MPERG Report 2010-1

Assessment of Low Permeability Cover as Infiltration and Oxygen Barrier to Reduce Acid Generation in Mine Tailings at the Arctic Gold and Silver Mine Site, Carcross, Yukon

By

EBA Engineering Consultants Ltd.

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ASSESSMENT OF LOW PERMEABILITY COVER AS INFILTRATION AND OXYGEN BARRIER TO REDUCE ACID GENERATION IN MINE TAILINGS AT THE ARCTIC GOLD AND SILVER MINE SITE, CARCROSS, YUKON

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EBA Engineering Consultants Ltd.
p. 867.668.3068 • f. 867.668.4349
Calcite Business Centre • Unit 6, 151 Industrial Road • Whitehorse, Yukon Y1A 2V3 • CANADA

EXECUTIVE SUMMARY

The production of acid rock drainage (ARD) from mine tailings is a significant environmental concern at various abandoned mine sites in Yukon. Leachate with low pH and high dissolved metals concentrations deriving from mine tailings impoundment areas can negatively impact various groundwater and surface water resources.

The presence of both oxygen and water is required for ARD to develop. Therefore, the reduction of the oxygen and water sources from the mine tailings will limit ARD production. This is the basis of reclamation of the Arctic Gold and Silver (AGS) Tailings Site near Carcross, Yukon using a low-permeability tailings cover which acts as an oxygen and water infiltration barrier. ARD processes have resulted in a significant contamination of the groundwater beneath the tailings impoundment at the AGS site with multiple dissolved metals showing elevated concentrations.

The use of a low permeability cover to reduce ARD such as that used at the AGS site is one of the first such reclamation applications in Yukon. EBA Engineering Consultants Ltd. and partners initiated a performance assessment of the low permeability cover system in the fall of 2000 and continued the monitoring in 2001 as part of Mining Environment Research Group (MERG) funded studies. The results of these assessments suggested that the low-permeability cover functions as an oxygen and infiltration barrier; however, the limited data and short period of monitoring precluded any prediction of the long-term performance of the tailings cover. Further monitoring was recommended.

With funding from the Mining and Petroleum Environment Research Group (MPERG) and EBA's Applied Technology and Development Fund, this third phase was undertaken by EBA about ten years after the installation of the tailings cover to assess the long-term performance of the tailings cover. The scope of services included the following:

- Groundwater level monitoring at existing monitoring wells;
- Assessment of groundwater quality using existing monitoring wells at the site;
- Assessment of surface water quality at the adjacent unnamed lake and Tank Creek;
- Measurement of moisture content within the low permeability cover and near surface tailings;
- Ground temperature profile within the cover, tailings and underlying native materials;
- Data interpretation with respect to the performance of the tailings cover; and,
- Preparation of this report.

Two site visits were conducted in July and October 2009 to collect the above mentioned field data. The soil gas probes were broken and not longer available for measuring the oxygen concentration in the soil gas. The observed profiles of ground temperature and soil moisture content were similar to those measured previously. The ground temperature within the tailings does not indicate the presence of any exothermic ARD processes. The soil moisture content profile is typical for this type

of tailings cover based on the capillary barrier concept. The groundwater flow direction was confirmed to be in a westerly direction toward the unnamed lake. The previously observed groundwater contamination beneath the tailings continues to persist. Measured concentrations are similar to those previously observed without any clear increasing or decreasing trend. Multiple dissolved metals and sulphate exceeded Yukon Contaminated Sites Regulation (CSR) water quality standards for the Protection of Aquatic Life. The persistent groundwater contamination may either be due to failure of the tailings cover to prevent water from infiltrating through the tailings or due to the slow groundwater flow velocity. Estimated hydraulic conductivities and associated groundwater travel times appear to be in the order of meters to tens of meters per year. Therefore, it may take longer than the ten years since the installation of the tailings cover until the contaminated groundwater will be replaced and a decrease in dissolved metals concentrations will be observable.

Some of the dissolved metals concentrations in the samples collected from the unnamed lake to the west of the tailings impoundment and Tank Creek exceeded CCME Water Quality Guidelines for the Protection of Aquatic Life.

Based on the results of this study, EBA recommends the following:

- The groundwater quality monitoring at the Site should be continued annually or bi-annually to identify any potential changes in the contamination of the groundwater;
- Future monitoring should primarily focus on groundwater and surface water quality monitoring as soil moisture, ground temperatures and oxygen profiles do not seem to provide conclusive data with respect to the performance of the tailings cover;
- Monitoring of ground temperature and soil moisture profiles should however be continued as well using existing monitoring equipment;
- Re-installation of the oxygen probes is not recommended as past data have been inconclusive;
- The installation of additional monitoring wells would be helpful in reducing uncertainty with respect to depth to groundwater, groundwater flow direction, and potential saturation of the tailings; and,
- Determination of groundwater residence times by tracer experiments or analysis of environmental tracers may provide more insight into the reason for persistent groundwater contamination.

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1.0 INTRODUCTION

1.1 HISTORICAL BACKGROUND

The Arctic Gold and Silver Mine Site (the Site) is located approximately 4 km south of the Village of Carcross, Yukon (Figures 1 and 2). It was the location of a 180 tonnes per day ore concentrating operation during the 1960s. Ore from underground workings several kilometres from the Site was processed in the mill with gold and silver concentrate being the final product.

During operation, the waste stream from the milling process included tailings and process water which were both discharged into a roughly trapezoidal tailings impoundment of about 1.8 hectare size. Over the life span of the mine, about 47,000 tonnes of ore were processed in the mill and about 27,000 m^3 of tailings were disposed of in the tailings impoundment. Some tailings were reportedly spilled outside of the impoundment including tailings that reached the unnamed lake, which is an impoundment of Tank Creek by the road bed, to the west of the tailings impoundment. All operations at the Site ceased in September 1969. Prior to reclamation of the Site in 1999, some of the exposed tailings were also blown from the impoundment to create a plume of wind drifted tailings north east of the impoundment.

A geochemical analysis of the tailings from the Site indicated that the tailings are strongly acidic and contain high concentrations of various metals; particularly, the tailings contain high concentrations of solid and soluble arsenic.

Following the recommendations of SRK (1999), a remediation plan was developed by Public Works and Government Services Canada (PWGSC), Environmental Services Directorate including consolidation and covering of the tailings within the upgraded existing impoundment.

The reclamation work was conducted in 1999 and 2000 and generally consisted of the following:

- Levelling and grading of the existing tailings;
- Placement of between 0.5 m and 0.6 m of sand and gravel;
- Covering the tailings with a final 0.3 m thick layer of clayey silt; and,
- Re-vegetation of the tailings cover.

A well-graded sand-till berm exists around the perimeter of the tailings impoundment.

1.2 PROJECT BACKGROUND

EBA has been involved with different aspects of the reclamation and environmental monitoring activities at the Site since 1998. The low permeability cover for the tailings impoundment area was constructed under EBA's supervision in the summer of 1999. To date, EBA has conducted two previous performance monitoring phases of the Site's low permeability cover. It is hoped that the results of the studies on the low permeability cover of the AGS Mine site can further the understanding of mine reclamation in Yukon. There are up to 40 abandoned mine sites in Yukon that have been evaluated by INAC which may require remediation.

Funded primarily by MERG with additional funding from INAC, and in-kind contributions of time and resources by EBA, the initial phase of this study endeavoured to research, monitor, and evaluate the performance of the low permeability cover at the tailings impoundment area beginning in the fall of 2000.

The second phase was also primarily funded by MERG with additional funding from INAC, as well as contributions of time and resources by EBA. The second phase of this study, which began in the spring of 2001, was to further evaluate the effectiveness of low permeability cover to act as an oxygen and moisture barrier.

Initial field observations and monitoring equipment installations were conducted by EBA during September 2000 to March 2002. The monitoring program consisted of data acquisition related to several indicative parameters associated with the performance of the low permeability cover. The following parameters were monitored during three successive site visits in September and November 2000, and January 2001:

- Concentration profiles of oxygen within the cover and tailings were measured to evaluate the effectiveness of the cover as a diffusion barrier for atmospheric oxygen;
- Moisture conditions within the low permeability cover and near surface tailings were monitored to evaluate infiltration conditions;
- Ground temperature profiles were measured within the cover, tailings, and underlying native material to potentially identify the presence of exothermic reactions as part of the ARD process; and,
- The average thickness of the low permeability cover material was measured.

In addition these parameters were monitored for the two subsequent site visits during the second phase of the study in October 2001, and March 2002.

The findings of the first and second phase of the study were documented in EBA (2001a and 2002). The first phase of the study concluded that the low permeability cover appeared to be functioning effectively as a moisture and oxygen barrier. Several recommendations resulted from the study for future work. To further assess the performance of the low permeability cover, it was deemed necessary to continue on-going monitoring of the oxygen concentrations, ground temperature, moisture, and groundwater chemistry.

The results of the second phase of the study supported the results of the initial phase that the low permeability cover functions to limit the moisture and oxygen flux into the tailings. However, it was concluded that the cover only limited the flux of oxygen to the tailings rather than essentially inhibiting the flux. When comparing the oxygen and moisture profile for the two phases of the study the results suggested that the cover was not acting as effectively as in the initial phase. It was recommended that long-term monitoring of temperature, oxygen, and moisture concentrations within the cover and tailings, and groundwater chemistry analysis be continued for further knowledge of the effectiveness of this type of system to suppress ARD production.

This report documents the results of the third phase of the study to assess the low permeability cover as an infiltration and oxygen barrier to reduce acid generation in mine tailings about 10 years after the tailings cover was constructed. This project has been funded by equal contributions from MPERG and EBA's Applied Technology and Development Fund.

2.0 SCOPE OF SERVICES

The scope of services for this project included:

- Two site visits in summer (July) and fall (October) 2009;
- Groundwater monitoring and sampling using existing monitoring wells;
- Surface water sampling from the unnamed lake to the west of the tailings impoundment and Tank Creek;
- Collection of soil samples for moisture content analysis;
- Ground temperature measurements;
- Data interpretation and comparison with existing data to assess long-term performance of the tailings cover; and,
- Preparation of this report summarizing the methods applied, results of the study, and conclusions and recommendations.

Soil gas measurements to determine the oxygen profile within the tailings cover and underlying tailings could not be conducted because the monitoring installation for soil gas sampling are broken and not longer available for use. An attempt failed to replace the destroyed soil gas probes during the second site visit using equipment readily available at EBA and within the existing project budget. A decision was made by EBA not to re-install the soil gas probes as part of this project because: (i) a re-installation of the soil gas probes were not included in the project scope and budget and the effort to replace the probes could not be accommodated within the current budget, and (ii) previous oxygen profile measurements were ambiguous and did not provide an essential contribution to the assessment of the tailings cover performance (EBA, 2001a and 2002).

3.0 METHODS

3.1 GROUNDWATER MONITORING

EBA monitored groundwater elevations in the existing monitoring wells during the two site visits in July and September 2009. Monitoring well MW3 could not be included in the monitoring because the PVC pipe was plugged above the groundwater table. The well had not been locked and may have been vandalized.

The static groundwater level was measured using a water level sounder prior to purging and sampling the well.

3.2 GROUNDWATER AND SURFACE WATER CHEMISTRY MONITORING

Groundwater samples were collected from each monitoring well, except MW3, after the well had been purged to remove at least three well volumes. Dedicated bailers were used to purge the wells and collect the groundwater samples in order to avoid cross contamination. The surface water samples were taken as grab samples from the unnamed lake to the west of the tailings impoundment and from Tank Creek at the locations indicated on Figure 2.

The field parameters pH, electrical conductivity, total dissolved solids, and dissolved oxygen were measured in the field prior to sample collection.

All sample bottles used were provided by Exova. Each bottle was rinsed three times with the water to be sampled before sample collection.

The samples were analyzed for physical parameters and total metals (surface water samples) or dissolved metals (groundwater samples). The samples to be analyzed for dissolved metals were field-filtered using a 0.45 µm sterilized membrane and a vacuum field filtration unit. Nitric acid (3 ml at 20 vol-%) provided by Exova was used to preserve all dissolved and total metals samples. The samples were sent on ice in coolers to the lab. A chain of custody form detailing the sample handling information and analyses required was prepared and included with the samples prior to shipping via air cargo to Exova in Surrey, B.C.

3.3 SOIL MOISTURE

Samples for gravimetric soil moisture content were collected at two locations (see Figure 2) at depths from 0.1 m to 0.6 m below ground surface. The soil samples were retrieved using a hand auger and stored in sealed plastic bags until they were analysed in EBA's geotechnical lab in Whitehorse.

Gravimetric moisture content is the ratio of the mass of water to the mass of solids in soil and is usually expressed as a percentage. The moisture content is determined by weighing the wet soil sample, drying the sample in an oven at a temperature at 105°C, and then reweighing the dry sample.

3.4 GROUND TEMPERATURE

Ground temperatures were obtained using a previously installed ground temperature cable at depths between 0.3 m and 1.8 m below ground surface.

The thermistor string was placed such that the uppermost bead was located above grade and provides an ambient air temperature. The other three beads are positioned within the tailings cover, tailings, and underlying native organic silt, respectively.

4.0 RESULTS AND DISCUSSION

4.1 GROUNDWATER FLOW REGIME

Groundwater elevation data were collected at five monitoring well locations (MW1, MW2, MW4, MW5, and MW6; see Figure 2) and compared to previous measurements. Table 3 summarizes all groundwater monitoring data collected at the Site. The groundwater elevations have fluctuated slightly over the monitoring period since 1998; however, groundwater elevations have not changed systematically and the fluctuations are relatively small.

The groundwater elevation data collected in July and October 2009 and from previous monitoring events were used to infer the groundwater flow direction in the area of the tailings impoundment. Figures 3 and 4 show the contour plots of the groundwater surface based on interpolated data using the measurements at the monitoring well locations. The data indicate a groundwater flow in a west-northwesterly direction towards the unnamed lake and Tank Creek. The hydraulic gradient is about 0.03 to 0.04 m/m. Assuming a mean hydraulic conductivity of the heterogeneous till sediments in the range of 10^{-5} m/s to 10^{-6} m/s, the groundwater travel time is probably in the order of meters to several tens of meters per year.

The contour plots in Figure 5 show that the groundwater flow regime has not changed significantly between the September 1998 and October 2009 monitoring events. The monitoring wells MW3 and MW6 are both located upgradient of the tailings impoundment.

4.2 WATER CHEMISTRY

The results of the chemical analysis of surface and groundwater samples from both sampling events in July and October 2009 along with previous chemistry data from the Site are presented in Tables 1 and 2. Historical data were obtained during previous sampling events conducted by EBA and INAC. Figure 6 shows a Piper Plot containing all water samples collected at the Site during the 2009 monitoring events. The laboratory reports are included as Appendix B.

To evaluate the quality of the analysis EBA calculated the ion balance for each sample, i.e., the balance between sum of anion and cation equivalent charges. Usually, an ion balance of within ± 10% is considered satisfactory. The calculated ion balances for samples collected

from wells MW1D, MW2 (October 2009), and MW5 (October 2009), and MW6 were within ± 8% which suggests that analytical errors are within acceptable limits and all major cations and anions were included in the analyses. The ion balances of the remaining samples exceeded ± 10% which either indicates that the analytical errors were unsatisfyingly high or some elements were not included in the analysis that contributed to the ion balance significantly. The lab report refers to the possibility that iron and other metals extracted from sediment present in the sample may have caused the ion balance being out of the ± 10% range.

The chemistry of the groundwater and surface water at the Site is discussed further in the following sections.

4.2.1 Groundwater

Groundwater samples were taken from monitoring wells MW1D, MW2, MW4, MW5, and MW6. The monitoring well MW6 is located upgradient of the tailings impoundment whereas all other monitoring wells sampled are located within the tailings impoundment.

Monitoring wells MW6 and MW1D showed low to moderate electrical conductivities (< 500 µS/cm) and total dissolved solids (< 300 mg/L) at both sampling events. All other groundwater samples exhibited very high electrical conductivities (> 3,000 µS/cm) and total dissolved solids (> 1,000 mg/L). The pH in MW6 and MW1D was near neutral whereas the pH in samples from wells MW2, MW4, and MW5 was acidic with values below 4. The significant differences in electrical conductivity, total dissolved solids, and pH between the samples from wells MW1D/MW6 and MW2/MW4/MW5 and the fact that MW6 and MW1D are located upgradient or close to the upgradient boundary of the tailings impoundment and the other three samples were collected from further downgradient within the tailings impoundment indicates that the samples MW2, MW4, and MW5 are considerably affected by leachate from the tailings whereas MW1D and MW6 are widely unaffected.

The water samples can be classified based on their major ion chemical composition, taking into account all major anions and cations exceeding 10 meq-%[1]. The water or hydrochemical facies is determined by listing the ions with concentrations greater than 10 meq-% in decreasing order (cations are listed first).

Calcium and magnesium are the dominating cations in all samples collected and there is no clear difference between wells affected by tailings leachate (MW2, MW4, and MW5) and those that are unaffected (MW1D and MW6; see Figure 6). The anions, however, show a clear difference between both groups of samples. Samples from MW1D and MW6 are bicarbonate dominated whereas the samples from MW2, MW4, and MW5 are dominated by sulphate with very high sulphate concentrations of several thousand milligrams per litre.

[1] The unit meq-% represents the percentage of cations and anions calculated from their milliequivalents per litre (meq/L). The unit meq/L is the molar concentration multiplied by the charge of the ions.

The measured concentrations were compared to Yukon Contaminated Sites Regulation (CSR) Aquatic Life standards and Canadian Council of Ministers of the Environment (CCME) Protection of Aquatic Life guidelines. However, CCME guidelines apply to surface water and the comparison with measured groundwater concentrations is for reference only.

The following exceedances of the CSR Aquatic Life standards were observed during the 2009 monitoring events (see also Figure 7):

- Arsenic: MW2, MW4, MW5
- Cadmium: MW2, MW4, MW5
- Chromium: MW2, MW5
- Cobalt: MW2, MW4, MW5
- Copper: MW2, MW5
- Lead: MW5
- Nitrite: MW2, MW4, MW5
- Sulphate: MW2, MW4, MW5
- Zinc: MW2, MW4, MW5

Figure 7 shows a comparison of metals concentration trends over time. The data show no consistent trend for any of the metals. Most of the metals concentration observed during the 2009 monitoring events are similar to those observed before without any clear increasing or decreasing trend.

4.2.2 Surface Water

Surface water samples were taken from the unnamed lake to the west of the tailings impoundment and from Tank Creek at the locations indicated on Figure 2.

All surface water samples showed low to moderate electrical conductivities (< 500 µS/cm) and total dissolved solids (< 300 mg/L). The pH of the lake samples and the Tank Creek sample collected in July 2009 were near neutral whereas the pH in the Tank Creek sample collected in October 2009 was slightly acidic with a value below the CCME guideline lower limit of 6.5.

Calcium and magnesium are the dominating cations in all samples. The dominating anion in all samples is bicarbonate.

The measured concentrations were compared to Yukon Contaminated Sites Regulation (CSR) Aquatic Life standards and Canadian Council of Ministers of the Environment (CCME) Protection of Aquatic Life guidelines.

The following exceedances of the standards and guidelines were observed during the 2009 monitoring events (see also Figure 8):

- Arsenic: Lake (CCME)
- Cadmium: Lake, Tank Creek (CCME, CSR)
- Chromium: Lake (CCME)
- Copper: Lake, Tank Creek (CCME)
- Iron: Lake, Tank Creek (CCME)
- Lead: Lake (CCME)

Figure 8 shows a comparison of metals concentration trends over time. The data show no consistent trend for any of the metals. Most of the metals concentration observed during the 2009 monitoring events are similar to those observed before without any clear increasing or decreasing trend.

4.3 SOIL MOISTURE

The soil moisture within the tailings cover was analysed at two locations shown in Figure 2 (Table 4). At both locations samples were retrieved from maximum depths of 0.5 m and 0.6 m below ground surface using a hand auger. Deeper samples could not be collected due to auger refusal.

TABLE 4: SOIL MOISTURE CONTENT

Location	Sample Depth	Moisture Content
		[%]
Location 1	0.1	23.2
	0.15	25.6
	0.25	23.2
	0.4	24
	0.45	13.4
	0.5	5.5
Location 2	0.1	20.8
	0.2	20.6
	0.3	19.5
	0.5	24.4
	0.55	7.9
	0.6	11.1

Figure 9 shows the soil moisture profiles for Locations 1 and 2 (cf. Figure 2). The soil moisture content within the clayey silt cover is relatively constant with values of about 20%

to 25%. The gravimetric moisture content can be converted into the volumetric moisture content by multiplying it with the specific gravity of silt of about 1.9 g/cm^3, yielding a volumetric moisture content of about 38% to 48%. The typical porosity of silt is in the range of 35% to 50% (Freeze and Cherry, 1979). The moisture content of the low permeability silt layer therefore indicates that water saturation is close to 100%.

At the base of the clayey silt cover the soil moisture content decreases to values of about 5% to 10% within the underlying gravel and sand layer. The soil moisture profiles at both locations were very similar to previously measured soil moisture profiles at the Site (EBA 2002).

4.4 GROUND TEMPERATURE

The ground temperature profiles measured in July and October 2009 are shown in Figure 10 along with previously observed profiles. The ground temperature profile from October 2009 is similar to previous profiles measured in the months of September, October and November (Table 5). The profile measured in July 2009 showed higher ground temperatures than previously observed profiles; however, higher shallow ground temperatures are expected during the summer months. No significant temperature increase within the tailings could be observed that would indicate that exothermic reactions causing acid rock drainage are taking place.

TABLE 5: GROUND TEMPERATURE PROFILE

Depth (m bgs)	Temp. (°C) 19-Sep-00	Temp. (°C) 9-Nov-00	Temp. (°C) 14-Jan-01	Temp. (°C) 3-Oct-01	Temp. (°C) 13-Mar-02	Temp. (°C) 28-Jul-09	Temp. (°C) 16-Oct-09
-0.01	9.1	-4	-3.8	6.6	-12.1	33.2	0.1
0.3	3.9	-1	-3.8	3.1	1.8	14.4	2.2
1.1	6.6	1.9	0.1	6.6	0.5	11.2	5.2
1.8	7	3.3	1.2	7.2	1.2	8.5	6.4

4.5 POTENTIAL REASONS FOR PERSISTENT GROUNDWATER CONTAMINATION

Figure 11 shows the thickness of the tailings based on data from 16 boreholes within the tailings impoundment (EBA, 2001b). The thickness of the tailings increases from east to west from less than 0.5 m to a maximum of about 4 m.

Areas where the groundwater table is situated within the tailings, i.e., areas within the impoundment where tailings are water saturated, may represent potential sources of groundwater contamination. SRK (1999) stated that the groundwater table was below the tailings at all points measured and that there was no evidence of groundwater passing through the tailings. The groundwater level measurements in July and October 2009 also

indicated that the groundwater level was below the base of the tailings at all monitoring well locations. However, previous groundwater level measurements in September and November 2000 indicated that the groundwater table was about 0.3 m to 0.4 m above the base of the tailings in monitoring well MW1D (see Table 3). Furthermore, Figure 12 shows that the southeastern corner of the tailings impoundment may contain saturated tailings, except for the monitoring event in March 2002. This figure is based on a comparison of the interpolated elevation of the base of the tailings based on data from 16 boreholes and the interpolated elevation of the groundwater table based on data from five monitoring wells. Unfortunately, no direct data on the base of the tailings and groundwater elevation are available for this particular area; however, based on the existing data it is likely that some of the tailings are – at least seasonally – located below the groundwater table. Based on the groundwater flow regime, this could explain at least part of the groundwater contamination found in the southern part of the tailings impoundment.

However, the contamination observed in the northern part (e.g., MW4) cannot be explained by groundwater passing through the tailings in the southeastern corner of the Site. In these areas, infiltration of precipitation through the tailings cover and the tailings may be the reason for the persistent groundwater contamination. Despite the low bulk permeability of the tailings cover, preferential flow paths – such as surface cracks due to freeze-thaw and/or drying and desiccation effects, or plant roots – may provide pathways for surface water to infiltrate through the cover material.

The persistent groundwater contamination may also be the result of the slow groundwater flow velocity. As discussed in Section 4.1, the flow velocity is likely in the order of meters to tens of meters per year. It may therefore take more than ten years, especially at the locations of the downgradient monitoring wells (MW2, MW4, and MW5) until a decrease in metals concentrations can be observed. The monitoring wells MW2, MW4, and MW5, which contained the water with the highest metals concentrations, are located about 80 to 100 m from the upgradient boundary of the tailings impoundment. The estimated travel time within the tailings impoundment of groundwater from these wells is therefore in the range of about 2 to 20 years, assuming a hydraulic conductivity of the underlying native sediments of 10^{-5} to 10^{-6} m/s, a mean hydraulic gradient of 0.035, and a porosity of 0.25 (cf. Section 4.1). This rough estimate of the groundwater residence time demonstrates that it may in fact take longer than 10 years to replace the contaminated groundwater beneath the tailings impoundment. However, further assessment is required to further explore this hypothesis and reduce the uncertainties with respect to hydraulic conductivity of the aquifer sediments and groundwater residence time.

5.0 CONCLUSIONS

Previous performance assessments of the tailings cover came to the conclusion that the field observations indicated that the cover effectively functioned as a moisture and oxygen barrier and thus limiting ARD processes in the tailings.

The soil moisture and ground temperature profiles observed as part of this study about ten years after the installation of the low-permeability cover were similar as the previously measured profiles. The soil moisture profile suggests that the cover material functions efficiently as a moisture barrier using the capillary barrier concept. The ground temperature profiles show no indication of increased temperatures within the tailings as a result of exothermic reactions as part of the ARD process.

In contrast, the persistent groundwater contamination suggests that metals are still being mobilized from the covered tailings. The measured dissolved metals concentrations are mostly similar to the previously observed concentrations with no clear temporal trends visible.

Groundwater contamination in the southern part of the tailings impoundment might (partially) be caused by a shallow groundwater table situated temporarily within the tailings. The groundwater table in the northern part of the tailings impoundment appears to be permanently below the base of the tailings. However, the limited number of groundwater observation wells and the associated spatially limited data on depth to groundwater and uncertainties in the thickness of the tailings make this conclusion uncertain.

Groundwater contamination may also be caused of precipitation infiltrating through the low-permeability cover and the underlying tailings, e.g., along preferential flow paths such as surface cracks. The persistent groundwater contamination may also be the result of the slow groundwater flow velocity (or long residence time) which could require considerably longer than ten years replacing the contaminated groundwater.

In summary, the results of this study show the groundwater contamination at the Site persists without any visible trend of improvement (or worsening). This may either be due to failure of the low-permeability cover or simply the result of slow groundwater flow velocities and long groundwater residence times, i.e., the contaminated groundwater may have not been replaced after ten years.

6.0 RECOMMENDATIONS

Based on the results of this study, EBA recommends the following:

- The groundwater quality monitoring at the Site should be continued annually or bi-annually to identify any potential changes in the contamination of the groundwater;
- Future monitoring should primarily focus on groundwater and surface water quality monitoring as soil moisture, ground temperatures and oxygen profiles do not seem to provide conclusive data with respect to the performance of the tailings cover;
- Monitoring of ground temperature and soil moisture profiles should however be continued as well using existing monitoring equipment;
- Re-installation of the oxygen probes is not recommended as past data have been inconclusive;

- The installation of additional monitoring wells would be helpful in reducing uncertainty with respect to depth to groundwater, groundwater flow direction, and potential saturation of the tailings;
- The installation of a pressure transducer and data logger, especially in the area with potential (seasonal) saturation of the tailings would provide additional information on seasonal groundwater table fluctuation and possible related issues;
- Hydraulic tests (pumping tests or slug tests) should be conducted on the existing monitoring wells to determine the hydraulic conductivity of the aquifer sediments; and,
- Determination of groundwater residence times by tracer experiments or analysis of environmental tracers may provide more insight into the reason for persistent groundwater contamination.

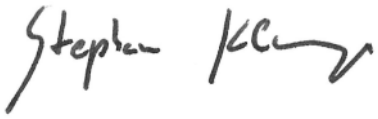
7.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of the Mining and Petroleum Environment Research Group (MPERG) and their agents. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than MPERG, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in EBA's General Conditions. EBA's General Conditions are provided in Appendix A of this report.

8.0 CLOSURE

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

Respectfully submitted,
EBA Engineering Consultants Ltd.



Stephan Klump, Ph.D.
Hydrogeologist, Team Lead
Whitehorse Environment Group
Direct Line: (867) 668-2071 ext.250
Email : sklump@eba.ca

Ryan Martin, M.Eng., P.Eng.,
Project Director, Hydrogeologist
Whitehorse Environment Group
Direct Line: (867) 668-2071 ext.231
Email: rmartin@eba.ca

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TABLES

TABLE 1: GROUNDWATER CHEMISTRY

Analyte		Units	Sample Name	MW-1D	MW-1D	MW-1D	MW-1D	MW-1D	MW-1D	MW-1D
			Sample Date	Aug-98	Oct-01	Aug-04	Jun-05	Jul-06	Aug-07	Jun-08
			Easting (UTM, Nad83)	08 515364	08 515364	08 515364	08 515364	08 515364	08 515364	08 515364
			Northing (UTM, Nad83)	6666307	6666307	6666307	6666307	6666307	6666307	6666307
			Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Detection Limit							
Ion Balance		%	-	-	-	-	-	-	-	-
Water type			-	-	-	-	-	-	-	-
Field Parameters										
Temperature	T	°C	-	-	-	-	-	-	-	-
pH		pH units	-	-	-	-	-	-	-	-
Dissolved O_2	DO	mg/L	-	-	-	-	-	-	-	-
Electrical Conductivity	EC	µS/cm at 25°C	-	260	-	-	-	-	-	-
Total Dissolved Solids	TDS	ppm	-	331	-	-	-	-	-	-
Physical Parameters										
pH		pH units	-	7.49	-	-	-	-	-	-
Electrical Conductivity	EC	µS/cm at 25°C	1	-	-	-	-	-	-	-
Hardness		mg/L	1	124	149	-	-	-	-	-
Total Dissolved Solids			-	-	-	-	-	-	-	-
Dissolved Major Ions										
Calcium	Ca	mg/L	0.05	37	45	37.4	39.5	40.6	46.1	46.3
Magnesium	Mg		0.05	7.5	9.0	7.94	9.0	8.9	9.5	9.5
Sodium	Na		0.05	4.0	4.0	3.6	3.4	3.2	4.0	4.0
Potassium	K		0.1	-	-	2.4	2.1	2.0	2.3	2.4
Silicon	Si		0.25	-	-	-	-	-	-	-
Chloride	Cl		0.2	-	-	-	-	-	-	-
Nitrate - N	NO_3		0.05	-	-	-	-	-	-	-
Nitrite - N	NO_2		-	-	-	-	-	-	-	-
Sulfate (SO_4)	SO_4		0.5	22	-	-	-	-	-	-
Hydroxide Alkalinity	OH		0.5	-	-	-	-	-	-	-
Carbonate Alkalinity	CO_3		0.5	-	-	-	-	-	-	-
Bicarbonate Alkalinity	HCO_3		0.5	-	-	-	-	-	-	-
Total Alkalinity	$CaCO_3$		0.5	-	-	-	-	-	-	-
Metals - Dissolved										
Aluminum	Al	mg/L	0.005	0.029	**0.730**	**0.15**	0.031	0.063	0.029	0.030
Antimony	Sb		0.001	<0.200	<0.010	0.0005	<0.0002	<0.0002	0.0006	<0.0002
Arsenic	As		0.001	**0.025**	**0.060**	0.0041	0.0016	0.0039	0.0019	0.0020
Barium	Ba		0.001	0.050	0.050	0.0327	0.029	0.028	0.036	0.040
Beryllium	Be		0.001	<0.005	<0.005	<0.0005	<0.0001	<0.0001	<0.0001	<0.0001
Bismuth	Bi		0.001	-	-	<0.00005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	B		0.05	<0.10	<0.10	0.012	0.004	0.005	0.006	0.006
Cadmium	Cd		0.0002	<0.0002	0.0004	0.0002	0.00008	0.00010	0.00011	0.00016
Chromium	Cr		0.001	<0.001	<0.010	<0.0004	0.0009	0.0013	0.0007	<0.0005
Cobalt	Co		0.001	<0.020	<0.010	0.0032	<0.0001	0.0025	<0.0001	0.0001
Copper	Cu		0.001	0.001	**0.005**	**0.0023**	<0.001	<0.001	0.001	0.002
Iron	Fe		0.05	0.04	**1.20**	0.118	0.03	0.09	0.12	0.52
Lead	Pb		0.001	<0.001	0.001	0.0002	0.0001	0.0001	<0.0001	<0.0001
Lithium	Li		0.001	<0.020	<0.050	-	0.003	0.003	0.004	0.003
Manganese	Mn		0.001	0.110	0.550	0.419	0.163	0.390	0.307	0.837
Mercury	Hg		0.00002	<0.00005	<0.00020	-	-	-	-	-
Molybdenum	Mo		0.0005	<0.0300	0.0020	0.0015	0.001	0.002	0.001	0.002
Nickel	Ni		0.001	<0.050	<0.050	0.0029	0.0026	0.0019	0.0008	0.0022
Phosphorus	P		0.15	-	-	-	-	-	-	-
Selenium	Se		0.001	<0.001	<0.001	<0.0004	<.00002	<0.0002	<0.0002	<0.0002
Silver	Ag		0.00025	<0.00010	<0.00010	<0.0002	<0.0001	<0.0001	<0.0001	0.00007
Strontium	Sr		0.001	-	-	0.162	0.172	0.169	0.207	0.199
Sulfur	S		-	-	-	-	8.0	8.6	14.3	13.0
Thallium	Tl		0.0001	<0.2000	<0.0002	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Thorium	Th		0.0005	-	-	-	-	-	-	-
Tin	Sn		0.001	-	-	<0.0002	<0.001	<0.001	<0.001	<0.001
Titanium	Ti		0.001	-	-	0.0021	0.0014	0.0013	0.0020	0.0015
Uranium	U		0.0005	-	0.0016	0.0014	0.0011	0.0013	0.0013	0.0015
Vanadium	V		0.001	<0.030	<0.030	0.0006	0.0009	0.0014	0.0019	0.0005
Zinc	Zn		0.005	<0.005	<0.050	<0.002	0.012	0.082	0.006	0.005
Zirconium	Zr		0.01	-	-	-	-	-	-	-

Notes:

Highlighted and bold cells exceed CSR and CCME

Highlighted cells exceed CSR

Bold cells exceed CCME

"<" indicates less than the laboratory detection limit

"-" indicates not analyzed / no guidline established

[1]Cadmium Guideline = 10^{0.86[log(hardness)]-3.2}

[2] Cadmium guidelines are based on hardness calculated for indivdual samples; 0.025-0.39mg/L is the range of calculated values

[3] Value shown applies to hexavalent chromium; guideline for trivalent chromium: 0.0089 mg/L

[4]Copper guideline: 0.002 mg/L @ hardness of 0-120 mg/L; 0.003 mg/L @ hardness of 120-180 mg/L; 0.004 mg/L @ hardness of >180 mg/L

[5] Lead guideline: 0.001 mg/L @ hardness of 0-60 mg/L; 0.002 mg/L @ hardness of 60-120 mg/L; 0.004 mg/L @ hardness of 120-180 mg/L; 0.007 mg/L @ hardness of >180 mg/L

[6]Nickel guideline: 0.025 mg/L @ hardness of 0-60 mg/L; 0.065 mg/L @ hardness of 60-120 mg/L; 0.110 mg/L @ hardness of 120-180 mg/L; 0.150 mg/L @ hardness of >180 mg/L

[7] Copper guidelines: 0.03mg/L @ hardness of 50-75 mg/L; 0.04mg/L @ a hardness of 75-100mg/L: 0.05 mg/L at a hardness of 100-125mg/L; 0.06mg/L at a hardness of 125-150mg/L; 0.08 at a hardness of 175-200mg/L; 0.09 at a hardness of 200mg/L

[8] Lead guidelines: 0.05mg/L at a hardness of 50 -100 mg/L; 0.06mg/L at a hardness of 100-200mg/L; 0.11mg/L at a hardness of 200-300mg/L; 0.160mg/L at a hardness of over 300mg/L

[9] Nickel guidelines: 0.65mg/l at a hardness of 60-120mg/l; 1.1mg/L at a hardness of 120-180mg/L; 1.5mg/L at a hardness of 180mg/L or more

[10] Silver guidelines: 0.0005mg/L at a hardness of 100mg/L or less; 0.015 mg/L at a hardness of more than 100mg/L

[11] Zinc Guidelines: 0.075mg/L at a hardness of 90mg/L or less; 0.150mg/L at a hardness of 90-100mg/L; 0.9mg/L at a hardness of 100-200mg/L, 1.65mg/L at a hardness of 200-300mg/L; 2.4mg/L at a hardness of 300-400mg/L

[12] Cadium Guideline: 0.0003mg/L at a hardness of 30-90 mg/L; 0.0005mg/L at a hardness of 90-150mg/L; 0.0006mg/L at a hardness of 150-210mg/L

TABLE 1 (continued): GROUNDWATER CHEMISTRY

Analyte		Units	Sample Name	MW-1D	MW-1D	MW-2	MW-2	MW-2	MW-2	MW-2
			Sample Date	Jul-09	Oct-09	Aug-98	Oct-01	Aug-04	Jun-05	Jul-06
			Easting (UTM, Nad83)	08 515364	08 515364	08 515318	08 515318	08 515318	08 515318	08 515318
			Northing (UTM, Nad83)	6666307	6666307	6666338	6666338	6666338	6666338	6666338
			Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Detection Limit							
Ion Balance		%	-	-2.0	-0.5	-4.0	-	-	-	-
Water type			-	-	-	-	-	-	-	-
Field Parameters										
Temperature	T	°C	-	7.3	5.1	-	-	-	-	-
pH		pH units	-	7.12	6.82	-	-	-	-	-
Dissolved O_2	DO	mg/L	-	7.4	4.4	-	-	-	-	-
Electrical Conductivity	EC	µS/cm at 25°C	-	516	184	3310	-	-	-	-
Total Dissolved Solids	TDS	ppm	-	259	90	4330	-	-	-	-
Physical Parameters										
pH		pH units	-	7.50	6.84	5.79	-	-	-	-
Electrical Conductivity	EC	µS/cm at 25°C	1	292	160	-	-	-	-	-
Hardness		mg/L	1	140	139	1180	1270	-	-	-
Total Dissolved Solids			-	-	180	-	-	-	-	-
Dissolved Major Ions										
Calcium	Ca	mg/L	0.05	41.7	41.1	352	340	282	513	394
Magnesium	Mg		0.05	8.8	8.8	72.4	102.0	99.6	216	149
Sodium	Na		0.05	4.3	4.4	39.0	19.0	39.2	32	13.6
Potassium	K		0.1	2.0	2.4	-	-	10.6	7	9.1
Silicon	Si		0.25	8.5	8.76	-	-	-	-	-
Chloride	Cl		0.2	7.4	0.5	-	-	-	-	-
Nitrate - N	NO_3		0.05	<0.10	<0.01	-	-	-	-	-
Nitrite - N	NO_2		-	<0.10	0.09	-	-	-	-	-
Sulfate (SO_4)	SO_4		0.5	24	28	**2550**	-	-	-	-
Hydroxide Alkalinity	OH		0.5	<5.0	<5	-	-	-	-	-
Carbonate Alkalinity	CO_3		0.5	<6.0	<6	-	-	-	-	-
Bicarbonate Alkalinity	HCO_3		0.5	150	150	-	-	-	-	-
Total Alkalinity	$CaCO_3$		0.5	126	124	-	-	-	-	-
Metals - Dissolved										
Aluminum	Al	mg/L	0.005	0.010	<0.005	**0.370**	**8.200**	**24.4**	**62.4**	**31.3**
Antimony	Sb		0.001	<0.0002	<0.0002	<0.200	<0.500	0.0022	0.002	0.0013
Arsenic	As		0.001	0.001	0.0018	**0.800**	**1.920**	**1.04**	**2.41**	**1.74**
Barium	Ba		0.001	0.032	0.033	0.030	0.050	0.0095	<0.01	0.0070
Beryllium	Be		0.001	<0.00004	<0.00004	<0.005	<0.010	0.0054	0.007	0.0026
Bismuth	Bi		0.001	<0.001	<0.001	-	-	0.00009	<0.005	<0.0005
Boron	B		0.05	0.01	0.008	<0.10	<0.20	0.072	<0.02	0.005
Cadmium	Cd		0.0002	0.0001	0.00021	0.0080	0.0100	0.0177	0.0226	0.0107
Chromium	Cr		0.001	0.001	0.0004	<0.001	<0.020	**0.029**	**0.067**	**0.0188**
Cobalt	Co		0.001	0.0001	0.0001	0.680	1.650	1.94	3.97	2.32
Copper	Cu		0.001	0.001	**0.007**	**0.030**	**0.410**	**0.326**	**0.33**	**0.137**
Iron	Fe		0.05	0.02	<0.01	**664**	**2000**	**2340**	**3140**	**2180**
Lead	Pb		0.001	0.0001	<0.0001	0.001	**0.025**	**0.0679**	**0.014**	**0.0172**
Lithium	Li		0.001	0.004	0.004	0.070	<0.100	-	0.09	0.029
Manganese	Mn		0.001	0.326	0.0706	68.2	55.9	49.6	108	88.0
Mercury	Hg		0.00002	<0.00001	0.00001	<0.00005	<0.00020	-	-	-
Molybdenum	Mo		0.0005	0.0011	0.0008	<0.0300	<0.0500	0.0009	<0.01	<0.001
Nickel	Ni		0.001	0.002	0.003	**0.280**	**0.500**	**0.800**	**1.46**	**0.939**
Phosphorus	P		0.15	<0.01	-	-	-	-	-	-
Selenium	Se		0.001	<0.001	<0.0006	0.001	<0.050	0.0032	<0.002	0.0018
Silver	Ag		0.00025	<0.00001	<0.00001	**0.00040**	<0.00500	<0.0002	<0.001	<0.0001
Strontium	Sr		0.001	0.2	0.184	-	-	0.621	1.03	0.798
Sulfur	S		-	8.1	9.5	-	-	-	2710	1980
Thallium	Tl		0.0001	<0.00001	<0.00001	<0.2000	<0.0100	0.00014	<0.0005	<0.00005
Thorium	Th		0.0005	<0.0004	<0.0004	-	-	-	-	-
Tin	Sn		0.001	<0.0001	<0.0001	-	-	0.0003	<0.01	<0.001
Titanium	Ti		0.001	<0.0004	<0.0004	-	-	0.0040	0.143	0.0404
Uranium	U		0.0005	0.0010	0.001	-	<0.0100	0.0102	0.013	0.0098
Vanadium	V		0.001	0.001	0.0004	<0.030	<0.060	0.0583	0.050	0.0181
Zinc	Zn		0.005	0.002	0.008	**16.6**	**55.8**	**83.5**	**152**	**90.2**
Zirconium	Zr		0.01	<0.0001	<0.0001	-	-	-	-	-

TABLE 1 (continued): GROUNDWATER CHEMISTRY

Analyte		Units	Sample Name	MW-2	MW-2	MW-2	MW-2	MW-3	MW-3	MW-4
			Sample Date	Aug-07	Jun-08	Jul-09	Oct-09	Aug-98	Oct-01	Aug-98
			Easting (UTM, Nad83)	08 515318	08 515318	08 515318	08 515318	08 515422	08 515422	08 515344
			Northing (UTM, Nad83)	6666338	6666338	6666338	6666338	08 6666278	08 6666278	6666372
			Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Detection Limit							
Ion Balance		%	-	-	-	-55.4	2.5	72.4	-	-
Water type			-	-	-	-	-	-	-	-
Field Parameters										
Temperature	T	°C	-	-	-	10.3	4.1	-	-	-
pH		pH units	-	-	-	-	2.96	-	-	-
Dissolved O_2	DO	mg/L	-	-	-	8.7	5.8	-	-	-
Electrical Conductivity	EC	µS/cm at 25°C	-	-	-	>4000	>4000	245	-	-
Total Dissolved Solids	TDS	ppm	-	-	-	8950	>2000	309	-	-
Physical Parameters										
pH		pH units	-	-	-	3.08	3.27	7.34	-	-
Electrical Conductivity	EC	µS/cm at 25°C	1	-	-	8430	10800	-	-	-
Hardness		mg/L	1	-	-	1760	974	86	100	1760
Total Dissolved Solids			-	-	-	-	4880	-	-	-
Dissolved Major Ions										
Calcium	Ca	mg/L	0.05	298	421	402	390	25	30	455
Magnesium	Mg		0.05	74.0	126	184.0	<0.1	5.9	6.5	152.0
Sodium	Na		0.05	12.6	12.4	21.9	16.4	14.0	4.0	12.0
Potassium	K		0.1	6.9	8.9	9.5	11.7	-	-	-
Silicon	Si		0.25	-	-	25.2	21.3	-	-	-
Chloride	Cl		0.2	-	-	0.2	1.3	-	-	-
Nitrate - N	NO_3		0.05	-	-	<0.10	<0.01	-	-	-
Nitrite - N	NO_2		-	-	-	**1.64**	**2.26**	-	-	-
Sulfate (SO_4)	SO_4		0.5	-	-	**8330**	**4400**	18	-	-
Hydroxide Alkalinity	OH		0.5	-	-	<5.0	<5	-	-	-
Carbonate Alkalinity	CO_3		0.5	-	-	<6.0	<6	-	-	-
Bicarbonate Alkalinity	HCO_3		0.5	-	-	<5	<5	-	-	-
Total Alkalinity	$CaCO_3$		0.5	-	-	<5	<5	-	-	-
Metals - Dissolved										
Aluminum	Al	mg/L	0.005	**13.3**	**45.9**	**101**	**47.6**	0.029	**0.350**	**0.880**
Antimony	Sb		0.001	0.0012	0.0013	0.001	<0.002	<0.200	<0.010	<1.000
Arsenic	As		0.001	**1.59**	**1.80**	**0.743**	**1.33**	**0.042**	**0.013**	**20.300**
Barium	Ba		0.001	0.003	0.004	0.002	<0.01	0.120	0.040	0.070
Beryllium	Be		0.001	0.0017	0.0030	0.003	0.0043	<0.005	<0.005	<0.030
Bismuth	Bi		0.001	<0.0005	<0.0005	<0.001	<0.01	-	-	-
Boron	B		0.05	0.011	0.009	0.01	<0.04	<0.10	<0.10	<0.50
Cadmium	Cd		0.0002	0.00368	0.00625	0.0089	0.00544	0.0004	0.0011	0.0040
Chromium	Cr		0.001	**0.0152**	**0.0161**	**0.027**	**0.012**	<0.001	<0.010	<0.001
Cobalt	Co		0.001	1.21	2.16	2.960	1.66	<0.020	<0.010	1.800
Copper	Cu		0.001	**0.052**	**0.088**	**0.117**	**0.05**	0.002	**0.005**	0.001
Iron	Fe		0.05	**919**	**2070**	**374**	**2120**	0.02	**0.76**	**3150.00**
Lead	Pb		0.001	0.0001	0.0006	0.001	0.001	0.001	0.001	**0.025**
Lithium	Li		0.001	0.036	0.037	0.028	0.03	<0.020	<0.050	<0.100
Manganese	Mn		0.001	46.7	89.6	83.0	67.2	0.187	0.090	163.000
Mercury	Hg		0.00002	-	-	0.00001	<0.00001	<0.00005	<0.00020	<0.00005
Molybdenum	Mo		0.0005	<0.001	<0.001	0.0002	<0.001	<0.0300	<0.0010	<0.2000
Nickel	Ni		0.001	**0.428**	**0.820**	**1.010**	**0.67**	0.025	0.025	**0.700**
Phosphorus	P		0.15	-	-	<0.10	-	-	-	-
Selenium	Se		0.001	0.0009	0.0006	<0.001	<0.006	<0.010	<0.001	<0.010
Silver	Ag		0.00025	<0.0001	0.00006	<0.00001	<0.0001	<0.00010	<0.00010	**0.00200**
Strontium	Sr		0.001	0.868	1.18	1.35	1.13	-	-	-
Sulfur	S		-	1130	1950	2780.0	1460	-	-	-
Thallium	Tl		0.0001	<0.00005	<0.00005	<0.00001	<0.0001	<0.2000	<0.0002	<1.0000
Thorium	Th		0.0005	-	-	0.0057	0.005	-	-	-
Tin	Sn		0.001	<0.001	<0.001	<0.0001	<0.001	-	-	-
Titanium	Ti		0.001	0.0512	0.0242	0.003	<0.004	-	-	-
Uranium	U		0.0005	0.0025	0.0057	0.0045	0.004	-	0.0010	-
Vanadium	V		0.001	<0.0001	0.0244	0.066	0.019	<0.030	<0.030	<0.200
Zinc	Zn		0.005	**38.2**	**74.6**	**115**	**56.9**	0.025	0.025	**35.500**
Zirconium	Zr		0.01	-	-	0.001	<0.001	-	-	-

TABLE 1 (continued): GROUNDWATER CHEMISTRY

Analyte		Units	Sample Name	MW-4	MW-4	MW-4	MV-5	MW-5	MW-5	MW-5
			Sample Date	Oct-01	Jul-09	Oct-09	Aug-98	Oct-01	Jul-09	Oct-09
			Easting (UTM, Nad83)	08 515344	08 515344	08 515344	08 515285	08 515285	08 515285	08 515285
			Northing (UTM, Nad83)	6666372	6666372	6666372	6666254	6666254	6666254	6666254
			Matrix	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater	Groundwater
			Detection Limit							
Ion Balance		%	-	-	-54.0	12.5	-20.9	-	-22.6	-6.2
Water type			-	-	-	-	-	-	-	-
Field Parameters										
Temperature	T	°C	-	-	5.3	4.6	-	-	7.7	5.5
pH		pH units	-	-	-	4.48	-	-		2.40
Dissolved O_2	DO	mg/L	-	-	3.5	3.8	-	-	2.2	2.8
Electrical Conductivity	EC	µS/cm at 25°C	-	-	>4000	2201	3940	-	3940	3192
Total Dissolved Solids	TDS	ppm	-	-	6440	1093	5970	-	3580	1595
Physical Parameters										
pH		pH units	-	-	3.85	3.98	3.66	-	2.72	2.97
Electrical Conductivity	EC	µS/cm at 25°C	1	-	6710	11600	-	-	3910	3380
Hardness		mg/L	1	1650	1310	1480	778	544	630	571
Total Dissolved Solids			-	-	-	5830	-	-	-	2550
Dissolved Major Ions										
Calcium	Ca	mg/L	0.05	421	357	365	187	117	127	103
Magnesium	Mg		0.05	146.0	101.0	137	75.3	61.0	76.0	76.1
Sodium	Na		0.05	15.0	17.6	17.9	19.0	11.0	12.0	10.2
Potassium	K		0.1	-	19.5	22	-	-	12.0	11.6
Silicon	Si		0.25	-	14.1	15.4	-	-	-	10.2
Chloride	Cl		0.2	-	<0.2	0.3	-	-	0.8	0.04
Nitrate - N	NO_3		0.05	-	<0.10	<0.01	-	-	<0.10	<0.01
Nitrite - N	NO_2		-	-	**2.51**	**1.99**	-	-	**1.68**	<0.01
Sulfate (SO_4)	SO_4		0.5	-	**5940**	**5240**	**4590**	-	**3340**	**2220**
Hydroxide Alkalinity	OH		0.5	-	<5.0	<5	-	-	<5.0	<5
Carbonate Alkalinity	CO_3		0.5	-	<6.0	<6	-	-	<6.0	<6
Bicarbonate Alkalinity	HCO_3		0.5	-	<5	<5	-	-	<5	<5
Total Alkalinity	$CaCO_3$		0.5	-	<5	<5	-	-	<5	<5
Metals - Dissolved										
Aluminum	Al	mg/L	0.005	**33.200**	**81.800**	**104**	**130.000**	**75.600**	**165.000**	**130**
Antimony	Sb		0.001	<0.500	0.003	0.003	<0.400	<0.100	0.076	0.115
Arsenic	As		0.001	**80.500**	**74.400**	**86.4**	**88.000**	**30.400**	**12.000**	**2.87**
Barium	Ba		0.001	<0.100	0.018	0.02	<0.020	0.020	0.007	<0.01
Beryllium	Be		0.001	<0.030	0.006	0.0106	0.020	0.011	0.010	0.0144
Bismuth	Bi		0.001	-	<0.001	<0.01	-	-	0.006	<0.01
Boron	B		0.05	<0.50	0.02	<0.04	<0.20	<0.10	0.004	<0.04
Cadmium	Cd		0.0002	0.0050	0.0220	0.0543	**1.7000**	**1.2700**	**1.5600**	**1.26**
Chromium	Cr		0.001	<0.050	**0.004**	<0.004	**0.012**	<0.010	**0.064**	**0.025**
Cobalt	Co		0.001	1.880	1.320	1.4	0.930	0.520	0.440	0.41
Copper	Cu		0.001	**0.025**	**0.014**	**0.02**	**1.470**	**4.430**	**8.420**	**6.2**
Iron	Fe		0.05	**3520.00**	**266.00**	**3060**	**1290.00**	**921.00**	**852.00**	**802**
Lead	Pb		0.001	**0.025**	0.001	**0.089**	**0.135**	**0.050**	**0.213**	**0.024**
Lithium	Li		0.001	<0.300	0.081	0.12	0.160	0.130	0.138	0.16
Manganese	Mn		0.001	116.000	62.800	63	23.400	11.900	13.900	11.2
Mercury	Hg		0.00002	<0.00020	0.00002	<0.00001	<0.00005	<0.00020	**0.00007**	0.00001
Molybdenum	Mo		0.0005	<0.0500	0.0005	<0.001	<0.0600	<0.0100	0.0120	0.003
Nickel	Ni		0.001	**1.000**	**0.644**	**0.74**	**0.600**	**0.450**	**0.407**	**0.39**
Phosphorus	P		0.15	-	<0.10	-	-		0.39	-
Selenium	Se		0.001	<0.050	<0.001	<0.006	<0.050	<0.010	<0.001	<0.006
Silver	Ag		0.00025	<0.00500	**0.00339**	**0.00036**	**0.00070**	<0.00100	**0.00168**	0.00088
Strontium	Sr		0.001	-	1.20	1.12	-	-	0.43	0.42
Sulfur	S		-	-	1980.00	1750	-	-	1120.00	739
Thallium	Tl		0.0001	<0.0100	0.00003	<0.0001	<0.4000	<0.0020	0.0004	<0.0001
Thorium	Th		0.0005	-	0.0007	<0.004		-	0.0089	<0.004
Tin	Sn		0.001	-	<0.0001	<0.001	-	-	<0.0001	<0.001
Titanium	Ti		0.001	-	0.002	<0.004	-	-	0.008	0.004
Uranium	U		0.0005	<0.010	0.0004	<0.004	-	<0.002	0.023	0.013
Vanadium	V		0.001	<0.200	0.011	0.013	0.080	0.100	0.111	0.092
Zinc	Zn		0.005	**60.100**	**58.400**	**61.6**	**29.700**	**22.400**	**24.000**	**20.8**
Zirconium	Zr		0.01	-	0.001	0.001	-	-	0.0003	<0.001

TABLE 1 (continued): GROUNDWATER CHEMISTRY

Analyte		Units	Sample Name	MW-6	MW-6	MW-6	Water Quality Guidelines	
			Sample Date	Oct-01	Jul-09	Oct-09	CSR Aquatic Life	CCME Protection of Aquatic Life
			Easting (UTM, Nad83)	08 515411	08 515411	08 515411		
			Northing (UTM, Nad83)	6666250	6666250	6666250		
			Matrix	Groundwater	Groundwater	Groundwater		
			Detection Limit					
Ion Balance		%	-	-	-7.6	4.0	-	-
Water type			-	-	-	-	-	-
Field Parameters								
Temperature	T	°C	-	-	9.2	5.2	-	-
pH		pH units	-	-	7.30	6.99	-	6.5 - 9
Dissolved O_2	DO	mg/L	-	-	1.5	2.6	-	-
Electrical Conductivity	EC	µS/cm at 25°C	-	-	181	195	-	-
Total Dissolved Solids	TDS	ppm	-	-	90	96	-	-
Physical Parameters								
pH		pH units	-	-	6.88	6.9	-	6.5 - 9
Electrical Conductivity	EC	µS/cm at 25°C	1	-	172	160	-	-
Hardness		mg/L	1	83	73	75	-	-
Total Dissolved Solids			-	-	-	110	-	-
Dissolved Major Ions								
Calcium	Ca	mg/L	0.05	24.5	21.6	22.3	-	-
Magnesium	Mg		0.05	5.20	4.60	4.8	-	-
Sodium	Na		0.05	4.00	3.80	3.3	-	-
Potassium	K		0.1	-	1.8	1.3	-	-
Silicon	Si		0.25	-	7.0	7.81	-	-
Chloride	Cl		0.2	-	8.50	0.22	-	-
Nitrate - N	NO_3		0.05	-	0.91	<0.01	400	2.9
Nitrite - N	NO_2		-	-	<0.10	<0.01	0.2	-
Sulfate (SO_4)	SO_4		0.5	-	3.10	3.4	1000	-
Hydroxide Alkalinity	OH		0.5	-	<5.0	<5	-	-
Carbonate Alkalinity	CO_3		0.5	-	<6.0	<6	-	-
Bicarbonate Alkalinity	HCO_3		0.5	-	100.0	100	-	-
Total Alkalinity	$CaCO_3$		0.5	-	86.0	86	-	-
Metals - Dissolved								
Aluminum	Al	mg/L	0.005	**0.200**	**0.012**	0.008	-	0.1
Antimony	Sb		0.001	<0.100	0.002	<0.0002	0.2	-
Arsenic	As		0.001	**0.060**	**0.015**	**0.012**	0.05	0.005
Barium	Ba		0.001	0.090	0.072	0.054	10	-
Beryllium	Be		0.001	<0.005	<0.00004	<0.00004	0.053	-
Bismuth	Bi		0.001	-	<0.001	<0.001	-	-
Boron	B		0.05	<0.10	0.01	0.006	50	-
Cadmium	Cd		0.0002	0.0010	0.00001	0.00004	0.0003-0.0006[12]	0.025-0.39[1,2]
Chromium	Cr		0.001	<0.010	<0.00040	0.0008	0.01	0.001[3]
Cobalt	Co		0.001	<0.010	0.00013	0.00021	0.009	-
Copper	Cu		0.001	**0.005**	0.001	<0.001	0.03-0.09[7]	0.002-0.004[4]
Iron	Fe		0.05	**3.69**	0.04	**4.83**	-	0.3
Lead	Pb		0.001	0.005	0.001	<0.0001	0.05-0.16[8]	0.002- 0.0070[5]
Lithium	Li		0.001	<0.050	0.003	0.002	-	-
Manganese	Mn		0.001	1.440	0.637	0.817	-	-
Mercury	Hg		0.00002	<0.00020	<0.00001	<0.00001	0.001	0.000026
Molybdenum	Mo		0.0005	<0.01	0.0041	0.0021	10	0.073
Nickel	Ni		0.001	0.025	0.001	<0.001	0.650-1.5[9]	0.065- 0.15[6]
Phosphorus	P		0.15	-	<0.01	-	-	-
Selenium	Se		0.001	<0.010	<0.001	<0.0006	0.01	0.001
Silver	Ag		0.00025	<0.00100	<0.00001	<0.00001	0.0005-0.015[10]	0.0001
Strontium	Sr		0.001	-	0.12	0.117	-	-
Sulfur	S		-	-	1.00	1.1	-	-
Thallium	Tl		0.0001	<0.0020	<0.00001	<0.00001	0.003	0.0008
Thorium	Th		0.0005	-	<0.0004	<0.0004	-	-
Tin	Sn		0.001	-	<0.0001	<0.0001	-	-
Titanium	Ti		0.001	-	<0.0004	0.0007	1	-
Uranium	U		0.0005	<0.0020	0.0012	<0.0004	3	-
Vanadium	V		0.001	<0.030	0.002	0.0013	-	-
Zinc	Zn		0.005	0.025	0.003	0.005	0.075-2.4[11]	0.03
Zirconium	Zr		0.01	-	0.001	0.0002	-	-

TABLE 2: SURFACE WATER CHEMISTRY

Analyte		Units	Sample Name	Lake	Lake	Lake	Lake	Lake	Lake	Tank Creek	Tank Creek	Tank Creek	Tank Creek	Tank Creek	Tank Creek	Water Quality Guidelines	
			Sample Date	Aug-98	Oct-01	Aug-02	Jul-06	Jul-09	Oct-09	Aug-98	Oct-01	Jul-01	Jul-06	Jul-09	Oct-09	CSR Aquatic Life	CCME Protection of Aquatic Life
			Easting (UTM, Nad83)	08 515220	08 515220	08 515220	08 515220	08 515220	08 515220	08 515149	08 515149	08 515149	08 515149	08 515149	08 515152		
			Northing (UTM, Nad83)	6666346	6666346	6666346	6666346	6666346	6666346	6666503	6666503	6666503	6666503	6666503	6666499		
			Matrix	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water		
			Detection Limit														
Ion Balance		%		-	-	-	-	94.0	97	-	-	-	-	93.0	100	-	-
Field Parameters																	
Temperature	T	°C	-	-	-	-	-	19.8	0.4	-	-	-	-	18.7	1.5	-	-
pH		pH units	-	-	-	-	-	7.37	6.5	-	-	-	-	7.20	**6.09**	-	6.5 - 9
Dissolved O_2	DO	mg/L	-	-	-	-	-	9.5	-	-	-	-	-	9.9	-	-	-
Electrical Conductivity	EC	µS/cm at 25°C	-	-	-	-	-	69	13	-	-	-	-	58	57	-	-
Total Dissolved Solids	TDS	ppm	-	-	-	-	-	34	6	-	-	-	-	37	28	-	-
Physical Parameters																	
pH		pH units	-	-	-	-	-	7.35	7.37	-	-	-	-	7.39	7.35	-	6.5 - 9
Electrical Conductivity	EC	µS/cm at 25°C	1	-	-	-	-	91	107	-	-	-	-	70	77	-	-
True Color		CU	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity		NTU	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hardness		mg/L	1	-	37	-	-	40	46	-	-	33	-	31	33	-	-
Dissolved Major Ions																	
Calcium	Ca	mg/L	0.05	-	11	13.5	-	11.7	13.5	9	-	10	-	9	9.4		-
Magnesium	Mg		0.05	-	2.5	3.1	-	2.6	3	2.1	-	2.2	-	2.1	2.2		-
Sodium	Na		0.05	-	<2.0	2.1	-	1.8	2.2	<2.0	-	<2.0	-	1.7	2		-
Potassium	K		0.1	-	-	<0.4	-	<0.4	0.6	-	-	-	-	<0.4	0.5		-
Silicon	Si		0.25	-	-	4.35	-	3.2	-	-	-	-	-	3.2	-		-
Chloride	Cl		0.2	-	-	-	-	0.5	<0.4	-	-	-	-	0.5	0.4		-
Nitrate - N	NO_3		0.05	-	-	-	-	0.01	<0.01	-	-	-	-	<0.01	<0.01	400	2.9
Nitrite - N	NO_2		-	-	-	-	-	<0.01	<0.005	-	-	-	-	<0.01	<0.005	0.2	-
Sulfate (SO_4)	SO_4		0.5	-	-	-	-	8	13	-	-	-	-	3	5.1	1000	-
Hydroxide Alkalinity	OH		0.5	-	-	-	-	<5.0	<5	-	-	-	-	<5.0	<5	-	-
Carbonate Alkalinity	CO_3		0.5	-	-	-	-	<6.0	<6	-	-	-	-	<6.0	<6	-	-
Bicarbonate Alkalinity	HCO_3		0.5	-	-	-	-	45	48	-	-	-	-	42	39	-	-
Total Alkalinity	$CaCO_3$		0.5	-	-	-	-	37	39	-	-	-	-	34	32	-	-
Metals - Total																	
Aluminum	Al		-	-	**0.110**	**0.114**	0.047	0.067	**1.48**	0.065	-	0.070	0.020	0.023	0.065	-	0.100
Antimony	Sb		-	-	<0.010	<0.0002	<0.0002	<0.0002	0.0002	<0.200	-	<0.010	<0.0002	<0.0002	<0.0002	0.2	
Arsenic	As		-	0.003	0.005	0.0033	0.0022	0.003	**0.0443**	0.003	<0.200	0.002	0.0013	0.002	0.0011	0.05	0.005
Barium	Ba		-	-	<0.020	0.007	0.006	0.008	0.023	<0.010	-	<0.020	0.006	0.007	0.007	10	-
Beryllium	Be		-	-	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.005	-	<0.005	<0.0001	<0.0001	<0.0001	0.053	-
Bismuth	Bi		-	-	-	<0.0005	<0.0005	<0.001	<0.0005	-	-	-	<0.0005	<0.001	<0.0005	-	-
Boron	B		-	-	<0.100	<0.002	0.003	0.005	0.003	<0.100	-	<0.100	0.003	0.004	<0.002	50	-
Cadmium	Cd		-	-	**0.0004**	**0.00084**	0.00012	**0.0004**	**0.00078**	<0.0002	-	<0.0002	<0.00001	**0.0001**	**0.0004**	0.0003 [12]	0.000012-0.000017 [1,2]
Chromium	Cr		-	-	<0.010	<0.0005	<0.0005	<0.001	**0.0025**	<0.001	-	<0.010	<0.0005	<0.001	<0.0005	0.01	0.001 [3]
Cobalt	Co		-	-	<0.010	0.0010	0.0008	0.001	0.003	<0.020	-	<0.010	<0.0001	0.0001	0.0003	0.009	-
Copper	Cu		-	-	**0.003**	**0.005**	**0.002**	**0.005**	**0.013**	<0.001	<0.005	**0.002**	<0.001	0.001	**0.003**	0.02 [7]	0.002 [4]
Iron	Fe		-	-	**0.360**	0.200	0.002	**0.360**	**11.1**	**0.360**	-	**0.360**	0.2	**0.400**	**0.32**	-	0.300
Lead	Pb		-	-	<0.001	<0.0001	0.0002	<0.0001	**0.0017**	<0.001	<0.050	<0.001	0.0001	<0.0001	<0.0001	0.04 [8]	0.001 [5]
Lithium	Li		-	-	<0.050	<0.001	<0.001	<0.001	0.001	<0.020	-	<0.050	<0.001	<0.001	<0.001	-	-
Manganese	Mn			-	0.040	0.137	0.211	0.124	0.419	0.010	-	0.020	0.008	0.025	0.04		-

TABLE 2: SURFACE WATER CHEMISTRY

Analyte		Units	Sample Name	Lake	Lake	Lake	Lake	Lake	Lake	Tank Creek	Tank Creek	Tank Creek	Tank Creek	Tank Creek	Tank Creek	Water Quality Guidelines	
			Sample Date	Aug-98	Oct-01	Aug-02	Jul-06	Jul-09	Oct-09	Aug-98	Oct-01	Jul-01	Jul-06	Jul-09	Oct-09	CSR Aquatic Life	CCME Protection of Aquatic Life
			Easting (UTM, Nad83)	08 515220	08 515220	08 515220	08 515220	08 515220	08 515220	08 515149	08 515149	08 515149	08 515149	08 515149	08 515152		
			Northing (UTM, Nad83)	6666346	6666346	6666346	6666346	6666346	6666346	6666503	6666503	6666503	6666503	6666503	6666499		
			Matrix	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water		
			Detection Limit														
Mercury	Hg	mg/L	-	<0.0001	<0.0002	-	-	<0.0001	<0.0001	<0.0001	-	<0.0002	-	<0.0001	<0.0001	0.001	0.00002
Molybdenum	Mo		-	-	<0.001	<0.001	<0.001	<0.001	0.001	<0.030	-	<0.001	0.001	0.001	<0.001	10	0.073
Nickel	Ni		-	-	<0.050	0.0010	0.0014	0.001	0.0031	<0.050	<0.020	<0.050	<0.0005	<0.001	0.0006	0.25 [9]	0.025 [6]
Phosphorus	P		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Selenium	Se		-	-	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	-	<0.001	<0.0002	<0.0002	<0.0002	0.01	0.001
Silver	Ag		-	-	<0.000	<0.0001	<0.0001	<0.000	0.00007	<0.0001	-	<0.0001	<0.0001	<0.00001	<0.00001	0.0005 [10]	0.0001
Strontium	Sr		-	-	-	0.059	0.045	0.053	0.064	-	-	-	0.035	0.045	0.048	-	-
Sulfur	S			-	-	4.14	5.2	3	5.2	-	-	-	1.1	0.9	1.9		
Tellurium	Te		-	-	-	-	-	-	-	-	-	-	-	-	-	0.003	-
Thallium	Tl		-	-	<0.0002	<0.00005	<0.00005	<0.0001	<0.00005	<0.200	-	<0.0002	<0.00005	<0.0001	<0.00005	0.003	0.001
Thorium	Th		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Tin	Sn		-	-	-	-	<0.001	<0.001	<0.001	-	-	-	<0.001	<0.001	<0.001	-	-
Titanium	Ti			-	-	0.0006	0.0008	0.001	0.061	-	-	-	<0.0005	0.001	0.0007	1	-
Uranium	U		-	-	<0.0002	<0.0005	<0.0005	<0.001	0.0008	-	-	<0.0002	<0.0005	<0.001	<0.0005	3	-
Vanadium	V		-	-	<0.030	<0.0001	<0.0001	0.0002	0.0026	<0.030	-	<0.030	<0.0001	0.0002	0.0002	-	-
Zinc	Zn		-	-	<0.050	**0.034**	0.015	0.017	**0.03**	<0.005	<0.005	<0.050	0.005	0.005	0.012	0.075 [11]	0.03

Notes:

Highlighted and bold cells exceed CSR and CCME

Highlighted cells exceed CSR

Bold cells exceed CCME

"<" indicates less than the laboratory detection limit

"-" indicates not analyzed / no guidline established

[1] Cadmium Guideline = 10^{0.86[log(hardness)]-3.2}

[2] Cadmium guidelines are based on hardness calculated for indivdual samples; 0.012 -0.017mg/L is the range of calculated values

[3] Value shown applies to hexavalent chromium; guideline for trivalent chromium: 0.0089 mg/L

[4] Copper guideline: 0.002 mg/L @ hardness of 0-120 mg/L; 0.003 mg/L @ hardness of 120-180 mg/L; 0.004 mg/L @ hardness of >180 mg/L

[5] Lead guideline: 0.001 mg/L @ hardness of 0-60 mg/L; 0.002 mg/L @ hardness of 60-120 mg/L; 0.004 mg/L @ hardness of 120-180 mg/L; 0.007 mg/L @ hardness of >180 mg/L

[6] Nickel guideline: 0.025 mg/L @ hardness of 0-60 mg/L; 0.065 mg/L @ hardness of 60-120 mg/L; 0.110 mg/L @ hardness of 120-180 mg/L; 0.150 mg/L @ hardness of >180 mg/L

[7] Copper guidelines: 0.02 mg/L @ hardness of 50mg/L or less; 0.03mg/L @ hardness of 50-75 mg/L; 0.04mg/L @ a hardness of 75-100mg/L: 0.05 mg/L at a hardness of 100-125mg/L; 0.06mg/L at a hardness of 125-150mg/L;0.08 at a hardness of 175-200mg/L; 0.09 at a hardness of 200mg/I

[8] Lead guidelines: 0.04 mg/L at a hardness of 50 mg/L or less; 0.05mg/L at a hardness of 50 -100 mg/L; 0.06mg/L at a hardness of 100-200mg/L; 0.11mg/L at a hardness of 200-300mg/L; 0.160mg/L at a hardness of over 300mg/L

[9] Nickel guidelines: 0.250 mg/L @ hardness of 60 mg/L or less; 0.65mg/l at a hardness of 60-120mg/l; 1.1mg/L at a hardness of 120-180mg/L; 1.5mg/L at a hardness of 180mg/L or more

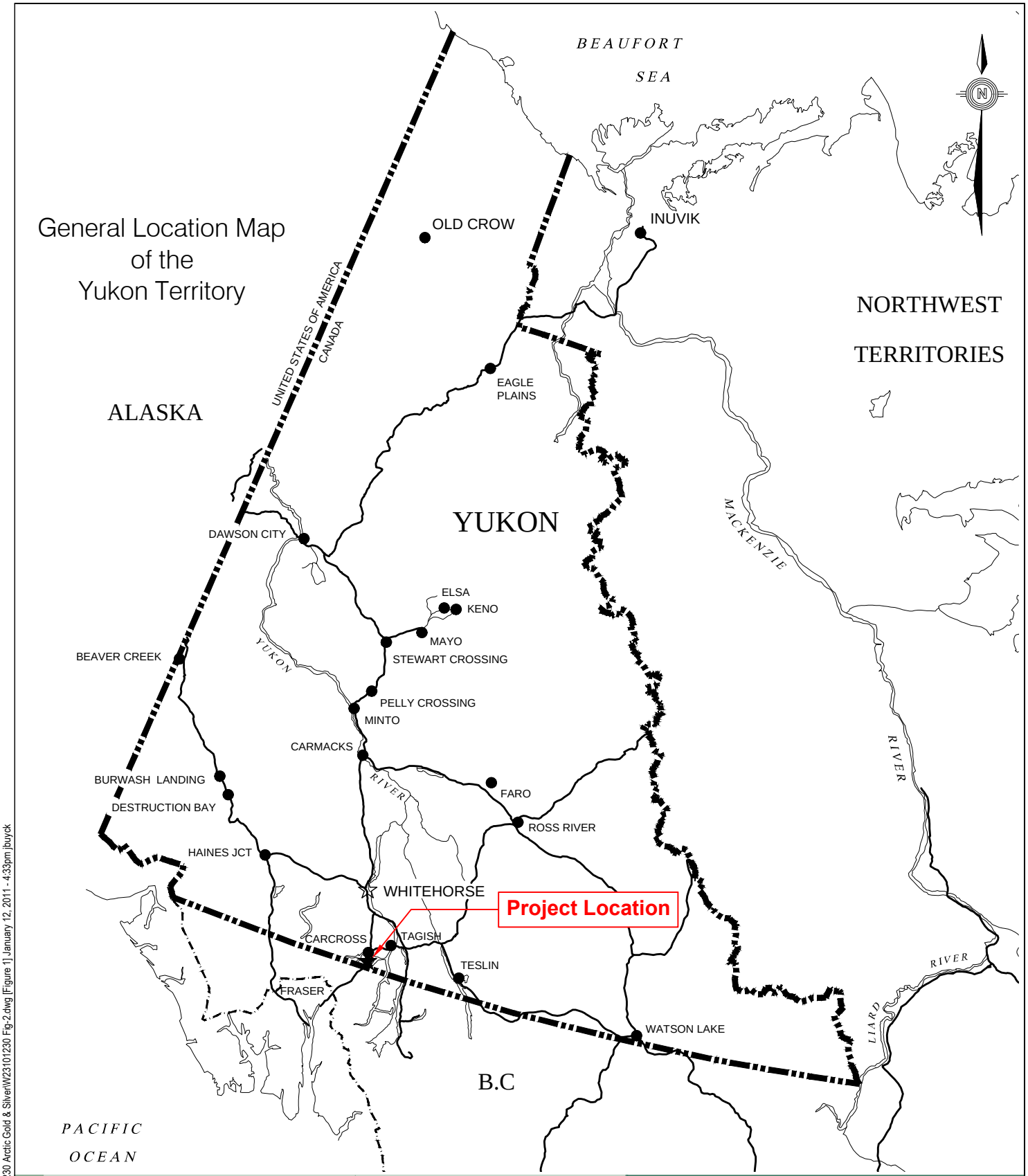
[10] Silver guidelines: 0.0005mg/L @ a hardness of 100mg/L or less; 0.015 mg/L at a hardness of more than 100mg/L

[11] Zinc Guidelines: 0.075mg/L @ a hardness of 90mg/L or less; 0.150mg/L at a hardness of 90-100mg/L; 0.9mg/L at a hardness of 100-200mg/L, 1.65mg/L at a hardness of 200-300mg/L; 2.4mg/L at a hardness of 300-400mg/L

[12] Cadium Guideline: 0.0003mg/L @ a hardness of 30-90 mg/L; 0.0005mg/L at a hardness of 90-150mg/L; 0.0006mg/L at a hardness of 150-210mg/L

TABLE 3: GROUNDWATER MONITORING DATA						
Well	Date	Well Elevation (top of PVC)	Depth to GW	Elevation of GW	Elevation of Bottom of Tailings	GW Level within Tailings
		[m]	[m]	[m]	[m]	yes/no
MW-1S	Sep-98	90.45	dry	-	88.2	-
	Oct-01	90.45	2.25	88.2	88.2	no
	Mar-02	90.45	2.346	88.104	88.2	no
	Jul-09	90.45	1.95	88.5	88.2	yes
	Oct-09	90.45	2.13	88.32	88.2	yes
MW-1D	Sep-98	90.2	2.4	87.8	88.2	no
	Sep-00	90.8	2.2	88.6	88.2	yes
	Nov-00	90.8	2.31	88.49	88.2	yes
	Jan-01	90.8	2.8	88	88.2	no
	Oct-01	90.8	2.66	88.14	88.2	no
	Mar-02	90.8	3.202	87.598	88.2	no
	Jul-09	90.8	2.84	87.96	88.2	no
	Oct-09	90.8	2.62	88.18	88.2	no
MW-2	Sep-98	90.6	5.36	85.24	87	no
	Sep-00	89.8	4	85.8	87	no
	Oct-01	89.8	4.13	85.67	87	no
	Mar-02	89.8	4.72	85.08	87	no
	Jul-09	89.8	3.81	85.99	87	no
	Oct-09	89.8	4	85.8	87	no
MW-3	Sep-98	92.25	3.15	89.1	no tailings	-
	Sep-00	92.25	2.302	89.948	no tailings	-
	Oct-01	92.25	3.06	89.19	no tailings	-
	Mar-02	92.25	3.395	88.855	no tailings	-
	Jul-09	92.25	-	-	no tailings	-
	Oct-09	92.25	-	-	no tailings	-
MW-4	Sep-98	90.95	5.51	85.44	87.05	no
	Oct-01	90.65	3.798	86.852	87.05	no
	Mar-02	90.65	4.575	86.075	87.05	no
	Jul-09	90.65	3.72	86.93	87.05	no
	Oct-09	90.65	4.4	86.25	87.05	no
MW-5	Sep-98	90.2	3.97	86.23	87.5	no
	Oct-01	90.9	4.37	86.53	87.5	no
	Mar-02	90.9	dry	-	87.5	-
	Jul-09	90.9	3.84	87.06	87.5	no
	Sep-09	90.9	4.25	86.65	87.5	no
MW-6	Sep-98	92.5	1.8	90.7	no tailings	-
	Oct-01	92.6	1.57	91.03	no tailings	-
	Jul-09	92.6	1.96	90.64	no tailings	-
	Oct-09	92.6	1.77	90.83	no tailings	no

FIGURES



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TAILINGS COVER ASSESSMENT
AGS MINE SITE, CARCROSS, YUKON

SITE LOCATION MAP

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PROJECT NO.	DWN	CKD	REV
W23101230	JSB	SK	0

OFFICE	DATE
EBA-WHSE	January 12, 2011

Figure 1

Q:\Whitehorse\Data\0201drawings\Carcross\W23101230 Arctic Gold & Silver\W23101230 Fig-2.dwg [Figure 1] January 12, 2011 - 4:33pm jbuyck

Q:\Whitehorse\Data\0201drawings\Carcross\W23101230 Arctic Gold & Silver\W23101230 Figure 2.dwg [FIGURE 2] January 12, 2011 - 4:25:18 pm (BY: BUYCK, JAMES)

LEGEND

- THERMISTOR CABLE
- SOIL SAMPLE
- MONITORING WELLS
- SURFACE WATER SAMPLE LOCATION

0 50

Scale: 1: 1 500 (metres)

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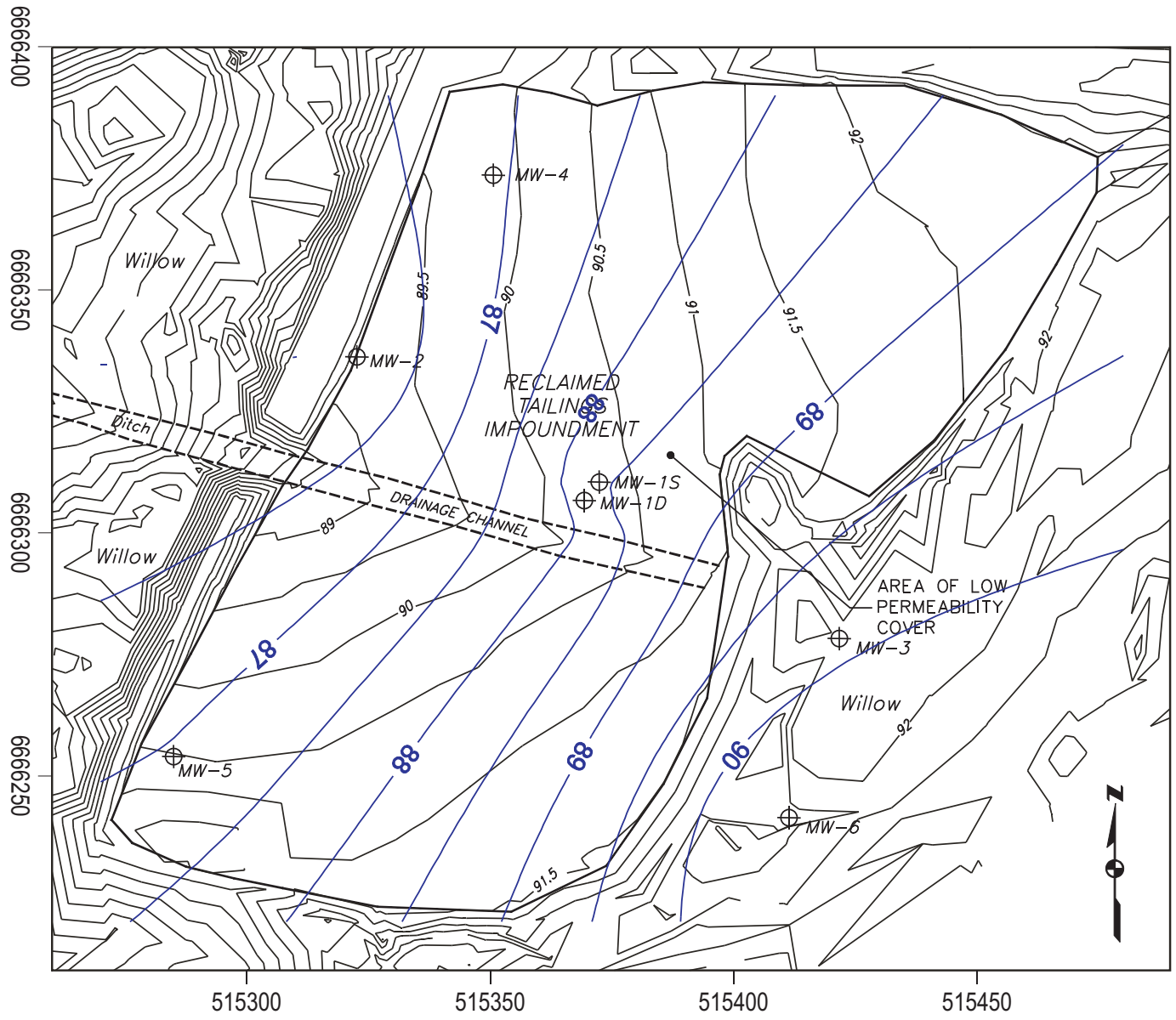
TAILINGS COVER ASSESSMENT
AGS MINE SITE - CARCROSS, YUKON

SITE PLAN SHOWING SAMPLING LOCATIONS

PROJECT NO.	DWN	CKD	REV
W23101230 / PE92501028	KJT	SK	0
OFFICE: EBA-WHSE	DATE: June 15, 2010		

Figure 2



LEGEND

88 Groundwater elevation (m relative to site benchmark)

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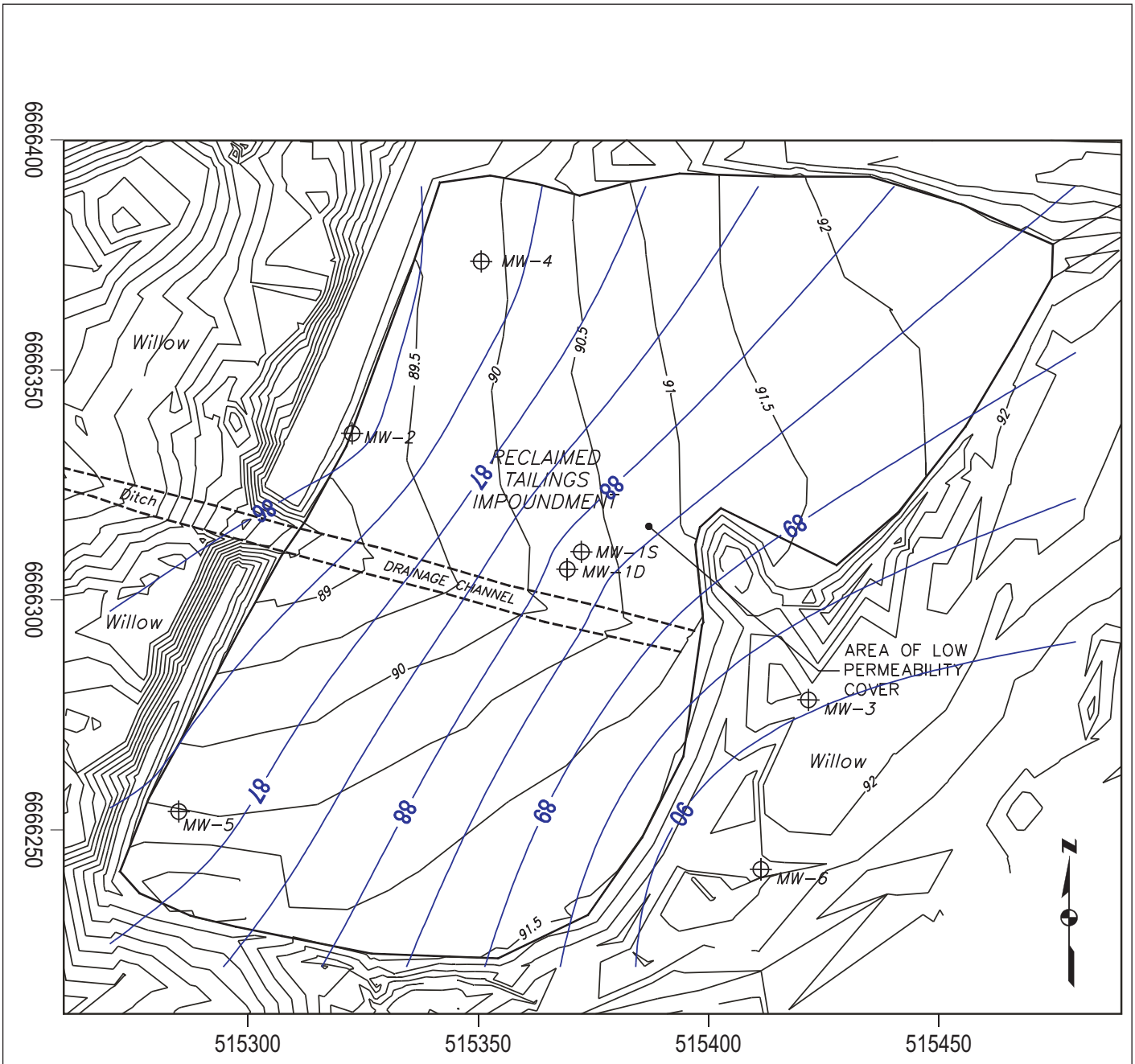
TAILINGS COVER ASSESSMENT
AGS MINE SITE, CARCROSS, YUKON

Groundwater Contour Map
July 2009

PROJECT NO.	DWN	CKD	REV
W23101230 / PE92501028	SK	RMM	0
OFFICE: EBA-WHSE	DATE: March 2010		

Figure 3



LEGEND

88 Groundwater elevation (m relative to site benchmark)

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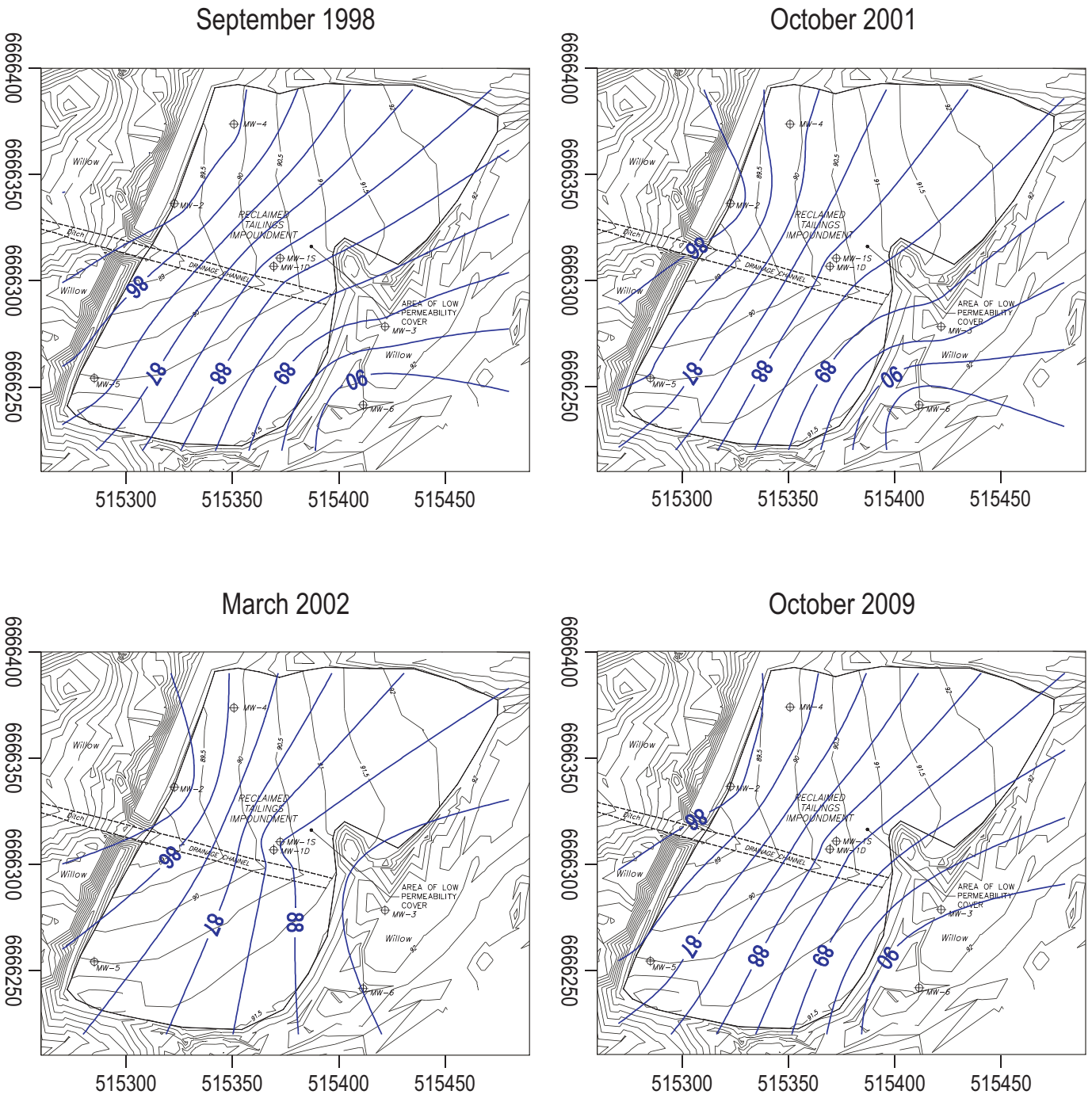
AGS MINE SITE, CARCROSS, YUKON

Groundwater Contour Map
October 2009

PROJECT NO.	DWN	CKD	REV
W23101230 / PE92501028	SK	RMM	0
OFFICE: EBA-WHSE	DATE: March 2010		

Figure 4



LEGEND

88 Groundwater elevation (m relative to site benchmark)

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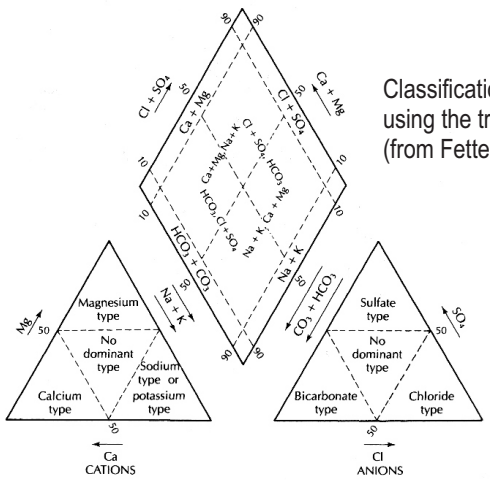
TAILINGS COVER ASSESSMENT AGS MINE SITE, CARCROSS, YUKON

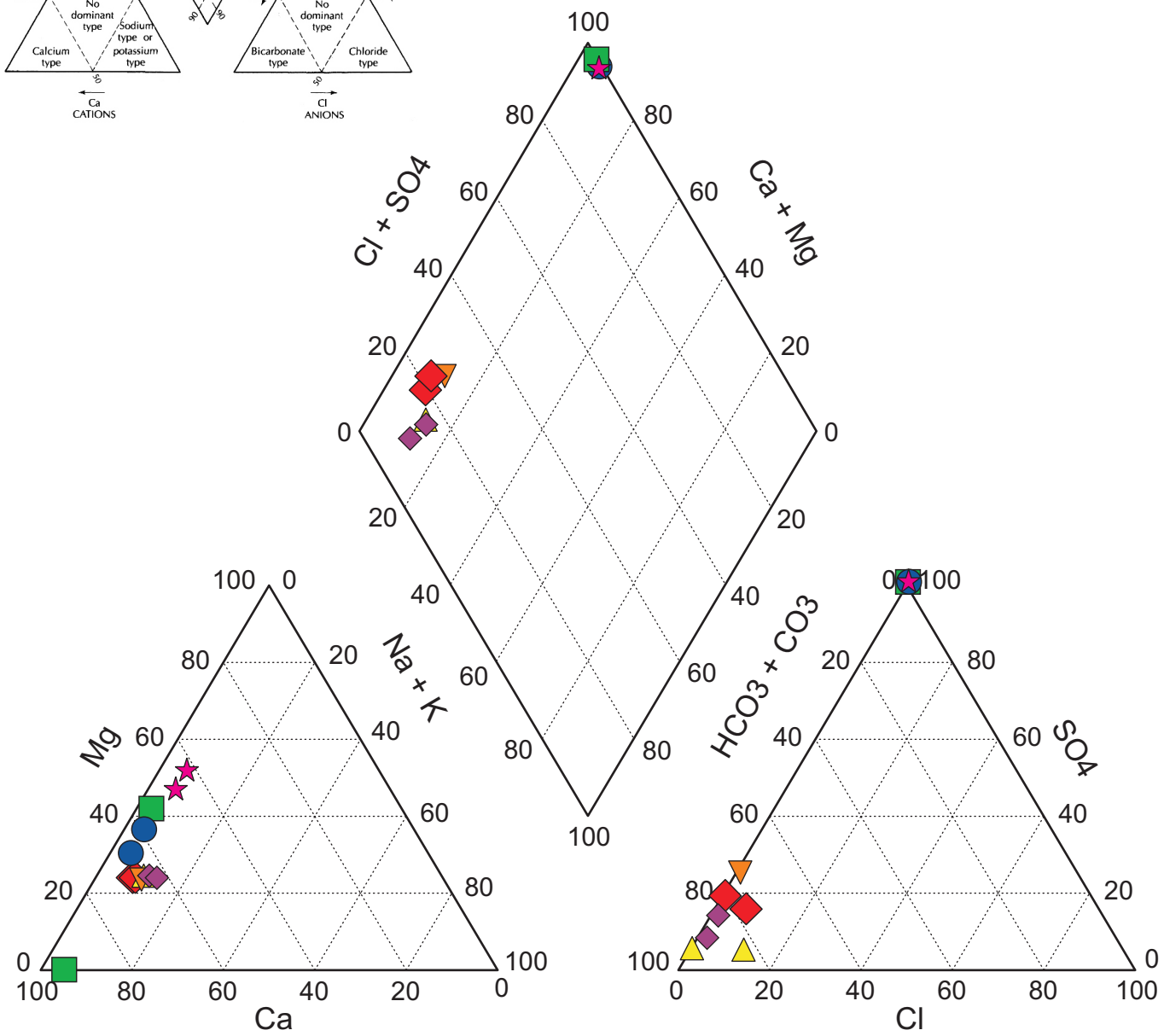
Groundwater Contour Map Multiple Dates

PROJECT NO.	DWN	CKD	REV
W23101230 / PE92501028	SK	RMM	0
OFFICE: EBA-WHSE	DATE: March 2010		

Figure 5



Classification of hydrogeochemical water types using the trilinear Piper diagram (from Fetter, 2001)



LEGEND

- MW1D
- MW2
- MW4
- MW5
- MW6
- Lake
- Tank Creek

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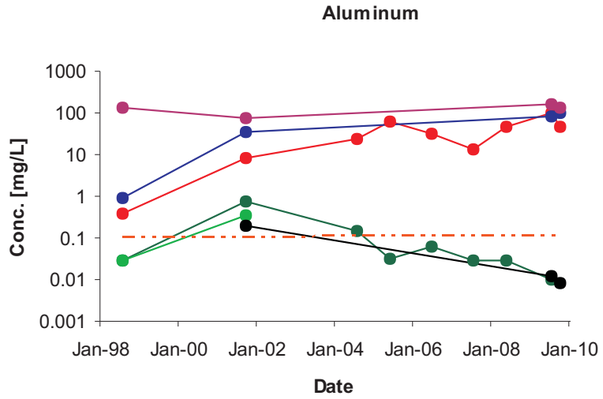
TAILINGS COVER ASSESSMENT
AGS MINE SITE, CARCROSS, YUKON

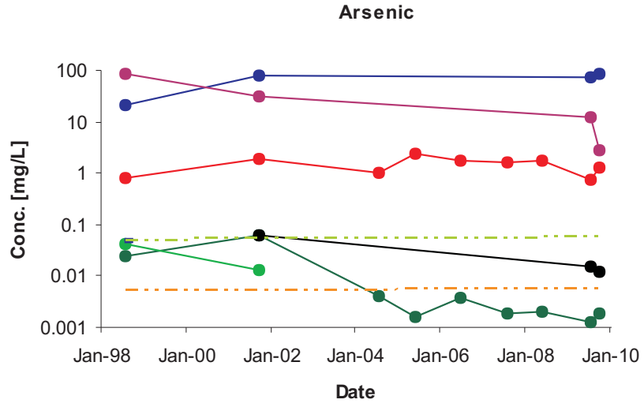
Piper Diagram

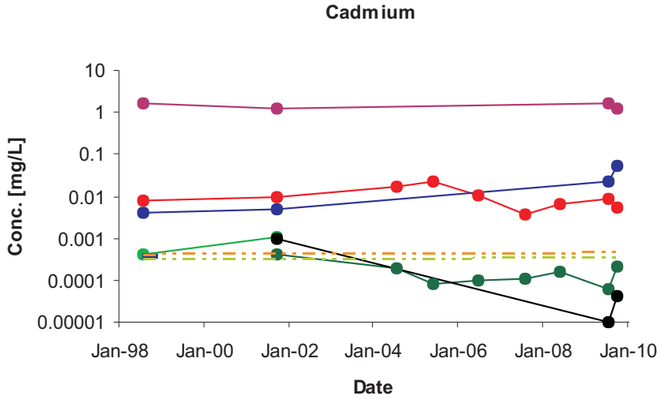
PROJECT NO.	DWN	CKD	REV
W23101230/PE92501028	SK	RMM	1

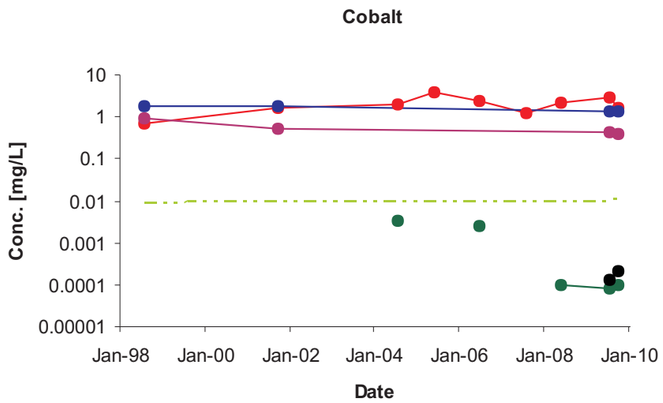
OFFICE	DATE
EBA-WHSE	June 2010

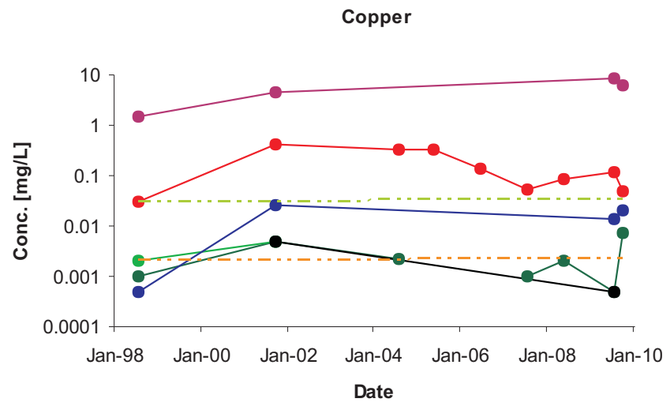
Figure 6

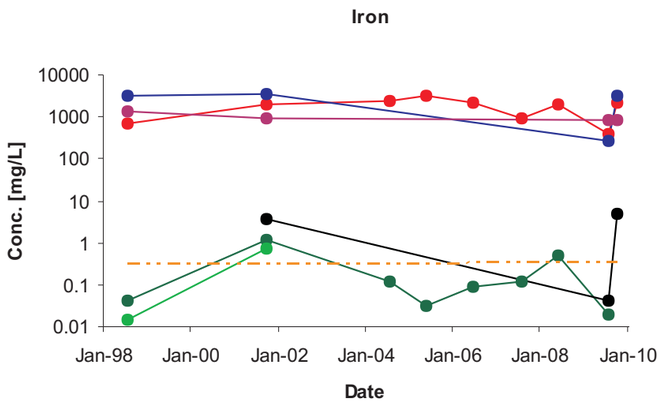


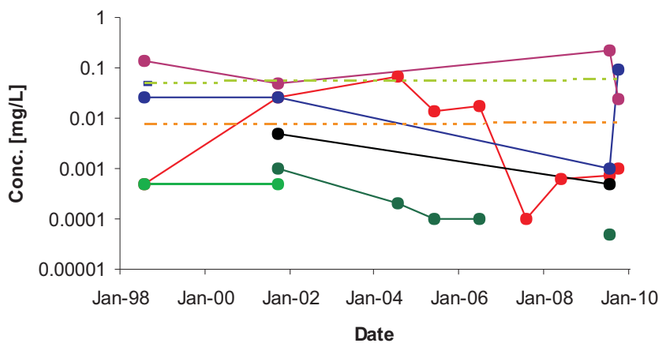


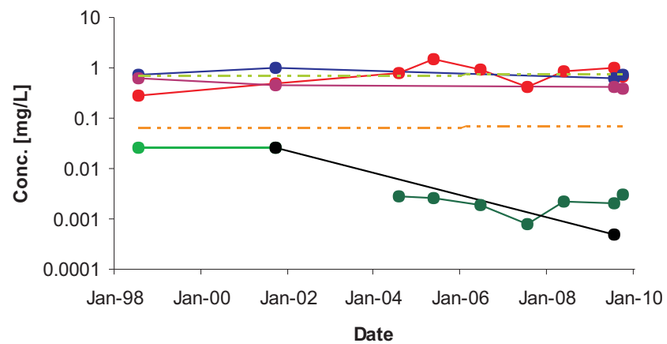


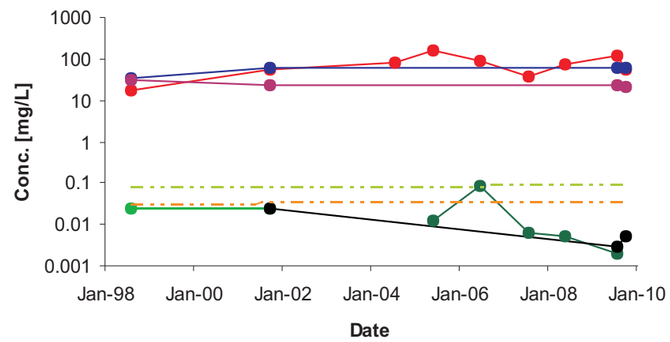












LEGEND

- MW-1D
- MW-2
- MW-3
- MW-4
- MW-5
- MW-6
- CCME Guidelines
- CSR Standards

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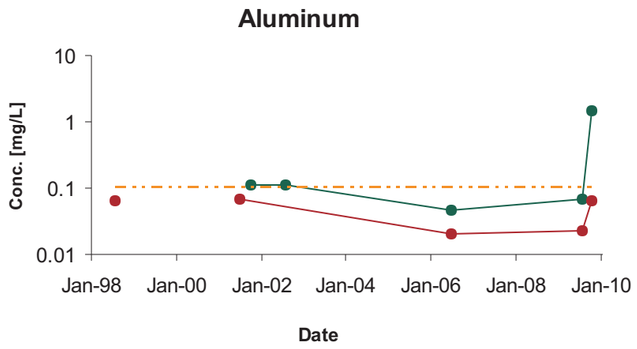
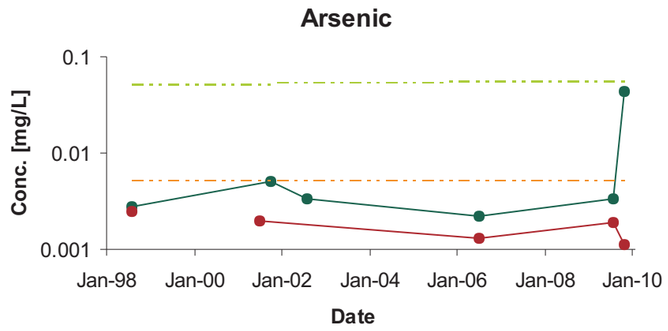
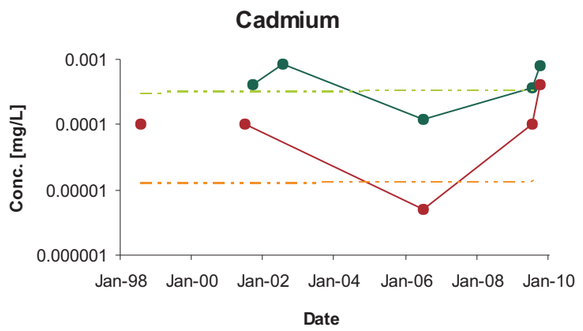
Dissolved Metals Concentrations Groundwater

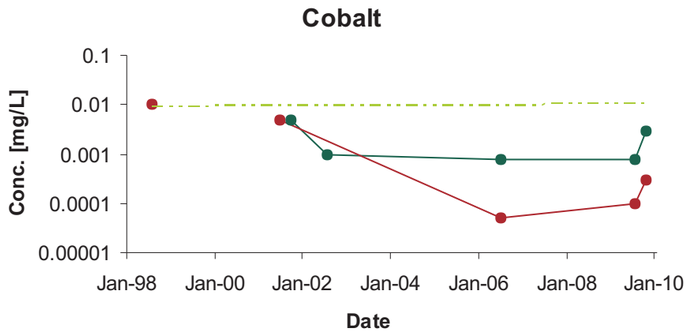
PROJECT NO.	DWN	CKD	REV
W23101230 / PE92501028	SK	RMM	1
OFFICE: EBA-WHSE	DATE: June 2010		

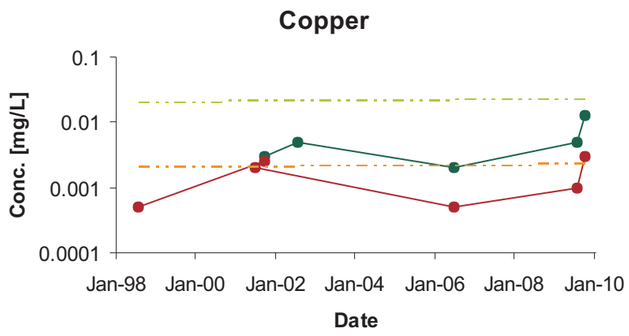
Figure 7

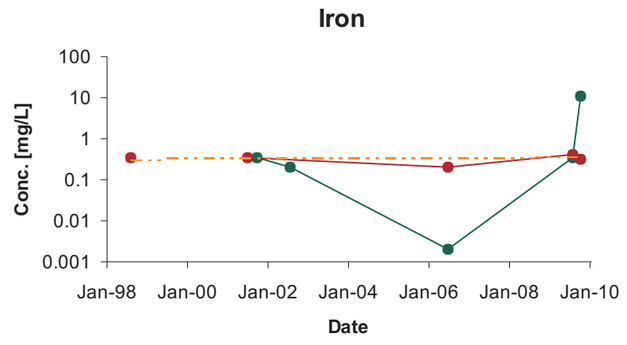


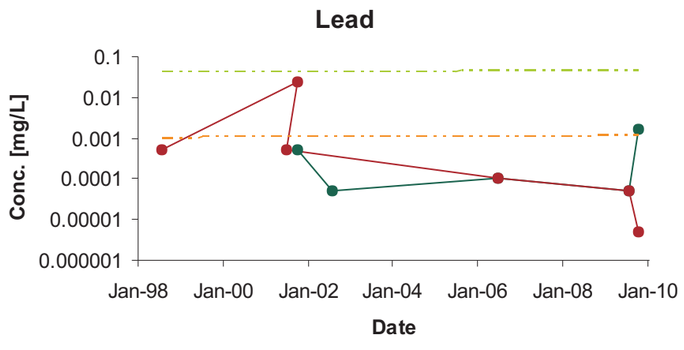


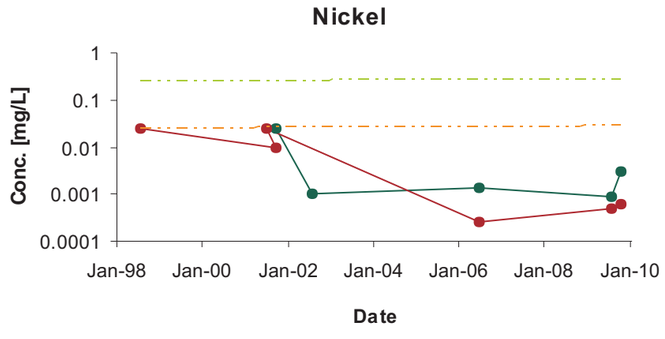


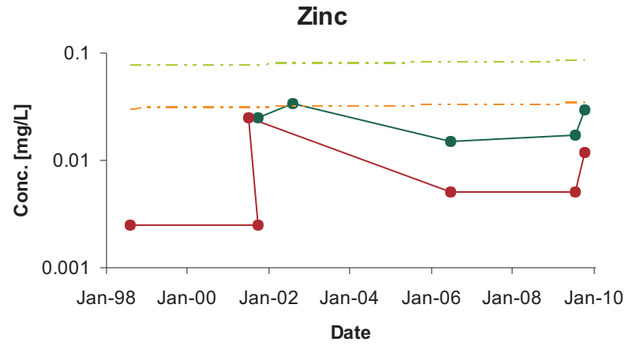












LEGEND

- Lake
- Tank Creek
- CCME
- CSR

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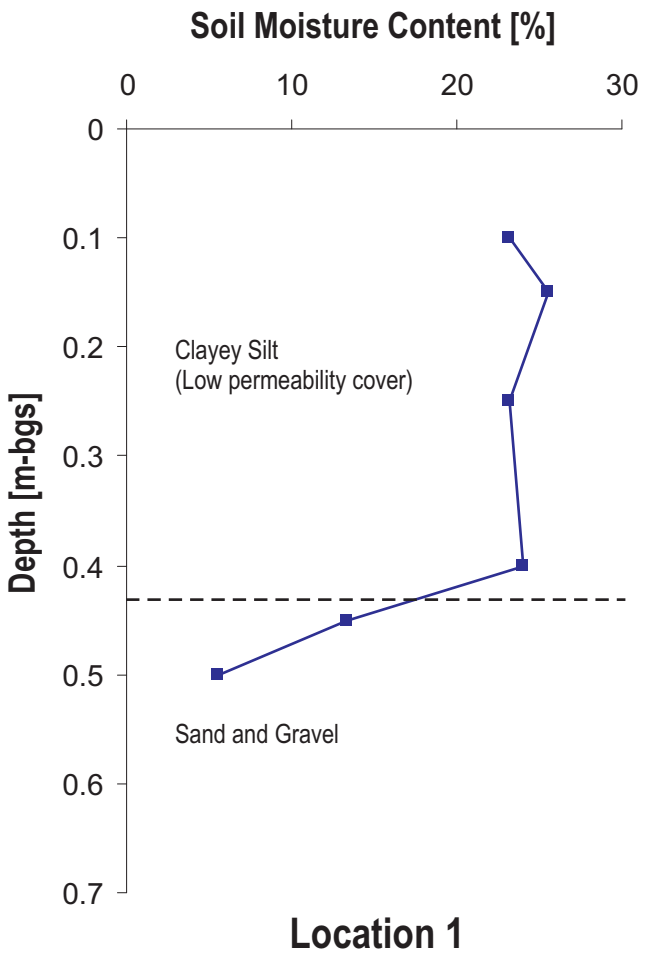
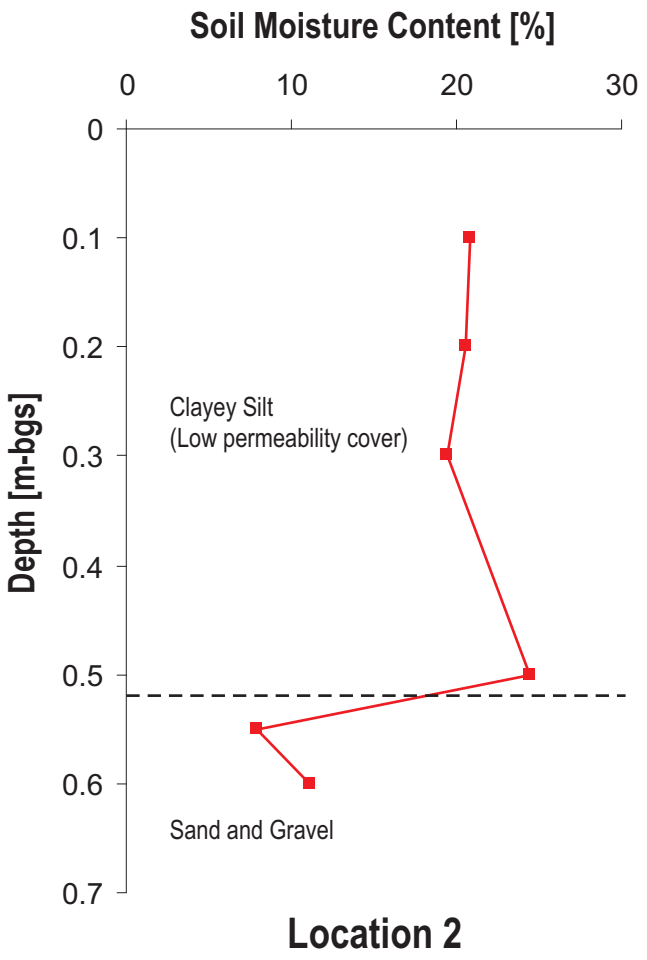
TAILINGS COVER ASSESSMENT
AGS MINE SITE, CARCROSS, YUKON

Total Metals Concentrations
Surface Water

PROJECT NO.	DWN	CKD	REV
W23101230 / PE92501028	SK	RMM	1
OFFICE	DATE		
EBA-WHSE	June 2010		

Figure 8





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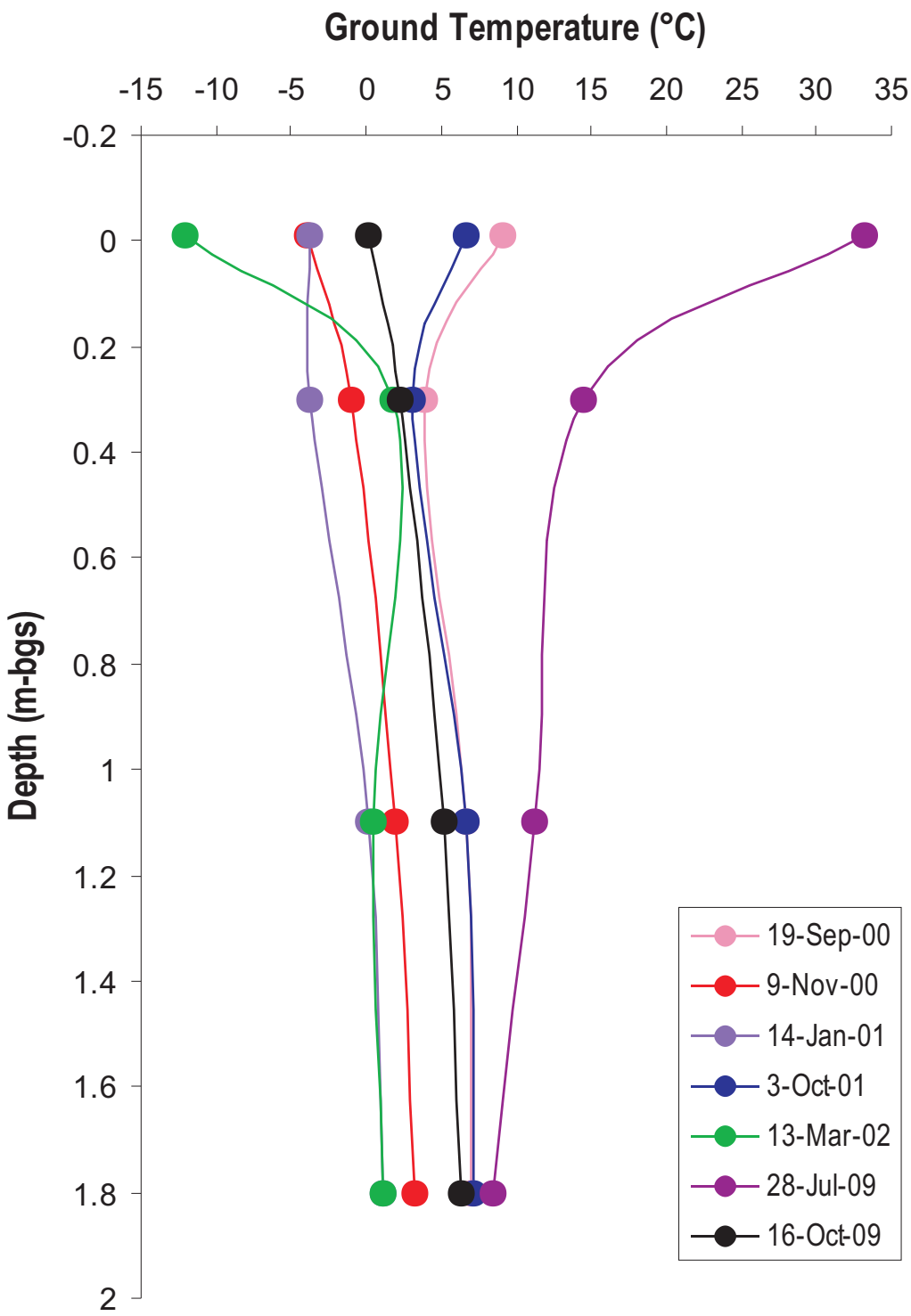
AGS MINE SITE, CARCROSS, YUKON

Soil Moisture Profiles

PROJECT NO.	DWN	CKD	REV
W23101230 / PE92501028	SK	RMM	1

OFFICE	DATE
EBA-WHSE	March 2010

Figure 9



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TAILINGS COVER ASSESSMENT
AGS MINE SITE, CARCROSS, YUKON

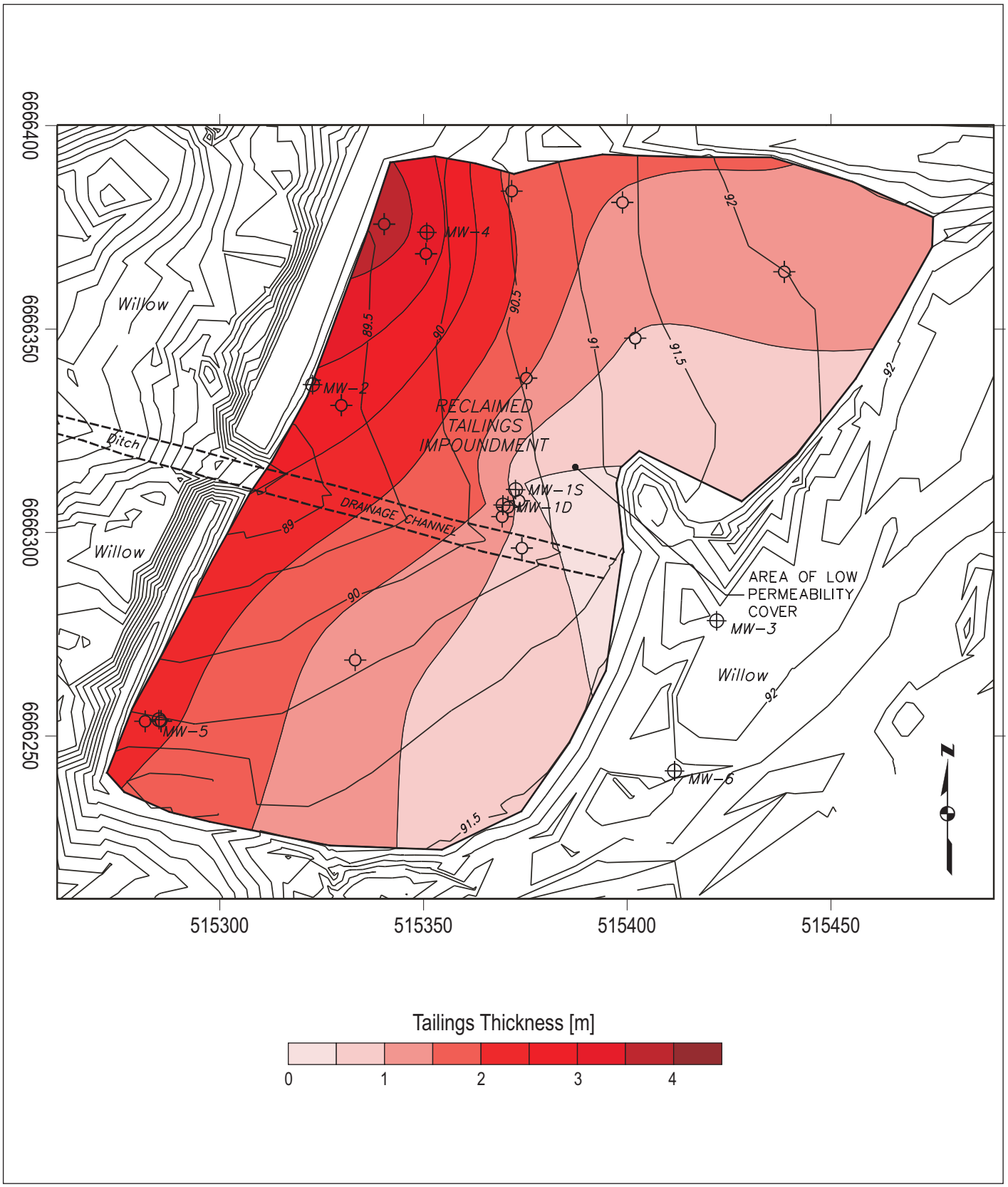
Ground Temperature

PROJECT NO.	DWN	CKD	REV
W23101230 / PE92501028	SK	RMM	0

OFFICE: EBA-WHSE

DATE: March 2010

Figure 10



LEGEND

Borehole with tailings thickness data

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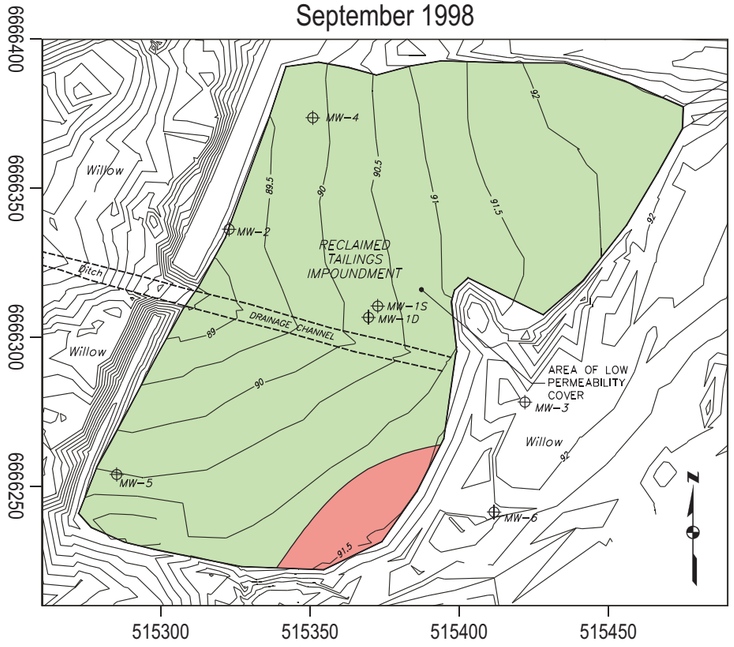
Tailings Thickness

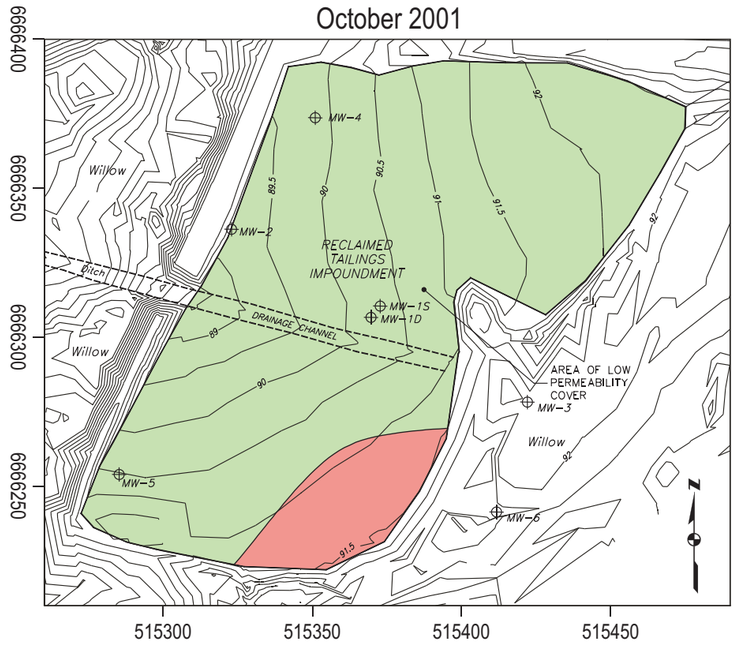
PROJECT NO.	DWN	CKD	REV
W23101230 / PE92501028	SK	RMM	0

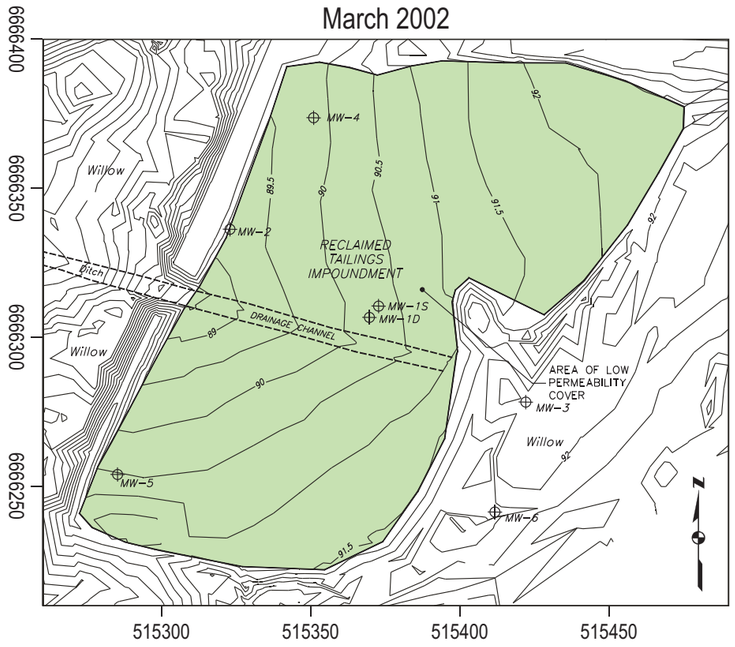
OFFICE: EBA-WHSE

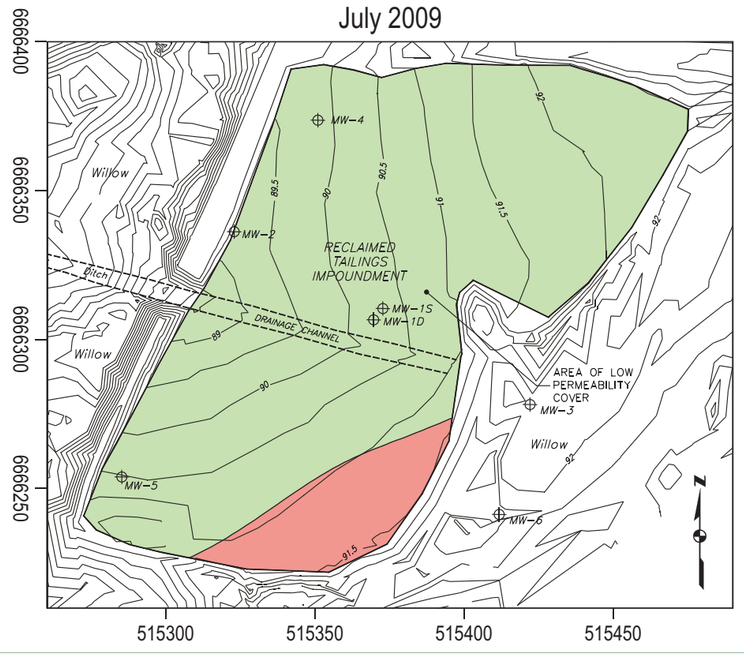
DATE: March 2010

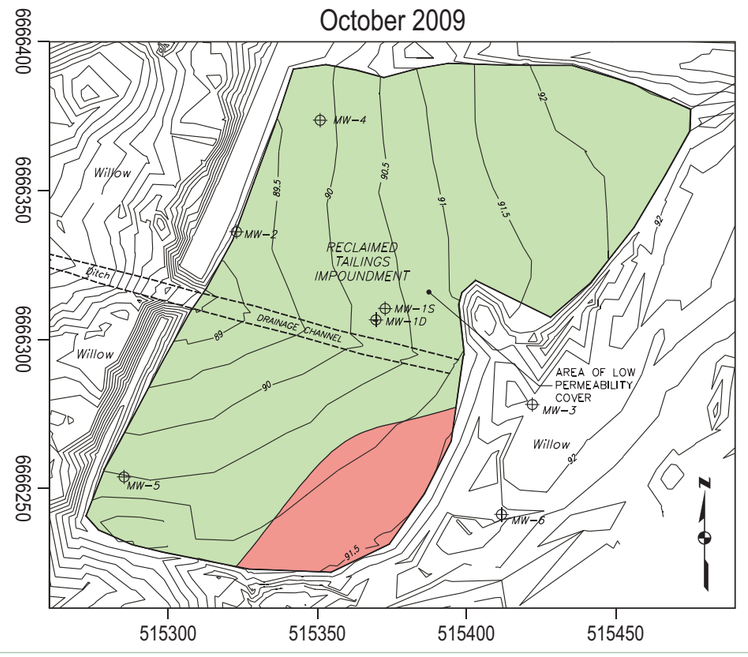
Figure 11











LEGEND

- Groundwater table below base of tailings (unsaturated)
- Groundwater table within tailings (saturated)

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TAILINGS COVER ASSESSMENT
AGS MINE SITE, CARCROSS, YUKON

Unsaturated / Saturated Tailings

EBA Engineering Consultants Ltd.

PROJECT NO.	DWN	CKD	REV
W23101230 / PE92501028	SK	RMM	1
OFFICE	DATE		
EBA-WHSE	March 2010		

Figure 12

APPENDIX A

APPENDIX A EBA'S GENERAL CONDITIONS

GEO-ENVIRONMENTAL REPORT – GENERAL CONDITIONS

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.

This report and the assessments and recommendations contained in it are intended for the sole use of EBA's client. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than EBA's Client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by EBA shall be deemed to be the original for the Project.

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.

3.0 NOTIFICATION OF AUTHORITIES

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

During the performance of the work and the preparation of the report, EBA may rely on information provided by persons other than the Client. While EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

APPENDIX B

APPENDIX B LABORATORY ANALYTICAL REPORTS

Exova
#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

T: +1 (604) 514-3322
F: +1 (604) 514-3323
E: NWL-Surrey@exova.com
W: www.exova.com

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Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS-MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**695526**
Approval Status:	Approved
Invoice Frequency:	by Lot
COD Status:	
Control Number:	
Date Received:	Jul 31, 2009
Date Reported:	Aug 11, 2009
Report Number:	1239335

Contact & Affiliation	Address	Delivery Commitments
Stephan Klump EBA Engineering - Edmonton	Unit 6, 151 Industrial Road, Calcite Business Whitehorse, Yukon Territory Y1A 2V3 Phone: (867) 668-2071 Fax: (867) 668-4349 Email: sklump@eba.ca	On [Lot Verification] send (COA) by Email - Single Report On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Report Approval] send (Test Report) by Email - Single Report On [Lot Approval and Final Test Report Approval] send (COC, Test Report, Invoice) by Post M

Notes To Clients:

- Some Trace total metal results were less than dissolved metal results for samples 695526-6&7. The results were verified and are within expected measurement uncertainty.

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Sample Custody

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS-MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**695526**
Control Number:	
Date Received:	Jul 31, 2009
Date Reported:	Aug 11, 2009
Report Number:	1239335

Sample Disposal Date: November 09, 2009

All samples will be stored until this date unless other instructions are received. Please indicate other requirements below and return this form to the address or fax number on the top of this page.

☐ Extend Sample Storage Until _____ (MM/DD/YY)

The following charges apply to extended sample storage:

Storage for an additional 30 days	$ 2.50 per sample
Storage for an additional 60 days	$ 5.00 per sample
Storage for an additional 90 days	$ 7.50 per sample

☐ Return Sample, collect, to the address below via:

- ☐ Greyhound
- ☐ DHL
- ☐ Purolator
- ☐ Other (specify) _____

Name _____
Company _____
Address _____
_____
Phone _____
Fax _____

Signature _____

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Analytical Report

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS-MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**695526**
Control Number:	
Date Received:	Jul 31, 2009
Date Reported:	Aug 11, 2009
Report Number:	1239335

Reference Number	695526-1	695526-2	695526-3
Sample Date	Jul 28, 2009	Jul 28, 2009	Jul 28, 2009
Sample Time	NA	NA	NA
Sample Location	AGS	AGS	AGS
Sample Description	MW6 (not filtered)	MW1D	MW4
Matrix	Water	Water	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Dissolved						
Mercury	Total Dissolved	ug/L	<0.01	<0.01	0.02	0.01
Aluminum	Dissolved	mg/L	0.012	0.010	81.80	0.005
Antimony	Dissolved	mg/L	0.0018	<0.0002	0.0025	0.0002
Arsenic	Dissolved	mg/L	0.0149	0.0013	74.4	0.0002
Barium	Dissolved	mg/L	0.072	0.032	0.018	0.001
Beryllium	Dissolved	mg/L	<0.00004	<0.00004	0.00598	0.00004
Bismuth	Dissolved	mg/L	<0.001	<0.001	<0.001	0.001
Boron	Dissolved	mg/L	0.005	0.007	0.017	0.004
Cadmium	Dissolved	mg/L	0.00001	0.00006	0.02200	0.00001
Chromium	Dissolved	mg/L	<0.0004	0.0007	0.0043	0.0004
Cobalt	Dissolved	mg/L	0.00013	0.00008	1.320	0.00002
Copper	Dissolved	mg/L	<0.001	<0.001	0.014	0.001
Iron	Dissolved	mg/L	0.04	0.02		0.01
Lead	Dissolved	mg/L	0.0005	<0.0001	0.0010	0.0001
Lithium	Dissolved	mg/L	0.003	0.004	0.081	0.001
Manganese	Dissolved	mg/L	0.6370	0.3260	62.80	0.0002
Molybdenum	Dissolved	mg/L	0.0041	0.0011	0.0005	0.0001
Nickel	Dissolved	mg/L	<0.001	0.002	0.644	0.001
Selenium	Dissolved	mg/L	<0.0006	<0.0006	<0.0006	0.0006
Silver	Dissolved	mg/L	<0.00001	<0.00001	0.00339	0.00001
Strontium	Dissolved	mg/L	0.116	0.201	1.200	0.001
Sulfur	Dissolved	mg/L	1.0	8.1	1980	0.2
Thallium	Dissolved	mg/L	<0.00001	<0.00001	0.00003	0.00001
Thorium	Dissolved	mg/L	<0.0004	<0.0004	0.0007	0.0004
Tin	Dissolved	mg/L	<0.0001	<0.0001	<0.0001	0.0001
Titanium	Dissolved	mg/L	<0.0004	<0.0004	0.0016	0.0004
Uranium	Dissolved	mg/L	0.0012	0.001	0.0004	0.0004
Vanadium	Dissolved	mg/L	0.0015	0.0005	0.0114	0.0001
Zinc	Dissolved	mg/L	0.003	0.002	58.4	0.001
Zirconium	Dissolved	mg/L	0.0005	<0.0001	0.0008	0.0001
Routine Water						
pH	@ 25 °C		6.88	7.50	3.85	
Electrical Conductivity		µS/cm at 25 C	172	292	6710	1
Calcium	Dissolved	mg/L	21.6	41.7	357	0.1
Iron	Dissolved	mg/L			266	0.005
Magnesium	Dissolved	mg/L	4.6	8.8	101	0.1

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Analytical Report

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS-MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**695526**
Control Number:	
Date Received:	Jul 31, 2009
Date Reported:	Aug 11, 2009
Report Number:	1239335

Reference Number		695526-1	695526-2	695526-3
Sample Date		Jul 28, 2009	Jul 28, 2009	Jul 28, 2009
Sample Time		NA	NA	NA
Sample Location		AGS	AGS	AGS
Sample Description		MW6 (not filtered)	MW1D	MW4
Matrix		Water	Water	Water

Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Routine Water - Continued						
Phosphorus	Dissolved	mg/L	<0.01	<0.01	<0.1	0.01
Potassium	Dissolved	mg/L	1.8	2.0	19.5	0.1
Silicon	Dissolved	mg/L	7.01	8.47	14.1	0.05
Sodium	Dissolved	mg/L	3.8	4.3	17.6	0.1
Bicarbonate		mg/L	100	150	<5	5
Carbonate		mg/L	<6	<6	<6	6
Hydroxide		mg/L	<5	<5	<5	5
P-Alkalinity	as CaCO3	mg/L	<5	<5	<5	5
T-Alkalinity	as CaCO3	mg/L	86	126	<5	5
Chloride	Dissolved	mg/L	8.5	7.4	<0.2	0.02
Nitrate - N	Dissolved	mg/L	0.91	<0.1	<0.1	0.01
Nitrite - N	Dissolved	mg/L	<0.1	<0.1	2.51	0.01
Sulfate (SO4)	Dissolved	mg/L	3.1	24	5940	0.6
Hardness	as CaCO3	mg/L	73	140	1310	5
Total Dissolved Solids	Dissolved	mg/L	120	190	6440	1
Ionic Balance	Dissolved	%	97	107	133	

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Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS-MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**695526**
Control Number:	
Date Received:	Jul 31, 2009
Date Reported:	Aug 11, 2009
Report Number:	1239335

Reference Number	695526-4	695526-5
Sample Date	Jul 28, 2009	Jul 28, 2009
Sample Time	NA	NA
Sample Location	AGS	AGS
Sample Description	MW2	MW5
Matrix	Water	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Dissolved						
Mercury	Total Dissolved	ug/L	0.01	0.07		0.01
Aluminum	Dissolved	mg/L	101.0	165.0		0.005
Antimony	Dissolved	mg/L	0.0012	0.0755		0.0002
Arsenic	Dissolved	mg/L	0.743	12.00		0.0002
Barium	Dissolved	mg/L	0.002	0.007		0.001
Beryllium	Dissolved	mg/L	0.00288	0.0104		0.00004
Bismuth	Dissolved	mg/L	<0.001	0.006		0.001
Boron	Dissolved	mg/L	0.008	0.004		0.004
Cadmium	Dissolved	mg/L	0.00886	1.560		0.00001
Chromium	Dissolved	mg/L	0.0272	0.0644		0.0004
Cobalt	Dissolved	mg/L	2.960	0.4400		0.00002
Copper	Dissolved	mg/L	0.117	8.42		0.001
Lead	Dissolved	mg/L	0.0007	0.213		0.0001
Lithium	Dissolved	mg/L	0.028	0.138		0.001
Manganese	Dissolved	mg/L	83.00	13.90		0.0002
Molybdenum	Dissolved	mg/L	0.0002	0.0120		0.0001
Nickel	Dissolved	mg/L	1.010	0.407		0.001
Selenium	Dissolved	mg/L	<0.0006	<0.0006		0.0006
Silver	Dissolved	mg/L	<0.00001	0.00168		0.00001
Strontium	Dissolved	mg/L	1.350	0.425		0.001
Sulfur	Dissolved	mg/L	2780	1120		0.2
Thallium	Dissolved	mg/L	<0.00001	0.00039		0.00001
Thorium	Dissolved	mg/L	0.0057	0.0089		0.0004
Tin	Dissolved	mg/L	<0.0001	<0.0001		0.0001
Titanium	Dissolved	mg/L	0.0025	0.0084		0.0004
Uranium	Dissolved	mg/L	0.0045	0.0231		0.0004
Vanadium	Dissolved	mg/L	0.0662	0.1110		0.0001
Zinc	Dissolved	mg/L	115.0	24.00		0.001
Zirconium	Dissolved	mg/L	0.0011	0.0003		0.0001

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Analytical Report

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS-MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID: **695526**
Control Number:
Date Received: Jul 31, 2009
Date Reported: Aug 11, 2009
Report Number: 1239335

	Reference Number	695526-4	695526-5	695526-6	
	Sample Date	Jul 28, 2009	Jul 28, 2009	Jul 28, 2009	
	Sample Time	NA	NA	NA	
	Sample Location	AGS	AGS	AGS	
	Sample Description	MW2	MW5	Lake	
	Matrix	Water	Water	Water	
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Routine Water						
pH					7.35	
Temperature of observed pH		°C			21.1	
Electrical Conductivity		µS/cm at 25 C			91	1
Calcium	Dissolved	mg/L			11.7	0.2
Magnesium	Dissolved	mg/L			2.6	0.2
Sodium	Dissolved	mg/L			1.8	0.4
Potassium	Dissolved	mg/L			<0.4	0.4
Iron	Dissolved	mg/L			0.08	0.01
Manganese	Dissolved	mg/L			0.085	0.005
Chloride	Dissolved	mg/L			0.5	0.4
Nitrate - N		mg/L			0.01	0.01
Nitrite - N		mg/L			<0.005	0.005
Nitrate and Nitrite - N		mg/L			<0.01	0.01
Sulfate (SO4)	Dissolved	mg/L			8.4	0.9
Hydroxide		mg/L			<5	5
Carbonate		mg/L			<6	6
Bicarbonate		mg/L			45	5
P-Alkalinity	as CaCO3	mg/L			<5	5
T-Alkalinity	as CaCO3	mg/L			37	5
Total Dissolved Solids	Calculated	mg/L			47	1
Hardness	Dissolved as CaCO3	mg/L			40	
Ionic Balance	Dissolved	%			94	
pH	@ 25 °C		3.08	2.72		
Electrical Conductivity		µS/cm at 25 C	8430	3910		1
Calcium	Dissolved	mg/L	402	127		0.1
Iron	Dissolved	mg/L	374	852		0.005
Magnesium	Dissolved	mg/L	184	76		0.1
Phosphorus	Dissolved	mg/L	<0.10	0.39		0.01
Potassium	Dissolved	mg/L	9.5	12		0.1
Silicon	Dissolved	mg/L	25.2			0.05
Sodium	Dissolved	mg/L	21.9	12		0.1
Bicarbonate		mg/L	<5	<5		5
Carbonate		mg/L	<6	<6		6
Hydroxide		mg/L	<5	<5		5
P-Alkalinity	as CaCO3	mg/L	<5	<5		5
T-Alkalinity	as CaCO3	mg/L	<5	<5		5

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Analytical Report

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Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS-MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**695526**
Control Number:	
Date Received:	Jul 31, 2009
Date Reported:	Aug 11, 2009
Report Number:	1239335

		Reference Number	695526-4	695526-5	695526-6	
		Sample Date	Jul 28, 2009	Jul 28, 2009	Jul 28, 2009	
		Sample Time	NA	NA	NA	
		Sample Location	AGS	AGS	AGS	
		Sample Description	MW2	MW5	Lake	
		Matrix	Water	Water	Water	
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Routine Water - Continued						
Chloride	Dissolved	mg/L	0.2	0.8		0.02
Nitrate - N	Dissolved	mg/L	<0.1	<0.1		0.01
Nitrite - N	Dissolved	mg/L	1.64	1.68		0.01
Sulfate (SO4)	Dissolved	mg/L	8330	3340		0.6
Hardness	as CaCO3	mg/L	1760	630		5
Total Dissolved Solids	Dissolved	mg/L	8950	3580		1
Ionic Balance	Dissolved	%	100	86		

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Analytical Report

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Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS-MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**695526**
Control Number:	
Date Received:	Jul 31, 2009
Date Reported:	Aug 11, 2009
Report Number:	1239335

Reference Number	695526-6	695526-7
Sample Date	Jul 28, 2009	Jul 28, 2009
Sample Time	NA	NA
Sample Location	AGS	AGS
Sample Description	Lake	Creek
Matrix	Water	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total						
Calcium	Total	mg/L	11.3	9.5		0.2
Iron	Total	mg/L	0.36	0.40		0.05
Magnesium	Total	mg/L	2.5	2.0		0.1
Manganese	Total	mg/L	0.124	0.025		0.005
Potassium	Total	mg/L	<0.4	<0.4		0.4
Silicon	Total	mg/L	3.19	3.18		0.05
Sodium	Total	mg/L	2.5	2.3		0.4
Sulfur	Total	mg/L	3.0	0.9		0.3
Mercury	Total	mg/L	<0.0001	<0.0001		0.0001
Aluminum	Total	mg/L	0.067	0.023		0.005
Antimony	Total	mg/L	<0.0002	<0.0002		0.0002
Arsenic	Total	mg/L	0.0033	0.0019		0.0002
Barium	Total	mg/L	0.008	0.007		0.001
Beryllium	Total	mg/L	<0.0001	<0.0001		0.0001
Bismuth	Total	mg/L	<0.0005	<0.0005		0.0005
Boron	Total	mg/L	0.005	0.004		0.002
Cadmium	Total	mg/L	0.00036	0.00010		0.00001
Chromium	Total	mg/L	<0.0005	<0.0005		0.0005
Cobalt	Total	mg/L	0.0008	0.0001		0.0001
Copper	Total	mg/L	0.005	0.001		0.001
Lead	Total	mg/L	<0.0001	<0.0001		0.0001
Lithium	Total	mg/L	<0.001	<0.001		0.001
Molybdenum	Total	mg/L	<0.001	0.001		0.001
Nickel	Total	mg/L	0.0009	<0.0005		0.0005
Selenium	Total	mg/L	<0.0002	<0.0002		0.0002
Silver	Total	mg/L	<0.00001	<0.00001		0.00001
Strontium	Total	mg/L	0.053	0.045		0.001
Thallium	Total	mg/L	<0.00005	<0.00005		0.00005
Tin	Total	mg/L	<0.001	<0.001		0.001
Titanium	Total	mg/L	0.0013	0.0006		0.0005
Uranium	Total	mg/L	<0.0005	<0.0005		0.0005
Vanadium	Total	mg/L	0.0002	0.0002		0.0001
Zinc	Total	mg/L	0.017	0.005		0.001

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Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS-MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**695526**
Control Number:	
Date Received:	Jul 31, 2009
Date Reported:	Aug 11, 2009
Report Number:	1239335

Reference Number	695526-7
Sample Date	Jul 28, 2009
Sample Time	NA
Sample Location	AGS
Sample Description	Creek
Matrix	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Routine Water						
pH			7.39			
Temperature of observed pH		°C	20.6			
Electrical Conductivity		µS/cm at 25 C	70			1
Calcium	Dissolved	mg/L	9.1			0.2
Magnesium	Dissolved	mg/L	2.1			0.2
Sodium	Dissolved	mg/L	1.7			0.4
Potassium	Dissolved	mg/L	<0.4			0.4
Iron	Dissolved	mg/L	0.08			0.01
Manganese	Dissolved	mg/L	<0.005			0.005
Chloride	Dissolved	mg/L	0.5			0.4
Nitrate - N		mg/L	<0.01			0.01
Nitrite - N		mg/L	<0.005			0.005
Nitrate and Nitrite - N		mg/L	<0.01			0.01
Sulfate (SO4)	Dissolved	mg/L	3			0.9
Hydroxide		mg/L	<5			5
Carbonate		mg/L	<6			6
Bicarbonate		mg/L	42			5
P-Alkalinity	as CaCO3	mg/L	<5			5
T-Alkalinity	as CaCO3	mg/L	34			5
Total Dissolved Solids	Calculated	mg/L	37			1
Hardness	Dissolved as CaCO3	mg/L	31			
Ionic Balance	Dissolved	%	93			

Approved by:

Andrew Garrard, BSc
General Manager

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#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

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Methodology and Notes

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS-MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**695526**
Control Number:	
Date Received:	Jul 31, 2009
Date Reported:	Aug 11, 2009
Report Number:	1239335

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Alk, pH, EC, Turb in water	APHA	*	Conductivity, 2510	04-Aug-09	Exova Surrey
Alk, pH, EC, Turb in water	APHA	*	Electrometric Method, 4500-H+ B	04-Aug-09	Exova Surrey
Alk, pH, EC, Turb in water	APHA	*	Titration Method, 2320 B	04-Aug-09	Exova Surrey
Alkalinity, pH, and EC in water	APHA	*	Conductivity, 2510	05-Aug-09	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	*	Electrometric Method, 4500-H+ B	05-Aug-09	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	*	Titration Method, 2320 B	05-Aug-09	Exova Edmonton
Anions (Routine) by Ion Chromatography	APHA	*	Ion Chromatography with Chemical Suppression of Eluent Cond., 4110 B	05-Aug-09	Exova Edmonton
Anions by IEC in water (Surrey)	APHA	*	Ion Chromatography with Chemical Suppression of Eluent Cond., 4110 B	05-Aug-09	Exova Surrey
Approval-Edmonton	APHA		Checking Correctness of Analyses, 1030 E	05-Aug-09	Exova Edmonton
Chloride in Water	APHA	*	Automated Ferricyanide Method, 4500-Cl- E	05-Aug-09	Exova Edmonton
Mercury (Total) in water	US EPA	*	Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5	06-Aug-09	Exova Edmonton
Mercury Low Level (Total) in water	EPA	*	Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7	05-Aug-09	Exova Surrey
Metals ICP-MS (Total) in water	US EPA	*	Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	05-Aug-09	Exova Edmonton
Metals SemiTrace (Dissolved) in water	US EPA	*	Metals & Trace Elements by ICP-AES, 6010B	05-Aug-09	Exova Surrey
Metals SemiTrace (Dissolved) in water	US EPA	*	Metals & Trace Elements by ICP-AES, 6010B	10-Aug-09	Exova Surrey
Metals Trace (Dissolved) in water	APHA		Hardness by Calculation, 2340 B	05-Aug-09	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	*	Inductively Coupled Plasma (ICP) Method, 3120 B	05-Aug-09	Exova Edmonton
Metals Trace (Total) in water	APHA	*	Inductively Coupled Plasma (ICP) Method, 3120 B	05-Aug-09	Exova Edmonton
Trace Metals (dissolved) in Water	US EPA	*	Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	05-Aug-09	Exova Surrey
Trace Metals (dissolved) in Water	US EPA	*	Metals & Trace Elements by ICP-AES, 6010B	05-Aug-09	Exova Surrey

** Laboratory method(s) based on reference method*

References

US EPA	US Environmental Protection Agency Test Methods
APHA	Standard Methods for the Examination of Water and Wastewater
EPA	Environmental Protection Agency Test Methods - US

Exova
#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

T: +1 (604) 514-3322
F: +1 (604) 514-3323
E: NWL-Surrey@exova.com
W: www.exova.com

Methodology and Notes

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS-MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**695526**
Control Number:	
Date Received:	Jul 31, 2009
Date Reported:	Aug 11, 2009
Report Number:	1239335

Comments:

- Some Trace total metal results were less than dissolved metal results for samples 695526-6&7. The results were verified and are within expected measurement uncertainty.

Bodycote TESTING GROUP

LOT: 695526 Control Number

Environmental Sample Information Sheet

Note: Proper completion of this form is required in order to proceed with analysis

See reverse for your nearest Bodycote location and proper sampling protocol

Billing Address:			**Copy of Report To:**		Copy of invoice:
Company:	EBA Engineering Consulting Ltd.		Company:	EBA Engineering Consulting Ltd.	Mail invoice to this address for approval ☐
Address:	Unit 6, 151 Industrial Rd Whitehorse, YT Y1A 2V3	QA/QC Report [x]	Address:	Unit 6, 151 Industrial Rd Whitehorse, YT Y1A 2V3	
Attention:	Stephan Klump	Report Result: Fax [ ]	Attention:		Fax [ ]
Phone:	867-668-3068	Mail [x]	Phone:	867-668-3068	Mail [ ]
Fax:	867-668-4349	Courier [ ]	Fax:	867-668-4349	Courier [ ]
Cell:		e-mail [x]	Cell:		e-mail [ ]
e-mail:	sklump@eba.ca	e-Service [ ]	e-mail:		e-Service [ ]

Information to be included on Report and Invoice

Project ID: W23101230
Project Name: AGS - MPERG
Project Location: Yukon
Legal Location:
PO#:
Proj. Acct. Code:
Agreement ID:

RUSH Please contact the laboratory to confirm rush dates and times before submitting samples.

Upon filling out this section, client accepts that surcharges will be attached to this analysis

RUSH required on: All Analysis ☐ or As indicated ☐

Date Required: _____

Signature: _____

Bodycote Authorization: _____

Sample Custody (Please Print)

Sampled by: SK

Company EBA Signature KL

I authorize Bodycote to proceed with the work work indicated on this form:

Date: 30-Jul Initial: SK

Received by:	Sample Temp.
Waybill #:	Date
Company	Time

Special Instructions / Comments

All "Dissolved Metals" samples (125 ml) are field-filtered and preserved (HNO3), except for MW6 which has not been filtered yet. Please filter prior to analysis.
Samples "Lake" and "Creek" are surface water and should be analyzed for total metals.

FOR LAB USE ONLY

Condiftion of containers/coolers upon arrival at lab

☐ Check here if Bodycote is required to report results directly to a regulatory body (Please include contact information)

☐ Check here if you are testing POTABLE WATER for **HUMAN CONSUMPTION**

Please indicate which regulations you are required to meet:

	Sample Identification	Location	Depth IN CM M	Date/Time Sampled	Matrix	Sampling Method	Number of Containers	Enter tests above (✓ relevant samples below) TW33F	TW33	TW35
1	MW6 (not filtered)	AGS		28-Jul-09	Water	Grab	2		☒	
2	MW1D	AGS		28-Jul-09	Water	Grab	2	☒		
3	MW4	AGS		28-Jul-09	Water	Grab	2	☒		
4	MW2	AGS		28-Jul-09	Water	Grab	2	☒		
5	MW5	AGS		28-Jul-09	Water	Grab	2	☒		
6	Lake	AGS		28-Jul-09	Water	Grab	2			☒
7	Creek	AGS		28-Jul-09	Water	Grab	2			☒
8										
9										
10										
11										
12										
13										
14										
15										

NOTE: All hazardous samples must be labelled according to WHIMIS guidelines.

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#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

T: +1 (604) 514-3322
F: +1 (604) 514-3323
E: Surrey@exova.com
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Report Transmission Cover Page

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS - MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**709488**
Approval Status:	Approved
Invoice Frequency:	by Lot
COD Status:	
Control Number:	
Date Received:	Oct 22, 2009
Date Reported:	Oct 29, 2009
Report Number:	1264960

Contact & Affiliation	Address	Delivery Commitments
Stephan Klump EBA Engineering - Edmonton	Unit 6, 151 Industrial Road, Calcite Business Whitehorse, Yukon Territory Y1A 2V3 Phone: (867) 668-2071 Fax: (867) 668-4349 Email: sklump@eba.ca	On [Lot Verification] send (COA) by Email - Single Report On [Report Approval] send (COC, Test Report) by Email - Merge Reports On [Report Approval] send (Test Report) by Email - Single Report On [Lot Approval and Final Test Report Approval] send (COC, Test Report, Invoice) by Post M

Notes To Clients:

- Some trace total metal results were less than dissolved metal results for samples 709488 (6 and 7). The results were verified and are within expected measurement uncertainty.
- The ion balance was outside the range 90 - 110% for sample 709488 (3, 4, 5). This may be due to iron and other metals extracted from sediment present in the sample.

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#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

T: +1 (604) 514-3322
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Sample Custody

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS - MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
Date Reported:	Oct 29, 2009
Report Number:	1264960

Sample Disposal Date: January 27, 2010

All samples will be stored until this date unless other instructions are received. Please indicate other requirements below and return this form to the address or fax number on the top of this page.

☐ Extend Sample Storage Until _____ (MM/DD/YY)

The following charges apply to extended sample storage:

Storage for an additional 30 days	$ 2.50 per sample
Storage for an additional 60 days	$ 5.00 per sample
Storage for an additional 90 days	$ 7.50 per sample

☐ Return Sample, collect, to the address below via:

- ☐ Greyhound
- ☐ DHL
- ☐ Purolator
- ☐ Other (specify) _____

Name _____
Company _____
Address _____
_____
Phone _____
Fax _____

Signature _____

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F: +1 (604) 514-3323
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Analytical Report

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS - MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
Date Reported:	Oct 29, 2009
Report Number:	1264960

Reference Number	709488-1	709488-2	709488-3
Sample Date	Oct 16, 2009	Oct 16, 2009	Oct 16, 2009
Sample Time	NA	NA	NA
Sample Location			
Sample Description	AGS / MW6	AGS / MW1D	AGS / MW4
Matrix	Water	Water	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Dissolved						
Mercury	Total Dissolved	ug/L	<0.01	<0.01	<0.01	0.01
Aluminum	Dissolved	mg/L	0.008	<0.005	104.0	0.005
Antimony	Dissolved	mg/L	<0.0002	<0.0002	0.003	0.0002
Arsenic	Dissolved	mg/L	0.0120	0.0018	86.4	0.0002
Barium	Dissolved	mg/L	0.054	0.033	0.02	0.001
Beryllium	Dissolved	mg/L	<0.00004	<0.00004	0.0106	0.00004
Bismuth	Dissolved	mg/L	<0.001	<0.001	<0.01	0.001
Boron	Dissolved	mg/L	0.006	0.008	<0.04	0.004
Cadmium	Dissolved	mg/L	0.00004	0.00021	0.05430	0.00001
Chromium	Dissolved	mg/L	0.0008	0.0004	<0.004	0.0004
Cobalt	Dissolved	mg/L	0.00021	0.00010	1.400	0.00002
Copper	Dissolved	mg/L	<0.001	0.007	0.02	0.001
Iron	Dissolved	mg/L	4.83	<0.01	3060	0.01
Lead	Dissolved	mg/L	<0.0001	<0.0001	0.089	0.0001
Lithium	Dissolved	mg/L	0.002	0.004	0.12	0.001
Manganese	Dissolved	mg/L	0.8170	0.0706	63.0	0.0002
Molybdenum	Dissolved	mg/L	0.0021	0.0008	<0.001	0.0001
Nickel	Dissolved	mg/L	<0.001	0.003	0.74	0.001
Selenium	Dissolved	mg/L	<0.0006	<0.0006	<0.006	0.0006
Silver	Dissolved	mg/L	<0.00001	<0.00001	0.00036	0.00001
Strontium	Dissolved	mg/L	0.117	0.184	1.12	0.001
Sulfur	Dissolved	mg/L	1.1	9.5	1750	0.2
Thallium	Dissolved	mg/L	<0.00001	<0.00001	<0.00010	0.00001
Thorium	Dissolved	mg/L	<0.0004	<0.0004	<0.004	0.0004
Tin	Dissolved	mg/L	<0.0001	<0.0001	<0.001	0.0001
Titanium	Dissolved	mg/L	0.0007	<0.0004	<0.004	0.0004
Uranium	Dissolved	mg/L	<0.0004	0.0010	<0.004	0.0004
Vanadium	Dissolved	mg/L	0.0013	0.0004	0.013	0.0001
Zinc	Dissolved	mg/L	0.005	0.008	61.6	0.001
Zirconium	Dissolved	mg/L	0.0002	<0.0001	0.001	0.0001
Routine Water						
pH	@ 25 °C		6.90	6.84	3.98	
Electrical Conductivity		dS/m at 25 C	0.160	0.285	11.6	0.001
Calcium	Dissolved	mg/L	22.3	41.1	365	0.1
Magnesium	Dissolved	mg/L	4.8	8.8	137	0.1
Potassium	Dissolved	mg/L	1.3	2.4	22	0.1

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V3S 8P8, Canada

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F: +1 (604) 514-3323
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Analytical Report

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS - MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
Date Reported:	Oct 29, 2009
Report Number:	1264960

		Reference Number	709488-1	709488-2	709488-3
		Sample Date	Oct 16, 2009	Oct 16, 2009	Oct 16, 2009
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	AGS / MW6	AGS / MW1D	AGS / MW4
		Matrix	Water	Water	Water
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Routine Water - Continued						
Silicon	Dissolved	mg/L	7.81	8.76	15.4	0.05
Sodium	Dissolved	mg/L	3.3	4.4	17.9	0.1
Bicarbonate		mg/L	100	150	<5	5
Carbonate		mg/L	<6	<6	<6	6
Hydroxide		mg/L	<5	<5	<5	5
P-Alkalinity	as CaCO3	mg/L	<5	<5	<5	5
T-Alkalinity	as CaCO3	mg/L	86	124	<5	5
Chloride	Dissolved	mg/L	0.22	0.50	0.3	0.02
Nitrate - N	Dissolved	mg/L	<0.01	<0.01	<0.01	0.01
Nitrite - N	Dissolved	mg/L	<0.01	0.09	1.99	0.01
Sulfate (SO4)	Dissolved	mg/L	3.4	28	5240	0.6
Hardness	as CaCO3	mg/L	75	139	1480	5
Total Dissolved Solids	Dissolved	mg/L	110	180	5830	1
Ionic Balance	Dissolved	%	130	114	181	

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Surrey, British Columbia
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Analytical Report

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS - MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
Date Reported:	Oct 29, 2009
Report Number:	1264960

Reference Number		709488-4	709488-5
Sample Date		Oct 16, 2009	Oct 16, 2009
Sample Time		NA	NA
Sample Location			
Sample Description		AGS / MW2	AGS / MW5
Matrix		Water	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Dissolved						
Mercury	Total Dissolved	ug/L	0.01	0.01		0.01
Aluminum	Dissolved	mg/L	47.60	130.0		0.005
Antimony	Dissolved	mg/L	<0.002	0.115		0.0002
Arsenic	Dissolved	mg/L	1.330	2.870		0.0002
Barium	Dissolved	mg/L	<0.01	<0.01		0.001
Beryllium	Dissolved	mg/L	0.0043	0.0144		0.00004
Bismuth	Dissolved	mg/L	<0.01	<0.01		0.001
Boron	Dissolved	mg/L	<0.04	<0.04		0.004
Cadmium	Dissolved	mg/L	0.00544	1.260		0.00001
Chromium	Dissolved	mg/L	0.012	0.025		0.0004
Cobalt	Dissolved	mg/L	1.660	0.4100		0.00002
Copper	Dissolved	mg/L	0.05	6.20		0.001
Iron	Dissolved	mg/L	2120	802		0.01
Lead	Dissolved	mg/L	0.001	0.024		0.0001
Lithium	Dissolved	mg/L	0.03	0.16		0.001
Manganese	Dissolved	mg/L	67.20	11.20		0.0002
Molybdenum	Dissolved	mg/L	<0.001	0.003		0.0001
Nickel	Dissolved	mg/L	0.67	0.39		0.001
Selenium	Dissolved	mg/L	<0.006	<0.006		0.0006
Silver	Dissolved	mg/L	<0.00010	0.00088		0.00001
Strontium	Dissolved	mg/L	1.13	0.42		0.001
Sulfur	Dissolved	mg/L	1460	739		0.2
Thallium	Dissolved	mg/L	<0.00010	<0.0001		0.00001
Thorium	Dissolved	mg/L	0.005	<0.004		0.0004
Tin	Dissolved	mg/L	<0.001	<0.001		0.0001
Titanium	Dissolved	mg/L	<0.004	0.004		0.0004
Uranium	Dissolved	mg/L	0.004	0.013		0.0004
Vanadium	Dissolved	mg/L	0.019	0.092		0.0001
Zinc	Dissolved	mg/L	56.9	20.80		0.001
Zirconium	Dissolved	mg/L	<0.001	<0.001		0.0001

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Analytical Report

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS - MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
Date Reported:	Oct 29, 2009
Report Number:	1264960

		Reference Number	709488-4	709488-5	709488-6
		Sample Date	Oct 16, 2009	Oct 16, 2009	Oct 16, 2009
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	AGS / MW2	AGS / MW5	AGS / Lake
		Matrix	Water	Water	Water
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Routine Water						
pH					7.37	
Temperature of observed pH		°C			22.5	
Electrical Conductivity		µS/cm at 25 C			107	1
Calcium	Dissolved	mg/L			13.5	0.2
Magnesium	Dissolved	mg/L			3.0	0.2
Sodium	Dissolved	mg/L			2.2	0.4
Potassium	Dissolved	mg/L			0.6	0.4
Iron	Dissolved	mg/L			6.57	0.01
Manganese	Dissolved	mg/L			0.324	0.005
Chloride	Dissolved	mg/L			<0.4	0.4
Nitrate - N		mg/L			<0.01	0.01
Nitrite - N		mg/L			<0.005	0.005
Nitrate and Nitrite - N		mg/L			<0.01	0.01
Sulfate (SO4)	Dissolved	mg/L			13	0.9
Hydroxide		mg/L			<5	5
Carbonate		mg/L			<6	6
Bicarbonate		mg/L			48	5
P-Alkalinity	as CaCO3	mg/L			<5	5
T-Alkalinity	as CaCO3	mg/L			39	5
Total Dissolved Solids	Calculated	mg/L			56	1
Hardness	Dissolved as CaCO3	mg/L			46	
Ionic Balance	Dissolved	%			97	
pH	@ 25 °C		3.27	2.97		
Electrical Conductivity		dS/m at 25 C	10.8	3.38		0.001
Calcium	Dissolved	mg/L	390	103		0.1
Magnesium	Dissolved	mg/L	<0.1	76.1		0.1
Potassium	Dissolved	mg/L	11.7	11.6		0.1
Silicon	Dissolved	mg/L	21.3	47.7		0.05
Sodium	Dissolved	mg/L	16.4	10.2		0.1
Bicarbonate		mg/L	<5	<5		5
Carbonate		mg/L	<6	<6		6
Hydroxide		mg/L	<5	<5		5
P-Alkalinity	as CaCO3	mg/L	<5	<5		5
T-Alkalinity	as CaCO3	mg/L	<5	<5		5
Chloride	Dissolved	mg/L	1.3	0.04		0.02
Nitrate - N	Dissolved	mg/L	<0.01	<0.01		0.01

Exova
#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

T: +1 (604) 514-3322
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E: Surrey@exova.com
W: www.exova.com

Analytical Report

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS - MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
Date Reported:	Oct 29, 2009
Report Number:	1264960

		Reference Number	709488-4	709488-5	709488-6
		Sample Date	Oct 16, 2009	Oct 16, 2009	Oct 16, 2009
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	AGS / MW2	AGS / MW5	AGS / Lake
		Matrix	Water	Water	Water
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Routine Water - Continued						
Nitrite - N	Dissolved	mg/L	2.26	<0.01		0.01
Sulfate (SO4)	Dissolved	mg/L	4400	2220		0.6
Hardness	as CaCO3	mg/L	974	571		5
Total Dissolved Solids	Dissolved	mg/L	4880	2550		1
Ionic Balance	Dissolved	%	150	121		

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Analytical Report

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS - MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID: **709488**
Control Number:
Date Received: Oct 22, 2009
Date Reported: Oct 29, 2009
Report Number: 1264960

Reference Number	709488-6	709488-7
Sample Date	Oct 16, 2009	Oct 16, 2009
Sample Time	NA	NA
Sample Location		
Sample Description	AGS / Lake	AGS / Creek
Matrix	Water	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total						
Calcium	Total	mg/L	15.0	10.4		0.2
Iron	Total	mg/L	11.1	0.32		0.05
Magnesium	Total	mg/L	3.6	2.4		0.1
Manganese	Total	mg/L	0.419	0.040		0.005
Potassium	Total	mg/L	0.8	0.6		0.4
Silicon	Total	mg/L	5.91	3.96		0.05
Sodium	Total	mg/L	2.2	2.0		0.4
Sulfur	Total	mg/L	5.2	1.9		0.3
Mercury	Total	mg/L	<0.0001	<0.0001		0.0001
Aluminum	Total	mg/L	1.48	0.065		0.005
Antimony	Total	mg/L	0.0002	<0.0002		0.0002
Arsenic	Total	mg/L	0.0443	0.0011		0.0002
Barium	Total	mg/L	0.023	0.007		0.001
Beryllium	Total	mg/L	<0.0001	<0.0001		0.0001
Bismuth	Total	mg/L	<0.0005	<0.0005		0.0005
Boron	Total	mg/L	0.003	<0.002		0.002
Cadmium	Total	mg/L	0.00078	0.00040		0.00001
Chromium	Total	mg/L	0.0025	<0.0005		0.0005
Cobalt	Total	mg/L	0.0030	0.0003		0.0001
Copper	Total	mg/L	0.013	0.003		0.001
Lead	Total	mg/L	0.0017	<0.0001		0.0001
Lithium	Total	mg/L	0.001	<0.001		0.001
Molybdenum	Total	mg/L	0.001	<0.001		0.001
Nickel	Total	mg/L	0.0031	0.0006		0.0005
Selenium	Total	mg/L	<0.0002	<0.0002		0.0002
Silver	Total	mg/L	0.00007	<0.00001		0.00001
Strontium	Total	mg/L	0.064	0.048		0.001
Thallium	Total	mg/L	<0.00005	<0.00005		0.00005
Tin	Total	mg/L	<0.001	<0.001		0.001
Titanium	Total	mg/L	0.0610	0.0007		0.0005
Uranium	Total	mg/L	0.0008	<0.0005		0.0005
Vanadium	Total	mg/L	0.0026	0.0002		0.0001
Zinc	Total	mg/L	0.030	0.012		0.001

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	Calcite Business Centre	Name:	AGS - MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID: **709488**
Control Number:
Date Received: Oct 22, 2009
Date Reported: Oct 29, 2009
Report Number: 1264960

Reference Number	709488-7
Sample Date	Oct 16, 2009
Sample Time	NA
Sample Location	
Sample Description	AGS / Creek
Matrix	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Routine Water						
pH			7.35			
Temperature of observed pH		°C	22.7			
Electrical Conductivity		µS/cm at 25 C	77			1
Calcium	Dissolved	mg/L	9.4			0.2
Magnesium	Dissolved	mg/L	2.2			0.2
Sodium	Dissolved	mg/L	2.0			0.4
Potassium	Dissolved	mg/L	0.5			0.4
Iron	Dissolved	mg/L	0.31			0.01
Manganese	Dissolved	mg/L	0.037			0.005
Chloride	Dissolved	mg/L	0.4			0.4
Nitrate - N		mg/L	<0.01			0.01
Nitrite - N		mg/L	<0.005			0.005
Nitrate and Nitrite - N		mg/L	<0.01			0.01
Sulfate (SO4)	Dissolved	mg/L	5.1			0.9
Hydroxide		mg/L	<5			5
Carbonate		mg/L	<6			6
Bicarbonate		mg/L	39			5
P-Alkalinity	as CaCO3	mg/L	<5			5
T-Alkalinity	as CaCO3	mg/L	32			5
Total Dissolved Solids	Calculated	mg/L	39			1
Hardness	Dissolved as CaCO3	mg/L	33			
Ionic Balance	Dissolved	%	100			

Approved by: Marie England
Marie England
Consulting Scientist

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	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID: **709488**
Control Number:
Date Received: Oct 22, 2009
Date Reported: Oct 29, 2009
Report Number: 1264960

Metals Dissolved

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Mercury	ug/L	<0.01	-19.98	19.98	yes
Date Acquired:	October 26, 2009				
Sulfur	mg/L	<0.3	-0.3	0.3	yes
Date Acquired:	October 27, 2009				

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Mercury	ng/L	97.80	85	115	yes
Date Acquired:	October 26, 2009				

Certified Reference Material	Units	Measured	Target	Lower Limit	Upper Limit	Passed QC
Mercury	ug/L	0.18	0.18	0.15	0.20	yes
Date Acquired:	October 26, 2009					
Aluminum	mg/L	0.295	0.301	0.257	0.345	yes
Antimony	mg/L	0.0777	0.0750	0.0558	0.0942	yes
Arsenic	mg/L	0.0651	0.0650	0.0530	0.0770	yes
Barium	mg/L	0.196	0.201	0.183	0.219	yes
Beryllium	mg/L	0.0680	0.07500	0.06540	0.08460	yes
Boron	mg/L	0.081	0.087	0.070	0.104	yes
Cadmium	mg/L	0.05420	0.05800	0.04960	0.06640	yes
Chromium	mg/L	0.0653	0.0680	0.0563	0.0797	yes
Cobalt	mg/L	0.07890	0.08000	0.07010	0.08990	yes
Copper	mg/L	0.057	0.057	0.053	0.062	yes
Iron	mg/L	0.28	0.32	0.28	0.36	yes
Lead	mg/L	0.155	0.1530	0.1308	0.1752	yes
Manganese	mg/L	0.3530	0.3760	0.3448	0.4132	yes
Molybdenum	mg/L	0.0568	0.06000	0.04980	0.07020	yes
Nickel	mg/L	0.224	0.221	0.198	0.244	yes
Selenium	mg/L	0.1060	0.1100	0.0935	0.1265	yes
Silver	mg/L	0.01410	0.01500	0.01260	0.01740	yes
Strontium	mg/L	0.047	0.050	0.042	0.058	yes
Thallium	mg/L	0.06420	0.06500	0.05270	0.07730	yes
Vanadium	mg/L	0.7450	0.75000	0.66390	0.83610	yes
Zinc	mg/L	0.123	0.130	0.115	0.145	yes
Date Acquired:	October 26, 2009					

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Sulfur	mg/L	1.1	1.1	30	3.0	yes
Date Acquired:	October 26, 2009					

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Sulfur	mg/L	47.8	45.0	55.0	yes
Date Acquired:	October 27, 2009				

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Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
Date Reported:	Oct 29, 2009
Report Number:	1264960

Metals Dissolved - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Sulfur	mg/L	1	0.9	1.1	yes
Date Acquired:	October 27, 2009				

Metals Total

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Calcium	mg/L	<0.2	-0.0	0.0	yes
Iron	mg/L	<0.05	-0.01	0.02	yes
Magnesium	mg/L	<0.1	-0.0	0.0	yes
Manganese	mg/L	<0.005	-0.001	0.001	yes
Potassium	mg/L	<0.4	-0.1	0.1	yes
Silicon	mg/L	<0.05	-0.03	0.04	yes
Sodium	mg/L	<0.4	-0.1	0.1	yes
Sulfur	mg/L	<0.3	-0.1	0.2	yes
Mercury	mg/L	<0.0001	-0.1108	0.1112	yes
Aluminum	ug/L	<5	-1	5	yes
Antimony	ug/L	<0.2	-0.2	0.2	yes
Arsenic	ug/L	<0.2	-0.2	0.2	yes
Barium	ug/L	<1	-1	1	yes
Beryllium	ug/L	<0.1	-0.1	0.1	yes
Bismuth	ug/L	<0.5	-0.5	0.5	yes
Boron	ug/L	<2	-1	3	yes
Cadmium	ug/L	<0.01	-0.01	0.01	yes
Chromium	ug/L	<0.5	-0.7	0.3	yes
Cobalt	ug/L	<0.1	-0.1	0.1	yes
Copper	ug/L	<1	-1	1	yes
Lead	ug/L	<0.1	-0.1	0.1	yes
Lithium	ug/L	<1	-1	1	yes
Molybdenum	ug/L	<1	-1	1	yes
Nickel	ug/L	<0.5	-0.5	0.5	yes
Selenium	ug/L	<0.2	-0.2	0.2	yes
Silver	ug/L	0.02	-0.02	0.10	yes
Strontium	ug/L	<1	-1	1	yes
Thallium	ug/L	<0.05	-0.05	0.05	yes
Tin	ug/L	<1	-1	1	yes
Titanium	ug/L	<0.5	-0.5	0.5	yes
Uranium	ug/L	<0.5	-0.5	0.5	yes
Vanadium	ug/L	<0.1	-0.1	0.1	yes
Zinc	ug/L	1	-0	1	yes
Date Acquired:	October 26, 2009				

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Calcium	mg/L	<0.2	<0.2	15	0.6	yes

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	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID: **709488**
Control Number:
Date Received: Oct 22, 2009
Date Reported: Oct 29, 2009
Report Number: 1264960

Metals Total - Continued

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Iron	mg/L	<0.05	<0.05	15	0.20	yes
Magnesium	mg/L	<0.1	<0.1	15	0.4	yes
Manganese	mg/L	<0.005	0.007	15	0.010	yes
Potassium	mg/L	<0.4	<0.4	15	1.2	yes
Silicon	mg/L	0.05	<0.05	15	0.10	yes
Sodium	mg/L	<0.4	<0.4	15	1.2	yes
Sulfur	mg/L	<0.3	<0.3	15	0.1	yes
Mercury	mg/L	0.0006	0.0007	10	0.0003	yes
Aluminum	ug/L	36200	31900	15	11	yes
Antimony	ug/L	<20	<20	15	0.4	yes
Arsenic	ug/L	0.8	0.7	15	0.4	yes
Barium	ug/L	3200	2900	15	2	yes
Beryllium	ug/L	<10	<10	15	0.2	yes
Bismuth	ug/L	<50	<50	15	1.1	yes
Boron	ug/L	232	219	15	4	yes
Cadmium	ug/L	7	7	15	0.02	yes
Chromium	ug/L	90	80	15	1.1	yes
Cobalt	ug/L	30	20	15	0.2	yes
Copper	ug/L	7	6	15	2	yes
Lead	ug/L	80	70	15	0.2	yes
Lithium	ug/L	381	355	15	2	yes
Molybdenum	ug/L	<2	<2	15	2	yes
Nickel	ug/L	5.7	5.3	15	1.1	yes
Selenium	ug/L	1	2	15	0.4	yes
Silver	ug/L	0.03	0.03	15	0.22	yes
Strontium	ug/L	600	500	15	2	yes
Thallium	ug/L	<5	<5	15	0.11	yes
Tin	ug/L	<2	<2	15	2	yes
Titanium	ug/L	570	580	15	1.1	yes
Uranium	ug/L	52.7	50.3	15	1.1	yes
Vanadium	ug/L	100	90	15	0.2	yes
Zinc	ug/L	5800	5300	15	2	yes

Date Acquired: October 26, 2009

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Calcium	mg/L	47.4	45.0	55.0	yes
Iron	mg/L	1.93	1.80	2.20	yes
Magnesium	mg/L	19.3	18.0	22.0	yes
Manganese	mg/L	0.469	0.450	0.550	yes
Potassium	mg/L	47.3	45.0	55.0	yes
Silicon	mg/L	1.80	1.80	2.20	yes
Sodium	mg/L	48.7	45.0	55.0	yes
Sulfur	mg/L	9.4	9.0	11.0	yes

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	Y1A 2V3	P.O.:	
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Company:	EBA		

Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
Date Reported:	Oct 29, 2009
Report Number:	1264960

Metals Total - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Mercury	mg/L	0.0008	0.0007	0.0010	yes
Aluminum	ug/L	315	211	421	yes
Antimony	ug/L	11.5	8.6	14.6	yes
Arsenic	ug/L	11.1	8.6	14.0	yes
Barium	ug/L	60	46	76	yes
Beryllium	ug/L	5.7	4.7	6.8	yes
Bismuth	ug/L	29.8	22.6	37.6	yes
Boron	ug/L	118	86	152	yes
Cadmium	ug/L	0.59	0.47	0.78	yes
Chromium	ug/L	30.7	26.6	35.4	yes
Cobalt	ug/L	6.3	4.8	7.8	yes
Copper	ug/L	59	45	75	yes
Lead	ug/L	6.2	4.7	7.7	yes
Lithium	ug/L	64	44	80	yes
Molybdenum	ug/L	60	47	77	yes
Nickel	ug/L	29.6	22.6	37.6	yes
Selenium	ug/L	11.2	8.4	13.8	yes
Silver	ug/L	6.28	4.67	7.67	yes
Strontium	ug/L	64	53	70	yes
Thallium	ug/L	3.22	2.56	3.72	yes
Tin	ug/L	58	51	65	yes
Titanium	ug/L	31.1	23.6	38.6	yes
Uranium	ug/L	31.3	23.2	38.2	yes
Vanadium	ug/L	6.0	5.0	7.2	yes
Zinc	ug/L	56	49	69	yes
Date Acquired:	October 26, 2009				
Mercury	mg/L	0.0030	0.0026	0.0032	yes
Date Acquired:	October 27, 2009				
Mercury	mg/L	0.0008	-0.0016	0.0032	yes
Aluminum	ug/L	990	900	1100	yes
Antimony	ug/L	42.2	36.0	44.0	yes
Arsenic	ug/L	40.3	36.0	44.0	yes
Barium	ug/L	198	180	220	yes
Beryllium	ug/L	21.0	18.0	22.0	yes
Bismuth	ug/L	97.0	90.0	110.0	yes
Boron	ug/L	403	360	440	yes
Cadmium	ug/L	2.06	1.80	2.20	yes
Chromium	ug/L	102	90.0	110.0	yes
Cobalt	ug/L	21.5	18.0	22.0	yes
Copper	ug/L	205	180	220	yes
Lead	ug/L	20.2	18.0	22.0	yes
Lithium	ug/L	203	180	220	yes

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Company:	EBA		

Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
Date Reported:	Oct 29, 2009
Report Number:	1264960

Metals Total - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Molybdenum	ug/L	202	180	220	yes
Nickel	ug/L	99.2	90.0	110.0	yes
Selenium	ug/L	42.3	36.0	44.0	yes
Silver	ug/L	21.3	18.00	22.00	yes
Strontium	ug/L	200	180	220	yes
Thallium	ug/L	10.5	9.00	11.00	yes
Tin	ug/L	193	180	220	yes
Titanium	ug/L	101	90.0	110.0	yes
Uranium	ug/L	92.6	90.0	110.0	yes
Vanadium	ug/L	19.0	18.0	22.0	yes
Zinc	ug/L	202	180	220	yes
Date Acquired:	October 26, 2009				
Aluminum	ug/L	54	45	55	yes
Antimony	ug/L	2.1	1.8	2.2	yes
Arsenic	ug/L	2.2	1.8	2.2	yes
Barium	ug/L	10	9	11	yes
Beryllium	ug/L	1.1	0.9	1.1	yes
Bismuth	ug/L	5.2	4.5	5.5	yes
Boron	ug/L	20	18	22	yes
Cadmium	ug/L	0.10	0.09	0.11	yes
Chromium	ug/L	4.9	4.5	5.5	yes
Cobalt	ug/L	1.1	0.9	1.1	yes
Copper	ug/L	10	9	11	yes
Lead	ug/L	1.0	0.9	1.1	yes
Lithium	ug/L	10	9	11	yes
Molybdenum	ug/L	10	9	11	yes
Nickel	ug/L	5.0	4.5	5.5	yes
Selenium	ug/L	2.0	1.8	2.2	yes
Silver	ug/L	1.06	0.90	1.10	yes
Strontium	ug/L	11	9	11	yes
Thallium	ug/L	0.53	0.45	0.55	yes
Tin	ug/L	10	9	11	yes
Titanium	ug/L	5.0	4.5	5.5	yes
Uranium	ug/L	5.2	4.5	5.5	yes
Vanadium	ug/L	1.0	0.9	1.1	yes
Zinc	ug/L	10	9	11	yes
Date Acquired:	October 26, 2009				
Calcium	mg/L	235	225.0	275.0	yes
Iron	mg/L	9.31	9.01	10.99	yes
Magnesium	mg/L	94.4	90.0	110.0	yes
Manganese	mg/L	2.30	2.251	2.749	yes
Potassium	mg/L	241	225.1	274.9	yes

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	Calcite Business Centre	Name:	AGS - MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
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Attn:	Stephan Klump	Acct code:	
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Company:	EBA		

Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
Date Reported:	Oct 29, 2009
Report Number:	1264960

Metals Total - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Silicon	mg/L	9.39	9.01	10.99	yes
Sodium	mg/L	241	225.1	274.9	yes
Sulfur	mg/L	47.1	45.0	55.0	yes
Date Acquired:	October 26, 2009				
Calcium	mg/L	5.0	4.5	5.5	yes
Iron	mg/L	0.21	0.18	0.22	yes
Magnesium	mg/L	1.9	1.8	2.2	yes
Manganese	mg/L	0.050	0.045	0.055	yes
Potassium	mg/L	4.8	4.5	5.5	yes
Silicon	mg/L	0.18	0.18	0.22	yes
Sodium	mg/L	5.0	4.5	5.5	yes
Sulfur	mg/L	1.1	0.9	1.1	yes
Date Acquired:	October 26, 2009				

Routine Water

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Calcium	mg/L	<0.1	-0.05	0.05	yes
Iron	mg/L	<0.005	-0.031	0.029	yes
Magnesium	mg/L	<0.1	-0.05	0.07	yes
Manganese	mg/L	<0.001	-0.008	-0.000	yes
Phosphorus	mg/L	<0.01	-0.04	0.04	yes
Potassium	mg/L	<0.1	-0.4	0.4	yes
Silicon	mg/L	<0.05	-0.20	0.25	yes
Sodium	mg/L	<0.1	-0.2	0.2	yes
Date Acquired:	October 26, 2009				
Calcium	mg/L	<0.1	-0.13	0.16	yes
Iron	mg/L	<0.005	-0.024	0.025	yes
Magnesium	mg/L	<0.1	-0.07	0.08	yes
Manganese	mg/L	<0.001	-0.009	0.002	yes
Phosphorus	mg/L	<0.01	-0.14	0.16	yes
Potassium	mg/L	<0.1	-0.8	0.8	yes
Silicon	mg/L	<0.05	-1.76	2.02	yes
Sodium	mg/L	<0.1	-0.3	0.4	yes
Date Acquired:	October 26, 2009				
Calcium	mg/L	<0.2	-0.1	0.2	yes
Magnesium	mg/L	<0.2	-0.1	0.1	yes
Sodium	mg/L	<0.4	-0.4	0.4	yes
Potassium	mg/L	<0.4	-0.4	0.4	yes
Iron	mg/L	<0.01	-0.01	0.01	yes
Manganese	mg/L	<0.005	-0.003	0.005	yes
Chloride	mg/L	<0.4	-0.4	0.4	yes

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V3S 8P8, Canada

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F: +1 (604) 514-3323
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W: www.exova.com

Quality Control

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS - MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
Date Reported:	Oct 29, 2009
Report Number:	1264960

Routine Water - Continued

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Nitrate - N	mg/L	<0.01	-0.01	0.01	yes
Nitrite - N	mg/L	<0.005	-0.005	0.005	yes
Date Acquired:	October 27, 2009				
Chloride	mg/L	0.32	-0.05	0.05	yes
Nitrate - N	mg/L	0.47	-0.03	0.03	yes
Nitrite - N	mg/L	<0.01	-0.10	0.10	yes
Date Acquired:	October 24, 2009				

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
pH	pH	100.07	97	103	yes
Date Acquired:	October 23, 2009				
Calcium	mg/L	95.37	90	110	yes
Iron	mg/L	66.70	85	115	yes
Magnesium	mg/L	98.38	90	110	yes
Manganese	mg/L	94.80	90	110	yes
Phosphorus	mg/L	101.32	90	110	yes
Potassium	mg/L	95.24	85	115	yes
Silicon	mg/L	93.43	80	120	yes
Sodium	mg/L	92.14	90	110	yes
Date Acquired:	October 26, 2009				
Chloride	mg/L	101.46	90	110	yes
Nitrate - N	mg/L	75.96	85	115	yes
Nitrite - N	mg/L	102.91	70	130	yes
Date Acquired:	October 24, 2009				
Chloride	mg/L	98.94	90	110	yes
Nitrate - N	mg/L	101.54	90	110	yes
Nitrite - N	mg/L	118.84	80	120	yes
Date Acquired:	October 24, 2009				

Certified Reference Material	Units	Measured	Target	Lower Limit	Upper Limit	Passed QC
T-Alkalinity	mg/L	9	10	9	12	yes
Date Acquired:	October 23, 2009					
Calcium	mg/L	23.3	25.11	21.93	28.29	yes
Iron	mg/L	0.270	0.321	0.281	0.359	yes
Magnesium	mg/L	14.4	15.04	13.00	17.08	yes
Manganese	mg/L	0.362	0.376	0.342	0.410	yes
Potassium	mg/L	11.9	12.4	10.6	14.3	yes
Sodium	mg/L	4.8	5.0	4.3	5.6	yes
Date Acquired:	October 26, 2009					

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
pH		7.82	7.82	10	0.10	yes

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Quality Control

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Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS - MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID: **709488**
Control Number:
Date Received: Oct 22, 2009
Date Reported: Oct 29, 2009
Report Number: 1264960

Routine Water - Continued

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Electrical Conductivity	dS/m at 25 C	3.31	3.27	10	0.002	yes
Calcium	mg/L	490	470	10	0.6	yes
Magnesium	mg/L	1510	1450	10	0.7	yes
Sodium	mg/L	12800	12100	10	1.2	yes
Potassium	mg/L	460	440	10	1.2	yes
Iron	mg/L	<0.5	<0.5	10	0.05	yes
Manganese	mg/L	<0.2	<0.2	10	0.010	yes
Chloride	mg/L	29.8	29.9	10	0.5	yes
Nitrate - N	mg/L	0.04	0.04	10	0.01	yes
Nitrite - N	mg/L	<0.005	<0.005	10	0.010	yes
Hydroxide	mg/L	<5	<5	10		yes
Carbonate	mg/L	<6	<6	10		yes
Bicarbonate	mg/L	590	590	10		yes
P-Alkalinity	mg/L	<5	<5	10	5	yes
T-Alkalinity	mg/L	484	484	10	5	yes
Date Acquired:	October 26, 2009					
Calcium	mg/L	22.3	22.3	30	1.00	yes
Iron	mg/L	4.84	4.79	30	0.060	yes
Magnesium	mg/L	4.8	4.8	30	1.00	yes
Manganese	mg/L	0.844	0.843	30	0.015	yes
Phosphorus	mg/L	0.01	<0.01	30	0.10	yes
Potassium	mg/L	1.3	1.3	30	1.0	yes
Silicon	mg/L	7.81	7.78	30	0.15	yes
Sodium	mg/L	3.3	3.3	30	1.0	yes
Date Acquired:	October 26, 2009					
pH		7.59	7.64	0	0.10	yes
Electrical Conductivity	dS/m at 25 C	0.160	0.160	10	0.005	yes
Bicarbonate	mg/L	60	60	10	10	yes
Carbonate	mg/L	<6	<6	10	10	yes
Hydroxide	mg/L	<5	<5	10	10	yes
P-Alkalinity	mg/L	<5	<5	10	5	yes
T-Alkalinity	mg/L	86	85	10	5	yes
Chloride	mg/L	8.78	8.48	15	0.25	yes
Nitrate - N	mg/L	<0.01	<0.01	15	0.05	yes
Nitrite - N	mg/L	0.06	0.06	15	0.50	yes
Date Acquired:	October 24, 2009					

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Chloride	mg/L	0.78	0.81	6	0.01	yes
Nitrate - N	mg/L	0.42	0.41	6	0.01	yes
Nitrite - N	mg/L	0.09	0.12	6	0.01	yes
Date Acquired:	October 24, 2009					

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	Unit 6, 151 Industrial Road	Location:	Yukon
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	Y1A 2V3	P.O.:	
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Company:	EBA		

Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
Date Reported:	Oct 29, 2009
Report Number:	1264960

Routine Water - Continued

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Control Sample	**Units**	**Measured**	**Lower Limit**	**Upper Limit**		**Passed QC**
pH		9.82	9.36	10.54		yes
Electrical Conductivity	µS/cm at 25 C	220	181	239		yes
P-Alkalinity	mg/L	24	9	49		yes
T-Alkalinity	mg/L	87	84	108		yes
Date Acquired: October 23, 2009						
Chloride	mg/L	2120	1900.0	2230.0		yes
Date Acquired: October 27, 2009						
Electrical Conductivity	µS/cm at 25 C	1500	1340	1482		yes
Date Acquired: October 28, 2009						
Electrical Conductivity	µS/cm at 25 C	<1	-2	2		yes
Date Acquired: October 28, 2009						
pH		9.24	9.07	9.27		yes
Electrical Conductivity	dS/m at 25 C	2.75	2.620	2.860		yes
Calcium	mg/L	242	225.1	274.9		yes
Magnesium	mg/L	97.1	90.0	110.0		yes
Sodium	mg/L	238	225.1	274.9		yes
Potassium	mg/L	232	225.1	274.9		yes
Iron	mg/L	9.52	9.01	10.99		yes
Manganese	mg/L	2.35	2.251	2.749		yes
Chloride	mg/L	80.8	76.1	85.1		yes
Nitrate - N	mg/L	9.88	9.60	10.58		yes
Nitrite - N	mg/L	10.1	9.510	10.530		yes
Nitrate and Nitrite - N	mg/L	20.0	18.09	22.11		yes
P-Alkalinity	mg/L	493	419	551		yes
T-Alkalinity	mg/L	989	900	1100		yes
Date Acquired: October 26, 2009						
pH		6.87	6.77	6.97		yes
Electrical Conductivity	dS/m at 25 C	0.080	0.070	0.082		yes
Calcium	mg/L	4.9	4.5	5.5		yes
Magnesium	mg/L	1.9	1.8	2.2		yes
Sodium	mg/L	5.1	4.5	5.5		yes
Potassium	mg/L	4.8	4.5	5.5		yes
Iron	mg/L	0.21	0.18	0.22		yes
Manganese	mg/L	0.049	0.045	0.055		yes
Chloride	mg/L	15.8	13.6	16.6		yes
Nitrate - N	mg/L	0.50	0.46	0.55		yes
Nitrite - N	mg/L	0.516	0.452	0.548		yes
Nitrate and Nitrite - N	mg/L	1.02	0.79	1.19		yes
P-Alkalinity	mg/L	43	22	82		yes
T-Alkalinity	mg/L	126	112	138		yes

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Routine Water - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Date Acquired:	October 26, 2009				

Trace Metals Dissolved

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Aluminum	µg/L	<5	-10	10	yes
Antimony	µg/L	<0.2	-0.4	0.2	yes
Arsenic	µg/L	<0.2	-0.5	0.5	yes
Barium	µg/L	<1	-0	0	yes
Beryllium	µg/L	<0.04	-0.10	0.10	yes
Bismuth	µg/L	<1	-1.0	1.0	yes
Boron	µg/L	<4	-6	5	yes
Cadmium	µg/L	<0.01	-0.03	0.03	yes
Chromium	µg/L	<0.4	-0.1	0.2	yes
Cobalt	µg/L	<0.02	-0.07	0.07	yes
Copper	µg/L	<1	-1	1	yes
Iron	µg/L	<10	-7	13	yes
Lead	µg/L	<0.1	-0.1	0.1	yes
Lithium	µg/L	<1	-1	1	yes
Manganese	µg/L	<0.2	-1.0	1.1	yes
Molybdenum	µg/L	<0.1	-0.31	0.29	yes
Nickel	µg/L	<1	-1	1	yes
Selenium	µg/L	<0.6	-1.7	1.3	yes
Silver	µg/L	<0.01	-0.05	0.05	yes
Strontium	µg/L	<1	-0	0	yes
Thallium	µg/L	<0.01	-0.03	0.03	yes
Thorium	µg/L	<0.4	-1.5	1.5	yes
Tin	µg/L	<0.1	-3.0	3.0	yes
Titanium	µg/L	<0.4	-0.2	0.2	yes
Uranium	µg/L	<0.4	-0.03	0.03	yes
Vanadium	µg/L	<0.1	-0.35	0.35	yes
Zinc	µg/L	<1	-2	4	yes
Zirconium	µg/L	<0.1	-0.0	0.0	yes
Date Acquired:	October 26, 2009				
Aluminum	µg/L	<5	-6	6	yes
Antimony	µg/L	<0.2	-0.4	0.3	yes
Arsenic	µg/L	1.4	-0.4	0.3	yes
Barium	µg/L	<1	-0	1	yes
Beryllium	µg/L	<0.04	-0.10	0.10	yes
Bismuth	µg/L	<1	0.0	0.0	yes
Boron	µg/L	<4	-18	19	yes
Cadmium	µg/L	<0.01	-0.03	0.03	yes
Chromium	µg/L	<0.4	-0.1	0.2	yes

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Quality Control

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	Calcite Business Centre	Name:	AGS - MPERG
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Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
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Trace Metals Dissolved - Continued

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Cobalt	µg/L	<0.02	-0.30	0.30	yes
Copper	µg/L	<1	-1	1	yes
Iron	µg/L	<10	-12	18	yes
Lead	µg/L	<0.1	-0.3	0.4	yes
Lithium	µg/L	<1	-0	0	yes
Manganese	µg/L	<0.2	-0.5	0.7	yes
Molybdenum	µg/L	<0.1	-0.95	0.85	yes
Nickel	µg/L	<1	-1	1	yes
Selenium	µg/L	<0.6	-1.7	1.7	yes
Silver	µg/L	<0.01	-0.67	0.47	yes
Strontium	µg/L	<1	-8	10	yes
Thallium	µg/L	<0.01	-0.06	0.06	yes
Thorium	µg/L	<0.4	-0.7	0.5	yes
Tin	µg/L	<0.1	-3.8	4.0	yes
Titanium	µg/L	<0.4	-0.3	0.2	yes
Uranium	µg/L	<0.4	-0.04	0.02	yes
Vanadium	µg/L	<0.1	-0.30	0.30	yes
Zinc	µg/L	<1	-58	74	yes
Zirconium	µg/L	<0.1	-0.0	0.0	yes

Date Acquired: October 26, 2009

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Aluminum	µg/L	105.72	70	130	yes
Antimony	µg/L	100.56	85	115	yes
Arsenic	µg/L	101.88	90	110	yes
Barium	µg/L	97.60	90	110	yes
Beryllium	µg/L	100.80	90	110	yes
Boron	µg/L	101.92	70	130	yes
Cadmium	µg/L	100.76	90	110	yes
Chromium	µg/L	100.48	90	110	yes
Cobalt	µg/L	100.80	90	110	yes
Copper	µg/L	105.18	90	110	yes
Iron	µg/L	100.00	80	120	yes
Lead	µg/L	106.56	90	110	yes
Manganese	µg/L	101.78	90	110	yes
Molybdenum	µg/L	95.60	90	110	yes
Nickel	µg/L	103.18	90	110	yes
Selenium	µg/L	100.04	90	110	yes
Silver	µg/L	0.13	90	110	yes
Strontium	µg/L	97.08	90	110	yes
Thallium	µg/L	102.04	90	110	yes
Tin	µg/L	98.20	90	110	yes
Vanadium	µg/L	98.82	90	110	yes

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Surrey, British Columbia
V3S 8P8, Canada

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Company:	EBA		

Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
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Report Number:	1264960

Trace Metals Dissolved - Continued

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit		Passed QC
Zinc	µg/L	104.56	90	110		yes
Date Acquired:	October 26, 2009					

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Aluminum	µg/L	8	7	20	20	yes
Antimony	µg/L	<0.2	<0.2	10	1.0	yes
Arsenic	µg/L	12.0	12.3	10	1.0	yes
Barium	µg/L	54	54	20	5	yes
Beryllium	µg/L	<0.04	<0.04	10	1.00	yes
Boron	µg/L	6	8	20	5	yes
Cadmium	µg/L	0.04	0.04	10	0.50	yes
Chromium	µg/L	0.8	0.8	20	5.0	yes
Cobalt	µg/L	0.21	0.20	20	0.50	yes
Copper	µg/L	<1	<1	20	5	yes
Iron	µg/L	4833	4890	20	50	yes
Lead	µg/L	<0.1	<0.1	10	0.5	yes
Lithium	µg/L	2	2	20	5	yes
Manganese	µg/L	816.9	821.1	20	0.5	yes
Molybdenum	µg/L	2.1	2.1	10	0.50	yes
Nickel	µg/L	<1	<1	20	5	yes
Selenium	µg/L	<0.6	<0.6	10	0.5	yes
Silver	µg/L	<0.01	<0.01	10	0.50	yes
Strontium	µg/L	117	115	20	0	yes
Thallium	µg/L	<0.01	<0.01	10	0.10	yes
Thorium	µg/L	<0.4	<0.4	10	0.1	yes
Tin	µg/L	<0.1	<0.1	10	0.5	yes
Titanium	µg/L	0.7	0.5	20	0.5	yes
Uranium	µg/L	<0.4	<0.4	10	0.10	yes
Vanadium	µg/L	1.3	1.3	20	0.50	yes
Zinc	µg/L	5	4	20	5	yes
Zirconium	µg/L	0.2	0.2	10	0.5	yes
Date Acquired:	October 26, 2009					

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Methodology and Notes

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Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
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Report Number:	1264960

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Alk, pH, EC, Turb in water	APHA	*	Conductivity, 2510	23-Oct-09	Exova Surrey
Alk, pH, EC, Turb in water	APHA	*	Conductivity, 2510	28-Oct-09	Exova Surrey
Alk, pH, EC, Turb in water	APHA	*	Electrometric Method, 4500-H+ B	23-Oct-09	Exova Surrey
Alk, pH, EC, Turb in water	APHA	*	Titration Method, 2320 B	23-Oct-09	Exova Surrey
Alkalinity, pH, and EC in water	APHA	*	Conductivity, 2510	26-Oct-09	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	*	Electrometric Method, 4500-H+ B	26-Oct-09	Exova Edmonton
Alkalinity, pH, and EC in water	APHA	*	Titration Method, 2320 B	26-Oct-09	Exova Edmonton
Anions (Routine) by Ion Chromatography	APHA	*	Ion Chromatography with Chemical Suppression of Eluent Cond., 4110 B	27-Oct-09	Exova Edmonton
Anions by IEC in water (Surrey)	APHA	*	Ion Chromatography with Chemical Suppression of Eluent Cond., 4110 B	24-Oct-09	Exova Surrey
Approval-Edmonton	APHA		Checking Correctness of Analyses, 1030 E	26-Oct-09	Exova Edmonton
Chloride in Water	APHA	*	Automated Ferricyanide Method, 4500-Cl- E	26-Oct-09	Exova Edmonton
Mercury (Total) in water	US EPA	*	Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5	27-Oct-09	Exova Edmonton
Mercury Low Level (Total) in water	EPA	*	Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7	26-Oct-09	Exova Surrey
Metals ICP-MS (Total) in water	US EPA	*	Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	26-Oct-09	Exova Edmonton
Metals SemiTrace (Dissolved) in water	US EPA	*	Metals & Trace Elements by ICP-AES, 6010B	26-Oct-09	Exova Surrey
Metals Trace (Dissolved) in water	APHA		Hardness by Calculation, 2340 B	26-Oct-09	Exova Edmonton
Metals Trace (Dissolved) in water	APHA	*	Inductively Coupled Plasma (ICP) Method, 3120 B	26-Oct-09	Exova Edmonton
Metals Trace (Total) in water	APHA	*	Inductively Coupled Plasma (ICP) Method, 3120 B	26-Oct-09	Exova Edmonton
Trace Metals (dissolved) in Water	US EPA	*	Determination of Trace Elements in Waters and Wastes by ICP-MS, 200.8	26-Oct-09	Exova Surrey
Trace Metals (dissolved) in Water	US EPA	*	Metals & Trace Elements by ICP-AES, 6010B	26-Oct-09	Exova Surrey

** Laboratory method(s) based on reference method*

References

APHA	Standard Methods for the Examination of Water and Wastewater
EPA	Environmental Protection Agency Test Methods - US
US EPA	US Environmental Protection Agency Test Methods

Exova
#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

T: +1 (604) 514-3322
F: +1 (604) 514-3323
E: Surrey@exova.com
W: www.exova.com

Methodology and Notes

Bill To:	EBA Engineering Consulting Lt	Project:	
Report To:	EBA Engineering Consulting Lt	ID:	W23101230
	Calcite Business Centre	Name:	AGS - MPERG
	Unit 6, 151 Industrial Road	Location:	Yukon
	Whitehorse, YT, Canada	LSD:	
	Y1A 2V3	P.O.:	
Attn:	Stephan Klump	Acct code:	
Sampled By:	SK		
Company:	EBA		

Lot ID:	**709488**
Control Number:	
Date Received:	Oct 22, 2009
Date Reported:	Oct 29, 2009
Report Number:	1264960

Comments:

- Some trace total metal results were less than dissolved metal results for samples 709488 (6 and 7). The results were verified and are within expected measurement uncertainty.
- The ion balance was outside the range 90 - 110% for sample 709488 (3, 4, 5). This may be due to iron and other metals extracted from sediment present in the sample.

Bodycote TESTING GROUP

LOT #: 709488

LOT: _____ Control Number _____

Environmental Sample Information Sheet

Note: Proper completion of this form is required in order to proceed with analysis

See reverse for your nearest Bodycote location and proper sampling protocol

Billing Address:			**Copy of Report To:**			Copy of invoice:
Company:	EBA Engineering Consulting Ltd.		Company:	EBA Engineering Consulting Ltd.		
Address:	Unit 6, 151 Industrial Rd Whitehorse, YT Y1A 2V3	QA/QC Report [x]	Address:	Unit 6, 151 Industrial Rd Whitehorse, YT Y1A 2V3	Mail invoice to this address for approval [ ]	
		Report Result:				Report Result:
Attention:	Stephan Klump	Fax [ ]	Attention:			Fax [ ]
Phone:	867-668-3068	Mail [x]	Phone:	867-668-3068		Mail [ ]
Fax:	867-668-4349	Courier [ ]	Fax:	867-668-4349		Courier [ ]
Cell:		e-mail [x]	Cell:			e-mail [ ]
e-mail:	sklump@eba.ca	e-Service [ ]	e-mail:			e-Service [ ]

Information to be included on Report and Invoice

Project ID: W23101230
Project Name: AGS - MPERG
Project Location: Yukon
Legal Location:
PO#:
Proj. Acct. Code:
Agreement ID:

RUSH Please contact the laboratory to confirm rush dates and times before submitting samples.

Upon filling out this section, client accepts that surcharges will be attached to this analysis

RUSH required on: All Analysis [ ] or As indicated [ ]

Date Required: _____

Signature: _____

Bodycote Authorization: _____

Sample Custody (Please Print)

Sampled by: SK

Company EBA Signature

I authorize Bodycote to proceed with the work indicated on this form:

Date Time

Received by: Sample Temp.

Waybill #: Date

Company Time

RECEIVED OCT 22 2009

Special Instructions / Comments

All "Dissolved Metals" samples (125 ml) are filtered and preserved (HNO3).

Samples "Lake" and "Creek" are surface water and should be analyzed for total metals.

Please indicate which regulations you are required to meet:

FOR LAB USE ONLY

Condiftion of containers/coolers upon arrival at lab

[ ] to report results directly to a regulatory body (Please include contact information)

[ ] Check here if you are testing POTABLE WATER for **HUMAN CONSUMPTION**

	Sample Identification	Location	Depth IN CM M	Date/Time Sampled	Matrix	Sampling Method	Number of Containers	Enter tests above (✓ relevant samples below) TW33F	TW35
1	MW6	AGS		16-Oct-09	Water	Grab	2	X	
2	MW1D	AGS		16-Oct-09	Water	Grab	2	X	
3	MW4	AGS		16-Oct-09	Water	Grab	2	X	
4	MW2	AGS		16-Oct-09	Water	Grab	2	X	
5	MW5	AGS		16-Oct-09	Water	Grab	2	X	
6	Lake	AGS		16-Oct-09	Water	Grab	2		X
7	Creek	AGS		16-Oct-09	Water	Grab	2		X
8									
9									
10									
11									
12									
13									
14									
15									

NOTE: All hazardous samples must be labelled according to WHIMIS guidelines.