003	0.043	0.3	0.1	0.029	< 0.05	0.0006	577	0.029	0.028	0.28	30.2	0.04
CCME	Guidelines for the Protection of Aquatic Life											0.005					0.0096		0.0089		0.003	0.3	0.004

Unit	Parameter	Dissolved Lithium Li	Dissolved Magnesium Mg	Dissolved Manganese Mn	Dissolved Molybdenum Mo	Dissolved Nickel Ni	Dissolved Phosphorus P	Dissolved Potassium K	Dissolved Selenium Se	Dissolved Silicon Si	Dissolved Silver Ag	Dissolved Sodium Na	Dissolved Strontium Sr	Dissolved Tellurium Te	Dissolved Thallium Tl	Dissolved Thorium Th	Dissolved Tin Sn	Dissolved Titanium Ti	Dissolved Uranium U	Dissolved Vanadium V	Dissolved Zinc Zn	Dissolved Zirconium Zr	
	Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	
	Method	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS		
Unit	Detection Limit	0.0002	0.00001	0.0002	0.0001	0.0002	0.00003	0.00002	0.0002	0.00005	0.00005	0.00001	0.0002	0.0002	0.00002	0.0001	0.0002	0.0002	0.0001	0.0002	0.0001		
1	Sample ID B348381	0.024	6.82	2.12	0.0012	0.071	12.2	8.1	0.003	188	< 0.00025	4.19	0.72	< 0.001	0.0004	< 0.0005	< 0.001	0.067	0.003	0.023	0.059	< 0.01	
1	B348383	0.048	8.1	0.93	0.0006	0.074	23	21.2	0.001	106	< 0.00025	3.1	0.26	< 0.001	0.0008	0.0008	< 0.001	0.1	0.0081	0.019	0.08	< 0.01	
1	B348184	0.066	10.7	1.79	0.0005	0.04	30.7	21.6	0.002	147	< 0.00025	5.35	0.36	< 0.001	0.0008	0.0084	< 0.001	0.24	0.013	0.031	0.066	< 0.01	
1	B348220	0.077	11.2	3.1	0.0018	0.021	37	21	0.002	72.5	< 0.00025	4.22	0.8	< 0.001	0.0007	0.0079	< 0.001	0.3	0.014	0.025	0.071	< 0.01	
3C	B348157	0.054	5.19	1.59	0.0017	0.047	21.7	10.3	0.002	112	< 0.00025	4.02	0.36	< 0.001	0.0005	0.001	0.002	0.2	0.041	0.3	0.33	< 0.01	
3C	B348402	0.006	3.73	4.85	0.0017	0.048	12.7	3.7	0.001	38.8	< 0.00025	1.46	0.5	< 0.001	0.0001	< 0.0005	< 0.001	0.023	0.02	0.029	0.47	< 0.01	
3C	B348472	0.052	8.94	3.98	0.0018	0.026	71.3	12.1	0.002	34.1	< 0.00025	1.69	1.22	< 0.001	0.0008	0.004	0.005	0.14	0.02	0.019	0.05	< 0.01	
3C	B348344	0.013	6.58	4.65	0.141	0.27	24	10.4	0.015	13.4	< 0.00025	2.6	1.17	< 0.001	0.0004	0.0015	< 0.001	0.033	0.025	0.061	0.15	< 0.01	
3C	B348500	0.007	3.12	6.92	0.0082	0.011	5.6	0.8	0.001	77.3	< 0.00025	1.56	0.12	0.001	< 0.0001	0.0025	0.004	0.01	0.0037	0.006	0.054	< 0.01	
3C/2B	B348426	0.037	4.74	7.23	0.0072	0.037	22.9	4.6	0.002	83.6	< 0.00025	3.59	0.99	< 0.001	0.0003	0.0047	0.005	0.044	0.019	0.14	0.34	< 0.01	
3C	B348264	0.011	3.35	5.3	0.0028	0.073	17.8	2.9	0.002	111	< 0.00025	2.92	0.96	< 0.001	< 0.0001	0.0015	< 0.001	0.038	0.028	0.042	0.73	< 0.01	
3C	B348403	0.035	6.1	2.1	0.0019	0.081	20.9	9.3	0.002	63	< 0.00025	2.73	2.42	< 0.001	0.0003	0.0012	< 0.001	0.093	0.014	0.18	0.28	< 0.01	
3C	B348517	0.005	11.7	24.2	0.0008	0.005	< 0.15	1.9	0.007	4.8	0.0011	0.71	0.77	< 0.001	< 0.0001	< 0.0005	< 0.001	< 0.001	0.027	< 0.001	0.048	< 0.01	
3C/2B	B348473	0.031	12.7	2.4	0.0015	0.056	29.2	10.2	0.004	44.9	< 0.00025	1.67	0.81	< 0.001	0.0006	0.001	0.002	0.097	0.06	0.042	0.042	< 0.01	
CCME					0.073	0.11			0.001		0.0001				0.0008						0.03		

Notes: Shake flask testing conducted using modified weak acid extraction procedure as listed in Price (1997).
Values in red and underlined indicate an exceedance of the Canadian water quality guidelines for the protection of aquatic life

TABLE 5: SHAKE FLASK ANALYTICAL RESULTS FOR NEUTRAL CONDITIONS

		pH	Redox	Conductivity	Acidity (to pH 4.5)	Total Acidity (to pH 8.3)	Alkalinity	Sulphate	Major Anions	Major Cations	Difference	Balance (%)	Hardness CaCO3	Aluminum Al
		meter	meter	meter	titration	titration	titration	Turbidity	Calc	Calc	Calc	Calc		ICP-MS
	Sample ID		mV	uS/cm	mg CaCO3/L	mg CaCO3/L	mg CaCO3/L	mg/L	meq/L	meq/L	meq/L	%	mg/L	mg/L
1	MS147-330.3-1	7.88	294	54	#N/A	3.1	28.7	3	0.64	1.10	-0.47	-26.8%	22.1	0.372
1	MS155-312.4-1	8.00	291	54	#N/A	3.0	31.6	3	0.69	0.68	0.01	0.8%	20.4	0.665
1	MS163-351.4-1	7.86	295	75	#N/A	3.4	35.6	4	0.80	0.81	-0.01	-0.6%	33.9	0.239
1	MS163-384.7-1	7.67	297	123	#N/A	4.2	32.1	17	1.00	1.14	-0.15	-6.8%	50.6	0.0553
1	MS163-386.2-1	7.77	255	94	#N/A	4.0	30.0	10	0.81	0.90	-0.10	-5.6%	38.5	0.0615
1	MS170-177.7-1	7.95	282	83	#N/A	3.5	42.0	3	0.90	0.83	0.07	3.9%	33.0	0.356
1	MS181-177.9-1	7.99	280	84	#N/A	3.0	45.3	3	0.97	0.86	0.11	6.2%	33.9	0.338
1	MS206-380.1-1	7.99	282	60	#N/A	2.7	30.4	3	0.67	0.62	0.05	3.9%	19.6	0.483
1	MWMT09-10-331.5-1	7.85	299	78	#N/A	3.5	25.9	4	0.60	0.58	0.02	1.9%	22.1	0.222
1	MS149-336.2-1	7.21	281	28	#N/A	2.5	12.1	3	0.30	0.28	0.02	4.1%	8.4	0.117
1	MS151-256.8-1	7.87	278	63	#N/A	1.7	36.8	3	0.80	0.71	0.09	6.2%	21.1	0.889
1	MS157-260-1	7.83	280	57	#N/A	1.7	33.8	3	0.74	0.66	0.08	5.6%	16.1	0.893
1	MS157-288.7-1	7.75	285	83	#N/A	2.1	42.3	4	0.93	0.85	0.08	4.2%	31.8	0.407
1	MS160-258.5-1	7.72	277	51	#N/A	1.7	25.6	3	0.57	0.55	0.03	2.5%	13.4	0.737
	AVERAGE	7.81	283.9657143	70.54142857	#N/A	2.858571429	32.30428571	4.714285714	0.7443	0.755174909	-0.0108749	-0.00031635	26.06428571	0.416771429
3	MS170-106.8-3C	7.94	280	56	#N/A	3.3	31.0	3	0.68	0.59	0.10	7.7%	25.7	0.215
3	MS206-259-3C	7.93	282	64	#N/A	3.0	30.5	3	0.67	0.66	0.01	1.0%	26.6	0.388
3	MS212-160.9-3C	7.77	290	38	#N/A	3.2	22.8	2	0.50	0.40	0.10	11.0%	16.4	0.100
3	MWMT09-10-185.1-3C	7.92	290	63	#N/A	3.1	31.0	3	0.68	0.64	0.04	2.9%	27.2	0.253
3	MWMT09-10-197-3C	7.92	285	58	#N/A	3.2	32.7	2	0.70	0.62	0.08	5.7%	27.2	0.251
3	MS142-185-3C/3D	7.79	331	146	#N/A	2.2	48.3	16	1.30	1.36	-0.06	-2.2%	60.6	0.127
3	MS143-275.2-3C	7.72	296	94	#N/A	2.2	36.0	7	0.87	0.89	-0.03	-1.5%	37.9	0.194
3	MS144-269.8-3C	7.77	283	88	#N/A	2.1	38.1	3	0.83	0.90	-0.07	-4.3%	35.0	0.441
3	MS149-285.9-3C	7.77	262	49	#N/A	2.1	28.4	3	0.63	0.56	0.07	6.1%	19.2	0.638
3	MS155-234.1-3C	7.59	286	50	#N/A	2.2	29.1	3	0.64	0.56	0.09	7.1%	20.1	0.487
3	MS157-112.2-3C	7.79	282	60	#N/A	1.7	33.5	3	0.73	0.67	0.06	4.4%	24.1	0.544
3	MS160-182.1-3C	7.83	282	78	#N/A	1.9	38.2	5	0.87	0.80	0.07	4.1%	22.8	0.465
3	MS160-183.5-3C	7.88	272	58	#N/A	1.5	34.5	2	0.73	0.67	0.06	4.5%	16.3	1.04
3	MS163-35.3-3H	7.43	275	60	#N/A	2.0	23.0	4	0.54	0.55	-0.01	-0.8%	19.9	0.164
3	MS181-50.9-3C	7.65	263	50	#N/A	1.8	27.9	3	0.62	0.52	0.10	9.1%	21.9	0.376
3	MS206-278.6-3C	7.98	313	72	#N/A	2.0	31.6	5	0.74	0.72	0.02	1.4%	30.1	0.424
3	MS229-107.2-3C	8.12	311	79	#N/A	1.5	41.3	3	0.89	0.68	0.21	13.0%	29.5	0.368
	AVERAGE	7.811764706	287.2188235	68.37294118	#N/A	2.291764706	32.81411765	4.117647059	0.742066667	0.693105497	0.04896117	0.040628444	27.088235	0.380882

TABLE 5: SHAKE FLASK ANALYTICAL RESULTS FOR NEUTRAL CONDITIONS

	Sample ID	Antimony Sb	Arsenic As	Barium Ba	Beryllium Be	Bismuth Bi	Boron B	Cadmium Cd	Calcium Ca	Chromium Cr	Cobalt Co	Copper Cu	Iron Fe	Lead Pb	Lithium Li	Magnesium Mg	Manganese Mn
		ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1	MS147-330.3-1	0.0011	0.0032	0.00151	< 0.00002	< 0.00001	0.0169	< 0.000003	6.79	< 0.0005	0.000036	0.0006	0.016	0.00002	0.012	1.24	0.0042
1	MS155-312.4-1	0.0005	0.0004	0.00181	< 0.00002	0.00004	0.0111	< 0.000003	7.73	< 0.0005	0.000033	< 0.0005	0.157	< 0.00002	0.009	0.267	0.0032
1	MS163-351.4-1	0.0123	0.009	0.00155	< 0.00002	< 0.00001	0.0158	0.000011	13.4	< 0.0005	0.000063	< 0.0005	0.005	0.00010	0.005	0.129	0.0024
1	MS163-384.7-1	0.0027	0.0061	0.00211	< 0.00002	< 0.00001	0.0093	0.000040	19.3	< 0.0005	0.000098	< 0.0005	0.007	< 0.00002	0.040	0.575	0.0225
1	MS163-386.2-1	0.0038	0.0119	0.00157	< 0.00002	< 0.00001	0.0129	0.000008	14.7	< 0.0005	0.000089	< 0.0005	0.008	0.00007	0.033	0.463	0.0145
1	MS170-177.7-1	0.0014	0.0003	0.00287	< 0.00002	< 0.00001	0.0170	< 0.000003	12.1	< 0.0005	0.000047	0.0007	0.029	0.00012	0.012	0.659	0.0097
1	MS181-177.9-1	0.0011	0.0020	0.00218	< 0.00002	< 0.00001	0.0164	< 0.000003	12.7	< 0.0005	0.000038	< 0.0005	< 0.002	0.00006	0.011	0.510	0.0119
1	MS206-380.1-1	0.0020	0.015	0.00157	< 0.00002	< 0.00001	0.0103	< 0.000003	7.77	< 0.0005	0.000040	0.0006	0.064	0.00008	0.015	0.060	0.0008
1	MWMT09-10-331.5-1	0.0024	0.0025	0.00120	< 0.00002	< 0.00001	0.0093	< 0.000003	8.52	< 0.0005	0.000081	< 0.0005	0.004	0.00002	0.008	0.203	0.0026
1	MS149-336.2-1	0.0002	0.0004	0.00152	< 0.00002	< 0.00001	0.0043	0.000003	3.10	< 0.0005	0.000159	0.0349	0.008	0.0122	0.003	0.161	0.0020
1	MS151-256.8-1	< 0.0002	0.0004	0.00160	< 0.00002	< 0.00001	0.0059	< 0.000003	8.15	0.0007	0.000030	0.0009	0.009	0.00007	0.010	0.187	0.0052
1	MS157-260-1	0.0004	0.0011	0.00205	< 0.00002	< 0.00001	0.0091	< 0.000003	5.96	< 0.0005	0.000020	0.0010	0.027	0.00005	0.018	0.283	0.0034
1	MS157-288.7-1	0.0005	0.0015	0.00362	< 0.00002	< 0.00001	0.0083	< 0.000003	12.2	< 0.0005	0.000067	0.0010	0.010	0.00015	0.008	0.289	0.0040
1	MS160-258.5-1	0.0004	0.0003	0.00205	< 0.00002	< 0.00001	0.0110	< 0.000003	5.09	< 0.0005	0.000027	< 0.0005	0.020	0.00009	0.006	0.171	0.0019
	AVERAGE	0.002215385	0.00386429	0.001943571	#DIV/0!	0.00004	0.011257143	0.0000155	9.822142857	0.0007	5.91429E-05	0.005671429	0.028	0.0010858	0.0135714	0.37121429	0.006307143
3	MS170-106.8-3C	0.0005	0.0006	0.0131	< 0.00002	< 0.00001	0.0103	< 0.000003	9.62	< 0.0005	0.000052	0.0013	0.006	0.00008	0.003	0.416	0.0057
3	MS206-259-3C	0.0023	0.0110	0.00407	< 0.00002	< 0.00001	0.0181	< 0.000003	10.4	< 0.0005	0.000037	0.0006	0.010	< 0.00002	0.004	0.173	0.0012
3	MS212-160.9-3C	0.0004	0.0006	0.0263	< 0.00002	0.00007	0.0167	< 0.000003	6.09	< 0.0005	0.000061	0.0010	0.014	0.00015	0.003	0.284	0.0168
3	MWMT09-10-185.1-3C	0.0262	0.278	0.00108	< 0.00002	< 0.00001	0.0073	< 0.000003	10.8	< 0.0005	0.000032	< 0.0005	< 0.002	< 0.00002	0.003	0.072	0.0003
3	MWMT09-10-197-3C	0.0006	0.0043	0.00614	< 0.00002	< 0.00001	0.0165	< 0.000003	10.7	< 0.0005	0.000037	< 0.0005	< 0.002	< 0.00002	0.004	0.128	0.0050
3	MS142-185-3C/3D	0.0099	0.0659	0.00443	< 0.00002	0.00002	0.0124	< 0.000003	24.0	< 0.0005	0.000099	0.0012	< 0.002	< 0.00002	0.008	0.177	0.0019
3	MS143-275.2-3C	0.0020	0.0061	0.00163	< 0.00002	0.00001	0.0109	< 0.000003	14.9	0.0012	0.000064	0.0017	0.008	0.00004	0.006	0.170	0.0008
3	MS144-269.8-3C	0.0025	0.0010	0.00565	< 0.00002	< 0.00001	0.0089	0.000005	13.7	< 0.0005	0.000062	< 0.0005	0.032	0.00005	0.006	0.194	0.0012
3	MS149-285.9-3C	0.0020	0.0121	0.00269	< 0.00002	< 0.00001	0.0046	< 0.000003	7.15	< 0.0005	0.000025	< 0.0005	< 0.002	0.00005	0.008	0.327	0.0002
3	MS155-234.1-3C	0.0004	0.0007	0.0121	< 0.00002	< 0.00001	0.0232	0.000004	7.26	< 0.0005	0.000033	< 0.0005	0.028	0.00003	0.008	0.486	0.0083
3	MS157-112.2-3C	0.0002	0.0015	0.0273	< 0.00002	< 0.00001	0.0153	< 0.000003	8.78	< 0.0005	0.000029	< 0.0005	0.012	0.00004	0.008	0.536	0.0044
3	MS160-182.1-3C	0.0015	0.0155	0.00121	0.00002	< 0.00001	0.0090	< 0.000003	9.00	< 0.0005	0.000035	< 0.0005	0.035	0.00006	0.019	0.076	0.0003
3	MS160-183.5-3C	0.0005	0.0003	0.00129	< 0.00002	< 0.00001	0.0096	< 0.000003	6.21	< 0.0005	0.000039	< 0.0005	0.031	0.00005	0.025	0.190	0.0012
3	MS163-35.3-3H	0.0008	< 0.0002	0.00534	< 0.00002	< 0.00001	0.0080	< 0.000003	6.99	< 0.0005	0.000118	< 0.0005	0.031	0.00006	0.003	0.604	0.0014
3	MS181-50.9-3C	0.0002	0.0039	0.00379	< 0.00002	< 0.00001	0.0178	< 0.000003	8.31	< 0.0005	0.000063	< 0.0005	0.004	0.00002	0.003	0.292	0.0051
3	MS206-278.6-3C	0.0019	0.0015	0.00258	< 0.00002	< 0.00001	0.0067	< 0.000003	11.7	< 0.0005	0.000054	< 0.0005	0.003	0.00003	0.004	0.188	0.0008
3	MS229-107.2-3C	0.0006	0.0008	0.00106	< 0.00002	0.00095	0.0304	< 0.000003	11.4	< 0.0005	0.000041	0.0007	< 0.002	< 0.00002	0.003	0.237	0.0021
	AVERAGE	0.003088	0.025238	0.007045	0.000020	0.000263	0.013276	0.000005	10.412353	0.001200	0.000052	0.001083	0.017833	0.000055	0.006941	0.267647	0.003335
	CCME		0.005					0.0096		0.0089		0.003	0.3	0.004			

Notes:
Values in red and underlined indicate an exceedance of the Canadian water quality guidelines for the protection of aquatic life

TABLE 5: SHAKE FLASK ANALYTICAL RESULTS FOR NEUTRAL CONDITIONS

		Mercury Hg	Molybdenum Mo	Nickel Ni	Phosphorus P	Potassium K	Selenium Se	Silicon Si	Silver Ag	Sodium Na	Strontium Sr	Sulphur (S)	Thallium Tl	Tin Sn	Titanium Ti	Uranium U	Vanadium V	Zinc Zn	Zirconium Zr
		ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS	ICP-MS
	Sample ID	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
1	MS147-330.3-1	< 0.01	0.00143	0.0005	< 0.009	5.50	0.00139	4.08	< 0.00001	11.0	0.0177	1.38	< 0.0002	0.00029	0.0007	0.000025	0.00116	0.001	0.00004
1	MS155-312.4-1	< 0.01	0.00043	0.0008	0.022	5.32	0.00114	3.51	< 0.00001	1.29	0.0073	0.65	< 0.0002	0.00012	0.0005	0.000075	0.00142	< 0.001	< 0.00001
1	MS163-351.4-1	< 0.01	0.0344	0.0007	< 0.009	1.51	0.00120	3.30	< 0.00001	1.40	0.0197	1.84	< 0.0002	0.00012	0.0002	0.000109	0.00058	0.004	0.00001
1	MS163-384.7-1	< 0.01	0.0168	0.0010	0.012	2.06	0.00014	3.71	< 0.00001	1.84	0.0709	20.0	< 0.0002	0.00011	0.0005	0.000439	0.00023	0.002	0.00003
1	MS163-386.2-1	< 0.01	0.0164	0.0008	0.009	2.21	0.00104	3.64	< 0.00001	1.74	0.0568	14.5	< 0.0002	0.00010	0.0004	0.000234	0.00024	0.003	0.00002
1	MS170-177.7-1	< 0.01	0.00272	0.0006	0.010	4.27	0.00083	2.18	< 0.00001	0.64	0.0216	1.64	< 0.0002	0.00013	0.0019	0.000324	0.00068	0.002	0.00001
1	MS181-177.9-1	< 0.01	0.00720	0.0006	0.019	3.48	0.00099	2.22	< 0.00001	1.22	0.0274	0.91	< 0.0002	0.00007	0.0001	0.00178	0.00132	< 0.001	< 0.00001
1	MS206-380.1-1	< 0.01	0.00478	0.0007	0.052	1.42	0.00013	2.47	< 0.00001	3.18	0.0087	0.73	< 0.0002	0.00008	0.0035	0.000192	0.00171	0.003	0.00002
1	MWMT09-10-331.5-1	< 0.01	0.0123	0.0015	< 0.009	1.62	0.00088	1.74	0.00006	1.65	0.0275	12.0	< 0.0002	0.00004	0.0003	0.000042	0.00041	0.002	0.00001
1	MS149-336.2-1	< 0.01	0.00034	0.0007	< 0.009	2.61	0.00007	1.41	< 0.00001	0.63	0.0023	1.06	< 0.00002	0.00042	0.0009	0.000011	0.00129	0.158	0.00002
1	MS151-256.8-1	< 0.01	0.00045	0.0005	0.009	5.46	0.00006	1.85	< 0.00001	1.03	0.0059	0.34	< 0.00002	0.00014	0.0014	0.000185	0.00247	< 0.001	0.00002
1	MS157-260-1	< 0.01	0.00126	0.0005	0.018	7.47	0.00008	1.83	< 0.00001	1.16	0.0056	0.41	< 0.00002	0.00006	0.0019	0.000094	0.00238	0.002	0.00002
1	MS157-288.7-1	< 0.01	0.00113	0.0008	< 0.009	3.47	0.00006	1.94	< 0.00001	2.01	0.0121	2.33	< 0.00002	0.00008	0.0014	0.000168	0.00135	< 0.001	0.00004
1	MS160-258.5-1	< 0.01	0.00016	0.0004	< 0.009	6.18	< 0.00004	1.97	< 0.00001	0.87	0.0035	5.10	< 0.00002	0.00007	0.0025	0.000071	0.00291	0.003	0.00003
AVERAGE		<0.01	0.007128571	0.0007214	0.018875	3.75571429	0.00061615	2.560714286	0.00006	2.118571429	0.0205	4.4921429	<0.0002	0.0001307	0.0011571	0.0002678	0.0012964	0.018	0.0000225
3	MS170-106.8-3C	< 0.01	0.00308	0.0006	0.022	1.24	0.00129	1.81	< 0.00001	0.37	0.0125	0.82	< 0.0002	0.00011	0.0005	0.000611	0.00134	0.003	0.00001
3	MS206-259-3C	0.01	0.00391	0.0010	0.030	2.17	0.00208	2.27	< 0.00001	0.64	0.0160	1.33	< 0.0002	0.00011	0.0005	0.000667	0.01008	0.002	< 0.00001
3	MS212-160.9-3C	< 0.01	0.0173	0.0011	0.026	0.934	0.00053	1.12	< 0.00001	0.70	0.0063	0.69	< 0.0002	0.00004	0.0003	0.000079	0.00063	0.001	< 0.00001
3	MWMT09-10-185.1-3C	< 0.01	0.00558	0.0011	< 0.009	0.438	0.00606	2.34	< 0.00001	1.37	0.0122	1.92	< 0.0002	0.00005	0.0001	0.000586	0.00713	0.003	0.00001
3	MWMT09-10-197-3C	< 0.01	0.00153	0.0005	0.016	0.818	0.00059	1.99	< 0.00001	0.61	0.0096	0.63	< 0.0002	0.00005	< 0.0001	0.000270	0.00295	< 0.001	0.00006
3	MS142-185-3C/3D	< 0.01	0.0264	0.0020	< 0.009	0.895	0.0246	2.13	0.00003	2.53	0.0334	13.8	< 0.00002	0.00008	0.0004	0.00232	0.00482	0.001	0.00007
3	MS143-275.2-3C	< 0.01	0.00405	0.0019	< 0.009	0.844	0.0391	2.48	0.00004	2.10	0.0401	20.3	< 0.00002	0.00019	0.0009	0.00254	0.0114	< 0.001	0.00004
3	MS144-269.8-3C	< 0.01	0.00688	0.0009	< 0.009	4.28	0.0141	2.15	0.00005	0.94	0.0138	21.9	< 0.00002	0.00005	0.0020	0.00215	0.00207	< 0.001	0.00003
3	MS149-285.9-3C	< 0.01	0.00362	0.0006	0.044	2.91	0.00347	2.21	< 0.00001	0.65	0.0164	0.85	< 0.00002	0.00006	0.0008	0.000645	0.0303	0.008	0.00002
3	MS155-234.1-3C	< 0.01	0.00343	0.0006	0.009	3.37	0.00160	2.20	< 0.00001	0.36	0.0071	0.69	< 0.00002	0.00005	0.0030	0.000213	0.0274	0.002	< 0.00001
3	MS157-112.2-3C	< 0.01	0.00093	0.0005	0.034	2.77	0.00068	2.18	< 0.00001	1.31	0.0138	0.74	< 0.00002	0.00010	0.0017	0.000375	0.0125	0.002	< 0.00001
3	MS160-182.1-3C	< 0.01	0.00603	0.0005	0.023	2.18	0.00046	2.70	0.00001	5.47	0.0068	6.91	< 0.00002	0.00010	0.0032	0.000657	0.00452	0.003	0.00006
3	MS160-183.5-3C	< 0.01	0.00039	0.0005	0.017	5.32	< 0.00004	2.01	< 0.00001	2.11	0.0053	0.44	< 0.00002	0.00015	0.0027	0.000175	0.00368	0.005	0.00001
3	MS163-35.3-3H	< 0.01	0.00027	0.0015	< 0.009	4.15	0.00111	1.93	< 0.00001	0.69	0.0082	9.47	< 0.00002	0.00005	0.0026	0.000470	0.00071	0.002	0.00010
3	MS181-50.9-3C	0.01	0.00080	0.0006	0.025	0.508	0.00007	2.04	< 0.00001	0.55	0.0079	1.41	< 0.00002	0.00010	0.0003	0.000184	0.00372	< 0.001	< 0.00001
3	MS206-278.6-3C	< 0.01	0.00391	0.0006	< 0.009	1.55	0.00798	1.84	0.00001	0.68	0.0060	23.0	< 0.00002	0.00010	0.0006	0.00124	0.00753	0.002	0.00001
3	MS229-107.2-3C	< 0.01	0.00452	0.0002	0.098	0.758	0.00013	2.36	< 0.00001	0.59	0.0166	2.24	< 0.00002	0.00007	< 0.0001	0.000109	0.00201	< 0.001	< 0.00001
AVERAGE		0.010000	0.005449	0.000865	0.031273	2.066765	0.006491	2.103529	0.000028	1.274706	0.013647	6.302353	<0.0002	0.000086	0.001307	0.000782	0.007811	0.002833	0.000038
CCME			0.073	0.11			0.001		0.0001				0.0008					0.03	

Notes:
Values in red and underlined indicate an exceedance of the Canadian water quality guidelines for the protection of aquatic life

Table 6: BASELINE SURFACE WATER QUALITY

		Inorganic Nonmetallic	Metals Dissolved																													Metals Extractable	Metals Total							
		Ammonia as N	Aluminium	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Chromium (III+VI)	Cobalt	Copper	Iron	Lead	Lithium	Manganese	Molybdenum	Nickel	Selenium	Silver	Strontium	Sulphur as S	Thallium	Thorium	Tin	Titanium	Uranium	Vanadium	Zinc	Zirconium	Mercury	Calcium	Iron	Magnesium	Manganese	Phosphorus	Potassium	Silicon	Sodium
		µg/L	mg/L	µg/L	µg/L	mg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	mg/L	µg/L	mg/L	µg/L	µg/L	mg/L	µg/L	µg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	µg/L	mg/L
EQL (Detection Limit)		10	0.005	0.2	0.2	0.001	0.04	1	0.004	0.01	0.4	0.02	0.001	0.01	0.1	0.001	0.2	0.1	0.001	0.6	0.01	0.001	0.2	0.01	0.4	0.1	0.4	0.4	0.1	0.001	0.1	0.01	0.05	0.01	0.05	5	0.01	0.1	50	0.02
CWQG Aquatic Life v7.1 (CCME)		15.2[#4]	0.005[#10]		5					0.017[#8]			0.002[#12]	0.3	1[#13]			73	0.025[#11]	1	0.1			0.8						0.03		0.026[#7]		0.3			0.004[#2]			
LocCode	Sampled_Date-Time																																							
WQ-C0	31/05/2009	<10	**0.012**	0.6	0.3	0.017	<0.04	<0.1	<0.004	**0.21**	<0.4	0.12	<0.001	-	<0.1	<0.001	9.4	0.37	0.002	<0.6	<0.01	0.054	-	<0.01	<0.1	<0.1	0.1	<0.4	0.06	0.008	<0.1	-	33.3	0.04	2.18	-	**<0.01**	1.2	2150	0.89
WQ-C0	24/06/2009	<10	**0.057**	0.8	<0.2	0.016	0.12	<0.1	<0.004	**0.32**	<0.4	0.62	<0.001	-	<0.1	0.003	27.6	1.05	0.006	0.8	0.02	0.066	-	<0.01	<0.1	<0.1	0.4	<0.4	0.09	0.015	<0.1	-	30.2	<0.01	1.99	-	**<0.01**	0.5	2250	0.34
WQ-C0	27/07/2009	-	**0.081**	<0.2	<0.2	0.026	0.08	<1	<0.004	**0.35**	<0.4	1.27	**0.002**	-	<0.1	0.008	70	0.9	0.014	<0.6	<0.01	0.122	-	<0.01	<0.4	<0.1	<0.4	<0.4	0.1	0.014	<0.1	-	43	0.011	3.53	-	**<0.01**	1	3020	0.52
WQ-C0	13/08/2009	-	**0.156**	0.6	<0.2	0.02	0.28	<1	<0.004	**0.27**	<0.4	3	**0.002**	<0.01	<0.1	0.006	129	1.3	0.017	**1**	<0.01	0.103	21.4	<0.01	<0.4	<0.1	0.4	<0.4	<0.1	0.019	<0.1	-	37	<0.01	2.86	-	**<0.01**	0.7	3070	0.8
WQ-C0	16/09/2009	10	**0.045**	0.4	0.2	0.028	0.11	<1	<0.004	**0.53**	<0.4	4.27	0.001	<0.01	<0.1	0.012	212	0.8	0.024	<0.6	0.02	0.155	32.4	<0.01	<0.4	<0.1	<0.4	0.4	<0.1	0.022	<0.1	-	55.6	0.011	4.94	-	**<0.01**	0.6	3860	1.32
WQ-C0	26/05/2010	10	**0.086**	0.4	<0.2	0.015	0.15	<1	<0.004	**0.29**	<0.4	0.7	**0.002**	<0.01	<0.1	0.004	37.8	0.8	0.006	<0.6	<0.01	0.054	12.6	<0.01	<0.4	<0.1	1.3	<0.4	0.1	0.012	<0.1	<0.01	24.5	0.174	1.74	-	**0.014**	0.6	2500	0.2
WQ-C0	21/06/2010	<10	**0.043**	<0.2	<0.2	0.015	0.15	<1	<0.004	**0.31**	0.8	1.4	0.001	0.02	<0.1	0.004	59.4	1	0.008	<0.6	<0.01	0.061	17.8	<0.01	<0.4	<0.1	<0.4	<0.4	0.1	0.012	<0.1	<0.01	31.4	0.029	2.2	-	**0.013**	0.6	2600	0.3
WQ-C0	26/07/2010	<10	**0.077**	<0.2	<0.2	0.023	0.1	<1	<0.004	**0.3**	1.1	2.25	**0.002**	<0.01	<0.1	0.008	114	0.9	0.014	<0.6	<0.01	0.117	26.9	<0.01	<0.4	<0.1	<0.4	<0.4	0.1	0.013	<0.1	<0.01	43.9	<0.01	3.66	-	**<0.01**	0.9	3160	0.41
WQ-C0	26/08/2010	<10	**0.009**	<0.2	0.9	0.024	<0.04	<1	<0.004	**0.16**	<0.4	0.19	<0.001	<0.01	<0.1	0.001	6.9	0.9	0.004	<0.6	<0.01	0.106	30	<0.01	<0.4	<0.1	<0.4	0.4	<0.1	0.004	<0.1	<0.01	53.3	0.031	3.57	-	**<0.01**	1	2280	0.59
WQ-C0	21/09/2010	<10	**0.03**	<0.2	<0.2	0.027	0.11	<1	<0.004	**0.43**	<0.4	2.58	0.001	-	<0.1	0.012	-	0.3	0.023	**1**	<0.01	0.183	38.6	<0.01	<0.4	<0.1	<0.4	<0.4	<0.1	0.022	<0.1	<0.01	58.2	0.012	5.95	181	**<0.01**	1.3	3580	0.73
WQ-C1	23/06/2009	<10	**0.005**	1	3.9	0.006	<0.04	<0.1	<0.004	**0.06**	<0.4	0.08	<0.001	-	<0.1	<0.001	0.2	1.85	0.002	0.7	<0.01	0.032	-	<0.01	<0.1	<0.1	0.2	<0.4	0.08	0.003	<0.1	-	15.7	0.03	0.76	-	**<0.01**	0.3	1160	0.27
WQ-C1	27/07/2009	-	<0.005	<0.2	3.6	0.01	<0.04	<1	<0.004	**0.13**	<0.4	0.06	<0.001	-	0.3	<0.001	0.3	2.6	0.005	<0.6	<0.01	0.046	-	<0.01	<0.4	<0.1	<0.4	<0.4	<0.1	0.009	<0.1	-	24	0.02	1.35	-	**<0.01**	0.4	1740	0.44
WQ-C1	13/08/2009	-	**0.022**	0.9	**5.8**	0.012	<0.04	<1	<0.004	**0.2**	<0.4	0.18	0.001	0.03	0.2	<0.001	1.4	3.6	0.004	**1.8**	<0.01	0.072	16.3	<0.01	<0.4	<0.1	1	0.9	0.1	0.01	<0.1	-	28.9	0.018	1.44	-	**<0.01**	0.4	2050	1.13
WQ-C1	16/09/2009	10	<0.005	0.4	3.3	0.016	<0.04	<1	<0.004	**0.15**	<0.4	0.07	<0.001	<0.01	<0.1	<0.001	0.6	3.4	0.002	0.9	0.01	0.085	24.5	<0.01	<0.4	<0.1	<0.4	1.4	<0.1	0.004	<0.1	-	45.1	0.025	2.16	-	**<0.01**	<0.1	2390	1.36
WQ-C1	14/10/2009	<10	<0.005	0.6	0.5	0.029	<0.04	<1	<0.004	**0.51**	<0.4	0.09	<0.001	<0.01	<0.1	<0.001	1.4	2	**0.026**	**2.3**	<0.01	0.101	36.2	<0.01	<0.4	<0.1	<0.4	0.7	<0.1	**0.033**	<0.1	-	54.6	0.01	4.01	-	**<0.01**	0.7	2790	1.49
WQ-C1	27/11/2009	<10	<0.005	0.3	0.9	0.027	<0.04	<1	<0.004	**0.42**	<0.4	0.06	<0.001	<0.01	<0.1	<0.001	<0.2	2.1	0.012	**2.3**	<0.01	0.093	29.2	<0.01	<0.4	<0.1	<0.4	<0.4	<0.1	0.019	<0.1	-	47.2	<0.01	3.46	-	**<0.01**	0.5	2630	1.89
WQ-C1	17/12/2009	<10	<0.005	0.6	0.8	0.025	<0.04	<1	<0.004	**0.39**	<0.4	0.05	<0.001	<0.01	0.2	<0.001	0.2	2.1	0.008	**2.2**	<0.01	0.098	25	<0.01	<0.4	<0.1	<0.4	<0.4	<0.1	0.014	<0.1	-	41.4	0.069	3.01	-	**0.022**	0.7	2280	0.79
WQ-C1	02/01/2010	10	<0.005	0.7	0.9	0.022	<0.04	<1	<0.004	**0.3**	<0.4	0.08	0.001	<0.01	<0.1	<0.001	0.4	1.6	0.003	**2.2**	<0.01	0.088	24	<0.01	<0.4	<0.1	<0.4	<0.4	<0.1	0.011	<0.1	-	37.6	**0.324**	2.33	-	**0.028**	0.5	2530	1.26
WQ-C1	26/05/2010	<10	**0.04**	0.5	1.8	0.021	<0.04	<1	<0.004	**0.3**	<0.4	0.1	<0.001	<0.01	<0.1	<0.001	1	1.7	0.016	0.8	<0.01	0.062	18.9	<0.01	<0.4	<0.1	0.6	<0.4	0.1	0.024	<0.1	<0.01	29.4	0.04	2.6	-	**<0.01**	0.8	2120	0.34
WQ-C1	21/06/2010	<10	**0.008**	<0.2	3.6	0.008	<0.04	<1	<0.004	**0.15**	0.9	0.05	<0.001	0.01	0.3	<0.001	0.7	1.9	0.004	<0.6	<0.01	0.038	11.2	<0.01	<0.4	<0.1	<0.4	<0.4	0.1	0.016	<0.1	<0.01	20	0.034	1.18	-	**<0.01**	0.3	1400	0.27
WQ-C1	26/07/2010	<10	**0.008**	<0.2	3.4	0.015	<0.04	<1	<0.004	**0.15**	1.1	0.05	0.001	<0.01	<0.1	<0.001	0.5	2.9	0.008	<0.6	<0.01	0.066	18.9	<0.01	<0.4	<0.1	<0.4	0.7	0.2	0.011	<0.1	<0.01	34.7	0.025	1.93	-	**0.011**	0.4	2110	0.5
WQ-C1	26/08/2010	<10	<0.005	<0.2	4.3	0.012	<0.04	<1	<0.004	**0.17**	0.8	0.05	<0.001	<0.01	<0.1	<0.001	0.5	4	0.005	<0.6	<0.01	0.062	17.7	<0.01	<0.4	<0.1	<0.4	0.7	<0.1	0.009	<0.1	<0.01	34.1	0.042	1.83	-	**<0.01**	0.6	1910	0.59
WQ-C1	21/09/2010	<10	<0.005	<0.2	0.7	0.025	<0.04	<1	<0.004	**0.33**	<0.4	0.05	<0.001	-	<0.1	<0.001	-	2	0.02	**1.9**	<0.01	0.094	29	<0.01	<0.4	<0.1	<0.4	0.7	<0.1	0.026	<0.1	<0.01	52.3	0.011	3.5	<5	**<0.01**	0.7	2560	0.95
WQ-C1	06/10/2010	<10	<0.005	<0.2	0.9	0.023	<0.04	<1	<0.004	**0.31**	<0.4	<0.02	<0.001	-	0.1	<0.001	-	1.5	0.015	**1**	0.01	0.081	25.2	<0.01	<0.4	<0.1	<0.4	<0.4	<0.1	0.016	<0.1	<0.01	40.2	<0.01	3.05	<5	**<0.01**	0.5	2430	0.48
WQ-C1	18/11/2010	<10	<0.005	<0.2	0.8	0.024	<0.04	<1	<0.004	**0.34**	<0.4	0.03	<0.001	-	<0.1	<0.001	-	1.9	0.008	**2.2**	<0.01	0.084	25.9	<0.01	<0.4	<0.1	0.4	<0.4	<0.1	0.014	<0.1	<0.01	40.9	<0.01	2.91	<5	**<0.01**	0.5	2440	0.58
WQ-C1	09/12/2010	<10	<0.005	<0.2	0.8	0.026	<0.04	<1	<0.004	**0.15**	<0.4	<0.02	<0.001	-	<0.1	<0.001	-	2	0.007	**2.4**	<0.01	0.098	28.7	<0.01	<0.4	<0.1	0.7	<0.4	0.1	0.015	<0.1	<0.01	42	0.048	2.96	<5	**0.012**	0.6	2520	0.7
WQ-C2	26/05/2010	10	**0.031**	0.5	<0.2	0.018	<0.04	<1	<0.004	**0.24**	<0.4	0.17	<0.001	<0.01	<0.1	<0.001	2.4	0.7	0.004	**1.1**	<0.01	0.077	23	<0.01	<0.4	<0.1	0.4	<0.4	0.1	0.008	<0.1	<0.01	41.1	0.109	2.71	-	**<0.01**	0.7	2300	0.38
WQ-C2	21/06/2010	<10	**0.006**	<0.2	<0.2	0.017	<0.04	<1	<0.004	**0.29**	0.9	0.04	<0.001	<0.01	0.2	<0.001	0.7	0.7	0.004	<0.6	<0.01	0.091	27.5	<0.01	<0.4	<0.1	<0.4	<0.4	<0.1	0.012	<0.1	<0.01	53	<0.01	3.12	-	**<0.01**	0.6	2310	0.52
WQ-C2	26/07/2010	<10	**0.008**	<0.2	<0.2	0.023	<0.04	<1	<0.004	**0.28**	1.3	0.05	<0.001	<0.01	<0.1	<0.001	0.3	0.8	0.006	**1.4**	<0.01	0.128	38.4	<0.01	<0.4	<0.1	<0.4	0.6	0.2	0.012	<0.1	<0.01	68.5	<0.01	4.14	-	**<0.01**	0.7	2570	0.61
WQ-C2	26/08/2010	<10	<0.005	<0.2	<0.2	0.024	<0.04	<1	<0.004	**0.68**	0.8	0.06	<0.001	<0.01	0.1	<0.001	0.2	0.7	0.012	**1.6**	<0.01	0.145	41.5	<0.01	<0.4	<0.1	<0.4	0.6	0.1	0.027	<0.1	<0.01	83.2	<0.01	4.93	-	**<0.01**	0.9	2660	0.73
WQ-C2	21/09/2010	<10	<0.005	<0.2	<0.2	0.025	<0.04	<1	<0.004	**0.78**	<0.4	0.06	<0.001	-	<0.1	<0.001	-	0.7	0.017	**2.3**	<0.01	0.168	51.8	<0.01	<0.4	<0.1	<0.4	1	<0.1	**0.037**	<0.1	<0.01	103	<0.01	6.13	<5	**<0.01**	1	2730	1.04
WQ-C2	06/10/2010	<10	<0.005	<0.2	<0.2	0.025	<0.04	<1	<0.004	**0.82**	<0.4	<0.02	<0.001	-	<0.1	<0.001	-	0.3	0.017	**1.8**	<0.01	0.178	55.3	<0.01	<0.4	<0.1	<0.4	1.2	<0.1	**0.035**	0.5	<0.01	106	<0.01	6.16	<5	**<0.01**	0.9	2720	0.71
WQ-C3	01/06/2009	**20**	**0.005**	0.4	<0.2	0.014	<0.04	<0.1	<0.004	**0.21**	<0.4	0.07	0.001	-	<0.1	<0.001	0.6	0.56	0.002	**1.2**	<0.01	0.061	-	<0.01	<0.1	<0.1	0.1	<0.4	<0.04	0.007	<0.1	-	40	0.03	2.58	-	**<0.01**	1	2080	0.99
WQ-C3	24/06/2009	<10	<0.005	1.1	0.3	0.007	<0.04	<0.1	<0.004	**0.04**	<0.4	0.15	<0.001	-	<0.1	<0.001	0.1	1.15	<0.001	0.8	<0.01	0.041	-	<0.01	<0.1	<0.1	0.4	0.5	0.39	0.001	<0.1	-	29.3	<0.01	1.32	-	**0.014**	0.5	2150	0.26
WQ-C3	13/08/2009	-	<0.005	0.8	<0.2	0.012	<0.04	<1	<0.004	**0.15**	<0.4	0.09	0.001	<0.01	0.2	<0.001	0.3	1.5	0.001	**2.3**	<0.01	0.069	20.1	<0.01	<0.4	<0.1	<0.4	0.5	0.5	0.005	<0.1	-	39.9	<0.01	1.78	-	**<0.01**	0.4	2780	0.72
WQ-C3	16/09/2009	10	**0.016**	0.3	0.3	0.018	<0.04	<1	<0.004	**0.18**	0.4	0.12	<0.001	<0.01	<0.1	<0.001	1.5	2	0.001	**4.6**	0.05	0.108	35.2	<0.01	<0.4	<0.1	<0.4	2.8	0.6	0.004	<0.1	-	82.8	0.016	3.77	-	**<0.01**	0.4	2650	1.32
WQ-C3	26/05/2010	<10	**0.015**	0.7	0.2	0.01	<0.04	<1	<0.004	**0.07**	0.4	0.06	<0.001	<0.01	<0.1	<0.001	0.4	1.2	<0.001	**1.3**	<0.01	0.051	17.7	<0.01	<0.4	<0.1	<0.4	0.5	0.5	0.004	<0.1	<0.01	37.2	<0.01	1.72	-	**<0.01**	0.6	2680	0.2
WQ-C3	21/06/2010	<10	**0.007**	<0.2	<0.2	0.008	<0.04	<1	<0.004	**0.1**	0.9	0.02	<0.001	<0.01	0.2	<0.001	0.4	1.1	<0.001	<0.6	<0.01	0.04	13.6	<0.01	<0.4	<0.1	<0.4	<0.4	0.4	0.022	<0.1	<0.01	32.9	<0.01	1.51	-	**0.011**	0.4	2300	0.22
WQ-C4	31/05/2009	**30**	**0.008**	1	0.3	0.011	<0.04	<0.1	<0.004	**0.17**	<0.4	0.14	0.001	-	0.2	<0.001	0.8	0.95	<0.001	**1.4**	<0.01	0.051	-	<0.01	<0.1	<0.1	0.2	0.9	0.43	0.006	<0.1	-	50.2	0.03	2.26	-	**0.015**	0.9	2800	0.89
WQ-C4	24/06/2009	<10	**0.007**	1.1	**5.1**	0.016	<0.04	<0.1	<0.004	**0.07**	<0.4	0.09	<0.001	-	<0.1	0.002	0.4	1.2	0.001	**2**	<0.01	0.07	-	<0.01	<0.1	<0.1	0.3	1.4	0.04	0.001	<0.1	-	39.4	<0.01	2.13	-	**<0.01**	0.8	2080	1.01
WQ-C4	27/07/2009	-	<0.005	<0.2	**5.6**	0.017	<0.04	<1	<0.004	**0.44**	<0.4	0.06	<0.001	-	0.5	0.002	0.5	1.8	<0.001	**1**	<0.01	0.073	-	<0.01	<0.4	<0.1	<0.4	1.5	0.1	0.004	<0.1	-	43.6	<0.01	2.29	-	**<0.01**	0.9	2550	1.23
WQ-C4	13/08/2009	-	**0.016 - 0.048**	0.9 - 1.5	**0.6 - 9.2**	0.014 - 0.04	<0.04	<1	<0.004	**0.19 - 0.2**	<0.4	0.15 - 0.45	0.001 - 0.002	<0.01 - 0.01	0.2	0.001 - 0.00	0.8 - 3.3	1.1 - 2.6	0.002	**1.1 - 8.8**	<0.01	0.05 - 0.074	13.4 - 25.6	<0.01	<0.4	<0.1	<0.4 - 0.5	<0.4 - 1.6	<0.1 - 0.2	0.009 - 0.01	<0.1	-	25.4 - 45.6	0.019 - 0.02	1.22 - 1.91	-	**<0.01**	0.4 - 0.7	2400 - 341	1.08 - 1.5
WQ-C4	16/09/2009	10	<0.005	0.6	**5.1**	0.02	<0.04	<1	<0.004	**0.08**	<0.4	0.05	<0.001	<0.01	<0.1	0.002	0.3	2	0.001	**1.4**	0.02	0.093	29.2	<0.01	<0.4	<0.1	<0.4	2.7	0.1	<0.001	<0.1	-	57.1	0.013	3.01	-	**<0.01**	0.4	3150	2.25
WQ-C4	14/10/2009	<10	<0.005	0.6	4.2	0.031	<0.04	<1	<0.004	**0.12**	<0.4	0.09	<0.001	<0.01	<0.1	0.002	0.4	1.4	0.002	**5.8**	<0.01	0.145	44	<0.01	<0.4	<0.1	<0.4	4.1	<0.1	0.003	<0.1	-	92.7	<0.01	5.05	-	**<0.01**	1.8	3880	3.1
WQ-C4	27/11/2009	<10	**0.01**	0.4	4.2	0.032	<0.04	<1	<0.004	**0.17**	<0.4	0.12	<0.001	<0.01	<0.1	0.002	1	1.5	0.002	**6.1**	<0.01	0.16	56.4	<0.01	<0.4	<0.1	0.4	4.8	0.1	0.006	<0.1	-	99	<0.01	5.12	-	**<0.01**	1.9	3850	5
WQ-C4	17/12/2009	<10	**0.006**	0.7	4.3	0.033	<0.04	<1	<0.004	**0.16**	0.5	0.13	<0.001	<0.01	<0.1	0.002	0.4	1.5	0.002	**5.8**	<0.01	0.166	57.1	<0.01	<0.4	<0.1	0.5	5.7	0.2	0.004	<0.1	-	106	0.012	5.66	-	**<0.01**	2.3	3710	2.84
WQ-C4	26/05/2010	10	**0.053**	0.6	**5**	0.009	<0.04	<1	<0.004	**0.06**	<0.4	0.2	0.001	0.04	0.3	0.001	14.2	0.8	0.001	<0.6	<0.01	0.031	8.6	<0.01	<0.4	<0.1	0.6	0.6	0.1	0.003	<0.1	<0.01	17.5	0.11	0.91	-	**<0.01**	0.6	1650	0.33
WQ-C4	05/06/2010	10	**0.066**	0.8	4.2	0.028	<0.04	<1	<0.004	**0.24**	<0.4	0.11	<0.001	0.03	<0.1	0.002	1.1	1.4	0.002	**4.1**	<0.01	0.149	44.7	<0.01	<0.4	<0.1	<0.4	4.7	0.2	0.005	<0.1	-	79.6	<0.01	3.99	-	**<0.01**	1.6	2720	1.67
WQ-C4	21/06/2010	<10	<0.005	0.5	**7.4**	0.011	<0.04	<1	<0.004	**0.06**	0.8	0.04	<0.001	<0.01	<0.1	0.001	1.2	1.3	<0.001	<0.6	<0.01	0.046	14.8	<0.01	<0.4	<0.1	<0.4	0.7	0.1	0.006	<0.1	<0.01	30	0.016	1.58	-	**<0.01**	0.4	2010	0.72
WQ-C4	26/07/2010	<10	**0.007**	0.6	**6.4**	0.016	<0.04	<1	<0.004	**0.11**	1.1	0.04	<0.001	<0.01	<0.1	0.001	0.6	2.1	<0.001	**1.2**	<0.01	0.071	22.5	<0.01	<0.4	<0.1	0.4	1.6	0.1	0.005	<0.1	<0.01	42.6	<0.01	2.17	-	**<0.01**	0.7	2720	1.13
WQ-C4	26/08/2010	<10	**0.005**	0.6	**5.5**	0.013	<0.04	<1	<0.004	<0.01	<0.4	0.04	<0.001	<0.01	<0.1	0.002	1.8	2.4	0.001	<0.6	<0.01	0.054	17.5	<0.01	<0.4	<0.1	<0.4	0.6	<0.1	<0.001	<0.1	<0.01	32.7	0.044	1.59	-	**<0.01**	0.6	2270	0.88
WQ-C4	21/09/2010	**20**	<0.005	<0.2	3.8	0.022	<0.04	<1	<0.004	**0.08**	<0.4	0.04	<0.001	-	<0.1	0.002	-	1.4	0.001	**3.3**	<0.01	0.105	38.2	<0.01	<0.4	<0.1	<0.4	3.7	0.1	0.001	<0.1	<0.01	69.5	0.019	3.49	<5	**<0.01**	1.4	3040	2.22
WQ-C4	06/10/2010	<10	<0.005	<0.2	4	0.024	<0.04	<1	<0.004	**0.06**	<0.4	<0.02	<0.001	-	<0.1	0.002	-	0.9	<0.001	**3.1**	<0.01	0.119	44.2	<0.01	<0.4	<0.1	<0.4	4.8	<0.1	0.001	<0.1	<0.01	62.7	<0.01	3.19	<5	**<0.01**	1.2	2610	1.48
WQ-C4	18/11/2010	10	<0.005	0.2	4.4	0.028	<0.04	<1	<0.004	**0.13**	<0.4	0.06	<0.001	-	<0.1	0.002	-	1.5	0.002	**5.6**	<0.01	0.138	48.8	<0.01	<0.4	0.2	1.2	5.4	<0.1	0.004	<0.1	<0.01	83.9	<0.01	4.21	<5	**<0.01**	1.6	3380	1.87
WQ-C4	11/12/2010	<10	**0.007**	<0.2	4.4	0.03	<0.04	<1	<0.004	**0.14**	<0.4	0.05	<0.001	-	<0.1	0.002	-	1.4	0.002	**5.3**	<0.01	0.157	54	<0.01	<0.4	<0.1	1.5	6	0.1	0.006	0.1	<0.01	94.5	<0.01	4.88	<5	**<0.01**	2	3680	2.15
Statistical Summary																																								
Number of Results		48	55	55	55	55	55	55	55	55	55	55	55	34	55	55	44	55	55	55	55	55	45	55	55	55	55	55	55	55	55	29	55	55	55	11	55	55	55	55
Number of Detects		13	32	32	39	55	8	0	0	54	14	51	15	6	13	25	43	55	47	39	6	55	45	0	0	1	21	33	33	53	2	0	55	31	55	1	9	54	55	55
Minimum Concentration		<10	<0.005	<0.2	<0.2	0.006	<0.04	<0.1	<0.004	<0.01	<0.4	<0.02	<0.001	<0.01	<0.1	<0.001	0.1	0.3	<0.001	<0.6	<0.01	0.031	8.6	<0.01	<0.1	<0.1	0.1	<0.4	<0.04	<0.001	<0.1	<0.01	15.7	<0.01	0.76	<5	<0.01	<0.1	1160	0.2
Maximum Concentration		30	0.156	1.5	9.2	0.041	0.28	<1	<0.004	0.82	1.3	4.27	0.002	0.04	0.5	0.012	212	4	0.026	8.8	0.05	0.183	57.1	<0.01	<0.4	0.2	1.5	6	0.6	0.037	0.5	<0.01	106	0.324	6.16	181	0.028	2.3	3880	5
Average Concentration		11	0.02	0.46	2.2	0.02	0.054	0.89	0.004	0.24	0.51	0.36	0.0011	0.012	0.13	0.0021	16	1.5	0.0064	1.9	0.011	0.092	30	0.01	0.36	0.1	0.46	1.3	0.15	0.011	0.11	0.01	50	0.03	3	21	0.011	0.8	2590	1
Median Concentration		10	0.006	0.4	0.9	0.02	0.04	1	0.004	0.195	0.4	0.07	0.001	0.01	0.1	0.001	0.7	1.4	0.004	1.2	0.01	0.085	26.9	0.01	0.4	0.1	0.4	0.6	0.1	0.009	0.1	0.01	42	0.011	2.86	5	0.01	0.7	2560	0.79
Standard Deviation		3.5	0.029	0.29	2.2	0.0072	0.041	0.3	0	0.18	0.23	0.82	0.00027	0.007	0.074	0.0025	42	0.79	0.0069	1.6	0.0058	0.041	13	0	0.1	0.013	0.25	1.6	0.12	0.009	0.054	0	24	0.05	1.4	53	0.003	0.46	589	0.86
Number of Guideline Exceedances		13	32	32	39	55	8	0	0	54	14	51	15	6	13	25	42	55	47	39	6	55	45	0	0	1	16	33	29	53	2	0	55	31	55	1	55	54	55	55
% of Detects at or above Guidelines		27.08333	58.1818182	58.18182	70.90909	100	14.54545	0	0	98.18182	25.45455	92.727273	27.2727273	17.64706	23.63636	45.45455	95.45455	100	85.45455	70.90909	10.90909	100	100	0	0	1.818182	29.09091	60	52.727273	96.3636364	3.636364	0	100	56.36364	100	9.090909	16.36364	98.18182	100	100
% of Results Below Guidelines or Non-Detect		72.91667	41.8181818	41.81818	29.09091	0	85.45455	100	100	1.818182	74.54545	7.2727273	72.7272727	82.35294	76.36364	54.54545	4.545455	0	14.54545	29.09091	89.09091	0	0	100	100	98.18182	70.90909	40	47.272727	3.63636364	96.36364	100	0	43.63636	0	90.90909	83.63636	1.818182	0	0

Notes

#1 warm water non early life stage biota (5500 ug/L); warm water early life stage biota (6000 ug/L); cold water non early life stage biota (6500 ug/L);cold water early life stage biota (9000 ug/L)
#2 ultra-oligotrophic <4 µg·.L-1; oligotrophic 4-10 µg·.L-1; mesotrophic 10-20 µg·.L-1; meso-eutrophic 20-35 µg·.L-1; eutrophic 35-100 µg·.L-1; hyper-eutrophic >100 µg·.L-1
#3 See Guidelines Narrative
#4 See Guidelines Endnotes
#5 Mosquito Management Value 0.53 ug/L
#6 May not prevent accumulation,may not fully protect higher trophic fish
#7 May not prevent accumulation
#8 Guidelines Endnotes gives 10{0.86[log(hardness)] - 3.2} as the calculation
#9 Expressed on a TEQ basis using NPTEFs see factsheet
#10 5 ug/L for pH<6.5, 100 ug/L for pH>=6.5
#11 25 µg·L-1 at a water hardness of 0–60 mg·L-1 (soft) as CaCO3; 65 µg·L-1 at 60–120 mg·L-1 (medium); 110 µg·L-1 at 120–180 mg·L-1 (hard); 150 µg·L-1 at >180 mg·L-1 (very hard)
#12 2 µg·L-1 at a water hardness of 0–120 mg·L-1 (soft to medium) as CaCO3; 3 µg·L-1 at a water harness of 120–180 mg·L-1 (hard) as CaCO3; 4 µg·L-1 at a water harness >180 mg·L-1 (very hard) as CaCO3
#13 1 µg·L-1 at a water hardness of 0–60 mg·L-1 (soft) as CaCO3;2 µg·L-1 at 60–120 mg·L-1 (medium);4 µg·L-1 at 120–180 mg·L-1 (hard) ;7 µg·L-1 at >180 mg·L-1 (very hard)
Values in bold and underlined indicate an exceedance of the Canadian water quality guidelines for the protection of aquatic life

Table 6: Surface Water Baseline Water Quality

Routine Water

LocCode	Sampled_Date-Time	Alkalinity (Bicarbonate)	Alkalinity (Carbonate)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total)	Alkalinity (total) as CaCO3	Bicarbonate	Calcium	Carbonate	Chloride	Electrical conductivity *(lab)	Hydroxide	Iron	Magnesium	Manganese	Nitrate (as N)	Nitrite (as N)	Phosphorus	Potassium	Silicon	Sodium	Sulphate	Sulphate as S	TDS	Hardness as CaCO3
		mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	uS/cm	µg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL (Detection Limit)		5	6	5000	5	5	5	0.1	6	0.02	1	5000	0.005	0.1	1	0.01	0.01	0.01	0.1	50	0.1	1	0.6	1	1
CWQG Aquatic Life v7.1 (CCME)													0.3			2.9	0.06	0.004#2							
WQ-C0	31/05/2009	40	<6	<5000	-	29	40	26	<6	0.19	162	<5000	<0.01	1.7	-	0.04	<0.01	**<0.01**	1	1680	0.7	47.5	-	99	92.2
WQ-C0	24/06/2009	-	-	-	-	27	30	20.6	<6	0.11	190	<5000	<0.01	1.47	-	0.08	<0.01	**<0.01**	0.3	1540	0.3	-	45.9	98	58 - 83.6
WQ-C0	27/07/2009	-	-	-	-	30	40	44.1	<6	0.05	258	<5000	<0.005	3.6	-	<0.01	<0.01	**0.02**	0.9	3010	0.5	-	89.9	165	122 - 125
WQ-C0	13/08/2009	-	-	-	<5	32	40	36.3	<6	0.11	223	<5000	-	2.8	-	0.02	<0.01	**<0.01**	0.8	3010	0.6	-	64.2	133	100 - 104
WQ-C0	16/09/2009	-	-	-	<5	29	40	52.4	<6	0.16	299	<5000	-	4.6	-	0.07	<0.01	**<0.01**	0.9	3400	0.6	-	97.1	183	150 - 159
WQ-C0	26/05/2010	30	<6	<5000	-	25	-	23.1	-	0.2	143	-	-	1.6	-	0.13	0.02	**<0.01**	0.5	2170	0.2	-	37.7	85	64 - 68.4
WQ-C0	21/06/2010	30	<6	<5000	-	28	-	29.8	-	0.25	181	-	-	2.1	-	0.18	<0.01	**<0.01**	0.5	2370	0.3	-	53.2	110	83 - 87.6
WQ-C0	26/07/2010	40	<6	<5000	-	32	-	41.2	-	0.18	243	-	-	3.5	-	<0.01	<0.01	**<0.01**	0.6	2920	0.4	-	80.7	154	117 - 125
WQ-C0	26/08/2010	50	<6	<5000	-	38	-	48.5	-	0.21	296	-	-	3.3	-	0.17	<0.01	**<0.01**	0.8	1980	0.5	-	90	172	134 - 148
WQ-C0	21/09/2010	30	<6	<5000	-	25	-	41	-	0.21	312	-	<0.005	4.3	128	0.15	<0.01	**<0.01**	1	2850	0.4	-	116	187	120 - 170
WQ-C1	23/06/2009	-	-	-	-	15	20	10.9	<6	0.12	102	<5000	<0.01	0.56	-	0.08	<0.01	**<0.01**	0.2	780	0.2	-	22	49	30 - 42.3
WQ-C1	27/07/2009	-	-	-	-	23	30	24	<6	0.03	147	<5000	<0.005	1.3	-	0.01	<0.01	**0.02**	0.3	1730	0.4	-	41.7	86	65 - 65.4
WQ-C1	13/08/2009	-	-	-	<5	25	30	28.9	<6	0.05	179	<5000	-	1.4	-	0.09	<0.01	**<0.01**	0.5	2040	0.8	-	48.9	100	78
WQ-C1	16/09/2009	-	-	-	<5	29	40	43	<6	0.05	235	<5000	-	2	-	0.13	<0.01	**<0.01**	0.6	2200	0.7	-	73.5	144	116 - 121
WQ-C1	14/10/2009	-	-	-	<5	32	40	55	<6	0.06	293	<5000	-	4	-	0.21	<0.01	**<0.01**	0.8	2790	1.2	-	109	197	153 - 154
WQ-C1	27/11/2009	-	-	-	<5	29	40	42.3	<6	0.1	258	<5000	-	3.2	-	0.14	<0.01	**<0.01**	0.5	2450	1	-	87.8	160	119 - 132
WQ-C1	17/12/2009	-	-	-	<5	29	40	39.8	<6	0.27	238	<5000	-	3	-	0.11	<0.01	**<0.01**	0.6	2350	0.8	-	75	144	110 - 116
WQ-C1	02/01/2010	40	<6	<5000	-	29	-	36.1	-	0.29	224	-	-	2.2	-	0.1	<0.01	**0.01**	0.6	2180	1.1	-	72.1	136	99 - 104
WQ-C1	26/05/2010	30	<6	<5000	-	22	-	28.2	-	0.2	177	-	-	2.5	-	0.08	<0.01	**<0.01**	0.8	2010	0.3	-	56.7	110	81 - 84.2
WQ-C1	21/06/2010	20	<6	<5000	-	17	-	18.9	-	0.22	115	-	-	1.1	-	0.14	<0.01	**<0.01**	0.4	1270	0.2	-	33.7	69	52 - 54.7
WQ-C1	26/07/2010	40	<6	<5000	-	31	-	31.5	-	0.16	189	-	-	1.7	-	0.13	<0.01	**<0.01**	0.2	1940	0.5	-	56.7	120	86 - 94.6
WQ-C1	26/08/2010	40	<6	<5000	-	29	-	31.5	-	0.21	196	-	-	1.7	-	0.29	<0.01	**<0.01**	0.5	1710	0.6	-	53.2	110	86 - 92.6
WQ-C1	21/09/2010	40	<6	<5000	-	34	-	41.4	-	0.19	267	-	<0.005	2.8	<1	0.24	0.02	**<0.01**	0.7	2140	0.6	-	87.1	160	115 - 145
WQ-C1	06/10/2010	40	<6	<5000	-	32	-	40.2	-	0.15	232	-	<0.005	3	<1	0.12	<0.01	**<0.01**	0.4	2330	0.6	-	75.8	146	113
WQ-C1	18/11/2010	40	<6	<5000	<5	32	40	40.4	<6	0.21	237	<5000	0.006	2.8	<1	0.13	<0.01	**<0.01**	0.4	2370	0.6	-	77.8	148	112 - 114
WQ-C1	09/12/2010	40	<6	<5000	-	30	-	45.7	-	0.21	251	-	<0.005	3.1	<1	1.37	<0.01	**<0.01**	0.5	2530	0.7	-	86	167	117 - 127
WQ-C2	26/05/2010	40	<6	<5000	-	35	-	39.2	-	0.2	227	-	-	2.6	-	0.11	<0.01	**<0.01**	0.7	2130	0.4	-	69.2	140	110 - 114
WQ-C2	21/06/2010	60	<6	<5000	-	47	-	49.4	-	0.22	274	-	-	2.9	-	0.19	<0.01	**<0.01**	0.6	2130	0.5	-	82.4	171	135 - 145
WQ-C2	26/07/2010	70	<6	<5000	-	57	-	64.5	-	<0.02	344	-	-	4	-	0.14	<0.01	**<0.01**	0.6	2430	0.6	-	115	226	177 - 188
WQ-C2	26/08/2010	70	<6	<5000	-	61	-	72.9	-	<0.02	421	-	-	4.3	-	0.19	**0.06**	**<0.01**	0.8	2240	0.7	-	124	247	200 - 228
WQ-C2	21/09/2010	80	<6	<5000	-	68	-	71.9	-	0.19	459	-	<0.005	4.4	<1	0.22	0.05	**<0.01**	0.8	2130	0.7	-	156	281	198 - 282
WQ-C2	06/10/2010	90	<6	<5000	-	72	-	94.3	-	0.17	480	-	0.027	5.5	2	0.1	0.04	**<0.01**	0.7	2410	0.8	-	166	318	258 - 289
WQ-C3	01/06/2009	40	<6	<5000	-	31	40	32.2	<6	0.12	191	<5000	<0.01	2.15	-	0.13	<0.01	**<0.01**	0.8	1630	0.6	59.5	-	120	110
WQ-C3	24/06/2009	-	-	-	-	42	50	28.4	<6	0.11	172	<5000	<0.01	1.27	-	0.07	<0.01	**<0.01**	0.5	2130	0.3	-	25	78	76 - 78.7
WQ-C3	13/08/2009	-	-	-	<5	40	50	39.7	<6	0.06	235	<5000	-	1.7	-	0.05	0.04	**<0.01**	0.5	2760	0.6	-	60.3	135	106 - 107
WQ-C3	16/09/2009	-	-	-	<5	81	100	79.1	<6	0.06	391	<5000	-	3.7	-	0.01	<0.01	**0.01**	1	2390	0.7	-	105	245	212 - 222
WQ-C3	26/05/2010	50	<6	<5000	-	38	-	34.8	-	0.1	198	-	-	1.6	-	0.2	<0.01	**<0.01**	0.6	2510	0.2	-	53.2	120	94 - 99.9
WQ-C3	21/06/2010	50	<6	<5000	-	40	-	30.9	-	0.22	172	-	-	1.4	-	0.16	<0.01	**0.02**	0.6	2090	0.2	-	40.6	100	83 - 88.3
WQ-C4	31/05/2009	60	<6	<5000	-	51	60	42.6	<6	0.13	221	<5000	0.016	1.99	-	0.18	<0.01	**<0.01**	0.8	2420	0.6	57.2	-	142	135
WQ-C4	24/06/2009	-	-	-	-	35	40	39	<6	0.08	240	<5000	<0.01	2.13	-	0.09	<0.01	**<0.01**	0.9	2120	1	-	54.5	120	106 - 107
WQ-C4	27/07/2009	-	-	-	-	38	50	43.8	<6	0.03	249	<5000	<0.005	2.3	-	0.06	<0.01	**<0.01**	1	2530	1.3	-	78.9	157	118 - 119
WQ-C4	13/08/2009	-	-	-	<5	24 - 41	30 - 50	25 - 45	<6	0.04 - 0.07	155 - 263	<5000	-	1.2 - 1.8	-	0.04 - 0.07	<0.01 - 0.0	**<0.01**	0.5 - 0.7	2360 - 338	0.8 - 1.3	-	40.2 - 76.9	89 - 160	67 - 122
WQ-C4	16/09/2009	-	-	-	<5	41	50	53	<6	0.05	292	<5000	-	2.8	-	0.07	<0.01	**<0.01**	1	2850	1.4	-	87.7	179	144 - 155
WQ-C4	14/10/2009	-	-	-	<5	62	80	79.5	<6	0.06	458	<5000	-	4.4	-	0.16	<0.01	**<0.01**	1.5	3350	2.4	-	132	267	217 - 252
WQ-C4	27/11/2009	-	-	-	<5	66	80	89.6	<6	0.04	485	<5000	-	4.8	-	0.2	<0.01	**<0.01**	1.9	3630	3	-	169	319	244 - 268
WQ-C4	17/12/2009	-	-	-	<5	66	80	97	<6	0.32	493	<5000	-	5.1	-	0.18	<0.01	**<0.01**	2.1	3640	2.5	-	171	329	263 - 287
WQ-C4	26/05/2010	30	<6	<5000	-	22	-	17	-	0.1	104	-	-	0.9	-	0.06	<0.01	**<0.01**	0.4	1540	0.3	-	26	62	46 - 47.5
WQ-C4	05/06/2010	80	<6	<5000	-	68	-	78.9	-	0.26	428	-	-	4	-	0.19	<0.01	**<0.01**	1.7	2720	1.9	-	134	270	213 - 215
WQ-C4	21/06/2010	30	<6	<5000	-	29	-	27.7	-	0.22	165	-	-	1.4	-	0.15	<0.01	**<0.01**	0.6	1780	0.6	-	44.4	98	75 - 81.5
WQ-C4	26/07/2010	40	<6	<5000	-	37	-	40.1	-	0.16	223	-	-	2.1	-	0.12	<0.01	**0.01**	0.7	2440	1.2	-	67.6	141	109 - 115
WQ-C4	26/08/2010	30	<6	<5000	-	27	-	31.2	-	0.22	189	-	-	1.5	-	0.23	<0.01	**<0.01**	0.4	2090	0.8	-	52.6	110	84 - 88.2
WQ-C4	21/09/2010	70	<6	<5000	-	54	-	50.2	-	0.21	347	-	<0.005	2.6	<1	0.2	0.02	**<0.01**	1.1	2420	1.4	-	115	210	136 - 188
WQ-C4	06/10/2010	70	<6	<5000	-	61	-	73.9	-	0.16	398	-	<0.005	3.7	<1	0.11	<0.01	**<0.01**	1.4	2940	1.8	-	132	258	170 - 200
WQ-C4	18/11/2010	80	<6	<5000	<5	68	80	81.4	<6	0.22	440	<5000	0.006	4.2	<1	0.18	<0.01	**<0.01**	1.5	3270	1.8	-	146	286	220 - 227
WQ-C4	11/12/2010	80	<6	<5000	-	69	-	90.8	-	0.22	474	-	<0.005	4.6	<1	0.23	<0.01	**<0.01**	1.6	3410	1.8	-	162	312	246 - 256
Statistical Summary																									
Number of Results		34	34	34	16	55	26	55	26	55	55	26	21	55	11	55	55	55	55	55	55	3	52	55	55
Number of Detects		34	0	0	0	55	26	55	0	53	55	0	4	55	2	53	8	6	55	55	55	3	52	55	55
Minimum Concentration		20	<6	<5000	<5	15	20	10.9	<6	<0.02	102	<5000	<0.005	0.56	<1	<0.01	<0.01	<0.01	0.2	780	0.2	47.5	22	49	30
Maximum Concentration		90	<6	<5000	<5	81	100	97	<6	0.32	493	<5000	0.027	5.5	128	1.37	0.06	0.02	2.1	3640	3	59.5	171	329	289
Average Concentration		49	6	5000	5	39	49	46	6	0.15	266	5000	0.0081	2.7	13	0.15	0.013	0.011	0.78	2377	0.84	55	84	164	132
Median Concentration		40	6	5000	5	32	40	40.4	6	0.16	237	5000	0.005	2.6	1	0.13	0.01	0.01	0.7	2370	0.6	57.2	76.8	144	113
Standard Deviation		19	0	0	0	16	19	21	0	0.078	107	0	0.0053	1.2	38	0.18	0.01	0.0023	0.41	583	0.62	6.4	40	72	60
Number of Guideline Exceedances		34	0	0	0	55	26	55	0	53	55	0	10	55	2	53	8	55	55	55	55	3	52	55	55
% of Detects at or above Guidelines		100	0	0	0	100	100	100	0	96.36364	100	0	19.04762	100	18.18182	96.36364	14.54545	10.90909	100	100	100	100	100	100	100
% of Results Below Guidelines or Non-Detect		0	100	100	100	0	0	0	100	3.636364	0	100	80.95238	0	81.81818	3.636364	85.45455	89.09091	0	0	0	0	0	0	0

Trace Metals Total

LocCode	Sampled_Date-Time	Aluminium	Antimony	Arsenic	Barium	Beryllium	Bismuth	Boron	Cadmium	Chromium (III+VI)	Cobalt	Copper
		mg/L	µg/L	µg/L	mg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	mg/L
EQL (Detection Limit)		0.005	0.2	0.2	0.001	0.04	1	0.005	0.01	0.4	0.02	0.001
CWQG Aquatic Life v7.1 (CCME)		0.005#10		5					0.017#8			0.002#12
WQ-C0	31/05/2009	**0.033**	<0.2	0.5	0.02	<0.04	<0.1	<0.005	**0.19**	<0.4	0.12	<0.001
WQ-C0	24/06/2009	**0.062**	0.3	<0.2	0.017	0.12	<0.1	<0.005	**0.34**	<0.4	0.62	0.001
WQ-C0	27/07/2009	**0.137**	<0.2	<0.2	0.024	0.31	<1	<0.005	**0.36**	<0.4	1.35	**0.003**
WQ-C0	13/08/2009	**0.176**	<0.2	0.4	0.023	0.23	<1	<0.005	**0.26**	<0.4	2.41	**0.003**
WQ-C0	16/09/2009	**0.437**	<0.2	0.2	0.029	0.82	<1	<0.005	**0.58**	<0.4	4.59	**0.005**
WQ-C0	26/05/2010	**0.253**	<0.2	<0.2	0.016	0.28	<1	<0.005	**0.38**	<0.4	1.43	**0.003**
WQ-C0	21/06/2010	**0.101**	<0.2	0.2	0.017	0.21	<1	<0.005	**0.26**	1	1.54	**0.002**
WQ-C0	26/07/2010	**0.18**	<0.2	<0.2	0.023	0.34	<1	<0.005	**0.31**	0.8	2.28	**0.003**
WQ-C0	26/08/2010	**0.018**	<0.2	1	0.024	<0.04	<1	<0.005	**0.2**	1	0.24	<0.001
WQ-C0	21/09/2010	**0.248**	<0.2	0.2	0.028	0.51	<1	<0.005	**0.45**	0.8	2.92	**0.004**
WQ-C1	23/06/2009	**0.024**	<0.2	4	0.006	<0.04	<0.1	<0.005	**0.08**	<0.4	0.04	<0.001
WQ-C1	27/07/2009	**0.008**	<0.2	3.5	0.01	<0.04	<1	<0.005	**0.14**	<0.4	0.04	<0.001
WQ-C1	13/08/2009	**0.015**	<0.2	4.6	0.01	<0.04	<1	<0.005	**0.1**	<0.4	0.03	<0.001
WQ-C1	16/09/2009	**0.007**	<0.2	3.9	0.016	<0.04	<1	<0.005	**0.12**	<0.4	0.06	<0.001
WQ-C1	14/10/2009	**0.005**	<0.2	1	0.029	<0.04	<1	<0.005	**0.46**	<0.4	0.07	<0.001
WQ-C1	27/11/2009	<0.005	<0.2	1	0.028	<0.04	<1	<0.005	**0.38**	<0.4	0.05	<0.001
WQ-C1	17/12/2009	**0.048**	<0.2	1.5	0.027	<0.04	<1	<0.005	**0.36**	<0.4	0.07	<0.001
WQ-C1	02/01/2010	**0.32**	<0.2	4.5	0.027	<0.04	<1	<0.005	**0.36**	0.6	0.24	**0.003**
WQ-C1	26/05/2010	**0.059**	<0.2	1.9	0.021	<0.04	<1	<0.005	**0.31**	<0.4	0.06	<0.001
WQ-C1	21/06/2010	**0.023**	<0.2	4.7	0.009	<0.04	<1	<0.005	**0.12**	0.8	0.05	<0.001
WQ-C1	26/07/2010	**0.011**	0.2	3.3	0.015	<0.04	<1	<0.005	**0.2**	0.7	0.05	<0.001
WQ-C1	26/08/2010	**0.019**	<0.2	4.9	0.012	<0.04	<1	<0.005	**0.17**	0.8	0.07	<0.001
WQ-C1	21/09/2010	**0.005**	<0.2	0.9	0.025	<0.04	<1	<0.005	**0.33**	<0.4	0.05	<0.001
WQ-C1	06/10/2010	**0.018**	<0.2	0.7	0.021	<0.04	<1	0.006	**0.3**	<0.4	<0.02	<0.001
WQ-C1	18/11/2010	**0.008**	<0.2	0.7	0.025	<0.04	<1	<0.005	**0.35**	<0.4	0.03	<0.001
WQ-C1	09/12/2010	**0.043**	<0.2	1.5	0.027	<0.04	<1	<0.005	**0.36**	<0.4	0.05	<0.001
WQ-C2	26/05/2010	**0.087**	<0.2	<0.2	0.017	<0.04	<1	<0.005	**0.23**	<0.4	0.17	0.001
WQ-C2	21/06/2010	**0.006**	<0.2	<0.2	0.019	<0.04	<1	<0.005	**0.27**	0.7	0.03	<0.001
WQ-C2	26/07/2010	**0.008**	<0.2	<0.2	0.022	<0.04	<1	<0.005	**0.34**	0.8	0.03	<0.001
WQ-C2	26/08/2010	**0.005**	<0.2	<0.2	0.024	<0.04	<1	<0.005	**0.67**	<0.4	0.09	<0.001
WQ-C2	21/09/2010	<0.005	<0.2	<0.2	0.027	<0.04	<1	<0.005	**0.85**	<0.4	0.07	<0.001
WQ-C2	06/10/2010	**0.006**	<0.2	<0.2	0.026	<0.04	<1	<0.005	**0.86**	<0.4	<0.02	<0.001
WQ-C3	01/06/2009	**0.031**	<0.2	<0.2	0.017	<0.04	<0.1	<0.005	**0.25**	0.7	0.08	<0.001
WQ-C3	24/06/2009	**0.006**	<0.2	0.2	0.008	<0.04	<0.1	<0.005	**0.05**	<0.4	0.03	<0.001
WQ-C3	13/08/2009	**0.006**	<0.2	0.6	0.011	<0.04	<1	<0.005	**0.07**	<0.4	<0.02	<0.001
WQ-C3	16/09/2009	**0.016**	<0.2	0.5	0.018	<0.04	<1	<0.005	**0.15**	<0.4	0.06	<0.001
WQ-C3	26/05/2010	**0.023**	<0.2	0.2	0.01	<0.04	<1	<0.005	**0.07**	<0.4	0.03	<0.001
WQ-C3	21/06/2010	<0.005	<0.2	0.2	0.008	<0.04	<1	<0.005	**0.03**	0.9	<0.02	<0.001
WQ-C4	31/05/2009	**0.021**	<0.2	0.3	0.012	<0.04	<0.1	<0.005	**0.07**	<0.4	0.06	0.001
WQ-C4	24/06/2009	**0.012**	0.3	**5.4**	0.017	<0.04	<0.1	<0.005	**0.08**	<0.4	0.05	<0.001
WQ-C4	27/07/2009	**0.007**	0.5	**5.4**	0.017	<0.04	<1	<0.005	**0.04**	<0.4	0.08	<0.001
WQ-C4	13/08/2009	**0.025 - 0.09**	<0.2 - 0.7	**0.4 - 8.3**	0.012 - 0.0	<0.04	<1	<0.005	**0.02 - 0.06**	<0.4 - 2.3	0.06 - 0.28	<0.001 - 0.001
WQ-C4	16/09/2009	**0.012**	0.4	4.8	0.021	<0.04	<1	<0.005	**0.07**	<0.4	0.05	<0.001
WQ-C4	14/10/2009	<0.005	<0.2	4.1	0.03	<0.04	<1	<0.005	**0.12**	<0.4	0.09	<0.001
WQ-C4	27/11/2009	**0.01**	<0.2	4.4	0.033	<0.04	<1	<0.005	**0.1**	<0.4	0.1	<0.001
WQ-C4	17/12/2009	<0.005	<0.2	4.5	0.032	<0.04	<1	<0.005	**0.12**	<0.4	0.08	<0.001
WQ-C4	26/05/2010	**0.092**	0.3	**6.1**	0.01	<0.04	<1	<0.005	**0.06**	<0.4	0.22	0.001
WQ-C4	05/06/2010	**0.034**	<0.2	4	0.025	<0.04	<1	0.006	**0.11**	<0.4	0.07	<0.001
WQ-C4	21/06/2010	**0.022**	0.5	**9.2**	0.012	<0.04	<1	<0.005	**0.03**	0.8	0.06	<0.001
WQ-C4	26/07/2010	**0.008**	0.6	**5.9**	0.016	<0.04	<1	<0.005	**0.05**	0.8	0.03	<0.001
WQ-C4	26/08/2010	**0.027**	0.6	**6.2**	0.014	<0.04	<1	<0.005	**0.05**	1	0.14	<0.001
WQ-C4	21/09/2010	**0.005**	<0.2	3.8	0.023	<0.04	<1	<0.005	**0.08**	<0.4	0.04	<0.001
WQ-C4	06/10/2010	**0.014**	<0.2	3.2	0.018	<0.04	<1	0.006	**0.06**	<0.4	<0.02	<0.001
WQ-C4	18/11/2010	**0.007**	<0.2	4.1	0.028	<0.04	<1	<0.005	**0.12**	<0.4	0.06	<0.001
WQ-C4	11/12/2010	**0.008**	<0.2	4.7	0.032	<0.04	<1	<0.005	**0.12**	<0.4	0.05	<0.001
Statistical Summary												
Number of Results		55	55	55	55	55	55	55	55	55	55	55
Number of Detects		50	10	44	55	8	0	3	55	16	50	13
Minimum Concentration		<0.005	<0.2	<0.2	0.006	<0.04	<0.1	<0.005	0.02	<0.4	<0.02	<0.001
Maximum Concentration		0.437	0.7	9.2	0.033	0.82	<1	0.006	0.86	2.3	4.59	0.005
Average Concentration		0.051	0.24	2.4	0.02	0.085	0.89	0.0051	0.23	0.53	0.37	0.0013
Median Concentration		0.016	0.2	1	0.021	0.04	1	0.005	0.17	0.4	0.06	0.001
Standard Deviation		0.087	0.1	2.3	0.0071	0.14	0.3	0.00023	0.19	0.22	0.86	0.00086
Number of Guideline Exceedances		50	10	44	55	8	0	3	55	16	50	13
% of Detects at or above Guidelines		90.909091	18.18182	80	100	14.54545	0	5.454545	100	29.09091	90.909091	23.63636364
% of Results Below Guidelines or Non-Detect		9.0909091	81.81818	20	0	85.45455	100	94.54545	0	70.90909	9.0909091	76.36363636

Notes

#1 warm water non early life stage biota (5500 ug/L); warm water early life stage biota (6000 ug/L); cold water non early life stage biota (6500 ug/L);cold water early life stage biota (9000 ug/L)
#2 ultra-oligotrophic <4 µg·.L-1; oligotrophic 4-10 µg·.L-1; mesotrophic 10-20 µg·.L-1; meso-eutrophic 20-35 µg·.L-1; eutrophic 35-100 µg·.L-1; hyper-eutrophic >100 µg·.L-1
#3 See Guidelines Narrative
#4 See Guidelines Endnotes
#5 Mosquito Management Value 0.53 ug/L
#6 May not prevent accumulation,may not fully protect higher trophic fish
#7 May not prevent accumulation
#8 Guidelines Endnotes gives 10{0.86[log(hardness)] - 3.2} as the calculation
#9 Expressed on a TEQ basis using NPTEFs see factsheet
#10 5 ug/L for pH<6.5, 100 ug/L for pH>=6.5
#11 25 µg·L-1 at a water hardness of 0–60 mg·L-1 (soft) as CaCO3; 65 µg·L-1 at 60–120 mg·L-1 (medium); 110 µg·L-1 at 120–180 mg·L-1 (hard); 150 µg·L-1 at >180 mg·L-1 (very hard)
#12 2 µg·L-1 at a water hardness of 0–120 mg·L-1 (soft to medium) as CaCO3; 3 µg·L-1 at a water harness of 120–180 mg·L-1 (hard) as CaCO3; 4 µg·L-1 at a water harness >180 mg·L-1 (very hard) as CaCO3
#13 1 µg·L-1 at a water hardness of 0–60 mg·L-1 (soft) as CaCO3;2 µg·L-1 at 60–120 mg·L-1 (medium);4 µg·L-1 at 120–180 mg·L-1 (hard) ;7 µg·L-1 at >180 mg·L-1 (very hard)

Values in bold and underlined indicate an exceedance of the Canadian water quality guidelines for the protection of aquatic life

Table 6: Surface Water Baseline Water Quality

		Trace Metals Total																		
		Lead	Lithium	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Strontium	tellurium	Thallium	Thorium	Tin	Titanium	Tungsten	Uranium	Vanadium	Zinc	Zirconium
		µg/L	mg/L	µg/L	µg/L	µg/L	mg/L	µg/L	µg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	µg/L
EQL (Detection Limit)		0.1	0.001	0.2	0.01	0.1	0.001	0.6	0.01	0.001	0.1	0.01	0.4	0.1	0.4	0.1	0.4	0.1	0.001	0.1
CWQG Aquatic Life v7.1 (CCME)		1[#13]			0.026[#7]	73	0.025[#11]	1	0.1			0.8							0.03	
LocCode	**Sampled_Date-Time**																			
WQ-C0	31/05/2009	<0.1	<0.001	10.8	<0.01	0.39	0.002	0.9	0.02	0.058	<0.1	<0.01	<0.1	<0.1	1	-	<0.4	0.15	0.016	<0.1
WQ-C0	24/06/2009	<0.1	0.003	28.3	<0.01	1.1	0.007	0.8	**0.9**	0.07	<0.1	<0.01	<0.1	<0.1	0.7	-	<0.4	0.12	0.009	<0.1
WQ-C0	27/07/2009	<0.1	0.008	70.6	<0.01	0.8	0.013	<0.6	<0.01	0.112	<0.1	<0.01	<0.4	<0.1	0.8	-	<0.4	<0.1	0.018	<0.1
WQ-C0	13/08/2009	0.4	0.006	121	<0.01	1.3	0.014	<0.6	<0.01	0.094	<0.1	<0.01	<0.4	<0.1	0.5	-	<0.4	<0.1	0.016	0.2
WQ-C0	16/09/2009	<0.1	0.012	235	<0.01	0.7	**0.026**	<0.6	<0.01	0.152	<0.1	<0.01	<0.4	<0.1	0.6	-	0.5	0.1	**0.034**	<0.1
WQ-C0	26/05/2010	0.1	0.004	72	-	0.8	0.008	<0.6	<0.01	0.056	<0.1	<0.01	<0.4	<0.1	5.8	3.5	<0.4	0.4	0.017	<0.1
WQ-C0	21/06/2010	0.1	0.003	65	-	1	0.008	<0.6	<0.01	0.067	<0.1	<0.01	<0.4	<0.1	0.7	5.7	<0.4	0.1	0.017	<0.1
WQ-C0	26/07/2010	0.1	0.008	120	-	0.9	0.015	<0.6	<0.01	0.119	<0.1	<0.01	<0.4	<0.1	<0.4	2.2	<0.4	<0.1	0.019	<0.1
WQ-C0	26/08/2010	0.2	0.001	8.1	-	1	0.005	**1.1**	<0.01	0.118	<0.1	<0.01	<0.4	<0.1	1	0.3	0.5	<0.1	0.006	0.2
WQ-C0	21/09/2010	0.1	0.012	-	-	0.3	0.024	0.8	<0.01	0.194	<0.1	<0.01	<0.4	<0.1	0.4	0.3	<0.4	<0.1	0.026	<0.1
WQ-C1	23/06/2009	<0.1	<0.001	0.6	<0.01	1.9	0.002	<0.6	0.09	0.033	<0.1	<0.01	<0.1	<0.1	1.2	-	<0.4	0.14	0.005	<0.1
WQ-C1	27/07/2009	<0.1	<0.001	0.4	<0.01	2.6	0.005	<0.6	<0.01	0.044	<0.1	<0.01	<0.4	<0.1	0.6	-	0.4	<0.1	0.015	<0.1
WQ-C1	13/08/2009	<0.1	<0.001	0.7	<0.01	3	0.003	0.7	<0.01	0.059	<0.1	<0.01	<0.4	<0.1	0.4	-	0.8	<0.1	0.006	<0.1
WQ-C1	16/09/2009	<0.1	<0.001	0.5	<0.01	3.2	0.002	<0.6	<0.01	0.081	<0.1	<0.01	<0.4	<0.1	<0.4	-	1.4	0.1	0.012	<0.1
WQ-C1	14/10/2009	<0.1	<0.001	0.5	<0.01	2.1	**0.026**	**1.1**	<0.01	0.101	<0.1	<0.01	<0.4	<0.1	0.6	0.1	0.7	<0.1	**0.032**	<0.1
WQ-C1	27/11/2009	<0.1	<0.001	<0.2	<0.01	2.2	0.012	**2.1**	<0.01	0.1	<0.1	<0.01	<0.4	<0.1	0.6	0.1	0.4	<0.1	0.018	<0.1
WQ-C1	17/12/2009	0.1	<0.001	0.9	<0.01	2	0.008	**1.9**	<0.01	0.094	<0.1	<0.01	<0.4	<0.1	1.8	<0.1	0.4	0.1	0.014	<0.1
WQ-C1	02/01/2010	0.6	<0.001	5.6	<0.01	1.8	0.005	**2.4**	0.01	0.092	<0.1	<0.01	<0.4	0.4	9.5	0.4	0.6	1.1	0.014	<0.1
WQ-C1	26/05/2010	0.1	<0.001	0.6	-	1.7	0.016	<0.6	<0.01	0.062	<0.1	<0.01	<0.4	<0.1	1.2	<0.1	<0.4	0.2	0.027	<0.1
WQ-C1	21/06/2010	0.2	<0.001	0.7	-	2	0.004	<0.6	<0.01	0.039	<0.1	<0.01	<0.4	<0.1	1.2	<0.1	<0.4	<0.1	0.008	<0.1
WQ-C1	26/07/2010	0.2	<0.001	0.5	-	3	0.007	<0.6	<0.01	0.067	<0.1	<0.01	<0.4	<0.1	<0.4	<0.1	0.8	<0.1	0.01	<0.1
WQ-C1	26/08/2010	0.2	<0.001	0.8	-	3.8	0.006	0.9	<0.01	0.065	<0.1	<0.01	<0.4	<0.1	1	0.2	1	0.1	0.017	0.1
WQ-C1	21/09/2010	<0.1	<0.001	-	-	2.1	0.02	**1.8**	<0.01	0.101	<0.1	<0.01	<0.4	<0.1	<0.4	<0.1	0.8	<0.1	0.025	<0.1
WQ-C1	06/10/2010	0.1	<0.001	-	-	1.9	0.014	**1.8**	<0.01	0.079	<0.1	<0.01	<0.4	<0.1	<0.4	<0.1	<0.4	<0.1	0.02	<0.1
WQ-C1	18/11/2010	0.1	<0.001	-	-	2	0.009	**1.8**	<0.01	0.096	<0.1	<0.01	<0.4	<0.1	<0.4	0.2	<0.4	<0.1	0.023	0.2
WQ-C1	09/12/2010	0.2	<0.001	-	-	2	0.008	**2**	<0.01	0.101	<0.1	<0.01	<0.4	<0.1	2.1	1	0.4	0.2	0.021	<0.1
WQ-C2	26/05/2010	0.1	<0.001	3.4	-	0.7	0.003	**1.2**	<0.01	0.078	<0.1	<0.01	<0.4	<0.1	2.1	<0.1	<0.4	0.2	0.008	<0.1
WQ-C2	21/06/2010	<0.1	<0.001	<0.2	-	0.7	0.004	<0.6	<0.01	0.097	<0.1	<0.01	<0.4	<0.1	<0.4	<0.1	<0.4	<0.1	0.01	<0.1
WQ-C2	26/07/2010	0.1	<0.001	<0.2	-	0.9	0.006	**1.2**	<0.01	0.124	<0.1	<0.01	<0.4	<0.1	<0.4	<0.1	0.5	<0.1	0.014	<0.1
WQ-C2	26/08/2010	<0.1	<0.001	<0.2	-	0.8	0.013	**2.1**	<0.01	0.154	<0.1	<0.01	<0.4	<0.1	0.5	<0.1	0.7	<0.1	**0.033**	<0.1
WQ-C2	21/09/2010	<0.1	<0.001	-	-	0.8	0.018	**2.9**	<0.01	0.19	<0.1	<0.01	<0.4	<0.1	<0.4	<0.1	1.1	<0.1	**0.041**	<0.1
WQ-C2	06/10/2010	<0.1	<0.001	-	-	0.8	0.019	**2.3**	<0.01	0.185	<0.1	<0.01	<0.4	<0.1	<0.4	<0.1	1.1	<0.1	**0.039**	0.6
WQ-C3	01/06/2009	<0.1	<0.001	1.2	<0.01	0.66	0.003	**1.6**	0.02	0.069	<0.1	<0.01	<0.1	<0.1	0.7	-	<0.4	0.15	0.014	<0.1
WQ-C3	24/06/2009	<0.1	<0.001	<0.1	<0.01	1.24	<0.001	**1**	**0.42**	0.043	<0.1	<0.01	0.2	<0.1	0.4	-	0.5	0.41	0.002	<0.1
WQ-C3	13/08/2009	<0.1	<0.001	<0.2	<0.01	1.3	<0.001	**1.2**	<0.01	0.06	<0.1	<0.01	<0.4	<0.1	<0.4	-	0.5	0.3	0.004	<0.1
WQ-C3	16/09/2009	<0.1	<0.001	<0.2	<0.01	1.9	<0.001	**4.1**	<0.01	0.106	<0.1	<0.01	<0.4	<0.1	<0.4	-	2.7	0.6	0.006	<0.1
WQ-C3	26/05/2010	<0.1	<0.001	0.2	-	1.2	<0.001	0.9	<0.01	0.051	<0.1	<0.01	<0.4	<0.1	<0.4	<0.1	0.6	0.4	0.002	<0.1
WQ-C3	21/06/2010	0.1	<0.001	<0.2	-	1.1	<0.001	<0.6	<0.01	0.042	<0.1	<0.01	<0.4	<0.1	<0.4	<0.1	0.4	0.4	0.002	<0.1
WQ-C4	31/05/2009	<0.1	<0.001	0.7	<0.01	1.17	<0.001	**1.6**	0.02	0.06	<0.1	<0.01	<0.1	<0.1	0.8	-	1.1	0.57	0.01	<0.1
WQ-C4	24/06/2009	<0.1	0.002	0.9	<0.01	1.34	0.001	**2.1**	**0.32**	0.074	<0.1	<0.01	0.1	<0.1	0.5	-	1.4	0.07	0.003	<0.1
WQ-C4	27/07/2009	<0.1	0.002	0.5	<0.01	1.7	0.001	**1.6**	<0.01	0.072	<0.1	<0.01	<0.4	<0.1	0.4	-	1.4	<0.1	0.008	<0.1
WQ-C4	13/08/2009	<0.1	0.001 - 0.00	1 - 3	<0.01	0.8 - 2.2	0.002	**<0.6 - 7**	<0.01	.042 - 0.05	<0.1	<0.01	<0.4	<0.1	0.4 - 1	-	<0.4 - 1.6	<0.1	.005 - 0.00	<0.1
WQ-C4	16/09/2009	<0.1	0.002	0.8	<0.01	2	0.001	**1.3**	<0.01	0.092	<0.1	<0.01	<0.4	<0.1	<0.4	-	2.8	<0.1	0.006	<0.1
WQ-C4	14/10/2009	<0.1	0.002	0.2	<0.01	1.4	0.002	**4.3**	<0.01	0.142	<0.1	<0.01	<0.4	<0.1	0.5	0.6	4.3	<0.1	0.002	<0.1
WQ-C4	27/11/2009	<0.1	0.002	0.3	<0.01	1.5	0.002	**5.4**	<0.01	0.169	<0.1	<0.01	<0.4	<0.1	0.8	0.7	5	0.1	0.004	<0.1
WQ-C4	17/12/2009	<0.1	0.002	<0.2	<0.01	1.4	0.002	**5.2**	<0.01	0.166	<0.1	<0.01	<0.4	<0.1	0.5	0.4	5.1	<0.1	0.008	<0.1
WQ-C4	26/05/2010	0.4	0.001	14.5	-	0.8	0.001	<0.6	<0.01	0.031	<0.1	<0.01	<0.4	<0.1	1.8	0.5	0.8	0.2	0.006	<0.1
WQ-C4	05/06/2010	0.1	0.002	0.5	<0.01	1.3	0.001	**3.2**	<0.01	0.137	<0.1	<0.01	<0.4	<0.1	0.4	0.5	5	0.1	0.015	<0.1
WQ-C4	21/06/2010	0.3	<0.001	2.2	-	1.4	<0.001	<0.6	<0.01	0.05	<0.1	<0.01	<0.4	<0.1	0.4	0.5	0.9	<0.1	0.003	<0.1
WQ-C4	26/07/2010	0.1	0.002	1.4	-	2.1	<0.001	<0.6	<0.01	0.072	<0.1	<0.01	<0.4	<0.1	<0.4	0.6	1.6	<0.1	0.005	<0.1
WQ-C4	26/08/2010	0.3	0.002	5.2	-	2.6	0.002	**1**	<0.01	0.057	<0.1	<0.01	<0.4	<0.1	0.9	0.6	1.9	0.2	0.006	0.1
WQ-C4	21/09/2010	<0.1	0.001	-	-	1.5	0.001	**3.7**	<0.01	0.114	<0.1	<0.01	0.5	<0.1	<0.4	0.5	4.3	0.2	0.004	0.2
WQ-C4	06/10/2010	0.1	0.001	-	-	1	<0.001	**3.1**	<0.01	0.096	<0.1	<0.01	<0.4	<0.1	<0.4	0.2	3.3	<0.1	0.005	<0.1
WQ-C4	18/11/2010	0.1	0.002	-	-	1.4	0.002	**4.4**	<0.01	0.149	<0.1	<0.01	<0.4	<0.1	<0.4	0.9	5.5	0.1	0.004	<0.1
WQ-C4	11/12/2010	<0.1	0.002	-	-	1.6	0.002	**5.3**	<0.01	0.173	<0.1	<0.01	<0.4	<0.1	2	0.8	6.2	0.1	0.012	<0.1
Statistical Summary																				
Number of Results		55	55	44	26	55	55	55	55	55	55	55	55	55	55	37	55	55	55	55
Number of Detects		25	24	35	0	55	46	38	8	55	0	0	3	1	36	23	39	28	55	7
Minimum Concentration		<0.1	<0.001	<0.1	<0.01	0.3	<0.001	<0.6	<0.01	0.031	<0.1	<0.01	<0.1	<0.1	<0.4	<0.1	<0.4	0.07	0.002	<0.1
Maximum Concentration		0.6	0.012	235	<0.01	3.8	0.026	7	0.9	0.194	<0.1	<0.01	0.5	0.4	9.5	5.7	6.2	1.1	0.041	0.6
Average Concentration		0.14	0.0021	18	0.01	1.5	0.0066	1.7	0.041	0.094	0.1	0.01	0.37	0.11	0.96	0.6	1.4	0.17	0.013	0.12
Median Concentration		0.1	0.001	0.7	0.01	1.4	0.003	1.2	0.01	0.092	0.1	0.01	0.4	0.1	0.5	0.2	0.6	0.1	0.01	0.1
Standard Deviation		0.095	0.0025	45	0	0.73	0.007	1.4	0.14	0.043	0	0	0.099	0.04	1.4	1.1	1.6	0.17	0.0098	0.071
Number of Guideline Exceedances		25	24	35	0	55	46	38	8	55	0	0	1	1	36	23	39	27	55	7
% of Detects at or above Guidelines		45.45455	43.63636	79.54545	0	100	83.63636	69.09091	14.54545	100	0	0	1.818182	1.818182	65.45455	62.16216	70.90909	49.09091	100	12.72727
% of Results Below Guidelines or N		54.54545	56.36364	20.45455	100	0	16.36364	30.90909	85.45455	0	100	100	98.18182	98.18182	34.54545	37.83784	29.09091	50.90909	0	87.27273

Comments

#1 warm water non early life stage biota (5500 ug/L); warm water early life stage biota (6000 ug/L); cold water non early life stage biota (6500 ug/L);cold water early life stage biota (9000 ug/L)
#2 ultra-oligotrophic <4 µg·.L-1; oligotrophic 4-10 µg·.L-1; mesotrophic 10-20 µg·.L-1; meso-eutrophic 20-35 µg·.L-1; eutrophic 35-100 µg·.L-1; hyper-eutrophic >100 µg·.L-1
#3 See Guidelines Narrative
#4 See Guidelines Endnotes
#5 Mosquito Management Value 0.53 ug/L
#6 May not prevent accumulation,may not fully protect higher trophic fish
#7 May not prevent accumulation
#8 Guidelines Endnotes gives 10{0.86[log(hardness)] - 3.2} as the calculation
#9 Expressed on a TEQ basis using NPTEFs see factsheet
#10 5 ug/L for pH<6.5, 100 ug/L for pH>=6.5
#11 25 µg·L-1 at a water hardness of 0–60 mg·L-1 (soft) as CaCO3; 65 µg·L-1 at 60–120 mg·L-1 (medium); 110 µg·L-1 at 120–180 mg·L-1 (hard); 150 µg·L-1 at >180 mg·L-1 (very hard)
#12 2 µg·L-1 at a water hardness of 0–120 mg·L-1 (soft to medium) as CaCO3; 3 µg·L-1 at a water harness of 120–180 mg·L-1 (hard) as CaCO3; 4 µg·L-1 at a water harness >180 mg·L-1 (very hard) as CaCO3
#13 1 µg·L-1 at a water hardness of 0–60 mg·L-1 (soft) as CaCO3;2 µg·L-1 at 60–120 mg·L-1 (medium);4 µg·L-1 at 120–180 mg·L-1 (hard) ;7 µg·L-1 at >180 mg·L-1 (very hard)

Notes

Values in bold and underlined indicate an exceedance of the Canadian water quality guidelines for the protection of aquatic life

Table 7: Whole Rock ICP Metals Analysis of Waste Rock Units 1 and 3C

	Sample ID	Al	B	Ba	Ca	Cr	Cu	Fe	K	Li	Mg	Mn	Na	Ni	P	S	Sr	Ti	V
		%	ppm	ppm	%	ppm	ppm	%	%	ppm	%	ppm	%	ppm	ppm	%	ppm	%	ppm
	Method Code	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B
Unit	LOD (Detection Limit)	0.01	10	5	0.01	1	0.5	0.01	0.01	1	0.01	2	0.01	0.5	50	0.01	0.5	0.01	1
	MS147-330.3-1	4.28	10	315	0.6	93	21.3	5.63	1.88	73	1.17	296	0.07	39.6	330	0.25	53.7	0.25	45
	MS149-336.2-1	5.86	20	132	3.11	105	120	3.79	1.33	104	1.1	325	0.23	35.8	420	1.45	65.6	0.17	77
	MS151-256.8-1	1.61	20	153	0.58	66	27.3	2.44	1	46	0.64	227	0.05	27.7	410	0.29	10.1	0.14	23
	MS155-312.4-1	3.91	20	324	1.73	67	67.7	4.14	1.31	61	1.03	299	0.1	30.7	340	1.11	65.1	0.15	25
	MS157-260-1	4.43	<10	400	1.37	77	43.7	5.38	2.15	110	1.29	395	0.12	32.2	470	0.67	45.3	0.26	44
	MS157-288.7-1	4.19	20	219	1.76	68	38.8	3.69	0.98	63	0.94	383	0.13	35	350	1.17	51.7	0.14	28
	MS160-258.5-1	4.2	30	203	2.13	53	38.5	2.84	1.03	36	0.87	264	0.12	29.2	430	0.79	48.8	0.11	23
	MS163-351.4-1	1.8	20	92	1.18	77	14.1	2.47	0.65	55	0.64	374	0.02	18.1	300	0.22	13.6	0.1	14
	MS163-384.7-1	3.17	10	164	0.35	60	31.3	4.53	1.05	87	0.8	700	0.03	40.2	580	0.58	30.9	0.15	17
	MS163-386.2-1	2.72	20	124	0.31	43	25.6	3.86	0.83	77	0.71	546	0.02	34.9	530	0.66	34.7	0.12	12
	MS170-177.7-1	1.69	20	130	0.51	72	124	4.36	1.19	90	0.89	529	0.02	44.2	330	1.3	19.2	0.16	27
	MS181-177.9-1	1.64	30	144	0.87	102	55.9	3.05	0.91	79	0.66	404	0.04	31	660	0.64	18.7	0.12	43
	MS206-380.1-1	3.55	<10	229	0.92	76	41.5	4.95	1.41	95	1.04	245	0.05	44.9	360	0.13	32.5	0.22	40
	MWMT09-10-331.5-1	2.71	10	133	0.23	57	34.8	4.49	0.77	103	0.84	550	0.03	39.5	550	0.51	37.1	0.16	12
	Average	3.268571	19.16667	197.2857	1.117857	72.57143	48.89286	3.972857	1.177857	77.07143	0.901429	395.5	0.073571	34.5	432.8571	0.697857	37.64286	0.160714	30.71429
	Max	5.86	30	400	3.11	105	124	5.63	2.15	110	1.29	700	0.23	44.9	660	1.45	65.6	0.26	77
	Min	1.61	10	92	0.23	43	14.1	2.44	0.65	36	0.64	227	0.02	18.1	300	0.13	10.1	0.1	12
	Standard Deviation	1.29997	6.685579	91.06332	0.827677	17.84426	33.83268	1.011704	0.418738	22.67654	0.205046	138.7503	0.060333	7.142075	110.2744	0.420808	18.16708	0.049686	17.76093
	10th Percentile	1.655	10	125.8	0.322	54.2	22.59	2.581	0.788	48.7	0.646	250.7	0.02	28.15	330	0.229	15.13	0.113	12.6
	Median	3.36	20	158.5	0.895	70	38.65	4	1.04	78	0.88	378.5	0.05	34.95	415	0.65	35.9	0.15	26
Unit 1	90th Percentile	4.385	29	321.3	2.019	99.3	104.31	5.251	1.739	103.7	1.149	548.8	0.127	43	571	1.261	61.68	0.241	44.7
	MS142-185-3C/3D	3.47	30	569	3.28	120	225	3.26	1.02	67	1.28	229	0.11	54	7730	1.35	188	0.13	231
	MS143-275.2-3C	2.8	30	119	1.93	187	211	1.94	0.76	36	0.91	150	0.06	56.3	1850	0.92	417	0.09	360
	MS144-269.8-3C	1.48	20	133	0.66	66	62.1	4.23	0.45	30	0.53	111	0.03	48.5	470	2.79	11.2	0.05	17
	MS149-285.9-3C	4.17	30	140	2.7	123	106	2.21	1.08	63	1.22	197	0.16	44.1	2880	0.95	72.8	0.08	433
	MS155-234.1-3C	4.25	20	345	2.59	156	250	2.93	1.16	63	1.34	339	0.21	68.3	1620	1.16	75.4	0.17	763
	MS157-112.2-3C	4.28	30	986	4.3	129	135	2.05	0.94	60	1.11	218	0.17	52.2	9170	0.55	107	0.13	318
	MS160-182.1-3C	3.26	20	240	0.92	83	25	4.07	1.63	103	1	222	0.09	33.7	420	0.36	87	0.26	49
	MS160-183.5-3C	3.31	<10	309	0.74	78	24	4.87	1.94	114	1.08	220	0.07	36.1	360	0.43	25.4	0.32	45
	MS163-35.1-3H	2.75	30	181	1.07	77	113	2.29	1.17	64	1.44	66	0.06	40.7	390	0.8	21.6	0.13	60
	MS170-106.8-3C	1.08	30	92	0.48	139	124	3.53	0.5	39	0.59	128	0.05	44.8	280	1.86	5.7	0.06	138
	MS181-50.9-3C	3.14	50	300	4.6	99	205	1.5	0.18	17	0.36	213	0.12	25.6	>10000	0.69	91.6	0.06	46
	MS206-259-3C	4.24	30	278	2.93	177	119	1.94	1.07	49	1.29	175	0.11	43.1	2250	0.44	67.4	0.17	505
	MS206-278.6-3C	1.95	30	104	1.15	93	78.3	2.66	0.5	32	0.83	114	0.04	56.5	320	1.63	19	0.06	119
	MS212-160.9-3C	3.14	30	652	2.72	172	242	2.44	0.64	50	0.97	195	0.11	43	3880	1.38	57.5	0.12	101
	MS229-107.2-3C	3.7	60	61	9.53	74	216	2	0.08	12	0.23	206	0.24	13.5	>10000	1	149	0.03	31
	MWMT09-10-185.1-3C	4.01	30	199	3.16	140	171	3.05	0.48	49	0.91	208	0.14	71.4	770	1.29	148	0.14	328
	MWMT09-10-197-3C	3.27	40	105	2.53	140	103	1.74	0.27	31	0.42	173	0.16	46.1	530	0.49	52	0.14	117
	Average	3.194118	31.875	283.1176	2.664118	120.7647	141.7294	2.747647	0.815882	51.70588	0.912353	186.1176	0.113529	45.75882	2194.667	1.064118	93.85882	0.125882	215.3529
	Max	4.28	60	986	9.53	187	250	4.87	1.94	114	1.44	339	0.24	71.4	9170	2.79	417	0.32	763
	Min	1.08	20	61	0.48	66	24	1.5	0.08	12	0.23	66	0.03	13.5	280	0.36	5.7	0.03	17
	Standard Deviation	0.957713	10.46821	244.3926	2.167827	38.86118	73.40532	0.967365	0.505335	27.05957	0.369282	61.59736	0.060306	14.22753	2774.697	0.627645	98.15615	0.075586	208.6312
	10th Percentile	1.762	20	99.2	0.708	75.8	47.26	1.86	0.234	24.8	0.396	112.8	0.046	30.46	336	0.436	15.88	0.056	39.4
	Median	3.27	30	199	2.59	123	124	2.44	0.76	49	0.97	197	0.11	44.8	770	0.95	72.8	0.13	119
Unit 3C	90th Percentile	4.244	45	602.2	4.42	174	231.8	4.134	1.354	81.4	1.31	224.8	0.186	61.22	6190	1.722	164.6	0.206	461.8
	Duplicates																		
	MS229-107.2-3C	3.7	60	60	9.55	75	215	1.98	0.08	11	0.22	205	0.24	13.7	>10000	1	148	0.03	31
	MWMT09-10-197-3C	3.29	40	104	2.5	137	102	1.68	0.27	31	0.41	173	0.16	45.2	540	0.49	51.4	0.14	116
	QC																		
	CH4	1.95	20	306	0.66	106	2000	4.74	1.51	13	1.29	326	0.06	51.6	700	0.76	9.4	0.22	77
	CH4	1.8	20	277	0.59	99	1970	4.81	1.46	12	1.16	301	0.05	47.9	670	0.73	9.2	0.21	71

Notes

"<" indicates an exceedence of the laboratory's lower detection limit

">" Indicates an exceedence of the laboratory's upper detection limit

Table 7: Whole Rock ICP Metals Analysis of Waste Rock Units 1 and 3C

	Sample ID	Zn	Zr	Ag	As	Be	Bi	Cd	Ce	Co	Cs	Ga	Ge	Hf	Hg	In
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	Method Code	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B
Unit	LOD (Detection Limit)	1	0.5	0.01	1	0.1	0.02	0.01	0.05	0.1	0.05	0.1	0.1	0.05	0.01	0.02
	MS147-330.3-1	84	3.2	0.06	2	2.9	0.23	0.02	63.2	18.2	33.6	11.1	0.2	<0.05	<0.01	0.03
	MS149-336.2-1	70	2.7	0.17	2	1.7	1.39	0.2	22.9	31.1	22.7	18.8	0.2	0.07	<0.01	0.06
	MS151-256.8-1	68	2.9	0.03	<1	0.6	0.27	0.03	38.1	10.7	21	4.6	0.1	0.07	<0.01	<0.02
	MS155-312.4-1	80	4.6	0.22	1	1.5	26.9	0.13	34.2	21.6	17.4	9.9	0.1	0.09	<0.01	0.03
	MS157-260-1	82	3.4	0.05	<1	1.1	1.6	0.04	23.7	15	41.9	11.5	0.2	0.08	<0.01	0.03
	MS157-288.7-1	313	2.7	0.31	1	1.7	0.86	5.33	30.3	14.8	12.8	10.3	0.2	0.08	<0.01	0.07
	MS160-258.5-1	57	3	0.03	1	1.3	1.02	0.12	24.5	19.2	14.5	9.5	0.1	0.07	<0.01	<0.02
	MS163-351.4-1	46	2.4	0.03	2	1.5	0.16	0.03	60.4	7.5	11.5	5.2	0.1	0.06	<0.01	<0.02
	MS163-384.7-1	95	7.3	0.05	4	3	0.46	0.05	56.5	18.7	15.7	8.5	0.2	0.15	<0.01	<0.02
	MS163-386.2-1	94	7.3	0.05	6	3.6	1.44	0.02	66.1	20.3	10.1	7	0.2	0.16	<0.01	<0.02
	MS170-177.7-1	53	3.9	0.22	1	1.6	0.57	0.05	49.2	20	40.3	5.5	0.2	0.08	<0.01	<0.02
	MS181-177.9-1	66	4	0.07	2	1.3	0.43	0.08	48.9	11.1	30.9	6.1	0.1	0.09	<0.01	<0.02
	MS206-380.1-1	84	3.7	0.02	2	3	0.32	<0.01	79.5	14.2	18.5	9.8	0.2	0.05	<0.01	0.02
Unit 1	MWMT09-10-331.5-1	106	7.2	0.05	4	1.7	0.87	0.05	76.8	19.4	16.2	6.7	0.1	0.16	<0.01	<0.02
	MS142-185-3C/3D	71	15.9	0.17	15	2.1	2.28	0.27	21.3	10.9	17.4	12.9	0.2	0.41	<0.01	0.02
	MS143-275.2-3C	97	10.5	0.37	5	1.8	0.87	0.52	8.73	6.5	12	9.1	0.1	0.22	<0.01	<0.02
	MS144-269.8-3C	26	33.6	0.82	3	0.3	0.46	0.15	9.06	13.5	4.53	3.8	<0.1	0.66	<0.01	<0.02
	MS149-285.9-3C	237	23.6	0.16	1	1.8	1.49	2.98	10.2	8.2	13.3	14	0.2	0.41	<0.01	0.09
	MS155-234.1-3C	480	11.1	0.15	<1	1.8	4.67	5.76	15.5	9.1	11.2	14.1	0.2	0.21	<0.01	0.13
	MS157-112.2-3C	98	9.6	0.07	1	2.2	7.06	0.48	27.7	7.4	13.8	15.9	0.2	0.2	<0.01	0.05
	MS160-182.1-3C	58	4.5	0.04	2	1.5	0.13	<0.01	39.3	12.9	31.1	9.4	0.2	0.1	<0.01	<0.02
	MS160-183.5-3C	59	4.3	0.03	1	0.7	0.13	<0.01	34.4	16.5	36.8	9.2	0.2	0.09	<0.01	<0.02
	MS163-35.1-3H	20	35.1	0.15	<1	1.6	0.47	0.01	9.94	10	10.3	8.5	0.1	0.61	<0.01	<0.02
	MS170-106.8-3C	13	21	0.2	2	0.4	1.29	0.05	14.7	12.7	7.15	4.7	0.1	0.48	<0.01	<0.02
	MS181-50.9-3C	26	4.7	0.1	2	2.7	3.06	0.06	35.2	5.4	4.16	13.4	0.2	0.13	<0.01	0.05
	MS206-259-3C	120	8.6	0.08	6	1.6	0.2	0.15	21.9	8.1	18.4	14.3	0.3	0.23	<0.01	0.02
	MS206-278.6-3C	114	23.5	0.36	3	0.7	1.11	0.76	6.56	10.4	5.92	5.1	<0.1	0.41	<0.01	<0.02
	MS212-160.9-3C	40	14.1	0.67	2	1.7	23.3	0.09	17.8	8.2	6.41	12.5	0.2	0.39	<0.01	0.02
	MS229-107.2-3C	11	2.7	0.46	2	5.7	316	0.08	31	10.9	2.71	23.5	0.2	0.07	<0.01	0.02
	MWMT09-10-185.1-3C	67	9.7	0.19	24	2.8	0.95	0.19	19.6	11.1	6.56	17.4	0.2	0.25	<0.01	0.03
Unit 3C	MWMT09-10-197-3C	20	8.4	0.08	2	3	0.19	0.04	27.6	8.4	3.81	19	0.2	0.24	<0.01	0.03
	Duplicates															
	MS229-107.2-3C	11	2.8	0.44	2	5.7	318	0.1	30.5	10.6	2.68	23	0.2	0.06	<0.01	0.03
	MWMT09-10-197-3C	20	8.6	0.06	2	2.9	0.19	0.02	26.9	8.3	3.76	18.9	0.2	0.24	0.02	0.03
	QC															
	CH4	215	14.8	2.04	11	<0.1	0.51	1.24	29.9	26.2	2.85	10.1	0.2	0.36	<0.01	0.11
	CH4	193	12.3	2.06	8	<0.1	0.45	1.13	28.7	22.7	2.74	8.8	0.2	0.29	<0.01	0.1

Notes

"<" indicates an exceedence of the laboratory's lower detection limit

Table 7: Whole Rock ICP Metals Analysis of Waste Rock Units 1 and 3C

Unit	Sample ID	La	Lu	Mo	Nb	Pb	Rb	Sb	Sc	Se	Sn	Ta	Tb	Te	Th	Tl	U	W	Y	Yb
		ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
	Method Code	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B	ICM14B
Unit	LOD (Detection Limit)	0.1	0.01	0.05	0.05	0.2	0.2	0.05	0.1	1	0.3	0.05	0.02	0.05	0.1	0.02	0.05	0.1	0.05	0.1
	MS147-330.3-1	31.4	0.03	3.04	0.52	10.2	159	0.13	6.4	<1	2.3	<0.05	0.43	<0.05	12.7	1.2	0.47	0.6	4.86	0.2
	MS149-336.2-1	11.6	0.05	0.65	0.21	17.4	121	<0.05	14	<1	14.1	<0.05	0.19	0.06	10.3	1.04	0.53	0.3	4.38	0.3
	MS151-256.8-1	20.6	0.07	0.92	1.07	3.2	102	<0.05	2.9	<1	1.4	<0.05	0.34	<0.05	13.3	0.87	0.66	0.8	6.28	0.5
	MS155-312.4-1	17.4	0.07	2.1	0.38	14.4	114	0.08	5	<1	2.9	<0.05	0.3	0.32	14.8	1.02	0.6	0.4	6.44	0.5
	MS157-260-1	11.8	0.05	0.48	1.16	6.9	188	<0.05	6.8	<1	3.6	<0.05	0.27	0.62	13.4	1.69	0.53	1.7	4.63	0.3
	MS157-288.7-1	14.5	0.04	0.5	0.46	92.7	78.2	0.07	5	<1	4.3	<0.05	0.26	<0.05	7.4	0.68	0.42	0.7	4.5	0.3
	MS160-258.5-1	11.9	0.05	0.39	0.61	22.6	83	<0.05	5.5	<1	3	<0.05	0.2	<0.05	14.5	0.94	0.76	1.7	3.67	0.4
	MS163-351.4-1	30.5	0.03	0.71	0.7	7	70	0.3	3.4	<1	2.2	<0.05	0.4	<0.05	12	0.66	0.51	0.2	5.48	0.3
	MS163-384.7-1	29.7	0.05	0.8	0.42	8.8	95.6	0.12	3.7	<1	0.8	<0.05	0.43	<0.05	14.8	0.75	1.23	<0.1	6.3	0.4
	MS163-386.2-1	34.7	0.05	0.72	0.44	8.5	74.8	0.22	2.5	<1	0.6	<0.05	0.48	<0.05	15.5	0.62	1.28	<0.1	6.8	0.4
	MS170-177.7-1	24.5	0.04	10.3	0.8	10.7	164	0.27	4.3	<1	2.5	<0.05	0.38	<0.05	10.9	1.45	0.67	0.9	5.48	0.3
	MS181-177.9-1	24.6	0.08	106	0.92	10	123	0.08	5.3	<1	2.6	<0.05	0.46	<0.05	10.9	0.86	1.24	1.2	8.45	0.6
	MS206-380.1-1	38.8	0.05	0.7	0.79	7.4	119	0.08	5.3	<1	1	<0.05	0.52	<0.05	16.7	0.89	0.77	0.3	6.63	0.3
Unit 1	MWMT09-10-331.5-1	39.8	0.06	1.66	0.6	12.1	62.4	0.11	2.6	<1	0.4	<0.05	0.53	<0.05	16	0.52	1.52	0.3	7.5	0.5
	MS142-185-3C/3D	10.9	0.23	11.2	0.81	6.1	95.1	1.02	8.7	5	1.9	<0.05	0.58	1.1	8	0.81	6.29	6.2	20.9	1.4
	MS143-275.2-3C	5.3	0.13	5.85	0.44	5.7	57.4	0.29	6.5	7	0.5	<0.05	0.22	<0.05	5.5	0.74	3.64	2.8	9.8	0.8
	MS144-269.8-3C	4.8	0.1	36.1	0.56	16.7	28.5	0.73	1.1	4	<0.3	<0.05	0.17	0.18	8.4	0.44	7.35	1.2	6	0.6
	MS149-285.9-3C	5.4	0.14	16.4	0.11	6.9	93.5	0.15	7.3	3	1.3	<0.05	0.3	<0.05	8.5	0.88	6.88	0.8	12.1	0.9
	MS155-234.1-3C	9	0.19	22.9	0.58	4.2	119	0.05	7.9	7	3.5	<0.05	0.22	0.48	7	0.95	4.47	18.2	9.02	0.8
	MS157-112.2-3C	14.3	0.21	18.3	0.91	2.8	96	0.05	6.8	2	2	<0.05	0.71	1.07	7.3	0.7	5.59	83	23.8	1.3
	MS160-182.1-3C	20.8	0.06	9.14	1.56	6.3	167	0.06	6	<1	2.1	<0.05	0.33	<0.05	12.9	1.5	0.89	1.1	5.74	0.4
	MS160-183.5-3C	18.1	0.05	0.37	1.42	3	180	0.05	5.2	<1	2.2	<0.05	0.31	0.41	12.3	1.69	0.72	4.7	4.8	0.3
	MS163-35.1-3H	6.5	0.11	0.96	0.62	5.9	84.6	0.15	3.9	1	0.5	<0.05	0.17	<0.05	9.5	0.48	2.09	0.3	6.2	0.7
	MS170-106.8-3C	8.5	0.09	37	0.29	10.7	51.7	<0.05	3.6	3	0.5	<0.05	0.17	<0.05	4.6	0.39	4.31	0.8	5.67	0.6
	MS181-50.9-3C	21.5	0.35	2.55	1.06	2.1	22.3	0.06	2	1	3	<0.05	0.78	0.57	4.9	0.16	3.94	666	29.4	1.6
	MS206-259-3C	12.1	0.18	13.8	0.32	5.8	114	0.44	9.1	3	1.8	<0.05	0.36	<0.05	7.4	0.94	4.55	2.1	14.5	1.2
	MS206-278.6-3C	3.8	0.08	28.3	0.41	9.8	35.5	0.56	0.9	3	<0.3	<0.05	0.1	0.06	7	0.51	6.87	22.5	4.32	0.5
	MS212-160.9-3C	9.4	0.17	5.22	0.69	8.3	66.1	0.07	6.4	3	2.2	<0.05	0.38	0.34	5.8	0.44	3.21	0.8	13.2	1.1
	MS229-107.2-3C	21.7	0.31	78	4.4	3.2	12.7	0.17	1.2	1	1.8	<0.05	0.4	6.05	3.8	0.08	9.68	1980	21.4	1.9
	MWMT09-10-185.1-3C	12.9	0.13	36.9	0.53	10.8	51.6	1.32	6.6	3	1.4	<0.05	0.2	<0.05	8.5	0.39	6.52	17.5	7.95	0.8
Unit 3C	MWMT09-10-197-3C	16.4	0.11	39.1	1.33	4.7	34.3	<0.05	4.7	<1	2.1	<0.05	0.27	<0.05	5.6	0.25	3.79	49.3	9.18	0.8
	Duplicates																			
	MS229-107.2-3C	21.5	0.31	75.8	4.51	3.2	12.6	0.18	1.2	1	1.8	<0.05	0.4	5.87	3.8	0.08	9.75	1970	21.6	1.9
	MWMT09-10-197-3C	16.1	0.12	38.7	1.42	4.8	34.6	<0.05	4.8	<1	2.1	<0.05	0.27	<0.05	5.5	0.26	3.91	45.6	9.31	0.8
	QC																			
	CH4	15.9	0.06	3.21	0.25	15.8	75.2	0.43	8.5	2	0.7	<0.05	0.3	0.39	2.3	0.43	0.31	3.2	6.23	0.5
	CH4	14.8	0.05	2.87	0.36	12.1	63.1	0.39	7.2	1	0.6	<0.05	0.27	0.32	2.3	0.4	0.28	3	5.45	0.4

Notes

"<" indicates an exceedence of the laboratory's lower detection limit

">" Indicates an exceedence of the laboratory's upper detection limit

TABLE 8: Metallurgical Program Composite 2009-1 (2008 Sample) ICP-MS Analytical Results

Sample	HOLE_ID	Al	As	Cd	Cr	Cu	Fe	Pb	Mo	Ni	Se	Ag	Ti	Zn	Ca	S
	Units:	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	%
B348078	MS168	1.97	11	***0.5***	32	2219	13.6	6	8	28	18	1.6	0.04	58	4.62	8.43
B348100	MS169	1.93	19	***0.5***	29	2351	12.94	7	3	24	15	2.2	0.02	140	8.17	7.49
B348127	MS170	2.75	2	***0.5***	89	297	2.99	***2***	44	30	7	***0.2***	0.11	33	4.07	1.4
B348133	MS170	2.13	3	***0.5***	123	540	5.39	***2***	73	20	12	***0.2***	0.11	44	3.19	1.98
B348138	MS170	2.28	***1***	***0.5***	72	1000	6.74	***2***	27	28	21	0.5	0.08	42	3.34	3.7
B348143	MS170	2.47	3	***0.5***	144	623	5	***2***	259	29	16	***0.2***	0.07	23	3.52	2.59
B348205	MS172	2.83	5	***0.5***	146	1220	10.22	***2***	20	48	42	***0.2***	0.08	58	3.75	5.85
B348211	MS172	2.62	8	1	117	1672	8.47	***2***	6	52	44	0.6	0.05	55	5.9	4.5
B348053	MS167	2.21	16	***0.5***	54	1354	9.59	5	***1***	34	***2.5***	1.3	0.03	164	6.53	4.51
B348057	MS167	0.85	21	***0.5***	17	1379	10.53	5	2	18	6	0.8	0.01	88	4.44	5.56
B348073	MS168	2.28	57	***0.5***	39	538	4.77	***2***	5	15	5	0.8	0.04	74	6.29	1.45
B348231	MS173	2.03	7	***0.5***	29	280	4.56	***2***	7	22	***2.5***	***0.2***	0.04	113	5.97	1.48
B348236	MS173	2.33	10	***0.5***	31	132	2.77	***2***	11	19	6	***0.2***	0.04	70	8.85	0.99
B348240	MS173	2.31	10	1	18	3494	23.7	7	2	36	19	1.4	0.02	45	3.41	15.1
B348247	MS173	2.19	6	***0.5***	24	144	1.47	***2***	6	12	***2.5***	***0.2***	0.06	72	6.18	0.33
B348253	MS173	3.04	4	***0.5***	16	876	5.24	***2***	***1***	24	5	***0.2***	0.03	39	5.12	3.31
B348275	MS174	1.14	6	***0.5***	60	852	5.87	***2***	7	16	5	***0.2***	0.02	73	4.31	3.45
B348285	MS174	3.13	4	5	89	659	5.7	***2***	26	119	36	***0.2***	0.08	419	4.81	3.65
B348291	MS174	3.15	3	1	27	2710	15.19	6	4	36	18	2.3	0.09	51	4.66	10.66
B348296	MS174	2.63	3	***0.5***	10	167	1.41	***2***	2	9	5	***0.2***	0.05	20	4.28	0.79
B348304	MS175	2.07	17	***0.5***	31	798	7.31	***2***	31	14	***2.5***	0.6	-0.01	84	7.85	3.75
B348309	MS175	1.79	***1***	1	37	3483	25.04	8	17	39	16	1.2	0.01	47	2.25	15.67
B348331	MS175	2.09	17	***0.5***	33	491	5.38	***2***	10	33	5	***0.2***	0.06	119	5.06	1.75
B348336	MS175	3.37	4	***0.5***	31	1241	7.99	***2***	3	29	9	***0.2***	0.05	23	5.06	4.94
B348341	MS175	3.96	5	***0.5***	63	443	3.91	***2***	32	52	23	***0.2***	0.08	38	7.69	1.86
B348522	MS176	1.67	71	***0.5***	15	1648	15.94	4	7	21	13	1.1	-0.01	31	4.08	9.09
B348528	MS176	2.29	2	1	43	680	6.67	***2***	6	55	22	***0.2***	0.04	87	3.19	3.23
B348535	MS176	1.89	3	1	40	3093	20.34	6	***1***	36	21	1.7	0.02	56	2.28	10.62
B348360	MS178	3.68	21	1	34	1174	10.27	***2***	4	36	36	1.2	0.02	120	4.72	6.33
B348365	MS178	3.2	11	2	29	4207	28.71	8	7	37	46	2.3	-0.01	66	3.07	19.05
B348371	MS178	3.75	7	2	28	2745	19.06	***2***	***1***	47	62	1.4	0.01	69	4.3	13.93
B348376	MS178	5.84	24	1	86	1822	14.81	***2***	***1***	75	39	0.5	0.06	51	6.32	10.74
B348381	MS178	6.02	7	***0.5***	54	747	5.39	***2***	2	50	32	***0.2***	0.05	21	8.51	3.69
B348406	MS179	0.74	3	***0.5***	116	248	7.94	***2***	4	22	25	***0.2***	-0.01	15	1.77	3.92
B348412	MS179	1.18	***1***	***0.5***	32	1058	5.74	***2***	76	18	6	1	-0.01	16	2.02	3.29
B348418	MS179	1.57	2	1	16	5422	31.26	7	***1***	29	35	2.9	0.04	70	0.76	17.34
B348431	MS179	2.1	2	***0.5***	23	550	4.17	***2***	13	19	6	0.6	0.07	43	3.32	2.32
B348436	MS179	0.61	***1***	***0.5***	115	24	0.29	***2***	***1***	14	***2.5***	***0.2***	-0.01	2	0.81	0.07
B348443	MS181	1.85	3	2	77	176	2.61	***2***	5	54	6	0.6	0.07	242	2.69	1.35
B348462	MS181	2.59	3	***0.5***	80	409	4.56	***2***	6	27	20	0.5	0.07	75	3.28	1.79
B348467	MS181	2.35	7	1	41	2724	28.34	***2***	7	57	41	2.3	0.01	63	3.54	18.26
B348473	MS181	3.54	13	***0.5***	63	528	5.27	***2***	6	62	18	***0.2***	0.14	75	5.06	2.12
B348478	MS181	1.68	5	***0.5***	74	895	7.28	***2***	362	39	10	***0.2***	0.02	17	2.32	4.06
B348483	MS181	1.42	6	***0.5***	78	874	5.64	***2***	124	31	25	0.5	0.05	31	1.86	2.56
B348499	MS182B	1.56	3	***0.5***	38	1460	10.97	***2***	18	27	16	0.8	0.01	41	2.71	6.22
B348504	MS182B	2.1	6	1	50	1800	11.86	***2***	4	47	49	1.1	0.06	50	3.29	6.24
B348509	MS182B	3.16	3	***0.5***	35	46	1.41	***2***	12	28	6	***0.2***	0.09	26	6.99	0.16
2008 Met Sample Statistics	Average	2.43	9.5	0.8	53.8	1304.1	9.67	3.0	27.1	34.4	18.7	0.8	0.04	69.34	4.39	5.57
	Max	6.02	71	5	146	5422	31.26	8	362	119	62	2.9	0.14	419	8.85	19.05
	Min	0.61	1	0.5	10	24	0.29	2	1	9	2.5	0.2	-0.01	2	0.76	0.07
	10th Percentile	1.32	2.0	0.5	17.6	172.4	2.71	2.0	1.0	15.6	4.0	0.2	-0.01	21	2.16	1.21
	Median (P50)	2.28	5.0	0.5	39.0	876.0	6.74	2.0	6.0	29.0	16.0	0.5	0.04	55	4.28	3.70
	90th Percentile	3.60	19.8	1.0	115.4	2884.2	21.68	6.4	55.6	54.4	41.4	1.9	0.08	119	7.27	14.40

Notes: Samples with concentrations less than detection limit (<DL) assigned values of 1/2xDL for purposes of statistical analysis
Values less than detection limit shown in bold italics

TABLE 9: Metallurgical Program Composite 2009-2 (2005 Sample) ICP-MS Analytical Results

Sample	HOLE_ID	Al	As	Cd	Cr	Cu	Fe	Pb	Mo	Ni	Ag	Ti	Zn	Ca
	Units:	%	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	ppm	ppm
B347237	MS142	1.15	11	***0.5***	8	227	1.76	7	11	11	0.4	0.01	5	10.53
B347247	MS142	1.03	5	***0.5***	20	38	1.23	8	3	***0.5***	***0.2***	0.03	16	6.53
B347252	MS142	1.65	***1***	***0.5***	38	404	2.91	***2***	8	12	0.9	0.02	33	2.2
B346240	MS143	0.63	13	1	17	24	2.8	***2***	6	11	1	0.01	38	6.27
B346245	MS143	4.21	2	***0.5***	56	15	1.27	21	6	4	0.4	0.06	15	4.03
B346250	MS143	4.95	3	***0.5***	58	121	1.74	31	2	14	***0.2***	0.12	25	4
B347401	MS146	2.19	22	***0.5***	26	34	1.94	8	43	***0.5***	***0.2***	0.04	43	3.66
B347406	MS146	2.86	***1***	1	48	52	2.56	4	***1***	16	***0.2***	0.1	48	7.21
B347411	MS146	1.57	23	***0.5***	26	39	3.9	***2***	***1***	9	0.5	0.06	103	8.71
B347416	MS146	3.08	9	1	29	770	9.31	7	***1***	33	1.9	0.08	45	3.29
B347385	MS147	3.66	4	***0.5***	32	61	1.87	***2***	5	7	0.6	0.05	34	4.45
B347390	MS147	3.75	9	1	21	484	3.59	5	9	7	0.4	0.02	23	4.7
B347395	MS147	5.82	5	1	64	304	2.47	8	***1***	12	0.6	0.12	64	4.59
B347454	MS148	2.03	***1***	1	60	303	2.45	6	11	46	0.7	0.03	32	4.23
B347458	MS148	1.67	***1***	1	23	190	2.98	***2***	7	26	0.4	0.02	24	7.95
B347464	MS148	4.51	***1***	***0.5***	48	283	3.73	11	4	28	***0.2***	0.05	41	4.97
B347469	MS148	4.25	***1***	***0.5***	30	286	3.22	10	4	36	***0.2***	0.03	31	4.15
B346385	MS149	2.07	***1***	1	53	158	2.87	***2***	8	25	0.4	0.07	60	4.81
B346390	MS149	1.69	4	1	45	432	3.48	5	10	66	2	0.01	40	11.55
B346395	MS149	4.18	4	25	163	428	4.1	7	25	64	***0.2***	0.12	1431	4.24
B347519	MS151	4.56	***1***	1	30	2041	9.59	11	***1***	22	***0.2***	0.04	46	4.24
B347525	MS151	3.7	9	***0.5***	15	1246	9.17	12	***1***	11	***0.2***	0.03	52	4.04
B347529	MS151	3.87	6	1	47	1411	7.32	8	2	24	***0.2***	0.04	21	3.41
B347534	MS151	0.66	6	***0.5***	31	33	1.79	4	***1***	30	***0.2***	0.02	27	0.17
B346458	MS156	3.14	***1***	1	13	2434	15	14	10	9	1.3	***0.005***	24	3.22
B346464	MS156	3.57	13	2	19	3595	24.38	29	10	24	1.9	***0.005***	25	3.83
B346469	MS156	4.79	***1***	***0.5***	25	423	3.69	10	2	11	***0.2***	0.02	22	4.23
B346474	MS156	2.94	4	1	14	1142	6.71	8	5	6	0.6	0.02	31	3.06
B346479	MS156	7.09	***1***	***0.5***	40	809	5.86	17	***1***	36	0.8	0.06	20	5.2
B347594	MS157	0.91	***1***	***0.5***	***2***	243	2.57	4	***1***	***0.5***	0.9	***0.005***	16	16.81
B347598	MS157	3.51	***1***	***0.5***	8	1134	7.6	13	28	7	1.2	***0.005***	15	3.46
B347605	MS157	0.8	20	1	25	672	6.8	5	3	12	1.1	0.03	48	5.58
B347610	MS157	5.9	2	1	30	75	1.1	13	***1***	19	***0.2***	0.04	33	4.62
B346535	MS160	2.37	7	1	26	2070	12	29	26	24	1.4	0.03	40	3.05
B346541	MS160	2.72	6	1	31	1091	9.45	13	4	37	0.5	0.02	25	2.45
B346546	MS160	4.54	9	1	36	2033	17.25	25	7	34	1.4	0.04	27	3.4
B346551	MS160	8.26	3	1	57	293	2.45	14	4	27	***0.2***	0.14	21	5.61
B347725	MS161	2.37	2	1	17	1497	13.64	18	13	26	1.5	0.01	49	3.59
B346666	MS162	2.43	10	***0.5***	100	149	1.94	15	19	20	***0.2***	0.02	20	2.6
B346671	MS162	1.25	11	***0.5***	95	221	1.57	27	9	7	***0.2***	***0.005***	10	2.23
B346676	MS162	5.62	23	***0.5***	34	1586	12.89	26	6	45	1.1	0.03	40	3.63
B346682	MS162	4.2	19	***0.5***	61	1058	11.38	25	***1***	37	0.7	0.09	39	2.7
B347758	MS163	3.44	31	7	49	194	5.16	20	22	49	0.5	0.09	790	6.99
B347764	MS163	5.35	9	2	10	57	1.78	11	12	6	0.4	0.02	70	5.02
B347769	MS163	0.99	4	1	14	68	3.22	4	2	6	***0.2***	0.04	75	3.71
B347774	MS163	5.26	6	1	17	497	6.15	12	14	30	***0.2***	0.01	28	5.25
B347779	MS163	7.14	9	***0.5***	51	162	4.6	21	2	19	***0.2***	0.07	56	5.87
B346714	MS164	2.71	14	***0.5***	85	1109	7.06	19	5	26	0.8	0.03	36	2.93
B346719	MS164	3.13	147	***0.5***	39	1230	9.76	20	***1***	27	0.5	0.03	143	4.65
B346725	MS164	1.72	198	***0.5***	55	1093	9.23	20	5	24	0.9	***0.005***	63	8.06
B346604	MS166	1.82	44	***0.5***	11	150	5.19	15	36	5	0.6	0.02	37	8.79
B346609	MS166	0.64	40	***0.5***	12	214	5.19	13	2	4	0.6	0.02	56	11.36
B346614	MS166	5.41	6	***0.5***	58	372	4.09	11	39	12	***0.2***	0.04	19	4.7
2005 Met Sample Statistics	Average	3.28	14.81	1.35	38.15	661.42	5.77	12.38	8.70	20.84	0.62	0.04	78.77	5.10
	Max	8.26	198	25	163	3595	24.38	31	43	66	2	0.14	1431	16.81
	Min	0.63	1	0.5	2	15	1.1	2	1	0.5	0.2	0.005	5	0.17
	10th Percentile	0.998	1	0.5	12.2	41.6	1.764	2.4	1	5.2	0.2	0.006	16.6	2.746
	Median (P50)	3.13	6	0.5	31	304	3.9	11	5	19	0.5	0.03	34	4.24
	90th Percentile	5.578	23	1	60.8	1568.2	11.876	25	24.4	37	1.38	0.09	68.8	8.58

Notes: Samples with concentrations less than detection limit (<DL) assigned values of 1/2xDL for purposes of statistical analysis
Values less than detection limit shown in bold italics

Table 10: Groundwater Baseline Water Quality

			LocCode	MW-MT-08-08D	MW-MT-08-08D	MW-MT-08-08D	MW-MT-08-08D	MW-MT-08-08D	MW-MT-08-08D	MW-MT-08-08D	MW-MT-08-08D	MW-MT-08-08D
			Sampled_Date-Time	8/18/2008	5/31/2009	8/18/2008	11/18/2008	4/18/2009	8/31/2009	5/28/2010	12/9/2010	8/26/2010
Chem_Group	**ChemName**	**Units**	**EQL (detection limit)**									
	P-Alkalinity	mg/L	5	-	-	-	-	-	<5	<5	<5	<5
	tellurium	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.1
Inorganics	Alkalinity (total) as CaCO3	mg/L	5	25	17	25	21	20	12	14	11	13
	Ammonia as N	µg/L	5	262	110	260	260	40	40	40	60	10
	Bicarbonate	mg/L	5	10	20	20	20	20	10	20	10	20
	Carbonate	mg/L	6	8	<6	7	<6	<6	<6	<6	<6	<6
	Chloride	mg/L	0.02	0.1	0.34	0.1	0.21	0.37	0.07	0.2	0.22	0.23
	Electrical conductivity *(lab)	uS/cm	1	183	237	184	228	241	209	245	211	239
	Hydroxide	µg/L	5000	<5000	<5000	<5000	<5000	<5000	<5000	<5000	<5000	<5000
	Ionic Balance	%	1	-	-	-	113	-	-	-	-	-
	Nitrate (as N)	mg/L	0.01	0.06	<0.01	0.06	<0.01	0.01	<0.01	<0.02	<0.01	<0.01
	Nitrite (as N)	mg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01
	Sodium	mg/L	0.02	5.4	11.4 - 12.3	5.4	9.4 - 9.45	9.32 - 11.5	11.8	6.6 - 8.44	3.4 - 3.73	5.9 - 5.97
	Sulphate	mg/L	0.05	69	89.6	69.6	75	85.8	79.2	83.9	76	82.5
	Sulphate as S	mg/L	0.1	-	30.2	-	-	-	-	-	-	-
	Sulphur as S	mg/L	0.1	-	-	-	-	23.8	26.4	28	25.4	27.5
	TDS	mg/L	1	137	159	136	145	160	147	151	135	147
	Thorium	µg/L	0.4	<0.1	<0.1 - 0.1	<0.1	<0.1 - 0.4	<0.1	<0.4	<0.4	<0.4	<0.4
	Hardness as CaCO3	mg/L	1	-	-	-	-	-	88	93 - 101	88 - 90.6	93 - 101
	Tungsten	µg/L	0.1	22.4	29.5	21.9	24.2	29.8	14.2	9	10.2	7.1
Lead	Lead	mg/L	0.0001	0.0015	0.0001 - 0.0054	0.0012 - 0.0016	0.0006 - 0.002	0.0001 - 0.0012	0.0002	0.0002 - 0.0027	<0.0001 - 0.0001	0.0001 - 0.0002
Metals	Aluminium	mg/L	0.005	0.694 - 1	0.018 - 0.962	0.572 - 1.05	0.312 - 1.1	0.035 - 0.534	0.026	0.034 - 0.127	0.006 - 0.009	0.01 - 0.016
	Antimony	mg/L	0.0002	0.0098 - 0.0105	0.0094 - 0.0107	0.0099 - 0.0108	0.0097 - 0.0141	0.01 - 0.0103	0.003	0.001 - 0.0015	0.0007	0.0006 - 0.0007
	Arsenic	mg/L	0.0002	0.006	0.0072 - 0.0095	0.0058 - 0.0063	0.006 - 0.0067	0.0073 - 0.0087	0.003	0.0021 - 0.0028	0.001 - 0.0011	0.001 - 0.0012
	Barium	mg/L	0.001	0.012 - 0.021	0.009 - 0.031	0.012 - 0.022	0.014 - 0.029	0.007 - 0.016	0.005	0.007 - 0.011	0.004 - 0.005	0.007
	Beryllium	mg/L	0.00004	0.00006 - 0.00007	<0.00004 - 0.00006	0.00006	<0.00004 - 0.00005	<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
	Bismuth	mg/L	0.001	0.0002 - 0.0005	<0.0001 - 0.0001	<0.0001 - 0.0005	0.0001 - 0.0002	<0.0001 - 0.0001	<0.001	<0.001	<0.001	<0.001
	Boron	mg/L	0.004	<0.004	0.011 - 0.016	<0.004	0.01 - 0.011	0.006	<0.004	0.005	<0.004	<0.005 - 0.005
	Cadmium	mg/L	0.00001	0.00008 - 0.00009	0.00029 - 0.00258	0.00008 - 0.00015	0.00014 - 0.0003	0.00015 - 0.00036	0.00001	0.00001 - 0.00002	<0.00001	<0.00001
	Calcium	mg/L	0.04	33	35.2 - 39	32.9	33.1 - 33.6	27.1 - 36.2	34.8	36.4 - 39.3	34.7 - 35.6	36.2 - 39.4
	Chromium (III+VI)	mg/L	0.0004	0.0009 - 0.0017	<0.0004 - 0.0035	0.0009 - 0.0018	0.0008 - 0.0022	<0.0004 - 0.0018	0.0011	<0.0004 - 0.0006	<0.0004	0.001 - 0.0014
	Cobalt	mg/L	0.00002	0.0001 - 0.00011	0.00031 - 0.00057	0.00009 - 0.00012	0.00052 - 0.00088	0.0001 - 0.00024	0.0002	0.00051 - 0.0007	0.00003 - 0.00018	0.00016 - 0.00033
	Copper	mg/L	0.001	0.001	<0.001 - 0.01	0.001 - 0.002	0.002 - 0.011	0.002 - 0.004	<0.001	<0.001	<0.001	<0.001
	Iron	mg/L	0.005	0.42 - 0.56	<0.01 - 1.28	0.31 - 0.58	0.17 - 0.8	<0.01 - 0.39	0.02	0.044 - 0.06	<0.005	<0.01 - 0.013
	Lithium	mg/L	0.001	0.003	0.003 - 0.005	0.003	0.003 - 0.004	0.003 - 0.004	0.003	0.003	0.002	0.003
	Magnesium	mg/L	0.04	0.65	0.63 - 1.04	0.68	0.8 - 1.13	0.66 - 0.7	0.3	0.6 - 0.7	0.4 - 0.42	0.7 - 0.72
	Manganese	mg/L	0.0002	0.0059 - 0.0087	0.0077 - 0.0228	0.005 - 0.0093	0.0062 - 0.0155	0.0055 - 0.0132	0.0053	0.0048 - 0.0049	<0.001	0.0034 - 0.0046
	Mercury	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
	Molybdenum	mg/L	0.0001	0.00856 - 0.00889	0.0113 - 0.0128	0.00842 - 0.00899	0.0097 - 0.0104	0.0115 - 0.013	0.0082	0.0068 - 0.0072	0.0062 - 0.0067	0.006 - 0.0062
	Nickel	mg/L	0.001	0.001	<0.001 - 0.003	0.001	<0.001 - 0.002	<0.001	<0.001	<0.001	<0.001	<0.001
	Phosphorus	mg/L	0.01	0.05 - 0.07	0.06 - 0.228	0.04 - 0.07	0.01 - 0.074	<0.01 - 0.011	0.03	<0.01 - 0.02	<0.01	<0.01
	Potassium	mg/L	0.04	0.86	1 - 1.1	0.88	0.7 - 0.9	0.5 - 1	0.2	0.3	0.2	<0.1 - 0.2
	Selenium	mg/L	0.0006	0.0017 - 0.0025	<0.0006	0.0018 - 0.0024	0.0019 - 0.0024	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006
	Silicon	µg/L	10	6630	3730 - 5190	6690	4920 - 6000	3690 - 4320	4820	5380 - 5870	5080 - 5340	5120 - 5510
	Silver	mg/L	0.00001	<0.00001	<0.00001 - 0.00003	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001 - 0.00002	<0.00001	<0.00001
	Strontium	mg/L	0.001	0.044 - 0.046	0.052 - 0.058	0.042 - 0.045	0.052	0.051 - 0.057	0.041	0.055 - 0.061	0.05 - 0.051	0.059
	Thallium	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
	Tin	mg/L	0.0001	<0.0001	0.0006 - 0.0036	<0.0001	0.0007 - 0.0015	0.0005 - 0.0013	<0.0001	<0.0001	<0.0001	<0.0001
	Titanium	mg/L	0.0004	0.009 - 0.0229	0.0006 - 0.0322	0.0092 - 0.0256	0.0046 - 0.0282	0.0005 - 0.0149	0.0006	0.0012 - 0.0024	0.0007 - 0.0008	<0.0004 - 0.0007
	Uranium	µg/L	0.4	0.7	<0.4 - 0.8	0.6 - 0.7	0.9 - 1	0.6 - 0.8	<0.4	<0.4	<0.4	<0.4
	Vanadium	mg/L	0.0001	0.00497 - 0.00761	0.00152 - 0.00499	0.0048 - 0.00808	0.0038 - 0.00646	0.00198 - 0.00395	0.0004	0.0003 - 0.0004	0.0001	0.0001 - 0.0002
	Zinc	mg/L	0.001	0.005 - 0.01	0.008 - 0.119	0.004 - 0.007	0.032 - 0.207	0.008 - 0.096	0.003	0.002 - 0.005	0.001 - 0.004	0.001 - 0.003
	Zirconium	µg/L	0.1	0.3 - 0.4	<0.1 - 0.2	0.3	<0.1	<0.1 - 0.2	<0.1	<0.1	<0.1	<0.1

Notes

"<" indicates less than the laboratory's detection limit

Table 11: 2008 Composite Tailings Humidity Test Cell Results

Date	Cycle No.	Volume mL Input	Volume mL Output	pH	ORP mV	Cond. umhos/cm	Acidity (pH 4.5) mgCaCO3/L	Acidity (pH 8.3) mgCaCO3/L	Alkalinity mgCaCO3/L	Sulphate mg/L	Hardness CaCO3 mg/L	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Ca mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Li mg/L	Mg mg/L	Mn mg/L	Hg ug/L	Mo mg/L	Ni mg/L
23-Jun-09	1	750	250	8.96	315	861	#N/A	#N/A	224.8	314	6.5	0.244	0.0098	0.0958	0.0029	0.0001	0.00445	<0.5	0.00025	2.28	<0.001	0.00104	0.0364	0.705	0.00814	<0.005	0.2	0.0171	<0.1	0.0382	0.0023
30-Jun-09	2	500	440	8.60	291	1037																									
7-Jul-09	3	500	380	8.37	329	1214	#N/A	#N/A	233.7	293	11	0.176	0.0258	0.183	0.0016	0.0001	0.00931	<0.5	0.00007	3.88	<0.001	0.0006	0.0204	0.521	0.00294	<0.005	0.32	0.0241	<0.1	0.0252	0.0029
14-Jul-09	4	500	440	8.45	304	1050																									
21-Jul-09	5	500	460	8.40	299	961	#N/A	#N/A	228.9	193	17.2	0.387	0.0201	0.0802	0.0022	0.00023	0.0286	<0.3	0.00026	6.02	<0.0005	0.0003	0.0138	1.21	0.00673	0.006	0.54	0.0479	<0.05	0.0065	0.0022
28-Jul-09	6	500	455	8.23	329	783																									
4-Aug-09	7	500	485	8.21	336	655	#N/A	2.1	160.3	175	36.4	0.138	0.0151	0.0841	0.0018	0.00007	0.0092	<0.05	0.00011	13	0.0005	0.000163	0.0086	0.368	0.00243	0.0063	0.99	0.0642	<0.01	0.00527	0.0007
11-Aug-09	8	500	465	8.15	308	625																									
18-Aug-09	9	500	475	7.83	281	588	#N/A	4.2	92.8	181	125	0.0277	0.0126	0.039	0.0031	0.00002	0.000791	<0.05	0.00019	44.7	<0.0001	0.000198	0.0042	0.035	0.000238	0.0095	3.18	0.149	<0.01	0.00499	0.0007
25-Aug-09	10	500	485	8.10	333	521																									
1-Sep-09	11	500	440	7.76	285	721	#N/A	7.5	74.5	270	292	0.0171	0.00869	0.0277	0.006	0.00001	0.000077	<0.05	0.00026	106	<0.0001	0.000424	0.0037	0.006	0.000081	0.013	6.9	0.362	<0.01	0.00477	0.0013
8-Sep-09	12	500	440	7.75	341	717																									
15-Sep-09	13	500	440	7.48	305	795	#N/A	7.2	67.7	334	387	0.0182	0.00641	0.0193	0.007	0.00002	0.000044	<0.05	0.00032	143	<0.0001	0.000621	0.0036	0.009	0.000034	0.0151	7.45	0.539	0.01	0.00471	0.0015
22-Sep-09	14	500	450	7.84	348	734																									
29-Sep-09	15	500	445	7.68	354	783	#N/A	6.0	67.5	438	396	0.0201	0.00495	0.0139	0.0081	0.00002	0.000034	<0.05	0.00029	148	<0.0001	0.000768	0.0046	0.011	0.000017	0.0147	6.45	0.615	<0.01	0.00416	0.0016
6-Oct-09	16	500	405	7.70	326	835																									
13-Oct-09	17	500	395	7.66	324	846	#N/A	4.0	57.6	418	470	0.0208	0.00407	0.0127	0.0079	<0.00001	0.00003	<0.05	0.00029	178	<0.0001	0.000925	0.0057	0.006	0.000028	0.0132	6.1	0.784	<0.01	0.00449	0.0019
20-Oct-09	18	500	375	7.63	331	800																									
27-Oct-09	19	500	395	7.68	324	752	#N/A	4.4	55.0	360	399	0.0247	0.00401	0.0089	0.0065	0.00001	0.000025	<0.05	0.00024	152	<0.0001	0.000769	0.0033	0.004	0.000051	0.0118	4.49	0.664	<0.01	0.00445	0.0015
3-Nov-09	20	500	410	7.79	326	647																									
10-Nov-09	21	500	415	7.39	320	594	#N/A	6.7	59.0	329	310	0.0271	0.0039	0.00688	0.0054	0.00002	0.00003	<0.05	0.00036	119	<0.0001	0.000747	0.0041	0.008	0.000047	0.0116	3.17	0.587	<0.01	0.00363	0.0013
17-Nov-09	22	500	400	7.77	327	666																									
24-Nov-09	23	500	470	7.84	368	592	#N/A	3.9	73.7	266	296	0.0233	0.00312	0.00474	0.0055	0.00002	0.000027	<0.05	0.00027	114	0.0001	0.000857	0.0047	0.004	0.000022	0.0111	2.75	0.671	<0.01	0.00272	0.0014
1-Dec-09	24	500	445	7.93	355	635																									
8-Dec-09	25	500	480	7.55	333	594	#N/A	5.2	70.6	269	301	0.0245	0.00261	0.00419	0.0054	0.00002	0.000028	<0.05	0.00022	116	<0.0001	0.000848	0.0037	0.004	0.000013	0.01	2.57	0.694	<0.01	0.00237	0.0014
15-Dec-09	26	500	470	7.98	323	577																									
22-Dec-09	27	500	430	7.80	314	618	#N/A	3.3	63.9	341	381	0.0272	0.00251	0.00283	0.0061	0.00002	0.000025	<0.05	0.00026	148	<0.0001	0.00102	0.0037	0.009	0.000007	0.0101	2.66	0.879	0.02	0.00267	0.0016
29-Dec-09	28	500	440	7.87	387	660																									
5-Jan-10	29	500	490	7.72	354	593	#N/A	5.2	85.2	256	307	0.0234	0.0022	0.00388	0.0057	0.00003	0.000021	<0.05	0.00028	120	<0.0001	0.00135	0.005	0.006	0.000041	0.0098	1.95	0.932	<0.01	0.00247	0.0019
12-Jan-10	30	500	425	7.76	334	857																									
19-Jan-10	31	500	435	7.74	319	775	#N/A	6.9	63.1	415	395	0.0273	0.00189	0.00286	0.007	0.00002	0.00002	<0.05	0.00047	155	<0.0001	0.00116	0.0139	0.007	0.000457	0.0094	2.14	0.958	0.01	0.00284	0.0015
26-Jan-10	32	500	430	7.74	360	698																									
2-Feb-10	33	500	480	7.67	337	527	#N/A	5.2	81.8	255	340	0.0209	0.00182	0.00277	0.0064	0.00003	0.000017	<0.05	0.00034	133	<0.0001	0.00155	0.0078	0.002	0.000047	0.0098	1.73	1.11	<0.01	0.00238	0.0018
9-Feb-10	34	500	445	7.75	291	837																									
16-Feb-10	35	500	445	7.65	238	791	#N/A	6.0	66.1	480	502	0.0252	0.00148	0.00296	0.0081	0.00003	0.000019	<0.05	0.00037	197	<0.0001	0.0018	0.0043	0.006	0.000018	0.0101	2.16	1.45	<0.01	0.00215	0.0018
23-Feb-10	36	500	435	7.86	315	728																									
2-Mar-10	37	500	435	7.69	289	909	#N/A	4.4	57.6	469	571	0.0306	0.00127	0.00229	0.0079	0.00002	0.000019	<0.05	0.00035	225	0.0001	0.00163	0.0035	0.008	0.000038	0.0092	1.99	1.47	<0.01	0.00233	0.0019
9-Mar-10	38	500	375	7.66	350	860																									
16-Mar-10	39	500	515	7.58	321	693	#N/A	5.8	64.3	386	466	0.0291	0.00108	0.00123	0.0113	0.00002	0.000069	<0.05	0.0003	184	<0.0001	0.00168	0.005	0.003	0.000012	0.0089	1.52	1.36	<0.01	0.00259	0.0018
23-Mar-10	40	500	475	7.78	325	674																									
30-Mar-10	41	500	450	7.46	361	1653	#N/A	5.2	36.8	416	417	0.0318	0.0009	0.0015	0.0135	0.00002	0.000016	<0.05	0.00025	165	<0.0001	0.00234	0.0037	0.004	0.000042	0.0084	1.35	0.735	<0.01	0.00245	0.002
6-Apr-10	42	500	460	7.70	342	745																									
13-Apr-10	43	500	460	7.53	307	971	#N/A	7.7	64.7	567	557	0.0287	0.00089	0.00118	0.0121	0.00002	0.000027	<0.05	0.00042	221	<0.0001	0.00244	0.0045	0.008	0.000061	0.009	1.6	1.94	<0.01	0.00279	0.0025
20-Apr-10	44	500	450	7.75	305	1089																									
27-Apr-10	45	500	455	7.47	327	1014	#N/A	3.8	60.2	598	578	0.0254	0.00078	0.00082	0.0145	0.00002	0.000031	<0.05	0.00041	229	<0.0001	0.00231	0.0049	0.004	0.000008	0.0058	1.58	1.9	<0.01	0.00277	0.0021
4-May-10	46	500	445	7.72	344	729																									
11-May-10	47	500	455	7.60	324	1128	#N/A	6.2	59.7	649	686	0.027	0.00084	0.00083	0.0147	0.00002	0.000016	<0.05	0.00042	272	<0.0001	0.00266	0.0041	0.005	0.000021	0.0088	1.71	2.27	<0.01	0.0026	0.0022
18-May-10	48	500	435	7.63	333	1215																									
25-May-10	49	500	440	7.37	384	1141	#N/A	9.1	61.1	610	719	0.0247	0.00082	0.00087	0.015	0.00002	0.000018	<0.05	0.00043	285	<0.0001	0.00258	0.0041	0.006	0.000012	0.0094	1.77	2.2	<0.01	0.00249	0.002

Notes:

"<" indicates less than the laboratory's detection limit

Table 11: 2008 Composite Tailings Humidity Test Cell Results

Date	Cycle No.	Volume mL Input	Volume mL Output	pH	ORP mV	Cond. umhos/cm	Acidity (pH 4.5) mgCaCO3/L	Acidity (pH 8.3) mgCaCO3/L	Alkalinity mgCaCO3/L	Sulphate mg/L	Hardness CaCO3 mg/L	P mg/L	K mg/L	Se mg/L	Si mg/L	Ag mg/L	Na mg/L	Sr mg/L	S mg/L	Tl mg/L	Sn mg/L	Ti mg/L	U mg/L	V mg/L	Zn mg/L	Zr mg/L	Major Anions	Major Cations	Diff	Diff (%)
23-Jun-09	1	750	250	8.96	315	861	#N/A	#N/A	224.8	314	6.5	0.698	4.12	0.0086	13.7	0.00087	211	0.0152	176	0.00003	0.0024	<0.005	0.00624	0.02	0.004	<0.001	11.04	9.41	-1.63	-8.0%
30-Jun-09	2	500	440	8.60	291	1037																								
7-Jul-09	3	500	380	8.37	329	1214	#N/A	#N/A	233.7	293	11	<0.02	4.07	0.016	9.53	0.00013	227	0.0319	229	0.00002	0.0004	<0.005	0.0117	0.004	0.005	<0.001	10.78	10.19	-0.58	-2.8%
14-Jul-09	4	500	440	8.45	304	1050																								
21-Jul-09	5	500	460	8.40	299	961	#N/A	#N/A	228.9	193	17.2	0.021	5.09	0.0075	10.4	0.00005	205	0.039	82	0.00003	0.00034	0.006	0.0055	0.002	0.0068	<0.0005	8.60	9.39	0.79	4.4%
28-Jul-09	6	500	455	8.23	329	783																								
4-Aug-09	7	500	485	8.21	336	655	#N/A	2.1	160.3	175	36.4	0.008	5.84	0.00309	9.14	0.000011	127	0.0643	66	0.000032	0.00028	0.002	0.0031	0.0013	0.0032	<0.0001	6.85	6.40	-0.45	-3.4%
11-Aug-09	8	500	465	8.15	308	625																								
18-Aug-09	9	500	475	7.83	281	588	#N/A	4.2	92.8	181	125	0.004	8.38	0.00175	8.37	<0.000005	79.3	0.164	82	0.000045	0.00016	<0.0005	0.00164	0.0004	0.0063	<0.0001	5.63	6.15	0.53	4.5%
25-Aug-09	10	500	485	8.10	333	521																								
1-Sep-09	11	500	440	7.76	285	721	#N/A	7.5	74.5	270	292	<0.002	9.42	0.0021	8.37	<0.000005	41	0.342	113	0.000127	0.00022	<0.0005	0.00162	<0.0002	0.0119	<0.0001	7.12	7.88	0.77	5.1%
8-Sep-09	12	500	440	7.75	341	717																								
15-Sep-09	13	500	440	7.48	305	795	#N/A	7.2	67.7	334	387	0.003	9.39	0.00119	8.01	<0.000005	19.8	0.429	129	0.000057	0.00014	<0.0005	0.00146	<0.0002	0.0073	<0.0001	8.31	8.85	0.54	3.1%
22-Sep-09	14	500	450	7.84	348	734																								
29-Sep-09	15	500	445	7.68	354	783	#N/A	6.0	67.5	438	396	0.003	8.25	0.00111	8.28	<0.000005	10.7	0.416	133	0.000049	0.00013	<0.0005	0.00136	<0.0002	0.0044	<0.0001	10.47	8.59	-1.88	-9.9%
6-Oct-09	16	500	405	7.70	326	835																								
13-Oct-09	17	500	395	7.66	324	846	#N/A	4.0	57.6	418	470	0.003	8.04	0.00145	6.69	<0.000005	7.57	0.42	152	0.000045	0.00011	<0.0005	0.00132	<0.0002	0.0059	<0.0001	9.86	9.92	0.06	0.3%
20-Oct-09	18	500	375	7.63	331	800																								
27-Oct-09	19	500	395	7.68	324	752	#N/A	4.4	55.0	360	399	<0.002	6.78	0.00112	6.17	<0.000005	5.06	0.327	127	0.00004	0.00011	<0.0005	0.00126	<0.0002	0.005	<0.0001	8.60	8.35	-0.25	-1.5%
3-Nov-09	20	500	410	7.79	326	647																								
10-Nov-09	21	500	415	7.39	320	594	#N/A	6.7	59.0	329	310	0.004	5.64	0.00094	6.03	0.000009	3.26	0.254	97	0.00004	0.00016	<0.0005	0.00127	<0.0002	0.0196	<0.0001	8.03	6.49	-1.55	-10.7%
17-Nov-09	22	500	400	7.77	327	666																								
24-Nov-09	23	500	470	7.84	368	592	#N/A	3.9	73.7	266	296	<0.002	5.54	0.00076	5.93	<0.000005	2.63	0.223	83	0.000039	0.00011	<0.0005	0.00143	<0.0002	0.0111	<0.0001	7.02	6.17	-0.84	-6.4%
1-Dec-09	24	500	445	7.93	355	635																								
8-Dec-09	25	500	480	7.55	333	594	#N/A	5.2	70.6	269	301	0.002	4.81	0.00158	5.16	<0.000005	2.16	0.217	83	0.000039	0.00018	<0.0005	0.00133	<0.0002	0.0083	<0.0001	7.02	6.22	-0.80	-6.0%
15-Dec-09	26	500	470	7.98	323	577																								
22-Dec-09	27	500	430	7.80	314	618	#N/A	3.3	63.9	341	381	<0.002	5.85	0.00082	4.76	0.000047	1.93	0.252	121	0.00005	0.00011	<0.0005	0.00121	<0.0002	0.005	<0.0001	8.38	7.84	-0.54	-3.4%
29-Dec-09	28	500	440	7.87	387	660																								
5-Jan-10	29	500	490	7.72	354	593	#N/A	5.2	85.2	256	307	<0.002	5.28	0.00067	6.11	<0.000005	1.55	0.202	88	0.000046	0.00038	<0.0005	0.00131	<0.0002	0.0085	<0.0001	7.04	6.35	-0.69	-5.1%
12-Jan-10	30	500	425	7.76	334	857																								
19-Jan-10	31	500	435	7.74	319	775	#N/A	6.9	63.1	415	395	0.002	5.15	0.00097	4.89	<0.000005	1.35	0.253	125	0.000044	0.00031	<0.0005	0.00095	<0.0002	0.0077	<0.0001	9.91	8.10	-1.81	-10.0%
26-Jan-10	32	500	430	7.74	360	698																								
2-Feb-10	33	500	480	7.67	337	527	#N/A	5.2	81.8	255	340	<0.002	4.94	0.00119	5.07	<0.000005	1.25	0.199	96	0.000053	0.0002	<0.0005	0.0011	<0.0002	0.0097	<0.0001	6.95	6.96	0.01	0.1%
9-Feb-10	34	500	445	7.75	291	837																								
16-Feb-10	35	500	445	7.65	238	791	#N/A	6.0	66.1	480	502	0.003	5.75	0.00102	5.11	<0.000005	1.24	0.283	160	0.00005	0.0001	<0.0005	0.00088	<0.0002	0.0058	<0.0001	11.32	10.21	-1.11	-5.2%
23-Feb-10	36	500	435	7.86	315	728																								
2-Mar-10	37	500	435	7.69	289	909	#N/A	4.4	57.6	469	571	0.003	5.93	0.00155	5.9	<0.000005	1.1	0.279	191	0.000045	0.00008	<0.0005	0.0008	<0.0002	0.0048	<0.0001	10.92	11.59	0.67	3.0%
9-Mar-10	38	500	375	7.66	350	860																								
16-Mar-10	39	500	515	7.58	321	693	#N/A	5.8	64.3	386	466	0.003	5.54	0.00077	5.22	0.000021	1.01	0.233	146	0.000048	0.00007	<0.0005	0.00076	<0.0002	0.0047	<0.0001	9.33	9.49	0.17	0.9%
23-Mar-10	40	500	475	7.78	325	674																								
30-Mar-10	41	500	450	7.46	361	1653	#N/A	5.2	36.8	416	417	<0.002	3.33	0.00148	4.04	<0.000005	0.99	0.268	133	0.000056	0.00012	<0.0005	0.00061	<0.0002	0.0088	<0.0001	9.40	8.47	-0.93	-5.2%
6-Apr-10	42	500	460	7.70	342	745																								
13-Apr-10	43	500	460	7.53	307	971	#N/A	7.7	64.7	567	557	<0.002	5.37	0.00094	4.33	<0.000005	0.88	0.249	183	0.000051	0.00013	<0.0005	0.00069	<0.0002	0.0062	<0.0001	13.11	11.34	-1.77	-7.2%
20-Apr-10	44	500	450	7.75	305	1089																								
27-Apr-10	45	500	455	7.47	327	1014	#N/A	3.8	60.2	598	578	<0.002	4.99	0.00091	3.86	0.00001	0.75	0.238	195	0.000041	0.00008	<0.0005	0.00039	<0.0002	0.0068	<0.0001	13.66	11.72	-1.95	-7.7%
4-May-10	46	500	445	7.72	344	729																								
11-May-10	47	500	455	7.60	324	1128	#N/A	6.2	59.7	649	686	<0.002	5.52	0.00089	5.75	<0.000005	0.85	0.248	248	0.000054	0.00007	<0.0005	0.00043	<0.0002	0.0085	<0.0001	14.71	13.89	-0.82	-2.9%
18-May-10	48	500	435	7.63	333	1215																								
25-May-10	49	500	440	7.37	384	1141	#N/A	9.1	61.1	610	719	<0.002	5.47	0.00101	4.62	<0.000005	0.71	0.251	249	0.000049	0.0001	<0.0005	0.00035	<0.0002	0.0058	<0.0001	13.93	14.54	0.61	2.1%

Notes:

"<" indicates less than the laboratory's detection limit

Table 11: 2008 Composite Tailings Humidity Test Cell Results

Date	Cycle No.	Volume mL Input	Volume mL Output	pH	ORP mV	Cond. umhos/cm	Acidity (pH 4.5) mgCaCO3/L	Acidity (pH 8.3) mgCaCO3/L	Alkalinity mgCaCO3/L	Sulphate mg/L	Hardness CaCO3 mg/L	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Ca mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Li mg/L	Mg mg/L	Mn mg/L	Hg ug/L	Mo mg/L	Ni mg/L
1-Jun-10	50	500	460	7.70	351	1043																									
8-Jun-10	51	500	420	7.44	337	1340	#N/A	7.0	51.7	702																					
15-Jun-10	52	500	440	7.67	346	1223																									
22-Jun-10	53	500	415	7.59	414	1347	#N/A	5.2	54.3	762	841	0.0232	0.00055	0.00131	0.018	0.00002	0.000017	<0.05	0.00053	334	<0.0001	0.00318	0.0069	0.006	0.000015	0.0096	1.86	2.58	<0.01	0.00199	0.0025
29-Jun-10	54	500	455	7.69	337	1160																									
6-Jul-10	55	500	440	7.56	339	1168	#N/A	5.9	56.9	464																					
13-Jul-10	56	500	445	7.64	293	1121																									
20-Jul-10	57	500	435	7.31	365	1211	#N/A	7.9	55.6	642	728	0.024	0.0005	0.0008	0.0151	<0.00005	<0.00003	<0.3	0.00042	289	<0.0005	0.00334	0.0058	<0.005	<0.00003	0.009	1.7	2.93	<0.05	0.0016	0.0039
27-Jul-10	58	500	455	7.57	289	1102																									
3-Aug-10	59	500	435	7.54	353	569	#N/A	5.5	53.5	186																					
10-Aug-10	60	500	440	7.58	250	1201																									
17-Aug-10	61	500	445	7.32	372	1247	#N/A	8.1	52.8	773	823	0.026	0.0004	0.0006	0.0157	0.00003	0.000013	<0.05	0.00043	327	<0.0001	0.00316	0.0057	0.005	0.000036	0.0089	1.63	2.79	<0.01	0.00151	0.0022
24-Aug-10	62	500	425	7.46	306	1507																									
31-Aug-10	63	500	425	7.16	363	1458	#N/A	12.4	45.6	994																					
7-Sep-10	64	500	430	7.32	339	1395																									
14-Sep-10	65	500	435	7.25	391	1264	#N/A	6.2	42.1	907	854	0.0234	0.00029	0.00049	0.016	0.00002	0.000014	<0.05	0.00045	339	<0.0001	0.00329	0.0037	0.009	0.000013	0.0081	1.68	2.76	<0.01	0.001	0.0026
21-Sep-10	66	500	425	7.52	287	1230																									
28-Sep-10	67	500	430	7.46	343	1353	#N/A	5.6	46.5	899																					
5-Oct-10	68	500	375	7.51	297	330																									
12-Oct-10	69	500	450	7.48	363	1719	#N/A	5.8	49.3	1053	1180	0.023	0.0003	0.0005	0.024	<0.00005	<0.00003	<0.3	0.00057	469	<0.0005	0.00662	0.0051	0.009	<0.00003	0.011	2.2	4.85	<0.05	0.0019	0.0056
19-Oct-10	70	500	410	7.60	282	657																									
26-Oct-10	71	500	435	7.39	367	1711	#N/A	6.1	46.1	1068																					
2-Nov-10	72	500	430	7.58	264	1501																									
9-Nov-10	73	500	425	7.19	414	1611	#N/A	6.6	36.1	1271	1330	0.022	0.0003	0.0014	0.0279	<0.00005	<0.00003	<0.3	0.00064	528	<0.0005	0.00764	0.0055	0.016	0.00005	0.01	2.5	5.33	<0.05	0.0009	0.0098
16-Nov-10	74	500	395	7.52	243	1751																									
23-Nov-10	75	500	445	7.30	318	1725	#N/A	6.8	43.9	961																					
30-Nov-10	76	500	445	7.33	276	1543																									
7-Dec-10	77	500	455	7.36	381	1403	#N/A	7.3	53.0	794	865	0.0143	0.00022	0.00048	0.0168	0.00002	0.000014	<0.05	0.00048	344	<0.0001	0.00738	0.0053	0.005	0.000209	0.0093	1.69	4.14	<0.01	0.00076	0.0061
14-Dec-10	78	500	415	7.27	340	1801																									
21-Dec-10	79	500	360	6.99	371	1581	#N/A	9.7	30.8	1012																					
28-Dec-10	80	500	420	7.22	245	956																									
4-Jan-11	81	500	445	7.07	399	1428	#N/A	10.2	47.3	859	1010	0.0158	0.00019	0.00033	0.0188	0.00002	0.000013	<0.05	0.0006	403	<0.0001	0.01	0.0048	0.013	0.000008	0.0097	2.19	7.13	<0.01	0.00068	0.0084
11-Jan-11	82	500	445	7.27	333	1648																									
18-Jan-11	83	500	420	7.19	376	2002	#N/A	6.7	21.8	1249																					
25-Jan-11	84	500	390	7.17	276	1795																									
1-Feb-11	85	500	455	7.16	381	1649	#N/A	6.6	34.5		1210	0.028	0.0002	0.001	0.0211	<0.00005	<0.00003	<0.3	0.0021	481	<0.0005	0.0178	0.0138	0.138	0.00004	0.01	3.1	10.8	<0.05	0.0005	0.0154
8-Feb-11	86	500	460	7.70	351	1043																									
15-Feb-11	87	500	420	7.44	337	1340	#N/A	7.0	51.7	702																					
22-Feb-11	88	500	440	7.67	346	1223																									
1-Mar-11	89	500	415	7.59	414	1347	#N/A	5.2	54.3	762	841	0.0232	0.00055	0.00131	0.018	0.00002	0.000017	<0.05	0.00053	334	<0.0001	0.00318	0.0069	0.006	0.000015	0.0096	1.86	2.58	<0.01	0.00199	0.0025
8-Mar-11	90	500	455	7.69	337	1160																									
15-Mar-11	91	500	440	7.56	339	1168	#N/A	5.9	56.9	464																					
22-Mar-11	92	500	445	7.64	293	1121																									
29-Mar-11	93	500	435	7.31	365	1211	#N/A	7.9	55.6	642	728	0.024	0.0005	0.0008	0.0151	<0.00005	<0.00003	<0.3	0.00042	289	<0.0005	0.00334	0.0058	<0.005	<0.00003	0.009	1.7	2.93	<0.05	0.0016	0.0039
5-Apr-11	94	500	455	7.57	289	1102																									
12-Apr-11	95	500	435	7.54	353	569	#N/A	5.5	53.5	186																					
19-Apr-11	96	500	440	7.58	250	1201																									
26-Apr-11	97	500	445	7.32	372	1247	#N/A	8.1	52.8	773	823	0.026	0.0004	0.0006	0.0157	0.00003	0.000013	<0.05	0.00043	327	<0.0001	0.00316	0.0057	0.005	0.000036	0.0089	1.63	2.79	<0.01	0.00151	0.0022
3-May-11	98	500	425	7.46	306	1507																									
10-May-11	99	500	425	7.16	363	1458	#N/A	12.4	45.6	994																					
17-May-11	100	500	430	7.32	339	1395																									
24-May-11	101	500	435	7.25	391	1264	#N/A	6.2	42.1	907	854	0.0234	0.00029	0.00049	0.016	0.00002	0.000014	<0.05	0.00045	339	<0.0001	0.00329	0.0037	0.009	0.000013	0.0081	1.68	2.76	<0.01	0.001	0.0026
31-May-11	102	500	425	7.52	287	1230																									
7-Jun-11	103	500	430	7.46	343	1353	#N/A	5.6	46.5	899																					
14-Jun-11	104	500	375	7.51	297	330																									
21-Jun-11	105	500	450	7.48	363	1719	#N/A	5.8	49.3	1053	1180	0.023	0.0003	0.0005	0.024	<0.00005	<0.00003	<0.3	0.00057	469	<0.0005	0.00662	0.0051	0.009	<0.00003	0.011	2.2	4.85	<0.05	0.0019	0.0056

Notes:

"<" indicates less than the laboratory's detection limit

Table 11: 2008 Composite Tailings Humidity Test Cell Results

Date	Cycle No.	Volume mL Input	Volume mL Output	pH	ORP mV	Cond. umhos/cm	Acidity (pH 4.5) mgCaCO3/L	Acidity (pH 8.3) mgCaCO3/L	Alkalinity mgCaCO3/L	Sulphate mg/L	Hardness CaCO3 mg/L	P mg/L	K mg/L	Se mg/L	Si mg/L	Ag mg/L	Na mg/L	Sr mg/L	S mg/L	Tl mg/L	Sn mg/L	Ti mg/L	U mg/L	V mg/L	Zn mg/L	Zr mg/L	Major Anions	Major Cations	Diff	Diff (%)
1-Jun-10	50	500	460	7.70	351	1043																								
8-Jun-10	51	500	420	7.44	337	1340	#N/A	7.0	51.7	702																				
15-Jun-10	52	500	440	7.67	346	1223																								
22-Jun-10	53	500	415	7.59	414	1347	#N/A	5.2	54.3	762	841	0.002	5.22	0.002	3.63	0.00016	0.66	0.257	295	0.00005	0.00007	<0.0005	0.00043	<0.0002	0.0073	<0.0001	16.96	16.98	0.02	0.1%
29-Jun-10	54	500	455	7.69	337	1160																								
6-Jul-10	55	500	440	7.56	339	1168	#N/A	5.9	56.9	464																				
13-Jul-10	56	500	445	7.64	293	1121																								
20-Jul-10	57	500	435	7.31	365	1211	#N/A	7.9	55.6	642	728	<0.01	4.3	0.0013	3.49	<0.00003	0.6	0.199	264	0.00004	0.0001	<0.003	0.00032	<0.001	0.0088	<0.0005	14.49	14.70	0.21	0.7%
27-Jul-10	58	500	455	7.57	289	1102																								
3-Aug-10	59	500	435	7.54	353	569	#N/A	5.5	53.5	186																				
10-Aug-10	60	500	440	7.58	250	1201																								
17-Aug-10	61	500	445	7.32	372	1247	#N/A	8.1	52.8	773	823	<0.002	4.63	0.00127	3.34	<0.000005	0.54	0.207	292	0.000047	0.00011	<0.0005	0.00028	<0.0002	0.0063	<0.0001	17.16	16.59	-0.57	-1.7%
24-Aug-10	62	500	425	7.46	306	1507																								
31-Aug-10	63	500	425	7.16	363	1458	#N/A	12.4	45.6	994																				
7-Sep-10	64	500	430	7.32	339	1395																								
14-Sep-10	65	500	435	7.25	391	1264	#N/A	6.2	42.1	907	854	0.002	3.9	0.00193	2.91	0.000008	0.51	0.173	316	0.000042	0.00016	<0.0005	0.00024	<0.0002	0.0082	<0.0001	19.74	17.18	-2.56	-6.9%
21-Sep-10	66	500	425	7.52	287	1230																								
28-Sep-10	67	500	430	7.46	343	1353	#N/A	5.6	46.5	899																				
5-Oct-10	68	500	375	7.51	297	330																								
12-Oct-10	69	500	450	7.48	363	1719	#N/A	5.8	49.3	1053	1180	<0.01	5	0.0021	3.17	<0.00003	0.5	0.215	385	0.00006	0.00048	0.006	0.00036	<0.001	0.0089	<0.0005	22.92	23.73	0.81	1.7%
19-Oct-10	70	500	410	7.60	282	657																								
26-Oct-10	71	500	435	7.39	367	1711	#N/A	6.1	46.1	1068																				
2-Nov-10	72	500	430	7.58	264	1501																								
9-Nov-10	73	500	425	7.19	414	1611	#N/A	6.6	36.1	1271	1330	<0.01	4.9	0.0034	2.62	<0.00003	0.6	0.223	460	0.00006	0.0001	<0.003	0.00019	<0.001	0.0109	<0.0005	27.20	26.70	-0.50	-0.9%
16-Nov-10	74	500	395	7.52	243	1751																								
23-Nov-10	75	500	445	7.30	318	1725	#N/A	6.8	43.9	961																				
30-Nov-10	76	500	445	7.33	276	1543																								
7-Dec-10	77	500	455	7.36	381	1403	#N/A	7.3	53.0	794	865	0.003	3.92	0.00139	2.36	<0.000005	0.44	0.137	310	0.000055	0.00004	<0.0005	0.0307	<0.0002	0.0061	<0.0001	17.60	17.42	-0.18	-0.5%
14-Dec-10	78	500	415	7.27	340	1801																								
21-Dec-10	79	500	360	6.99	371	1581	#N/A	9.7	30.8	1012																				
28-Dec-10	80	500	420	7.22	245	956																								
4-Jan-11	81	500	445	7.07	399	1428	#N/A	10.2	47.3	859	1010	0.003	4.25	0.00292	2.84	<0.000005	0.44	0.156	355	0.000058	0.00009	<0.0005	0.00024	<0.0002	0.0076	0.0004	18.84	20.42	1.58	4.0%
11-Jan-11	82	500	445	7.27	333	1648																								
18-Jan-11	83	500	420	7.19	376	2002	#N/A	6.7	21.8	1249																				
25-Jan-11	84	500	390	7.17	276	1795																								
1-Feb-11	85	500	455	7.16	381	1649	#N/A	6.6	34.5		1210	<0.01	4.3	0.0016	2.8	<0.00003	0.5	0.151	372	0.00006	0.00008	<0.003	0.00014	<0.001	0.148	<0.0005				
8-Feb-11	86	500	440	7.29	398	1688																								
15-Feb-11	87	500	410	7.07	354	1782	#N/A	6.2	16.0	854																				
22-Feb-11	88	500	480	7.09	369	1761																								
1-Mar-11	89	500	465	6.80	370	1680	#N/A	5.9	11.4	1130	1040	<0.01	4.9	0.0022	4.18	<0.00003	0.8	0.174	332	0.0001	0.00012	<0.003	0.00002	<0.001	0.0747	<0.0005	23.77	0.16	-23.61	-98.6%
8-Mar-11	90	500	440	5.97	264	1910																								
15-Mar-11	91	500	435	5.33	189	1904	#N/A	47.3	0.8	1450																				
22-Mar-11	92	500	435	5.19	174	1660																								
29-Mar-11	93	500	460	4.97	185	1656	#N/A	146.4	<0.1	823	857	<0.01	5.4	0.0048	14.1	<0.00003	2.3	0.233	411	0.00016	0.00008	<0.003	0.00028	<0.001	0.439	<0.0005	17.15	0.24	-16.90	-97.2%
5-Apr-11	94	500	485	5.03	160	1516																								
12-Apr-11	95	500	470	4.47	198	1491	2.9	203.4	#N/A	764																				
19-Apr-11	96	500	515	4.47	251	1398																								
26-Apr-11	97	500	490	3.99	275	1319	12.1	250.0	#N/A	715	434	<0.01	3.8	0.001	11.6	<0.00003	2.8	0.167	253	0.00004	0.00026	<0.003	0.00028	<0.001	0.151	<0.0005	14.90	0.33	-14.57	-95.7%
3-May-11	98	500	480	3.88	269	1305																								
10-May-11	99	500	465	3.82	288	1346	18.2	315.2	#N/A	862																				
17-May-11	100	500	450	3.58	321	1824																								
24-May-11	101	500	435	3.43	313	2105	52.9	688.7	#N/A	1431	725	<0.01	5.7	0.0149	34.4	0.00005	5.4	0.404	470	0.00021	0.00084	<0.003	0.00246	<0.001	1.99	<0.0005	29.81	0.82	-28.99	-94.6%
31-May-11	102	500	445	3.41	296	2109																								
7-Jun-11	103	500	400	3.45	312	2027	73.6	667.5	#N/A	1145																				
14-Jun-11	104	500	445	3.58	246	1884																								
21-Jun-11	105	500	475	3.61	229	1591	43.6	579.7	#N/A																					

Notes:

"<" indicates less than the laboratory's detection limit

Table 12: 2005 Composite Tailings Humidity Test Cell Results

Date	Cycle No.	Volume mL Input	Volume mL Output	pH	ORP mV	Cond. umhos/cm	Acidity (pH 4.5) mgCaCO3/L	Acidity (pH 8.3) mgCaCO3/L	Alkalinity mgCaCO3/L	Sulphate mg/L	Hardness CaCO3 mg/L	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Ca mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Li mg/L	Mg mg/L	Mn mg/L	Hg ug/L	Mo mg/L	Ni mg/L
30-Jun-09	1	750	235	8.81	295	740	#N/A	#N/A	248.0	32	27	0.28	0.0034	0.0347	0.0181	<0.0001	0.00005	<0.5	0.00085	7.6	<0.001	0.00055	0.0114	0.566	0.00077	<0.005	1.94	0.0154	<0.5	0.0215	0.0049
7-Jul-09	2	500	460	9.02	292	967																									
14-Jul-09	3	500	455	8.87	267	912	#N/A	#N/A	316.8	66	5.3	0.083	0.0201	0.195	0.0007	<0.0002	0.0002	<1	<0.0001	2.1	<0.002	0.0002	0.016	0.099	0.0008	<0.01	<0.2	0.006	<0.2	0.017	0.0036
21-Jul-09	4	500	435	8.56	287	845																									
28-Jul-09	5	500	475	8.32	316	770	#N/A	#N/A	199.4	179	14.8	0.064	0.0182	0.13	0.0014	<0.00005	0.00028	<0.3	0.00008	5.33	<0.0005	0.00012	0.008	0.063	0.00071	0.009	0.37	0.0137	0.07	0.0066	0.0015
4-Aug-09	6	500	425	8.11	338	754																									
11-Aug-09	7	500	460	8.09	312	719	#N/A	4.0	102.9	274	98.8	0.026	0.0104	0.0898	0.0049	<0.00005	<0.00003	<0.3	0.00004	35.6	<0.0005	0.00021	0.0031	0.008	0.00029	0.018	2.39	0.0771	<0.05	0.0044	0.0018
18-Aug-09	8	500	460	7.93	296	625																									
25-Aug-09	9	500	425	8.08	336	606	#N/A	3.4	74.9	210	204	0.0231	0.00919	0.0406	0.0067	<0.00001	0.00002	<0.05	0.000142	74.7	<0.0001	0.000458	0.0047	0.004	0.000113	0.0225	4.17	0.169	<0.01	0.00435	0.0012
1-Sep-09	10	500	490	7.98	274	578																									
8-Sep-09	11	500	495	7.84	334	557	#N/A	6.9	87.7	213	237	0.0212	0.00723	0.0248	0.0078	0.00001	0.000022	<0.05	0.000166	87.9	0.0011	0.000944	0.0039	0.004	0.000031	0.0203	4.29	0.308	0.01	0.00391	0.0019
15-Sep-09	12	500	510	7.98	300	607																									
22-Sep-09	13	500	435	7.93	345	887	#N/A	5.5	74.0	420	479	0.0211	0.00515	0.0162	0.015	0.00001	0.000022	<0.05	0.000233	181	<0.0001	0.00177	0.0037	0.004	0.000028	0.0256	6.72	0.608	<0.01	0.00399	0.0026
29-Sep-09	14	500	400	7.77	347	770																									
6-Oct-09	15	500	440	7.85	318	759	#N/A	5.6	66.8	429	393	0.0266	0.0043	0.0104	0.0121	<0.00001	0.000027	<0.05	0.000168	150	<0.0001	0.00123	0.003	0.019	0.000051	0.0221	4.59	0.441	<0.01	0.00477	0.0019
13-Oct-09	16	500	425	7.84	320	826																									
20-Oct-09	17	500	445	7.80	319	623	#N/A	3.6	55.8	301	319	0.0342	0.00355	0.0075	0.0097	<0.00001	0.000022	<0.05	0.000238	123	<0.0001	0.00105	0.0034	0.003	0.000148	0.0168	3.16	0.385	<0.01	0.00475	0.0014
27-Oct-09	18	500	440	7.83	312	732																									
3-Nov-09	19	500	385	7.85	325	645	#N/A	3.6	55.8	334	328	0.04	0.00295	0.0057	0.0093	0.00001	0.000025	<0.05	0.00016	127	<0.0001	0.00135	0.0028	0.004	0.000027	0.0151	2.85	0.454	<0.01	0.00473	0.0015
10-Nov-09	20	500	505	7.63	315	631																									
17-Nov-09	21	500	465	7.90	323	590	#N/A	6.2	59.7	285	309	0.0476	0.00239	0.0042	0.0094	<0.00001	0.000024	<0.05	0.000156	120	<0.0001	0.00125	0.0024	0.001	0.00001	0.0133	2.19	0.418	<0.01	0.00385	0.0014
24-Nov-09	22	500	460	7.90	354	652																									
1-Dec-09	23	500	450	7.93	342	678	#N/A	2.97	63.5	322	348	0.042	0.00242	0.004	0.0107	0.00002	0.000026	<0.05	0.000196	136	<0.0001	0.00152	0.0035	0.006	0.000162	0.0149	2.29	0.493	<0.01	0.0038	0.0015
8-Dec-09	24	500	440	7.77	331	607																									
15-Dec-09	25	500	435	7.71	336	601	#N/A	3.7	50.6	298	309	0.0407	0.00181	0.0032	0.0089	<0.00001	0.000029	<0.05	0.000141	121	<0.0001	0.00133	0.0164	0.007	0.000341	0.011	1.67	0.434	<0.01	0.00299	0.0014
22-Dec-09	26	500	445	7.87	312	601																									
29-Dec-09	27	500	445	7.89	362	624	#N/A	3.0	58.4	267	312	0.0464	0.00167	0.0029	0.0096	0.00001	0.000025	<0.05	0.000142	122	0.0002	0.00137	0.0092	0.012	0.000054	0.0108	1.66	0.441	0.01	0.00292	0.0015
5-Jan-10	28	500	490	7.86	328	614																									
12-Jan-10	29	500	440	7.82	314	632	#N/A	6.7	59.6	307	325	0.055	0.00241	0.0028	0.0097	0.00001	0.000023	<0.05	0.000316	127	0.0001	0.00148	0.0075	0.006	0.000434	0.0106	1.68	0.482	<0.01	0.00293	0.0016
19-Jan-10	30	500	405	7.81	318	670																									
26-Jan-10	31	500	395	7.76	333	614	#N/A	3.8	53.9	354	351	0.0367	0.00131	0.0024	0.0102	<0.00001	0.000025	<0.05	0.000131	138	<0.0001	0.00141	0.036	0.009	0.000823	0.0092	1.47	0.466	<0.01	0.00258	0.0016
2-Feb-10	32	500	445	7.70	334	508																									
9-Feb-10	33	500	440	7.76	294	630	#N/A	3.8	56.0	286	355	0.0429	0.00138	0.0023	0.0106	0.00001	0.000015	<0.05	0.000156	140	<0.0001	0.0014	0.0029	0.005	0.000033	0.0097	1.46	0.468	<0.01	0.00281	0.0015
16-Feb-10	34	500	440	7.68	244	534																									
23-Feb-10	35	500	430	7.84	312	504	#N/A	3.4	53.7	266	313	0.0411	0.0012	0.002	0.0132	<0.00001	0.00002	<0.05	0.000126	124	<0.0001	0.00126	0.0021	0.004	0.000021	0.0084	1.09	0.422	<0.01	0.00252	0.0011
2-Mar-10	36	500	410	7.77	297	628																									
9-Mar-10	37	500	385	7.75	341	635	#N/A	3.5	51.8	317	355	0.0362	0.00113	0.0025	0.0096	0.00001	0.00002	<0.05	0.000141	140	0.0004	0.00139	0.0025	0.012	0.00006	0.0085	1.2	0.466	0.01	0.00326	0.0013
16-Mar-10	38	500	510	7.70	312	489																									
23-Mar-10	39	500	465	7.79	303	630	#N/A	4.6	70.0	351	361	0.0373	0.00102	0.0014	0.011	<0.00001	0.000022	<0.05	0.00019	143	<0.0001	0.00198	0.0026	0.002	0.000022	0.0086	1.21	0.63	<0.01	0.00267	0.0014
30-Mar-10	40	500	450	7.74	322	973																									
6-Apr-10	41	500	455	7.71	324	977	#N/A	5.3	61.6	484	569	0.028	0.0009	0.0019	0.0124	<0.00005	<0.00003	<0.3	0.00047	225	<0.0005	0.00213	0.0047	0.033	0.00008	0.009	1.65	1.92	<0.05	0.0025	0.0023
13-Apr-10	42	500	460	7.66	291	713																									
20-Apr-10	43	500	440	7.84	297	810	#N/A	4.5	62.5	391	441	0.0414	0.00091	0.0018	0.0153	0.00002	0.000022	<0.05	0.000257	174	<0.0001	0.00245	0.0025	0.006	0.000027	0.0085	1.26	0.736	<0.01	0.0028	0.0018
27-Apr-10	44	500	450	7.75	291	693																									
4-May-10	45	500	455	7.73	322	1024	#N/A	5.3	62.5	579	586	0.0253	0.00085	0.001	0.0134	0.00002	0.000021	<0.05	0.00042	232	<0.0001	0.00237	0.0059	0.008	0.000195	0.0087	1.47	1.88	<0.01	0.0026	0.002
11-May-10	46	500	445	7.72	300	721																									
18-May-10	47	500	445	7.74	301	743	#N/A	5.2	59.8	335	424	0.04	0.00079	0.0018	0.0143	0.00001	0.000011	<0.05	0.000236	168	<0.0001	0.00204	0.0027	0.002	0.000011	0.0076	1.13	0.608	<0.01	0.00274	0.0017
25-May-10	48	500	415	7.65	343	765																									

Notes:

"<" indicates less than the laboratory's detection limit

Table 12: 2005 Composite Tailings Humidity Test Cell Results

Date	Cycle No.	Volume mL Input	Volume mL Output	pH	ORP mV	Cond. umhos/cm	Acidity (pH 4.5) mgCaCO3/L	Acidity (pH 8.3) mgCaCO3/L	Alkalinity mgCaCO3/L	Sulphate mg/L	Hardness CaCO3 mg/L	P mg/L	K mg/L	Se mg/L	Si mg/L	Ag mg/L	Na mg/L	Sr mg/L	S mg/L	Tl mg/L	Sn mg/L	Ti mg/L	U mg/L	V mg/L	Zn mg/L	Zr mg/L	Major Anions	Major Cations	Diff	Diff (%)
30-Jun-09	1	750	235	8.81	295	740	#N/A	#N/A	248.0	32	27	0.067	0.85	0.0025	6.5	0.00009	85.6	0.0529	49	0.00013	0.0004	0.008	0.00438	0.006	0.064	<0.001	5.63	4.28	-1.34	-13.6%
7-Jul-09	2	500	460	9.02	292	967																								
14-Jul-09	3	500	455	8.87	267	912	#N/A	#N/A	316.8	66	5.3	0.085	2.7	0.0089	11.2	<0.0001	206	0.016	157	0.00006	0.0002	<0.01	0.00875	0.008	0.006	<0.002	7.71	9.13	1.42	8.4%
21-Jul-09	4	500	435	8.56	287	845																								
28-Jul-09	5	500	475	8.32	316	770	#N/A	#N/A	199.4	179	14.8	0.014	3.62	0.0063	8.93	0.00004	150	0.036	111	0.00014	0.00026	<0.003	0.00353	0.003	0.0119	<0.0005	7.72	6.91	-0.81	-5.5%
4-Aug-09	6	500	425	8.11	338	754																								
11-Aug-09	7	500	460	8.09	312	719	#N/A	4.0	102.9	274	98.8	<0.01	6.29	0.002	8.03	<0.00003	111	0.154	90	0.00006	0.00009	<0.003	0.00135	<0.001	0.0029	<0.0005	7.77	6.96	-0.81	-5.5%
18-Aug-09	8	500	460	7.93	296	625																								
25-Aug-09	9	500	425	8.08	336	606	#N/A	3.4	74.9	210	204	0.002	6.89	0.00126	6.92	<0.000005	49.8	0.251	90	0.000067	0.00023	<0.0005	0.0011	0.0002	0.0081	<0.0001	5.87	6.41	0.54	4.4%
1-Sep-09	10	500	490	7.98	274	578																								
8-Sep-09	11	500	495	7.84	334	557	#N/A	6.9	87.7	213	237	0.005	5.76	0.00059	7.15	0.000066	19.9	0.268	70	0.000059	0.00017	<0.0005	0.00127	<0.0002	0.0084	<0.0001	6.19	5.75	-0.44	-3.7%
15-Sep-09	12	500	510	7.98	300	607																								
22-Sep-09	13	500	435	7.93	345	887	#N/A	5.5	74.0	420	479	0.003	6.82	0.00073	6.78	<0.000005	12	0.481	157	0.000072	0.00012	<0.0005	0.00116	<0.0002	0.0082	<0.0001	10.23	10.28	0.05	0.3%
29-Sep-09	14	500	400	7.77	347	770																								
6-Oct-09	15	500	440	7.85	318	759	#N/A	5.6	66.8	429	393	0.003	6.18	0.0007	6.18	<0.000005	6.83	0.375	122	0.000062	0.00009	<0.0005	0.000986	<0.0002	0.0059	<0.0001	10.27	8.32	-1.95	-10.5%
13-Oct-09	16	500	425	7.84	320	826																								
20-Oct-09	17	500	445	7.80	319	623	#N/A	3.6	55.8	301	319	0.003	4.72	0.00062	4.67	<0.000005	4.08	0.294	101	0.000197	0.00007	<0.0005	0.000759	<0.0002	0.0275	<0.0001	7.39	6.70	-0.69	-4.9%
27-Oct-09	18	500	440	7.83	312	732																								
3-Nov-09	19	500	385	7.85	325	645	#N/A	3.6	55.8	334	328	<0.002	4.29	0.00055	4	<0.000005	3.1	0.281	95	0.000046	0.00013	<0.0005	0.000781	<0.0002	0.0062	<0.0001	8.07	6.82	-1.26	-8.5%
10-Nov-09	20	500	505	7.63	315	631																								
17-Nov-09	21	500	465	7.90	323	590	#N/A	6.2	59.7	285	309	<0.002	4.17	0.00048	4.03	<0.000005	2.32	0.263	91	0.000047	0.00007	<0.0005	0.000809	<0.0002	0.0071	<0.0001	7.13	6.38	-0.76	-5.6%
24-Nov-09	22	500	460	7.90	354	652																								
1-Dec-09	23	500	450	7.93	342	678	#N/A	2.97	63.5	322	348	<0.002	4.5	0.00054	4.68	<0.000005	2.21	0.277	107	0.000055	0.0001	<0.0005	0.000749	<0.0002	0.0085	<0.0001	7.98	7.19	-0.79	-5.2%
8-Dec-09	24	500	440	7.77	331	607																								
15-Dec-09	25	500	435	7.71	336	601	#N/A	3.7	50.6	298	309	0.002	3.7	0.00058	3.59	<0.000005	1.54	0.229	94	0.000042	0.00021	<0.0005	0.000675	<0.0002	0.0057	<0.0001	7.22	6.34	-0.88	-6.5%
22-Dec-09	26	500	445	7.87	312	601																								
29-Dec-09	27	500	445	7.89	362	624	#N/A	3.0	58.4	267	312	<0.002	3.69	0.00048	4	<0.000005	1.5	0.236	92	0.000043	0.00011	<0.0005	0.000674	<0.0002	0.0063	<0.0001	6.73	6.38	-0.35	-2.6%
5-Jan-10	28	500	490	7.86	328	614																								
12-Jan-10	29	500	440	7.82	314	632	#N/A	6.7	59.6	307	325	0.003	3.72	0.00053	4.46	<0.000005	1.48	0.226	99	0.000048	0.00016	<0.0005	0.000644	<0.0002	0.0075	<0.0001	7.59	6.64	-0.95	-6.7%
19-Jan-10	30	500	405	7.81	318	670																								
26-Jan-10	31	500	395	7.76	333	614	#N/A	3.8	53.9	354	351	<0.002	3.46	0.00059	4.22	0.000009	1.21	0.235	109	0.000038	0.0003	<0.0005	0.000498	<0.0002	0.025	<0.0001	8.45	7.15	-1.30	-8.4%
2-Feb-10	32	500	445	7.70	334	508																								
9-Feb-10	33	500	440	7.76	294	630	#N/A	3.8	56.0	286	355	<0.002	3.65	0.00057	4.41	<0.000005	1.16	0.229	110	0.00004	0.00016	<0.0005	0.000604	<0.0002	0.0051	<0.0001	7.08	7.25	0.17	1.2%
16-Feb-10	34	500	440	7.68	244	534																								
23-Feb-10	35	500	430	7.84	312	504	#N/A	3.4	53.7	266	313	<0.002	3.12	0.0006	3.84	<0.000005	0.86	0.217	97	0.000039	0.00009	<0.0005	0.000468	<0.0002	0.0043	<0.0001	6.62	6.39	-0.22	-1.7%
2-Mar-10	36	500	410	7.77	297	628																								
9-Mar-10	37	500	385	7.75	341	635	#N/A	3.5	51.8	317	355	0.005	3.42	0.00084	3.88	<0.000005	0.96	0.219	107	0.000043	0.00045	<0.0005	0.000576	<0.0002	0.0055	<0.0001	7.64	7.21	-0.43	-2.9%
16-Mar-10	38	500	510	7.70	312	489																								
23-Mar-10	39	500	465	7.79	303	630	#N/A	4.6	70.0	351	361	<0.002	3.49	0.00053	3.99	<0.000005	0.96	0.23	107	0.000046	0.00006	<0.0005	0.000666	<0.0002	0.0069	<0.0001	8.71	7.37	-1.35	-8.4%
30-Mar-10	40	500	450	7.74	322	973																								
6-Apr-10	41	500	455	7.71	324	977	#N/A	5.3	61.6	484	569	<0.01	5.14	0.0012	3.57	0.00006	0.79	0.25	179	0.00003	0.00011	0.004	0.00047	<0.001	0.0118	<0.0005	11.32	11.53	0.21	0.9%
13-Apr-10	42	500	460	7.66	291	713																								
20-Apr-10	43	500	440	7.84	297	810	#N/A	4.5	62.5	391	441	0.003	3.68	0.00155	4	<0.000005	0.92	0.27	138	0.000072	0.00012	<0.0005	0.000472	<0.0002	0.0082	<0.0001	9.39	8.92	-0.47	-2.6%
27-Apr-10	44	500	450	7.75	291	693																								
4-May-10	45	500	455	7.73	322	1024	#N/A	5.3	62.5	579	586	<0.002	4.92	0.00094	4	<0.000005	0.76	0.234	192	0.000052	0.00007	<0.0005	0.000385	<0.0002	0.0092	<0.0001	13.31	11.86	-1.46	-5.8%
11-May-10	46	500	445	7.72	300	721																								
18-May-10	47	500	445	7.74	301	743	#N/A	5.2	59.8	335	424	<0.002	3.32	0.0005	5.42	<0.000005	0.8	0.238	138	0.000047	0.00008	<0.0005	0.000334	<0.0002	0.0066	<0.0001	8.18	8.60	0.42	2.5%
25-May-10	48	500	415	7.65	343	765																								

Notes:

"<" indicates less than the laboratory's detection limit

Table 12: 2005 Composite Tailings Humidity Test Cell Results

Date	Cycle No.	Volume mL Input	Volume mL Output	pH	ORP mV	Cond. umhos/cm	Acidity (pH 4.5) mgCaCO3/L	Acidity (pH 8.3) mgCaCO3/L	Alkalinity mgCaCO3/L	Sulphate mg/L	Hardness CaCO3 mg/L	Al mg/L	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Bi mg/L	B mg/L	Cd mg/L	Ca mg/L	Cr mg/L	Co mg/L	Cu mg/L	Fe mg/L	Pb mg/L	Li mg/L	Mg mg/L	Mn mg/L	Hg ug/L	Mo mg/L	Ni mg/L
1-Jun-10	49	500	445	7.77	328	725	#N/A	4.1	57.7	265																					
8-Jun-10	50	500	410	7.68	314	802																									
15-Jun-10	51	500	440	7.83	304	705	#N/A	4.2	57.7	350	425	0.0402	0.00073	0.0013	0.0125	<0.00001	0.000008	<0.05	0.000238	168	0.0001	0.00179	0.0029	0.006	0.000028	0.0074	1.05	0.558	<0.01	0.00276	0.0013
22-Jun-10	52	500	425	7.86	404	719																									
29-Jun-10	53	500	450	7.81	168	658	#N/A	3.1	63.6	254																					
6-Jul-10	54	500	440	7.72	307	624																									
13-Jul-10	55	500	465	7.76	302	575	#N/A	4.4	61.0	224	317	0.0341	0.00062	0.0021	0.0096	<0.00001	0.000016	<0.05	0.000152	126	<0.0001	0.00171	0.0021	0.002	0.000016	0.0061	0.82	0.504	<0.01	0.00254	0.001
20-Jul-10	56	500	440	7.76	339	600																									
27-Jul-10	57	500	455	7.70	304	594	#N/A	5.2	59.6	249																					
3-Aug-10	58	500	450	7.72	375	1098																									
10-Aug-10	59	500	440	7.89	290	591	#N/A	5.6	54.5	325	326	0.0435	0.00063	0.001	0.0095	<0.00001	0.000014	<0.05	0.000133	129	<0.0001	0.00132	0.0021	0.003	0.000027	0.0057	0.81	0.432	<0.01	0.00255	0.001
17-Aug-10	60	500	415	7.86	367	642																									
24-Aug-10	61	500	415	7.73	298	645	#N/A	4.5	51.2	281																					
31-Aug-10	62	500	425	7.88	363	612																									
7-Sep-10	63	500	440	7.62	324	582	#N/A	6.7	55.5	288	352	0.0428	0.0006	0.0009	0.0094	<0.00001	0.000012	<0.05	0.000139	140	0.0002	0.00124	0.0038	0.013	<0.000005	0.0054	0.78	0.405	<0.01	0.00264	0.0013
14-Sep-10	64	500	435	7.60	337	502																									
21-Sep-10	65	500	440	7.73	291	480	#N/A	4.5	54.7	301																					
28-Sep-10	66	500	410	7.70	309	638																									
5-Oct-10	67	500	385	7.60	320	616	#N/A	4.9	53.4	312	344	0.0377	0.00059	0.0008	0.0106	0.00001	0.000017	<0.05	0.000132	136	<0.0001	0.00115	0.0022	0.003	0.000007	0.0061	0.8	0.374	<0.01	0.00289	0.0009
12-Oct-10	68	500	425	7.81	301	718																									
19-Oct-10	69	500	395	7.36	312	1660	#N/A	6.5	37.7	1124																					
26-Oct-10	70	500	420	7.68	314	622																									
2-Nov-10	71	500	430	7.90	297	727	#N/A	3.4	65.1	274	358	0.0318	0.00065	0.0013	0.0114	<0.00001	0.000011	<0.05	0.000175	142	<0.0001	0.00174	0.0026	0.004	0.000012	0.0063	0.9	0.49	<0.01	0.00307	0.0013
9-Nov-10	72	500	425	7.69	401	702																									
16-Nov-10	73	500	395	7.93	263	581	#N/A	3.5	56.3	374																					
23-Nov-10	74	500	450	7.61	288	594																									
30-Nov-10	75	500	440	7.67	284	522	#N/A	5.7	61.7	233	267	0.0381	0.00064	0.0006	0.0085	<0.00001	0.000015	<0.05	0.000108	106	<0.0001	0.00102	0.0024	0.003	0.000244	0.005	0.63	0.353	<0.01	0.0031	0.0009
7-Dec-10	76	500	445	7.69	301	535																									
14-Dec-10	77	500	405	7.48	308	566	#N/A	6.2	54.1	242																					
21-Dec-10	78	500	415	7.60	336	500																									
28-Dec-10	79	500	425	7.71	271	427	#N/A	7.8	64.5	202	234	0.0338	0.00059	0.0006	0.0076	<0.00001	0.000013	<0.05	0.000101	92.5	<0.0001	0.000987	0.0028	0.001	0.000034	0.0047	0.61	0.323	<0.01	0.00314	0.0007
4-Jan-11	80	500	440	7.76	335	444																									
11-Jan-11	81	500	420	7.67	322	480	#N/A	5.2	56.8	217																					
18-Jan-11	82	500	415	7.61	337	533																									
25-Jan-11	83	500	400	7.67	284	460	#N/A	4.5	53.7	184	226	0.0348	0.00056	0.0005	0.0065	<0.00001	0.000014	<0.05	0.000093	89.6	<0.0001	0.00082	0.0032	0.002	0.000299	0.004	0.54	0.269	<0.01	0.00275	0.0006
1-Feb-11	84	500	435	7.67	325	433																									
8-Feb-11	85	500	425	7.78	351	417	#N/A	3.5	55.4	193																					
15-Feb-11	86	500	405	7.65	314	430																									
22-Feb-11	87	500	470	7.81	308	434	#N/A	3.5	63.3	175	201	0.0295	0.00063	0.0005	0.0064	<0.00001	0.000006	<0.05	0.000083	79.7	<0.0001	0.0008	0.003	0.002	0.00001	0.0043	0.47	0.254	<0.01	0.00245	0.0005
1-Mar-11	88	500	445	7.73	318	407																									
8-Mar-11	89	500	440	7.75	257	427	#N/A	3.5	56.5	163																					
15-Mar-11	90	500	440	7.65	165	414																									
22-Mar-11	91	500	410	7.65	146	433	#N/A	4.8	52.6	162	195	0.0326	0.00056	0.0004	0.0061	<0.00001	0.000117	<0.05	0.000079	77.3	<0.0001	0.000727	0.0044	0.003	0.000013	0.0036	0.47	0.238	<0.01	0.00268	0.0006
29-Mar-11	92	500	455	7.81	125	507																									
5-Apr-11	93	500	450	7.60	83	437	#N/A	6.4	62.6	146																					
12-Apr-11	94	500	430	7.50	125	405																									
19-Apr-11	95	500	415	7.63	85	406	#N/A	8.5	60.2	145	199	0.0332	0.00058	0.0004	0.008	<0.00001	0.000006	<0.05	0.000127	79.1	<0.0001	0.000644	0.0021	0.002	0.000015	0.0035	0.48	0.216	<0.01	0.00244	0.0006
26-Apr-11	96	500	420	7.62	83	393																									
3-May-11	97	500	415	7.57	248	381	#N/A	6.1	53.6	127																					
10-May-11	98	500	460	7.58	264	372																									
17-May-11	99	500	445	7.62	146	361	#N/A	5.4	72.9	118	180	0.0298	0.00072	0.0006	0.0055	<0.00001	0.000007	<0.05	0.000091	71.4	0.0001	0.000804	0.0023	0.001	0.000019	0.0043	0.43	0.252	<0.01	0.00245	0.0005
24-May-11	100	500	495	7.17	30	362																									
31-May-11	101	500	495	7.29	23	358	#N/A	7.9	70.8	104																					
7-Jun-11	102	500	445	7.58	117	356																									
14-Jun-11	103	500	460	7.68	168	340	#N/A	4.4	71.4	102																					
21-Jun-11	104	500	515	7.82	115	347																									

Notes:

"<" indicates less than the laboratory's detection limit

Table 12: 2005 Composite Tailings Humidity Test Cell Results

Date	Cycle	Volume mL		pH	ORP	Cond.	Acidity	Acidity	Alkalinity	Sulphate	Hardness	P	K	Se	Si	Ag	Na	Sr	S	Tl	Sn	Ti	U	V	Zn	Zr	Major	Major	Diff	Diff
	No.	Input	Output			umhos/cm	(pH 4.5)	(pH 8.3)			CaCO3																Anions	Cations		(%)
					mV		mgCaCO3/L	mgCaCO3/L	mgCaCO3/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L				
1-Jun-10	49	500	445	7.77	328	725	#N/A	4.1	57.7	265																				
8-Jun-10	50	500	410	7.68	314	802																								
15-Jun-10	51	500	440	7.83	304	705	#N/A	4.2	57.7	350	425	0.084	3.39	0.0006	4	<0.000005	0.69	0.217	138	0.000038	0.00005	<0.0005	0.000354	<0.0002	0.0058	<0.0001	8.45	8.59	0.14	0.8%
22-Jun-10	52	500	425	7.86	404	719																								
29-Jun-10	53	500	450	7.81	168	658	#N/A	3.1	63.6	254																				
6-Jul-10	54	500	440	7.72	307	624																								
13-Jul-10	55	500	465	7.76	302	575	#N/A	4.4	61.0	224	317	<0.002	2.43	0.00057	3.59	<0.000005	0.47	0.173	97	0.000036	0.0002	<0.0005	0.000432	<0.0002	0.0054	<0.0001	5.89	6.44	0.55	4.5%
20-Jul-10	56	500	440	7.76	339	600																								
27-Jul-10	57	500	455	7.70	304	594	#N/A	5.2	59.6	249																				
3-Aug-10	58	500	450	7.72	375	1098																								
10-Aug-10	59	500	440	7.89	290	591	#N/A	5.6	54.5	325	326	<0.002	2.36	0.00061	3.14	<0.000005	0.46	0.167	105	0.000034	0.00005	<0.0005	0.000344	<0.0002	0.0042	<0.0001	7.86	6.59	-1.27	-8.8%
17-Aug-10	60	500	415	7.86	367	642																								
24-Aug-10	61	500	415	7.73	298	645	#N/A	4.5	51.2	281																				
31-Aug-10	62	500	425	7.88	363	612																								
7-Sep-10	63	500	440	7.62	324	582	#N/A	6.7	55.5	288	352	<0.002	2.34	0.00097	3.45	<0.000005	0.49	0.151	102	0.000033	0.00009	<0.0005	0.000372	<0.0002	0.0044	<0.0001	7.11	7.13	0.02	0.2%
14-Sep-10	64	500	435	7.60	337	502																								
21-Sep-10	65	500	440	7.73	291	480	#N/A	4.5	54.7	301																				
28-Sep-10	66	500	410	7.70	309	638																								
5-Oct-10	67	500	385	7.60	320	616	#N/A	4.9	53.4	312	344	<0.002	2.52	0.00112	3.19	<0.000005	0.44	0.165	104	0.000046	0.00005	<0.0005	0.000399	<0.0002	0.004	<0.0001	7.57	6.94	-0.63	-4.3%
12-Oct-10	68	500	425	7.81	301	718																								
19-Oct-10	69	500	395	7.36	312	1660	#N/A	6.5	37.7	1124																				
26-Oct-10	70	500	420	7.68	314	622																								
2-Nov-10	71	500	430	7.90	297	727	#N/A	3.4	65.1	274	358	<0.002	2.4	0.00102	3.33	<0.000005	0.41	0.182	113	0.000042	0.00004	<0.0005	0.000535	<0.0002	0.0081	<0.0001	7.01	7.24	0.23	1.6%
9-Nov-10	72	500	425	7.69	401	702																								
16-Nov-10	73	500	395	7.93	263	581	#N/A	3.5	56.3	374																				
23-Nov-10	74	500	450	7.61	288	594																								
30-Nov-10	75	500	440	7.67	284	522	#N/A	5.7	61.7	233	267	0.002	2.02	0.00063	2.73	<0.000005	0.37	0.129	79	0.000038	0.00011	<0.0005	0.000429	<0.0002	0.0061	0.0001	6.09	5.41	-0.68	-5.9%
7-Dec-10	76	500	445	7.69	301	535																								
14-Dec-10	77	500	405	7.48	308	566	#N/A	6.2	54.1	242																				
21-Dec-10	78	500	415	7.60	336	500																								
28-Dec-10	79	500	425	7.71	271	427	#N/A	7.8	64.5	202	234	<0.002	1.88	0.00043	2.5	<0.000005	0.32	0.12	72	0.000035	0.00006	<0.0005	0.000502	<0.0002	0.003	<0.0001	5.50	4.73	-0.77	-7.5%
4-Jan-11	80	500	440	7.76	335	444																								
11-Jan-11	81	500	420	7.67	322	480	#N/A	5.2	56.8	217																				
18-Jan-11	82	500	415	7.61	337	533																								
25-Jan-11	83	500	400	7.67	284	460	#N/A	4.5	53.7	184	226	<0.002	1.65	0.00064	2.33	<0.000005	0.26	0.104	66	0.000034	0.00005	<0.0005	0.000432	<0.0002	0.0041	<0.0001	4.91	4.57	-0.34	-3.5%
1-Feb-11	84	500	435	7.67	325	433																								
8-Feb-11	85	500	425	7.78	351	417	#N/A	3.5	55.4	193																				
15-Feb-11	86	500	405	7.65	314	430																								
22-Feb-11	87	500	470	7.81	308	434	#N/A	3.5	63.3	175	201	1.52	0.0007	2.28	<0.00000	0.22	0.0986	55	3E-05	0.00006	<0.0005	0.0004	<0.0002	0.0025	<0.0001		1.39	0.05	-1.34	-93.0%
1-Mar-11	88	500	445	7.73	318	407																								
8-Mar-11	89	500	440	7.75	257	427	#N/A	3.5	56.5	163																				
15-Mar-11	90	500	440	7.65	165	414																								
22-Mar-11	91	500	410	7.65	146	433	#N/A	4.8	52.6	162	195	1.46	0.0007	2.22	<0.00000	0.27	0.0925	56	3E-05	0.00012	<0.0005	0.0004	<0.0002	0.0041	<0.0001		1.19	0.05	-1.14	-91.8%
29-Mar-11	92	500	455	7.81	125	507																								
5-Apr-11	93	500	450	7.60	83	437	#N/A	6.4	62.6	146																				
12-Apr-11	94	500	430	7.50	125	405																								
19-Apr-11	95	500	415	7.63	85	406	#N/A	8.5	60.2	145	199	1.59	0.0009	2.63	<0.00000	0.29	0.0917	59	3E-05	0.00009	<0.0005	0.0004	<0.0002	0.0029	<0.0001		1.42	0.06	-1.37	-92.5%
26-Apr-11	96	500	420	7.62	83	393																								
3-May-11	97	500	415	7.57	248	381	#N/A	6.1	53.6	127																				
10-May-11	98	500	460	7.58	264	372																								
17-May-11	99	500	445	7.62	146	361	#N/A	5.4	72.9	118	180	1.44	0.0007	3.23	<0.00000	0.24	0.0817	44	3E-05	0.00008	<0.0005	0.0005	<0.0002	0.0032	<0.0001		1.63	0.05	-1.58	-94.1%
24-May-11	100	500	495	7.17	30	362																								
31-May-11	101	500	495	7.29	23	358	#N/A	7.9	70.8	104																				
7-Jun-11	102	500	445	7.58	117	356																								
14-Jun-11	103	500	460	7.68	168	340	#N/A	4.4	71.4	102																				
21-Jun-11	104	500	515	7.82	115	347																								

Notes:

"<" indicates less than the laboratory's detection limit

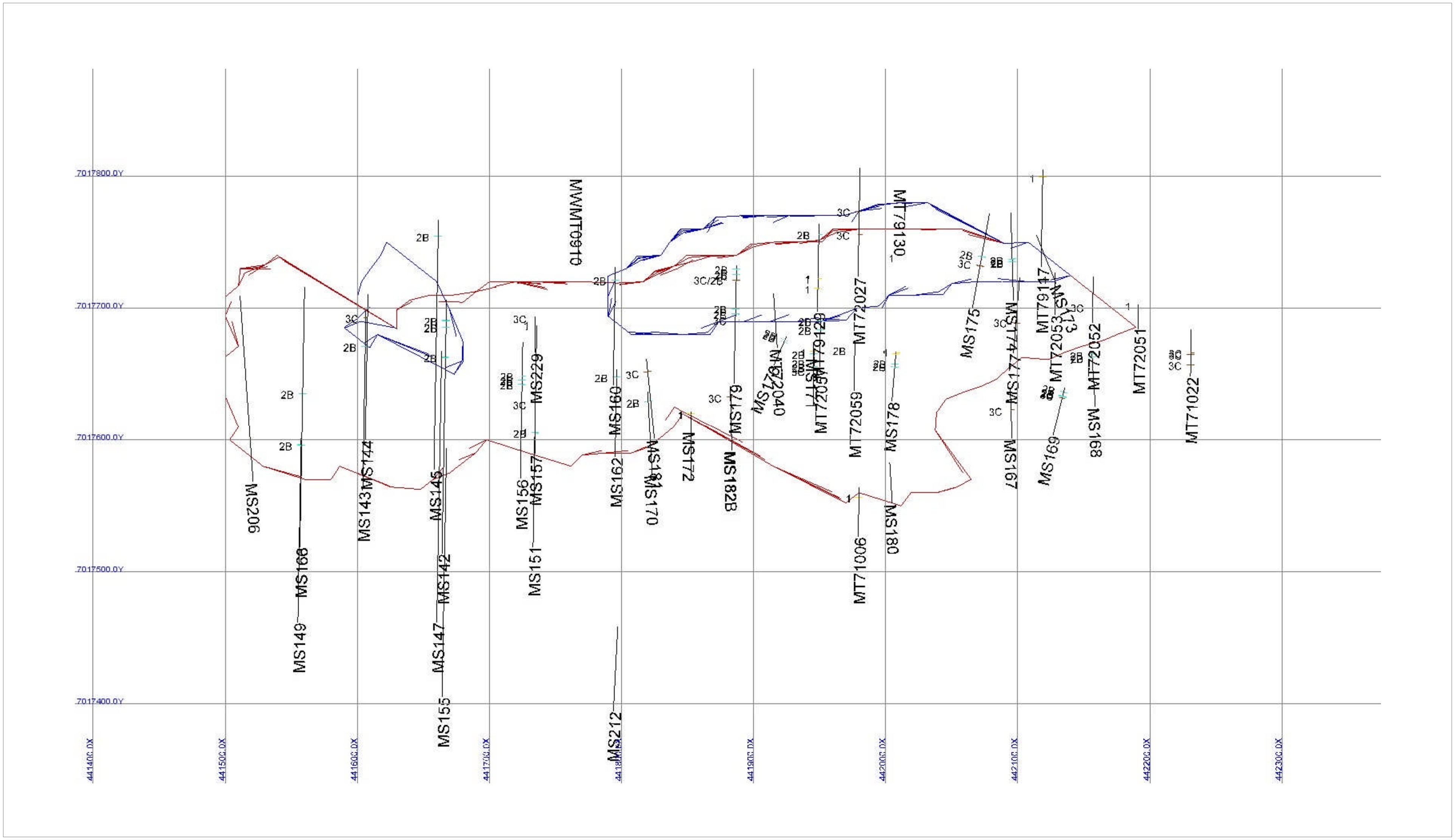
Table 13: PHREEQCI Input and Output Solution Composition

	soln	pH	Percent Error (%)	Alkalinity	Ag	Al	As	B	Ba	C	Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	P	Pb	S	Sulfate	Se	U	Zn
Starting Solutions	Unit 1 Acidic Leachate	7.4	23.4317	1.75E+03	0.00E+00	***1.16E+02***	***7.81E-03***	3.90E-02	4.45E-01	1.58E-02	***7.76E-04***	2.73E-02	***7.08E-02***	***2.50E-01***	***5.71E+01***	1.99E+00	1.03E-03	5.15E-02	2.57E+01	***2.33E-02***	7.41E-01	1.00E-01	***2.00E-03***	9.53E-03	***6.91E-02***
	Unit 3C Acidic Leachate	7.4	57.1932	8.36E+02	***1.25E-04***	***5.28E+01***	***1.17E-02***	3.17E-02	2.88E-01	1.05E-01	***3.10E-03***	1.54E-02	***8.90E-02***	***1.71E-01***	***3.30E+01***	4.34E+00	1.86E-02	***7.21E-02***	2.51E+01	***2.20E-02***	4.87E+00	3.61E+00	***3.40E-03***	***2.56E-02***	***2.72E-01***
	Precipitation	5.7	-22.7027	1.17E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.01E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Tailings Leachate - Neutral	7.85	-12.3448	1.34E+02	2.50E-06	2.66E-02	***1.04E-02***	2.50E-02	1.21E-02	1.65E+01	***1.68E-04***	1.23E-03	5.00E-05	***3.00E-03***	1.90E-02	4.41E-01	4.77E-03	1.90E-03	3.00E-03	5.10E-05	1.43E+02	1.43E+02	7.00E-04	9.87E-04	5.91E-03
	Unit 1 Leachate - Neutral	7.81	1.05808	6.45E+01	6.00E-05	***4.17E-01***	3.86E-03	1.13E-02	1.94E-03	7.34E+00	5.50E-06	5.91E-05	7.00E-04	***5.67E-03***	2.80E-02	6.30E-03	7.12E-03	7.21E-04	1.89E-02	1.09E-03	1.57E+00	1.57E+00	6.16E-04	2.60E-04	1.80E-02
	Unit 3C Leachate - Neutral	7.81	-3.81487	6.45E+01	2.80E-05	***3.80E-01***	***2.50E-02***	1.30E-02	7.04E-03	7.41E+00	2.00E-06	5.20E-05	3.06E-04	1.08E-03	1.80E-02	3.33E-03	5.50E-03	8.70E-04	3.10E-02	5.50E-05	1.57E+00	1.57E+00	***6.50E-03***	7.81E-04	2.80E-03
	Tributary C, Points C0 and C1	11.2641	-3.47388	5.60E+01	1.10E-05	2.80E-02	1.50E-03	4.00E-03	2.00E-02	1.18E+00	***2.80E-04***	6.70E-04	5.00E-04	1.20E-03	1.20E-02	3.20E-02	1.70E-03	1.00E-02	1.20E-02	1.20E-04	2.80E+01	2.80E+01	***1.20E-03***	5.00E-04	1.40E-02
	Tailings Supernatant	9.85	-2.52092	5.58E+02	0.00E+00	***2.60E-01***	***1.10E-02***	2.00E-02	3.40E-03	5.28E+01	0.00E+00	0.00E+00	7.00E-04	***8.40E-03***	***3.40E-01***	1.40E-02	1.00E-02	7.00E-04	4.90E-01	***3.80E-03***	4.34E+00	4.34E+00	***1.10E-03***	8.00E-04	4.00E-03
	Tributary C, Point C0	11.295	4.83555	6.00E+01	1.20E-05	6.00E-02	2.80E-04	4.00E-03	2.10E-02	1.18E+00	***3.20E-04***	1.60E-03	5.10E-04	1.40E-03	1.20E-02	7.40E-02	8.30E-04	1.20E-02	1.10E-02	1.00E-04	2.50E+01	2.50E+01	7.00E-04	4.00E-04	1.40E-02
	Groundwater	7.41408	-4.08927	3.60E+01	7.20E-06	***3.60E-01***	4.70E-03	5.20E-03	1.20E-02	4.13E+00	***2.40E-04***	3.00E-04	1.10E-03	***2.10E-03***	2.60E-01	7.20E-03	8.80E-03	8.30E-04	4.00E-02	1.10E-03	2.64E+01	2.64E+01	9.10E-04	4.80E-04	2.90E-02
	Tailings Leachate, Post-Oxidation	3.43	-7.23014	-5.90E+01	5.01E-05	***1.38E+01***	6.01E-04	0.00E+00	7.14E-02	0.00E+00	***4.95E-02***	7.87E-01	6.01E-04	***1.94E-01***	***2.49E+02***	2.27E+01	0.00E+00	***6.55E-01***	0.00E+00	***4.83E-03***	4.79E+02	4.79E+02	***1.49E-02***	2.47E-03	***1.99E+00***
Calculated Solutions	Tributary C Inflow, Pre-Oxidation	7.97802	-0.411535	6.68E+01	1.12E-05	6.00E-02	1.54E-03	6.22E-03	2.00E-02	8.11E+00	***3.01E-04***	1.55E-03	4.62E-04	1.56E-03	4.95E-10	1.10E-01	1.28E-03	1.09E-02	1.04E-02	9.58E-05	3.68E+01	3.68E+01	7.53E-04	4.63E-04	1.31E-02
	Waste Rock Leachate, Post-Oxidation	5.77171	57.1126	1.33E+01	***1.11E-04***	***2.57E+00***	***1.13E-02***	3.26E-02	3.06E-01	3.17E-01	***2.84E-03***	1.68E-02	***8.69E-02***	***1.80E-01***	1.76E-08	4.07E+00	1.66E-02	***6.97E-02***	2.52E+01	***2.22E-02***	2.92E+01	2.92E+01	***3.25E-03***	***2.38E-02***	***2.49E-01***
	Tributary C Inflow, Post-Oxidation	3.38169	-2.32178	-4.90E+01	1.61E-05	***1.48E+00***	1.51E-03	3.88E-03	2.82E-02	2.63E-01	***5.38E-03***	8.18E-02	1.40E-03	***2.29E-02***	6.25E-05	2.41E+00	1.68E-03	***7.71E-02***	2.70E-01	8.32E-04	7.45E+01	7.45E+01	***2.64E-03***	9.43E-04	***2.20E-01***
	Reservoir, Year 1, Average Precipitation	7.92781	-1.788	5.92E+01	1.09E-05	6.30E-02	1.71E-03	5.11E-03	1.95E-02	7.22E+00	***2.88E-04***	1.06E-03	5.18E-04	1.43E-03	5.04E-10	6.74E-02	1.93E-03	9.85E-03	1.29E-02	1.68E-04	3.20E+01	3.20E+01	9.73E-04	4.81E-04	1.45E-02
	Reservoir, Year 1, Dry Year	7.9244	-1.87394	5.88E+01	1.09E-05	6.41E-02	1.73E-03	5.06E-03	1.94E-02	7.16E+00	***2.87E-04***	1.03E-03	5.23E-04	1.42E-03	5.04E-10	6.50E-02	1.99E-03	9.77E-03	1.31E-02	1.74E-04	3.18E+01	3.18E+01	9.84E-04	4.82E-04	1.46E-02
	Reservoir, Year 1, Wet Year	7.9341	-1.59202	6.01E+01	1.09E-05	6.34E-02	1.69E-03	5.26E-03	1.95E-02	7.32E+00	***2.89E-04***	1.12E-03	5.12E-04	1.45E-03	5.02E-10	7.28E-02	1.86E-03	9.96E-03	1.27E-02	1.61E-04	3.26E+01	3.26E+01	9.44E-04	4.79E-04	1.43E-02
	Reservoir, Year 10+, Average Precipitati	5.96062	-2.86907	2.44E+00	1.35E-05	***7.33E-01***	1.54E-03	3.95E-03	2.40E-02	3.38E-01	***2.83E-03***	4.12E-02	9.56E-04	***1.21E-02***	1.04E-08	1.22E+00	1.76E-03	4.34E-02	1.41E-01	4.86E-04	5.12E+01	5.12E+01	***1.91E-03***	7.21E-04	***1.17E-01***
	Reservoir, Year 10+, Dry Year	6.0901	-2.91155	2.10E+00	1.33E-05	***3.79E-01***	1.54E-03	3.96E-03	2.38E-02	3.64E-01	***2.68E-03***	3.88E-02	9.29E-04	***1.14E-02***	7.80E-09	1.15E+00	1.76E-03	4.14E-02	1.34E-01	4.65E-04	4.98E+01	4.98E+01	***1.87E-03***	7.08E-04	***1.11E-01***
	Reservoir, Year 10+, Wet Year	4.501	-2.79436	-3.54E+00	1.38E-05	***8.42E-01***	1.54E-03	3.95E-03	2.45E-02	2.65E-01	***3.13E-03***	4.61E-02	1.01E-03	***1.34E-02***	3.86E-07	1.37E+00	1.76E-03	4.75E-02	1.57E-01	5.29E-04	5.40E+01	5.40E+01	***2.00E-03***	7.48E-04	***1.30E-01***
	CCME	6.5-9.0			0.0001	0.1	0.005				.000024-.000048		0.0089	.002-.003	0.3		0.073	0.065-0.11		0.002-0.004			0.001	0.015	0.03
	MMER - Maximum Monthly Mean						0.5							0.3				0.5		0.2					0.5

Notes

The values in bold and italicised indicate an exceedance of the Canadian water quality guideline value for the protection of aquatic life

FIGURES



LEGEND

Upper Ore Zone

Lower Ore Zone

MT7XXXX – Borehole ID
3C / 1 – Rock type of sample

NOTES

STATUS
ISSURED FOR USE

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

eba
A TETRA TECH COMPANY

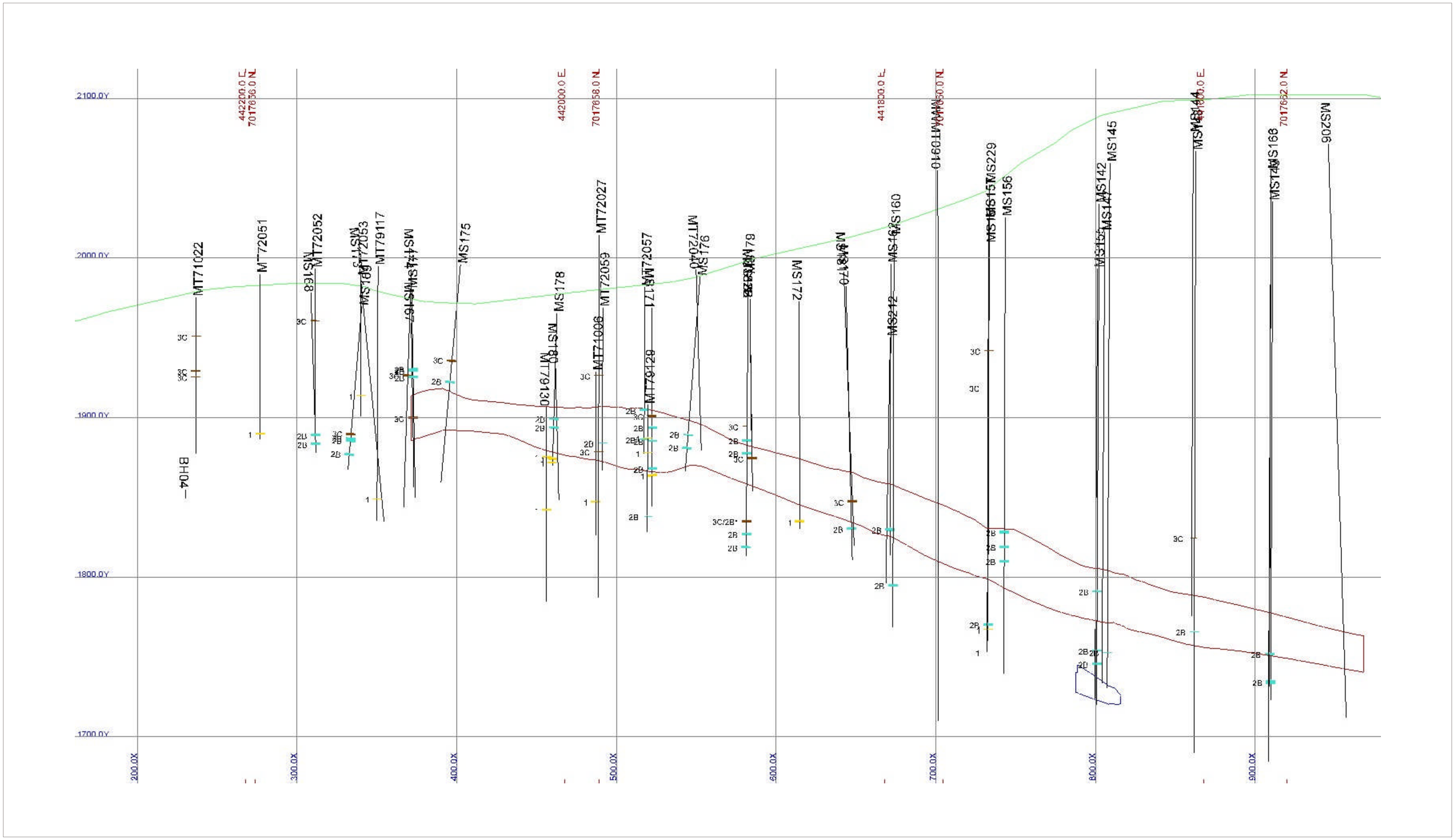
MACTUNG

Mactung Plan Map Showing Location of ABA and ML Samples

PROJECT NO.	DWN	CKD	APVD	REV
W23101211.003	AN	LR	LR	

OFFICE	DATE
EBA-VANC	July 14, 2011

Figure 1a



LEGEND

- Ground Surface
- Upper Ore Zone
- Lower Ore Zone

MT7XXXX – Borehole ID
3C / 1 – Rock type of sample

NOTES

STATUS
ISSURED FOR USE

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

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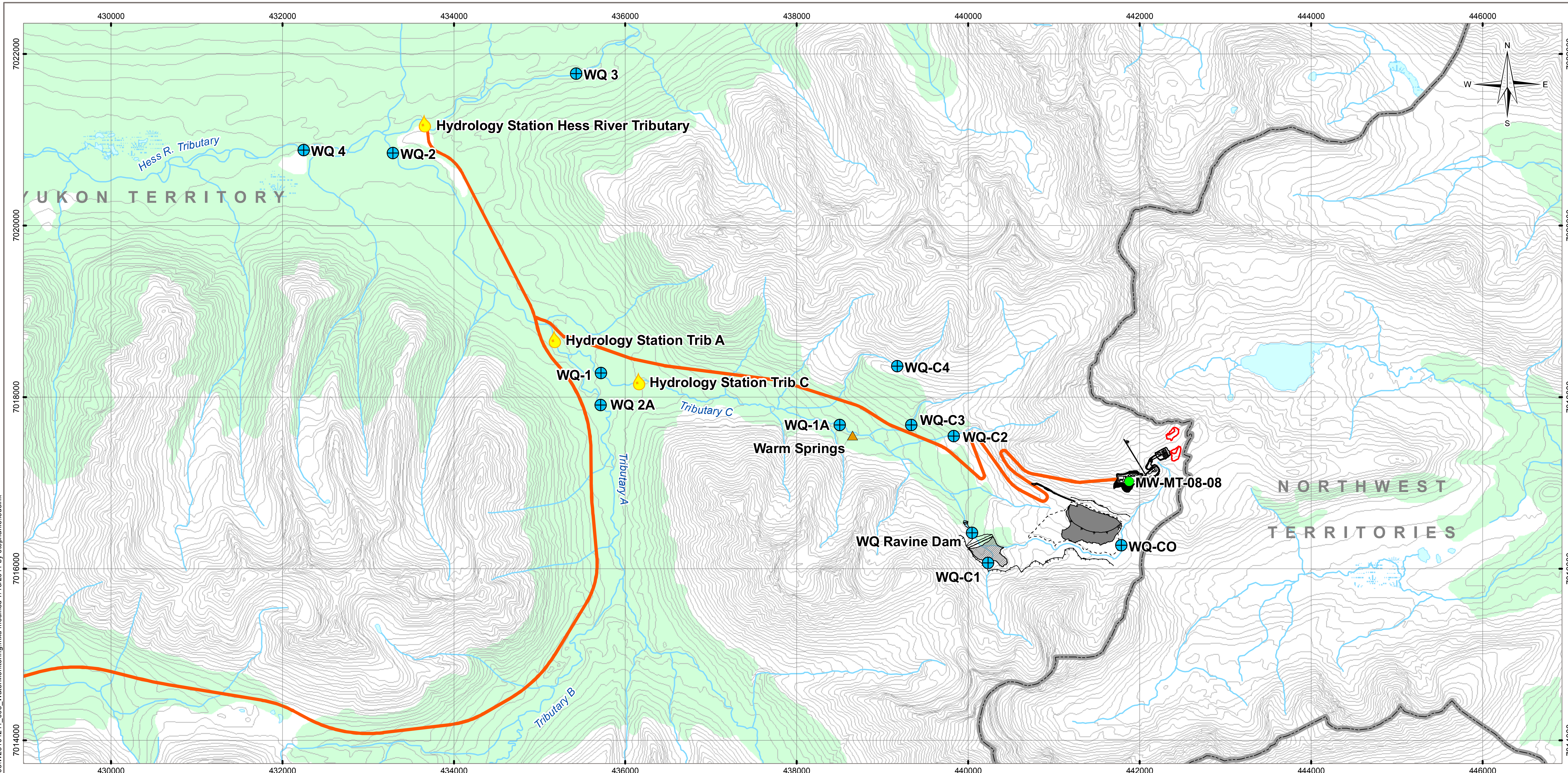
MACTUNG

Mactung Long Section Showing Location of ABA and ML Samples

PROJECT NO.	DWN	CKD	APVD	REV
W23101211.003	AN	LR	LR	

OFFICE	DATE
EBA-VANC	July 14, 2011

Figure 1b



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LEGEND

- Groundwater Monitoring Point
- Water Quality Station
- Hydrology Station
- Warm Springs
- Temporary Waste Rock Dump
- Proposed Access Road Route
- NWT-YT Border
- Contours (20 m)
- Watercourse
- Wetland
- Waterbody
- Vegetation

NOTES
Base data source: 1:50,000 NTS

STATUS
ISSUED FOR USE

MACTUNG

Water Monitoring and Waste Rock Dump Locations

PROJECTION	DATUM	CLIENT
UTM Zone 9	NAD83	NORTH AMERICAN TUNGSTEN CORPORATION LTD

Scale: 1:45,000
500 250 0 500 1,000
Metres

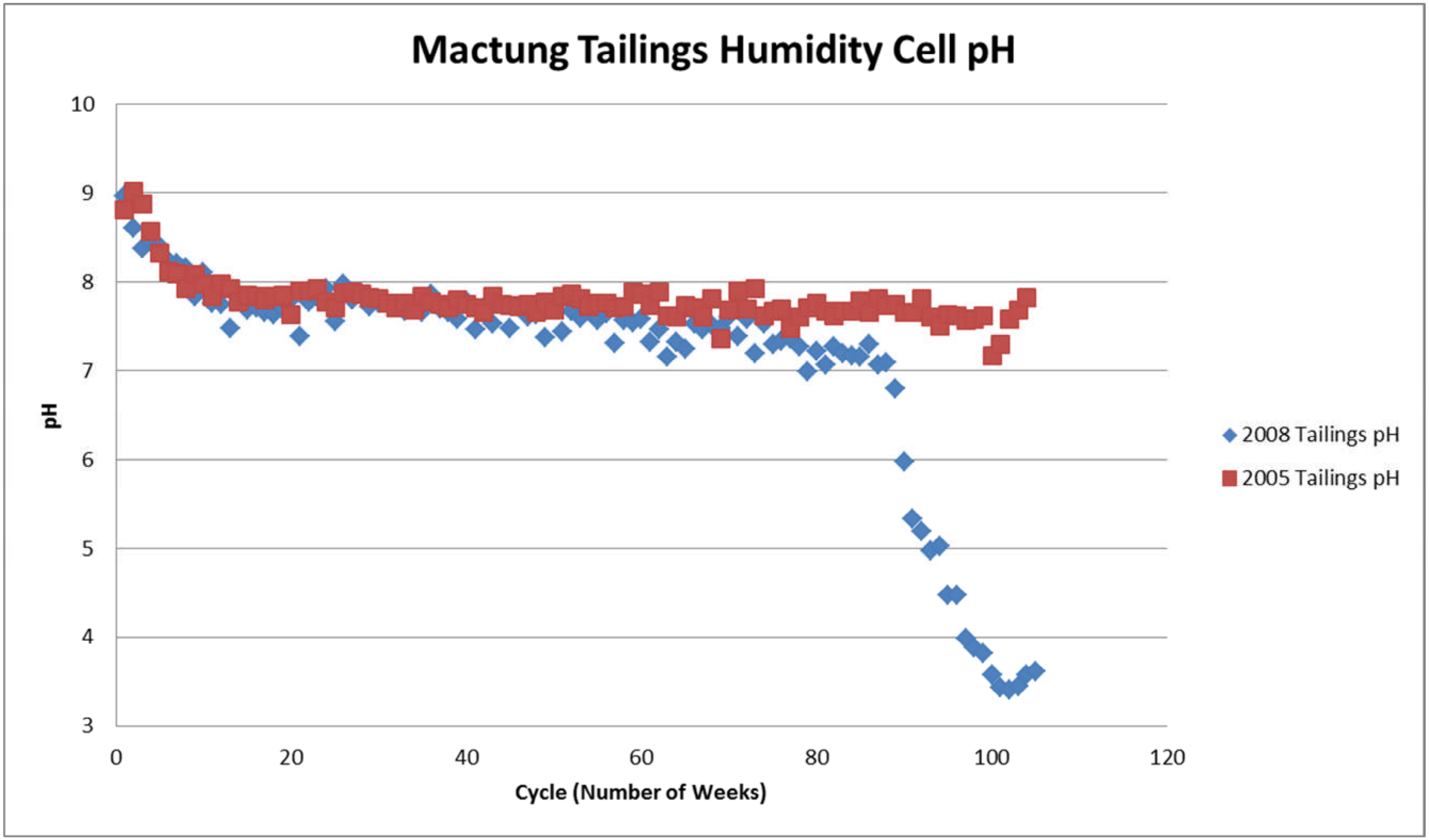
FILE NO.
W23101211_003_WaterMonitoring.mxd

eba A TETRA TECH COMPANY

PROJECT NO.	DWN	CKD	APVD	REV
W23101211.003	SL	GR	GR	0

OFFICE	DATE
EBA-VANC	July 13, 2011

Figure 2



LEGEND

NOTES

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

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STATUS
ISSUED FOR USE

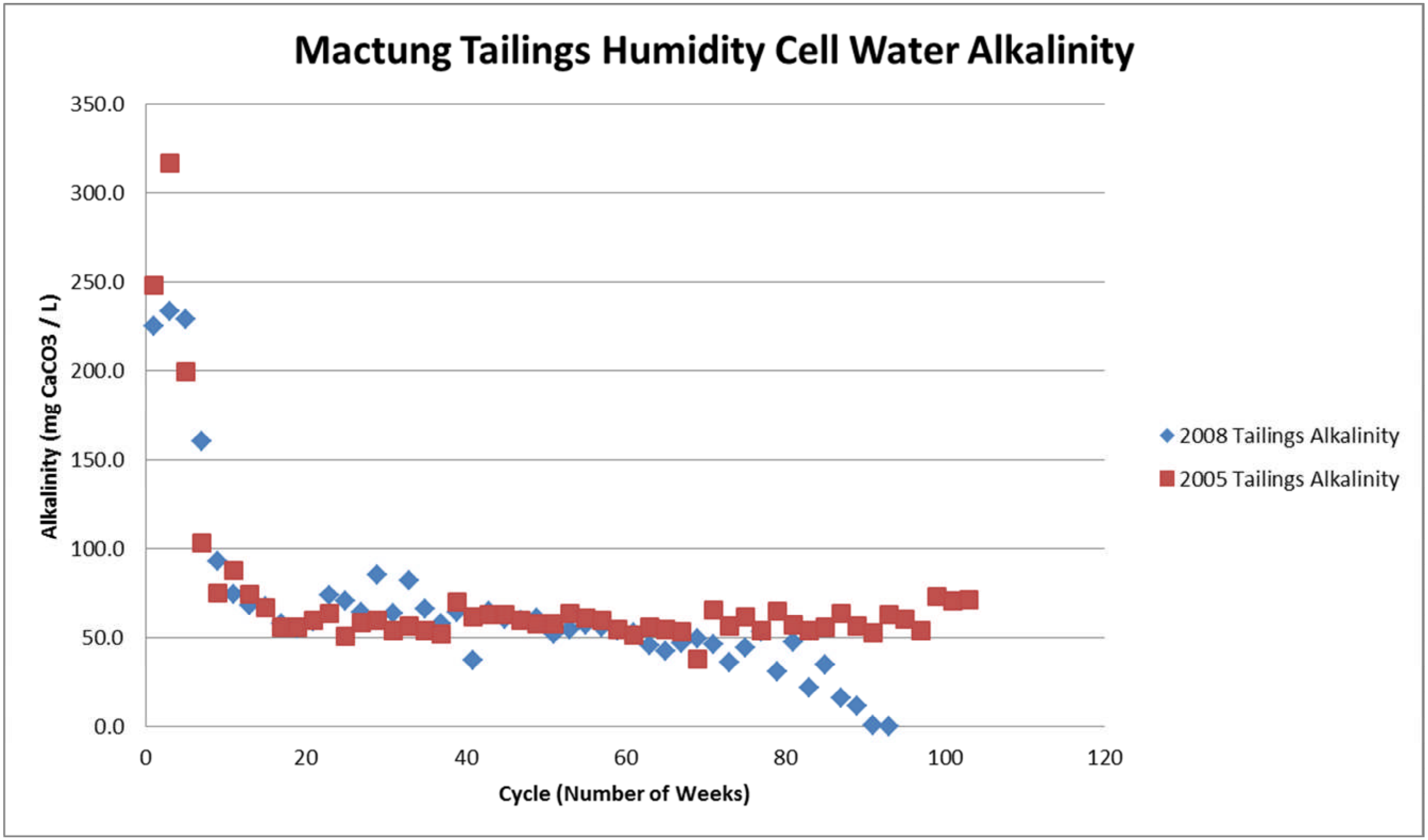
MACTUNG

Tailings Humidity Cell pH

PROJECT NO.	DWN	CKD	APVD	REV
W23101211.003	TD	GMR	GMR	-

OFFICE	DATE
EBA-WHITEHORSE	July 10, 2011

Figure 3



LEGEND

NOTES

CLIENT

NORTH AMERICAN TUNGSTEN CORPORATION LTD

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STATUS
Issued for Use

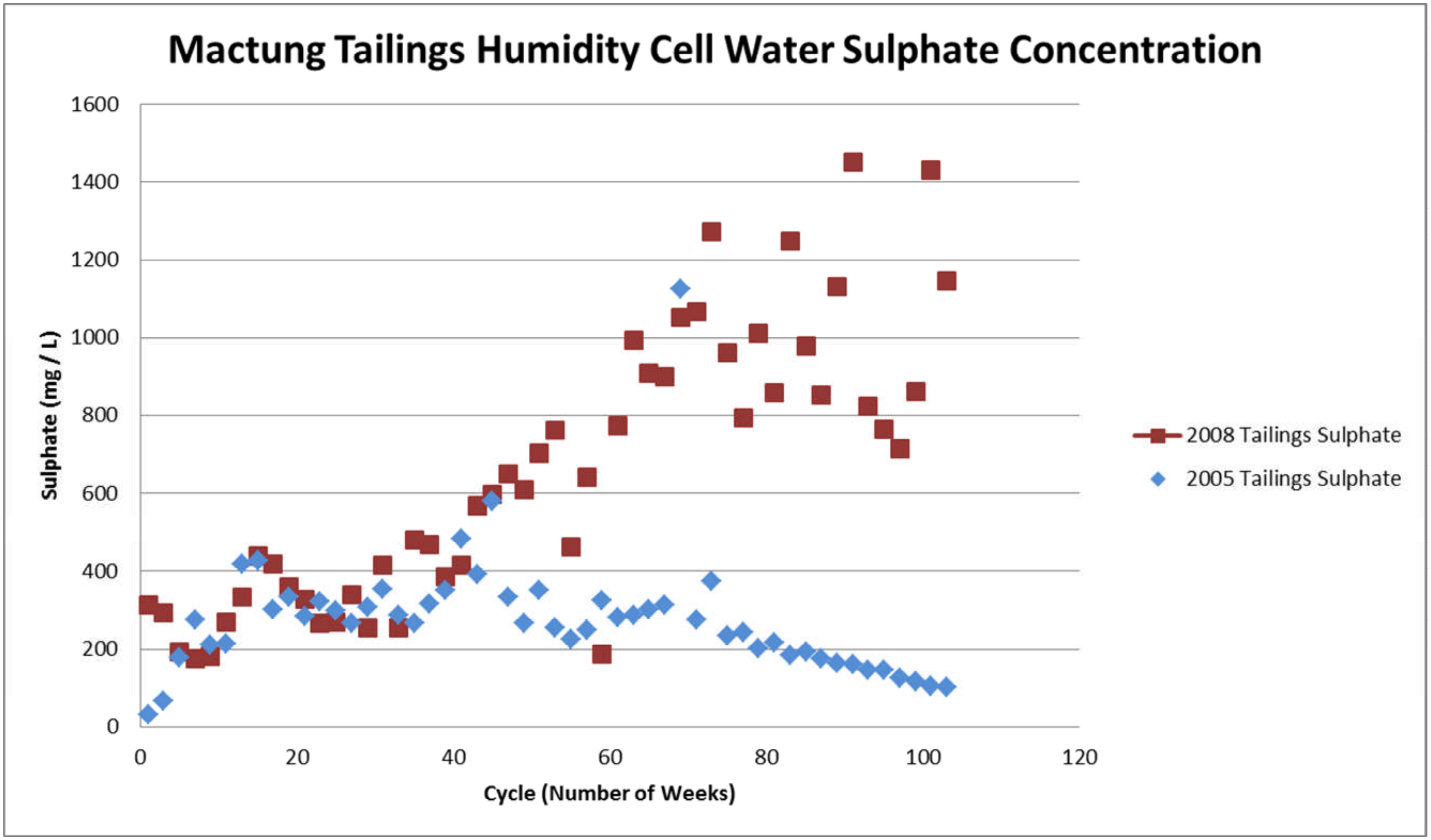
MACTUNG

Tailings Humidity Cell Water Alkalinity

PROJECT NO.	DWN	CKD	APVD	REV
W2311211.003	TD	GMR	GMR	-

OFFICE	DATE
EBA-WHITEHORSE	July 10, 2011

Figure 4



LEGEND	NOTES	CLIENT	MACTUNG
		NORTH AMERICAN TUNGSTEN CORPORATION LTD	Tailings Humidity Cell Water Sulphate Concentration
	STATUS Issued for Use	eba A TETRA TECH COMPANY	PROJECT NO. W23101211.003; DWN TD; CKD GMR; APVD GMR; REV -; OFFICE EBA-WHITEHORSE; DATE July 10, 2011

Figure 5

Q:\Whitehorse\Data\for_GMR\Mactung\Geochem Report\Figures 5 Humidity cell sulphate conc.doc

APPENDIX A

APPENDIX A EBA'S GENERAL CONDITIONS

GENERAL CONDITIONS

GEO-ENVIRONMENTAL REPORT

This report incorporates and is subject to these "General Conditions".

1.0 USE OF REPORT AND OWNERSHIP

This report pertains to a specific site, a specific development, and a specific scope of work. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development would necessitate a supplementary investigation and assessment.

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Both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. The Client warrants that EBA's instruments of professional service will be used only and exactly as submitted by EBA.

Electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

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In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by EBA in its reasonably exercised discretion.

4.0 INFORMATION PROVIDED TO EBA BY OTHERS

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