MVEIRB Request #34

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

Appendix A: Scope of Development - Construction, Thor Lake: construction of the concentrate and supply storage/laydown area adjacent to the barge docking facility.

The information need identified by the Review Board is as follows:

The minimum area required for storage of full containers (16,000 m^2) and empty containers (1,200 m^2) is described in Section 4.7.5.7. For the purposes of determining impacts of the development on the environment and in particular on the viewshed from Great Slave Lake, the total maximum footprint of the concentrate and supply storage/laydown area is required. Please describe the maximum footprint required for all container laydown areas and the total terrestrial project footprint at the dock facility. Please provide the information in Figure 4.7-11, Nechalacho Docking Facilities, in a scale drawing.

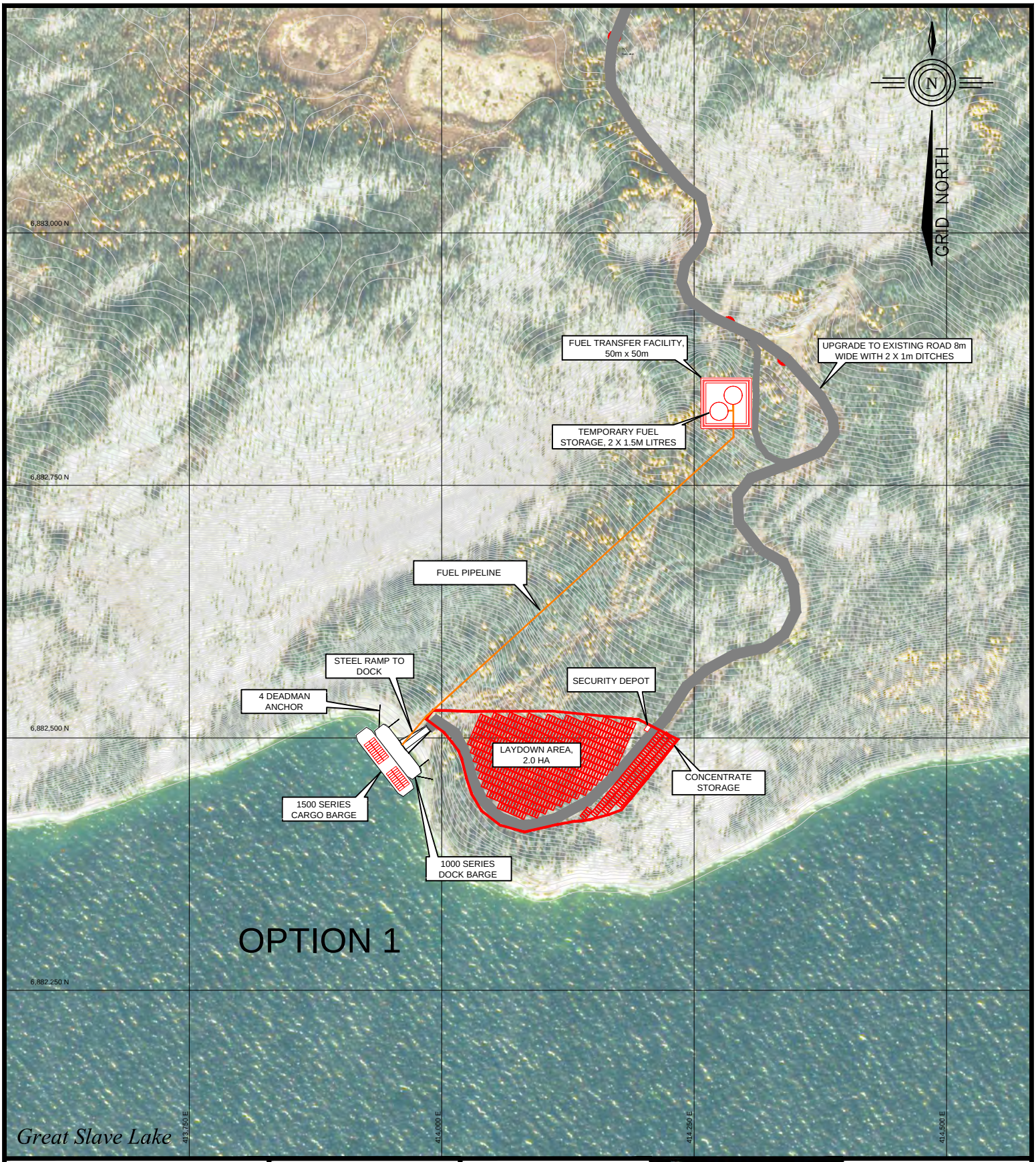
Avalon Response #34

As requested, Avalon is pleased to provide an updated, scaled version of Figure 4.7-11 complete with dimensions for the proposed Nechalacho docking facilities. This figure also shows the general layout of the concentrate containers at peak times, typically in late spring prior to the open water barging season.

The factors used to estimate the required laydown area are identified in Table 1.

TABLE 1: ESTIMATED LAYDOWN AREA FOR THOR LAKE DOCK FACILITY

Laydown Area Factors	Values
Container Dimensions:	
Width	6.1 m
Length	2.4 m
Height	1.3 m
Area	14.64 m^2
Number of Containers	3300
Number of Stacks	2
Laydown Area Required	24,156 m^2 (2.4 ha)



0 25 50 75 100 125
metres

NOTES	
COORD. SYS.:	UTM 12 North NAD 1983
PAPER SIZE:	8.5x11 P
AUTOCAD FILE LOCATION:	H:\9 - Technical Information\General Site\General Arrangement\Thor Lake\AVL TL GA v2011\Avalon Thor Lake Site GA v 1.7.dwg
PDF FILE LOCATION:	H:\9 - Technical Information\General Site\General Arrangement\Thor Lake\AVL TL GA v2011\

REVISIONS

CHANGE	BY	DATE	CHECKED

AVALON RARE METALS INC

PROJECT: Nechalacho

TITLE: Thor Lake Topo Map	DWG NO.: GA - 000 - 001
TITLE 2: Proposed Docking Facilities	DATE: Sep 13, 2011 / DRAWN BY: S. Chan
TITLE 3: Option 1	SCALE: 1:5,000 / CHECKED BY: D. Swisher

3.0 SECTION 3.3.2 KEY LINE OF INQUIRY: WATER QUALITY

MVEIRB Request #35

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

Avalon proposes to have an underground mine in the proximity of lakes (proposed tailings management facility) that have been drawn down, in addition to bypassing the flow of volumes of water around Murky Lake by pumping directly from Drizzle Lake into Thor Lake while discharging effluent into, and recycling certain volumes of water from this watershed. This complex water management within a small area – and any potential impact(s) that may come from it – deserves a thorough analysis in this environmental assessment.

Thor Lake

Other Potential Pathways for Impacts to Water Quality

11. Describe the collective impact of all changes listed above on the watershed.

The information need identified by the Review Board is as follows:

Although the DAR discusses individual impacts to surface water and groundwater components within the watershed, it does not present a clear summary of the collective water quality impacts. By project phase from start to closure and according to the criteria listed in section 3.3.1 of the ToR, provide this clear summary.

Avalon Response #35

Section 6.4 of the DAR discusses the anticipated effects of the Nechalacho Mine and Flotation Plant on the quality of the surface waters in the Project area for the initial 20-year life of the Project. As discussed in this Section, a proprietary three-dimensional hydrodynamic model (H3D) was used to simulate the release and fate of 16 dissolved metals contaminants including ^{226}Ra over the initial 20-year mine life.

Table 6.4-2 in the DAR, reproduced below, details the predicted change in a typical inert tracer concentration in various waterbodies of the Thor Lake System over the current 20-year life of mine period. Groundwater contributions (mine water) to the process water and effluent stream were included in the water balance and hence the modeling simulation.

As indicated in the table, in general, the tracer concentrations in all waterbodies increase and the rate of increase slows with time. Meanwhile, the tracer concentration decreases progressively from one waterbody to another as the water travels downstream. This is mainly due to mixing of the tracer with the large volumes of water in the downstream waterbodies. As well, the fresh natural runoff entering into different parts of the Thor Lake system leads to further dilution of the tracer.

TABLE 6.4-2: AVERAGE CONCENTRATION OF INERT TRACER IN THE THOR LAKE SYSTEM						
Year of Simulation	Plant Discharge	Tailings Pond	Polishing Pond	Drizzle Lake	Murky Lake	Thor Lake
1	1.0	0.00091	0.00026	0.00004	0.00003	<0.00001
2	1.0	0.00160	0.00073	0.00021	0.00017	0.00001
3	1.0	0.00215	0.00119	0.00043	0.00037	0.00004
4	1.0	0.00260	0.00164	0.00064	0.00058	0.00009
5	1.0	0.00299	0.00208	0.00092	0.00085	0.00016
6	1.0	0.00331	0.00241	0.00111	0.00104	0.00024
7	1.0	0.00360	0.00269	0.00126	0.00119	0.00031
8	1.0	0.00386	0.00292	0.00138	0.00132	0.00038
9	1.0	0.00408	0.00313	0.00152	0.00144	0.00044
10	1.0	0.00423	0.00330	0.00159	0.00152	0.00050
11	1.0	0.00437	0.00342	0.00178	0.00159	0.00057
12	1.0	0.00455	0.00355	0.00179	0.00166	0.00058
13	1.0	0.00466	0.00369	0.00180	0.00171	0.00061
14	1.0	0.00477	0.00379	0.00185	0.00177	0.00063
15	1.0	0.00485	0.00387	0.00190	0.00183	0.00066
16	1.0	0.00492	0.00394	0.00199	0.00186	0.00070
17	1.0	0.00500	0.00392	0.00194	0.00186	0.00068
18	1.0	0.00500	0.00389	0.00191	0.00176	0.00067
19	1.0	0.00504	0.00400	0.00199	0.00186	0.00070
20	1.0	0.00508	0.00408	0.00207	0.00191	0.00071

Table 6.4-3 of the DAR, also reproduced below, summarizes the maximum predicted concentrations of all metal species in Drizzle, Murky and Thor lakes over the 20-year period. Also included in the table are the MMER effluent criteria and CCME water quality guideline values.

TABLE 6.4-3: MAXIMUM METAL CONCENTRATIONS IN THE THOR LAKE SYSTEM AND WATER QUALITY GUIDELINES FOR METALS OF CONCERN					
Metal Species	Thor Lake	Murky Lake	Drizzle Lake	CCME Water Quality Guideline	MMER Effluent Criteria
Al (mg/L)	0.0005	0.0013	0.0017	0.1	-
Fe (mg/L)	0.0004	0.0012	0.0015	0.3	-
Cd (mg/L)	5.1E-8	1.4E-7	1.8E-7	0.00002-0.00013	-
Hg (mg/L)	7.6E-8	2.1E-7	2.7E-7	0.000026	-
Ag (mg/L)	2.3E-8	6.4E-8	8.1E-8	0.0001	-
As (mg/L)	1.7E-6	4.7E-6	5.9E-6	0.005	0.5
Cr (mg/L)	8.3E-7	2.3E-6	3.0E-6	0.0089	-

TABLE 6.4-3: MAXIMUM METAL CONCENTRATIONS IN THE THOR LAKE SYSTEM AND WATER QUALITY GUIDELINES FOR METALS OF CONCERN					
Metal Species	**Thor Lake**	**Murky Lake**	**Drizzle Lake**	**CCME Water Quality Guideline**	**MMER Effluent Criteria**
Cu (mg/L)	1.7E-6	4.9E-6	6.2E-6	0.002-0.004	0.30
Mo (mg/L)	3.6E-5	1.0E-4	1.3E-4	0.073	-
Ni (mg/L)	5.3E-6	1.5E-5	1.9E-5	0.025-0.150	0.50
Pb (mg/L)	4.5E-7	1.3E-6	1.6E-6	0.001-0.007	0.20
Zn (mg/L)	5.3E-6	1.5E-5	1.9E-5	0.03	0.50
U (mg/L)	7.3E-6	1.7E-5	2.3e-5	0.015	-
Th (mg/L)	5.8E-7	1.3E-6	1.8E-6	-	-
^{226}Ra (Bq/L)	8.3E-6	1.9E-5	2.6E-5	-	0.37

As summarized in Table 6.4-3, the model predicts that the CCME guideline values for all parameters will be met over the entire 20-year simulation period, in each of the lakes within the Thor Lake system.

It is noted that the concentrations shown in Table 6.4-3 represent conservative values, since no allowance was made in the model for decreases in concentration due to natural remediation processes including degradation, chemical oxidation, precipitation, and biodegradation.

Considerable further dilution of water flowing out of Thor Lake is anticipated as it progresses through a series of wetlands, streams and lakes towards Great Slave Lake comprising a watershed estimated to be more than three times the catchment of Thor Lake. As such, it is expected that metal levels in water entering Great Slave Lake will be similar to pre-development background levels.

Based on the foregoing, as indicated in Section 6.4.2.6 of the DAR, water quality in Thor Lake and further downstream is not anticipated to be adversely affected by mining activities (including underground) and discharges of decant water from the TMF throughout the initial projected mine life.

During the closure period, direct discharges of effluent from the Process Plant and TMF will cease, the exposed tailings surface will be capped with overburden and stockpiled organics and revegetated. Surface runoff control channels and permanent spillways will be constructed to provide sustainable and acceptable surface runoff conditions. The underground mine workings will be backfilled, and access to the underground will be sealed off.

In summary, Avalon is confident that no adverse residual effects on surface water or groundwater quality are anticipated to occur throughout the life of the Nechalacho Mine Project from initial development through to eventual closure. It is also anticipated that these predictions will be confirmed by the water quality monitoring program that will be conducted throughout the life of the Project, including the closure period.

MVEIRB Request #36

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

12. *Describe the long-term effects of all changes listed above on the watershed. Include a discussion of changes to water quality from chemical loading of the receiving environment.*

The information need identified by the Review Board is as follows:

The DAR discusses the collective loading from the TMF at various locations downstream as far as Thor Lake over the 20 year operational life of the mine. No other long-term water quality effects are thoroughly discussed for any other points within the watershed.

Avalon Response #36

Avalon believes that the preceding response to MVEIRB Request #35 also generally addresses Request #36. However, in addition, as stated in Section 6.4.4 of the DAR (Project Design Feature and Mitigation Measures), with the application of the mitigative measures as described, the overall effects on the water quality of the downstream lakes, including Thor Lake, are expected to be localized, low in magnitude and insignificant. Thus, although not explicitly stated, it is reasonable to assume that this prediction applies to the series of lakes extending downstream from Thor Lake to Great Slave Lake.

MVEIRB Request #37

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

See the previously described Terms of Reference.

The information need identified by the Review Board is as follows:

In addition, Avalon has not characterized long term paste backfill interaction and potential effects to water quality. By project phase from start to closure and according to the criteria listed in section 3.3.1 of the ToR, provide further discussion on this line item overall, and on the points raised here.

Avalon Response #37

Section 6.5.1.5 of the DAR (Groundwater Quality) discussed how the existing groundwater quality of the underground mine may be affected by Project activities. As indicated in this Section, the quality of the mine water will be potentially impacted by the underground operations (dust, ammonia, nitrates, nitrites, hydrocarbons). In addition, when the paste backfill is first placed, 2-3 inch PVC pipes will be installed to allow water drainage from the paste. Once the paste has set it will behave like

concrete and will be relatively impermeable. Any water interaction with the paste is expected to make the pH slightly basic during the short time needed for the paste backfill to harden.

As also indicated in this Section, during the operations phase, all excess mine water from the underground operations will be pumped to the surface for use in the Flotation Plant and will ultimately be directed to the Tailings Management Facility (TMF).

Effluent discharged from the TMF will be required to comply with the terms and conditions, including effluent quality criteria, of the future MVLWB Water Licence and the effluent quality criteria of the Metal Mining Effluent Regulations.

Section 6.5.1.4 of the DAR indicated that during the post-closure period the underground workings will be allowed to flood naturally. The current mine plan estimates that 95% of the void space of the underground mine will eventually be filled with paste backfill. The remaining void space will be flooded with groundwater.

The volume of the void space including the ramp and non-backfilled stopes for the end of mine is estimated to be approximately 500,000 m^3. Based on the estimated void volume and the simulated mine inflows, the underground mine will be flooded in approximately 5.3 years after mine closure, assuming the lower inflow projections, and more rapidly (1.6 years) if the higher inflow projections are applied. Once the water level in the mine reaches the pre-development or natural level, seepage inflow will cease and the groundwater regime will return to pre-development conditions.

Since the paste backfill will be similar in characteristics to hardened concrete, it will be essentially inert and is not expected to affect the existing or future groundwater quality of the Nechalacho Mine area.

MVEIRB Request #38

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

Pine Point

Potential Pathways for Impacts to Water Quality from Project Components

At the Pine Point processing site, Avalon proposes to deposit tailings into a porous pit and use a second pit to hold supernatant water – this requires thorough analysis. For the locally impacted watershed and downstream water bodies of the Pine Point processing site (up to, and including a reasonable local area after, the confluence with Great Slave Lake):

12. Describe impacts to water quality from the following sources:

g. impacts on local aquifer(s) if exfiltration through an existing pit is selected as one of the preferred options for the Pine Point site, the hydrogeological information must include a review of, travel time to Great Slave Lake, volume of ex-filtrate, migration pathway (location and depth), monitoring points, distinct points of control and contingencies for non-compliant discharges.

The information need identified by the Review Board is as follows:

For the L-37 pit, please indicate monitoring points, distinct points of control, and contingencies for non-compliant discharges.

Avalon Response #38

The principle objective of the HTF design is to provide tailings storage, ensure protection of the environment during operations and in the long-term (after closure) and achieve effective reclamation at mine closure. This will be accomplished based on the following principles;

- Permanent, secure and total confinement of all tailings solids within an historic open pit with engineered preparation and management strategies;
- Control, collection and removal (if required, via excess water transfer system) of free draining liquids from the tailings during operations, to the maximum practical extent; and
- The inclusion of monitoring features for all aspects of the facility to ensure performance goals are achieved and design criteria and assumptions are met.

The HTF, to be established in the L-37 pit, has sufficient storage capacity to avoid overtopping and sufficient freeboard to safely accommodate the maximum operating pond and Environmental Design Storm event, combined with wave run-up without the construction of any confining embankments or berms. An emergency overflow channel is included to pass the IDF event during operations and closure. A temporary separator berm with a decant system has been included for the initial years to separate the supernatant water and tailings solids within the HTF.

The majority of the runoff and process water that infiltrates into the bedrock from the HTF will occur in the northeast side of the pit where the water will be forced to collect. An excess water transfer system has also been included in the design, however it is yet to be determined if this system will be required.

The amount and type of pit preparation required for the L-37 pit, prior to the deposition of tailings, will depend on the potential for the bedrock to allow tailings solids/particles to migrate through the pit and into the groundwater system. Although investigations are underway, limited site specific information is currently available

regarding the quality, characteristics and permeability of the rock immediately surrounding the L-37 pit.

The pit preparation options that have been considered to date include; shotcrete barrier application, till filter barrier construction, or a combination of these methods. Other options will be considered if required as part of the design process. Areas of the pit floor where water (Presqu'ile aquifer) is currently exposed in the form of standing water (i.e. below 191 masl) will be backfilled with waste rock locally available in the pit bottom to just above the water level, followed by placement of a till filter barrier above the waste rock.

Monitoring of the HTF will be carried out for performance evaluation and refinement of operating practices. In addition to the physical parameters associated with the tailings densities and deposition methods, etc., water management-related issues will also be monitored, including.

- Daily recording of the pond water levels;
- Daily production records for deposited tailings;
- Daily pumping records for all process water taken from the J-44 Pit (formerly T-37 Pit), and all excess water transferred to the N-42 Pit for infiltration;
- Site specific meteorological data; and
- Periodic water quality samples collection to monitor water quality down-gradient of the HTF.

Proposed and installed monitoring well locations are listed in Table 1 and presented in Figure 6.1 (Revision B, from the Draft Feasibility Study).

TABLE 1: MONITORING WELL LOCATIONS AT THE PINE POINT SITE

Monitoring Wells[2]	Approximate Location[1]	
	Northing	Easting
DH-2010-01	6,749,627	640,377
DH-2010-02D	6,750,910	641,116
DH-2010-02S	6,750,914	641,105
DH-2010-03	6,751,244	642,925
DH-2010-04	6,751,146	640,635
DH-2010-05	6,753,511	641,707
HG-PP11-01	6,751,149	639,982
HG-PP11-02	6,750,664	641,510
HG-PP11-03	6,750,522	640,674
HG-PP11-04	6,749,960	641,092
HG-PP11-05	6,749,058	639,281
HG-PP11-06	6,748,662	639,260
GT-PP11-08	6,750,595	641,116

Notes:

1. Coordinates are in UTM NAD 83. Surveyed coordinates provided where available.
2. Yellow highlighted wells are planned, but not yet installed.

638 000 E
639 000 E
640 000 E
641 000 E
642 000 E
643 000 E
6 753 000 N
6 752 000 N
6 751 000 N
6 750 000 N
6 749 000 N

LIMITS OF UPDATED TOPOGRAPHIC SURVEY

HISTORIC TECK COMINCO TAILINGS AREA

DH-2010-05
DH-2010-03
DH-2010-04
HG-PP11-01
DH-2010-02S
DH-2010-02D
HG-PP11-02
HG-PP11-03
GT-PP11-08 (TO BE DECOMMISSIONED PRIOR TO HTMF OPERATIONS)
HG-PP11-04
DH-2010-01
HG-PP11-05
HG-PP11-06

EXISTING SUB-STATION

PROPOSED NEW LOCATION OF HYDROMETALLURGICAL PLANT SITE

TAILINGS DELIVERY PIPELINE

HYDROMETALLURGICAL TAILINGS FACILITY (L-37 PIT)

PROCESS WATER SUPPLY (J-44 PIT)

EXCESS WATER TRANSFER PIPELINE

EXCESS WATER INFILTRATION (N-42 PIT)

LIMITS OF UPDATED TOPOGRAPHIC SURVEY

PLAN
SCALE A

LEGEND:

- WATER
- TAILINGS
- TAILINGS DELIVERY PIPELINE
- EXCESS WATER TRANSFER PIPELINE
- PROCESS WATER SUPPLY PIPELINE
- TAILINGS DEPOSITION POINT
- ACCESS ROAD
- POWERLINE
- GROUNDWATER MONITORING WELL (EXISTING)
- MONITORING WELL (INSTALLATION IN PROGRESS)

NOTES:

1. COORDINATE GRID IS UTM NAD83 ZONE 11N.
2. CONTOURS ARE IN METRES. CONTOUR INTERVAL IS 0.5 METRES.
3. CONTOURS AND IMAGE PROVIDED BY PINE POINT COMBINED SURVEY, NOVEMBER 1, 2010.

SCALE A
200 100 0 200 400 600 800 1000 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
B	20SEP'11	ISSUED WITH MEMO	CLS	SIR	KEH	KDE
A	24JUN'11	ISSUED WITH REPORT	CLS	SIR	KEH	KDE

AVALON RARE METALS INC.

THOR LAKE PROJECT

HTF
PROPOSED MONITORING LOCATIONS

Knight Piésold CONSULTING

P/A NO. NB101-390/2
REF NO. 3
FIGURE 6.1
REV B

Although not expected, in the event that unacceptable impacts to the groundwater are encountered during the monitoring activities, remedial measures will be explored to mitigate such impacts. These measures may include strategic deposition of tailings to allow collection of all supernatant and runoff for treatment or grouting the perimeter of the supernatant pond area.

In addition to the data collected, regular inspections of the HTF and associated structures will be completed. Regular inspections will help identify any areas of concern that may require maintenance or more detailed evaluation. The inspection program will include detailed visual inspection of all berms, pipelines, pumps, culverts, channels, spillways etc.

MVEIRB Request #39

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

Impacts to Water Quality after mitigation and Avalon's last point of control

17. Describe the collective impact of all potential changes listed above on the local watershed.

The information need identified by the Review Board is as follows:

Although the DAR discusses individual impacts to surface water and groundwater components within the watershed, it does not present a clear summary of the collective water quality impacts. By project phase from start to closure, provide this clear summary according to the criteria listed in section 3.3.1 of the ToR.

Avalon Response #39

Avalon believes that the preceding response to MVEIRB Request #35 also generally addresses Request #39. However, in addition, as stated in Section 6.4.4 of the DAR (Project Design Feature and Mitigation Measures), decant water to be released from the Nechalacho Mine TMF into Drizzle Lake (the last point of control/final discharge point) will comply with the requirements of the MVLWB Water Licence and the federal MMER regulations.

In addition, effluent and receiving water quality and biological monitoring will be carried out according to requirements of the Water Licence and the MMER. The monitoring results will be used to confirm that effluent quality and water quality downstream of the TMF discharge remains within allowable limits. With the application of the mitigative measures as described, the overall effects on the water quality of the downstream lakes, including Thor Lake, are expected to be localized, low in magnitude and insignificant during all Project phases from the initial construction phases to the eventual closure and post-closure phases.

MVEIRB Request #40

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

Impacts to Water Quality after mitigation and Avalon's last point of control

Both sites

19. For the local watershed and downstream water bodies (up to and including a reasonable local area after the confluence with Great Slave Lake, describe impacts to water quality and quantity from final effluent discharged to the environment during all phases of the Thor Lake Rare Earth Element Project life cycle, incorporating:

a. identification of the constituents of, and quantity likely to come out of, each on-site water source;

d. predicted changes over time in the amount or quality of project water outflows.

The information need identified by the Review Board is as follows:

For each year of operation, provide a thorough analysis for the discharge from the Pine Point HMF according to the criteria listed in section 3.3.1 of the ToR.

Avalon Response #40

Section 4.8.3.1 of the DAR provided a general description of the composition of the proposed Hydrometallurgical Plant tailings. As indicated, the Hydrometallurgical tailings properties will consist of solids from the proposed milling process made up predominantly of gypsum (approximately 85%) with some leach residue (approximately 6%) and miscellaneous other solids (approximately 9%) and are expected to be similar to phosphogypsum tailings in terms of void ratio, dry densities and consolidation properties.

As a result of Avalon's decision to complete the processing of the rare metals products produced at the Pine Point Hydrometallurgical facility at another processing plant to be located in the south, the previously identified leach residue will no longer be produced at the Pine Point Hydrometallurgical Plant site.

More specifically, all of the acid-baked residue will be shipped south and there will be no leach residue in the hydrometallurgical tailings that will be directed to the L-37 Pit. In addition, the revised Hydrometallurgical Plant will also result in the production of less hydrometallurgical tailings, probably less than 100,000 tonnes per year, compared to the 171,000 tonnes per year quantity provided in the DAR. However, to be conservative in the assessment, it was decided to leave the higher, more conservative quantity in the DAR.

Regarding the anticipated concentrations of the constituents present in the hydrometallurgical tailings that will be directed to the L-37 Pit (HTF), Table 6.5-6 in the DAR summarizes the chemical properties of the water component of the tailings solution based on test work completed by SGS (2011).

Avalon appreciates that the MVEIRB has requested that a thorough analysis of the discharge be provided for each year of operation but it must be noted that the quality of the Hydrometallurgical Plant effluent is not anticipated to change from year to year. A copy of Table 6.5-6 from the DAR is re-presented as follows.

TABLE 6.5-6: SOLUTION ANALYSIS RESULTS – HYDROMET SOLUTIONS

Parameter	Unit	MMER*	CH-WT1 PLS +Wash Simulated Hydromet Tls Filtrate
Radionuclide Analyses			
^{226}Ra	Bq/L	.37	0.10
^{228}Ra	Bq/L		<0.2
^{210}Pb	Bq/L		<0.1
General Analyses			
pH	Units	6.0-9.5	7.73
Alkalinity	mg/L as $CaCO_3$		118
EMF	mV		214
Conductivity	µS/cm		13,400
TDS	mg/L		16,800
TSS	mg/L	15.00	---
Cl	mg/L		55
SO4	mg/L		11,000
F	mg/L		1.82
TOC	mg/L		53.9
NH_3+NH_4	as N mg/L		91.7
Metal Analyses			**Diss**
Hg	mg/L		<0.0001
As	mg/L	.50	0.0022
Ca	mg/L		393
Cu	mg/L	.30	0.0226
Fe	mg/L		0.150
K	mg/L		86.8
Li	mg/L		2.18
Mg	mg/L		1,530
Mn	mg/L		6.15
Na	mg/L		1,580
Ni	mg/L	.50	0.0701
Pb	mg/L	.20	0.00052
Se	mg/L		0.005
Si	mg/L		2.47
Sr	mg/L		11.2
Th	mg/L		0.002945
U	mg/L		0.0239
Zn	mg/L	.50	<0.002

*Department of Justice Canada. 2002. Metal Mining Effluent Regulations, Fisheries Act SOR-2022-222.

A comparison of the projected chemical properties of the HTF tailings water with the historically documented groundwater quality results shows that the concentrations of all metals parameters in the tailings water will be well below the MMER criteria and lower than or within the same range of concentrations for these parameters in the existing groundwater of the area. In particular, the concentrations of arsenic, mercury, iron, lead and zinc are expected to be lower, and the concentrations of copper and nickel will be within the same range as existing conditions.

The pH of the tailings water is expected to be slightly above neutral (7.7), while conductivity, sodium, chloride and other parameters that contribute to water hardness, including calcium, magnesium and sulphate will be elevated compared to current background conditions.

However, these elevated levels are expected to rapidly diffuse and dilute to natural background values within the Presqu'ile Formation. The radionuclide parameters including ^{226}Ra, ^{228}Ra and ^{210}Pb are all expected to be at or below detection limits.

Since the projected concentrations of all of the parameters of potential concern will be lower than or within the range of existing conditions, the anticipated effects on groundwater quantity and quality are expected to be insignificant. Nevertheless, Avalon is committed to implementing a groundwater quality monitoring program designed to monitor the effects of the proposed tailings water infiltration program on the quality of the groundwater in the area of the Hydrometallurgical Plant and associated infrastructure.

MVEIRB Request #41

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

h. identification of the uncertainties and confidence levels in the predictions, the assumptions used, and the likely range of variation for the parameters identified.

The information need identified by the Review Board is as follows:

The DAR does not present all of the thorough discussions or analyses required above. According to the criteria listed in section 3.3.1 of the ToR, please provide an expanded discussion and identification of uncertainties, confidence levels in predictions, assumptions used and likely ranges of variation for presented parameters.

Avalon Response #41

Model Uncertainties and Confidence Estimates

There are two aspects that determine confidence and uncertainties in the reported model results: the numerical model itself and the data used as input to the model.

Confidence and Uncertainties in the Model, H3D

A comprehensive document describing H3D and its validation is provided as Attachment 7. The model is capable of producing accurate simulations of temperature and other scalars, given adequate input data. With adequate meteorological data, errors in temperature are generally less than 0.5°C. Errors in currents are typically less than 10%.

Confidence and Uncertainties in the Input Data

A key factor in the modelling is that the Thor Lake system, including Murky and Drizzle lakes, receives a large amount of freshwater from surface flows. Consequently, it was found that even after the full 20 years of mine operation, dilution of contaminants introduced in the tailings stream remained high, at a value of 1408:1. The major factor driving this beneficial result is the hydrology. The water balance (i.e., the hydrology of the system) including stream flows into the various lakes and flows between the lakes, was developed by Knight Piesold.

The other major factors that affect the dilution calculation are meteorology, which affects the thermal structure and wind mixing, and the characterization of the Flotation Plant effluent. The long-term meteorology was derived from data collected by Environment Canada at the Yellowknife Airport. A local correction for wind speed was made, based on a shorter record from a meteorological station at the site. The meteorological data appear to be correct and consistent, and in a limited amount of preliminary testing, enabled H3D to correctly predict the seasonal cycle of temperature in Thor Lake. As well, ice formation was simulated by the model, based on the meteorological forcing. The formation of ice is significant, as it shuts down flow between the lakes in winter, and eliminates wind mixing in winter.

The lake bathymetry was originally collected by Stantec, but was subsequently validated by Knight Piesold.

The characterization of the Flotation Plant effluent was based on a 5-day settled decant. Contaminant concentrations in the 5-day settled decant are considerably lower than in fresh decant, because contaminants that are adsorbed onto fine sediment settled out of the test column during the 5-day test. The representativeness of these data were confirmed by conducting a separate simulation of the movement of fine sediment potentially brought in with the tailings. It was found that more than 99% of the sediment settled in the TMF pond. Thus, with respect to downstream water bodies, contaminant concentrations leaving the TMF would be very similar to the 5-day decant values.

4.0 SECTION 3.3.6 WILDLIFE

MVEIRB Request #42

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

1f. Discuss effects of tailings ponds on waterfowl, other aquatic birds and furbearers Section 6.9.1.10 discusses potential impacts to horned grebes (and other waterfowl) from construction of the tailings management facility (TMF) at the Nechalacho Mine.

The information need identified by the Review Board is as follows:

General mitigation measures are provided, however, no discussion of impacts to horned grebes (or other waterfowl) is provided for the operations phase of the TMF. Waterfowl are known to use active tailings ponds during mine operations. Please describe the potential impacts of horned grebe (and other waterfowl) interaction with the TMF during the operations phase of the project and provide mitigation measures to reduce or eliminate impacts.

Avalon Response #42

As discussed in Section 2.11.7.8 of the DAR, the Horned Grebe has been assessed by COSEWIC as "Special Concern" (as of April 2009). The Horned Grebe is also ranked by GNWT ENR as "Secure" under the general status program and is not listed by SARA. The Horned Grebe population is stable in the Yellowknife area, and is presumed to be stable throughout its range in the NWT (GNWT ENR 2010a).

Horned Grebes occupy small ponds, wetlands, shallow lakeshores and protected bays, and other natural or man-made permanent or semi-permanent waterbodies (Environment Canada 2010d). Their diet consists of aquatic insects, fish, frogs, and crustaceans. In the Yellowknife area, Horned Grebes were found to prefer small lakes of 0.3 to 2.0 hectares (ha) in size, although breeding also occurred on smaller and larger lakes if suitable conditions exist (Fournier and Hines 1999).

Horned Grebes are expected to arrive within the study area at the end of April or early May to breed and depart by mid-August to early September (GNWT ENR 2010d). Nests are anchored to emergent plants, primarily cattails and willows, which provide cover and support (Fournier and Hines 1999). Lakes and ponds preferred for molting are commonly greater than 15 ha in size and greater than 1 m deep (Stout and Cooke 2003).

Horned Grebe nesting and feeding habitat occurs within the Nechalacho Mine site and Hydrometallurgical Plant site areas (including along Highway 5/6 and the proposed barging route). A single Horned Grebe was observed on Murky Lake in the Nechalacho Mine study area during the July 2010 field survey, and a single observation was also recorded by Sirois (1987). Horned Grebes were not observed in the Pine Point study area during previous surveys.

As discussed in Section 6.9.1.10 of the DAR, Horned Grebes are most sensitive to disturbance during the nesting season (including pre-fledging) and moult. Horned Grebes have the potential to occur within the Nechalacho Mine local and regional study areas during the construction, operation, and closure phases.

The main ways that the Nechalacho Mine and associated infrastructure and activities could potentially affect Horned Grebe and other waterfowl species is through habitat loss, changes to daily movements including habitat avoidance and displacement, and possibly mortality. Within the Nechalacho Mine footprint area, potential Horned Grebe nesting habitat currently exists at the Tailings Management Facility (TMF).

Direct loss of this potential Horned Grebe nesting habitat will occur as a result of the construction and operation of the TMF. This loss will be irreversible because at closure the TMF will be capped and vegetated and will not be returned to a pond-type condition.

During the operations phase, it is unlikely that Horned Grebe would use the waterbody contained within the TMF, primarily because Horned Grebe and other waterfowl nesting and moulting habitat is common throughout the local and regional study areas. However, if Horned Grebes or other waterfowl spend some time on the water in the TMF, they would not be harmed or contaminated as the effluent is predicted to be non-toxic to fish and aquatic life and any suspended tailings particles have been demonstrated to be essentially inert. Thus Avalon does not believe that it would become necessary to deploy bird deterrents to keep Horned Grebes or other waterfowl off the TMF.

Construction of the TMF poses the greatest risk of mortality to nesting birds, their eggs, and young. To avoid this concern, the initial clearing and construction activities associated with the TMF will be undertaken in the fall/winter period when Horned Grebes and other waterfowl have left the area.

In addition, as indicated in the DAR, to minimize any potential for direct and indirect Nechalacho Mine development-related Horned Grebe effects, Avalon will implement the following policies and mitigation measures:

- No hunting policy for all Project employees and contractors while working on site for Avalon.
- Maintain existing drainage patterns to avoid potential alterations to existing Horned Grebe habitat.
- Keep worksites clean and manage waste to avoid attracting egg and chick predators such as gulls and Common Ravens.
- Maintain sufficient buffer distances between development activities (e.g., re-fuelling and material storage) and waterbodies, where possible.
- Avoid all known or suspected nest sites during the nesting season.
- Develop and implement an education program for wildlife related policies and mitigation to all Project employees and contractors.

5.0 SECTION 3.3.8 AIR QUALITY

MVEIRB Request #43

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

1b. Provide test results for the general composition of and impacts from dispersion of dust from tailings facilities, stockpiles, waste rock piles and similar dust producing components of the project. Include an analysis of the levels of uranium and thorium in fugitive tailings dust, or any other radioactive element from any material.

The information need identified by the Review Board is as follows:

Emissions sources at the Nechalacho mine site are described in Table 6.2-9. The source of fugitive dust emissions from haul truck/roads is described in this table and the transfer and handling of ore is described in table 6.2-17. Fugitive dust emissions are not described from other potential sources such as the ore stockpile, waste rock pile, tailings pond or the quarry. In addition, an analysis of uranium and thorium from these fugitive dust sources was requested. Please predict impacts of fugitive dust from all project components during operations including ore stockpile, waste rock pile, tailings management facility and quarry at the TLP. Include an analysis of levels of thorium and uranium in fugitive dust. Please also provide mitigation measures for all sources of fugitive dust noted above (Section 6.2.4).

Avalon Response #43

Fugitive Dust Sources

The air quality assessment and modelling conducted by RWDI (2011) and presented in Section 6.2.2 of the DAR focused mainly on the primary sources of anticipated air emissions from the Thor Lake Project components. Fugitive emissions (dust) that could be associated with the temporary waste rock pile and temporary ore stockpile developed during the construction phase at the Nechalacho Mine and Flotation Plant site were considered to be very minor, short-term sources of dust and were bounded (in the assessment) by the larger sources of air emissions generated during the operations phase.

As discussed in Section 4.7.2.1 of the DAR, decline ramp development activities will generate approximately 400,000 tonnes of waste rock, plus low grade and ore grade material. This material will be hauled to the surface and segregated in a temporary storage area (adjacent to the entrance to the decline ramp). All of the waste rock will be used for surface construction activities, specifically for dam building for the Tailings Management Facility (TMF), extension of the existing airstrip and road upgrading.

The minimal amount of ore produced from the initial development will be temporarily stockpiled on the surface and utilized for the flotation plant feed during start-up

operations. During operations, ore will be stockpiled underground in a 500 tonne ore bin prior to crushing.

As discussed in Section 4.7.5.5 of the DAR, The proposed rock quarry operation will be located southwest of the proposed TMF and will be developed in phases in response to the need for construction materials. Phase 1 has an approximate surface area of 4.6 ha and will provide roughly 130,000 m^3 (bulk) of rock material. Phase 2 will have a final surface area of 8.7 ha (inclusive of Phase 1) and will provide another 232,500 m^3 (bulk) of rock material.

Fugitive dust associated with the operation of the proposed quarry was not specifically discussed or assessed in the DAR, again because it was considered to be a minor source of air emissions, but Avalon is committed to minimizing dust emissions from the quarry operation through the diligent application of appropriate dust suppression strategies (in particular water spray), as per the GNWT dust suppression guidelines.

The Tailings Management Facility (TMF) and in particular the tailings contained in the TMF was not considered to be a potential source of air emissions in the air quality assessment conducted by RWDI because as noted in the DAR, the tailings will be wet and water will be contained within the pore spacing of the tailings. Therefore, the active tailings facility is anticipated to remain moist throughout the operations phase of the Project. During the closure period, the tailings surface will be capped with overburden and stockpiled organics and will be re-vegetated.

Radioactivity Pathways Assessment

Regarding the possible effects of radioactive components in dust and other sources of emissions from the Nechalacho Mine and Flotation Plant Project on humans and the environment, Avalon appreciates that this has been a continuing concern for the general public and the MVEIRB. This important matter was initially addressed in Section 4.9.6 (Radiation Protection Program) of the DAR.

As noted in this section, although not specifically requested in the MVEIRB Terms of Reference, Avalon retained SENES Consultants Limited (SENES) to prepare a screening-level radioactivity pathways assessment of the Thor Lake Project to determine if there were any potential environmental pathways for radiological exposures, in particular, to humans, vegetation, wildlife or fish and fish habitat. The initial memorandum, prepared by SENES, was provided in Appendix G of the DAR.

The radiological exposure pathways assessment was conducted to evaluate contaminant sources, assesses the environmental fate of released radioactive species, and estimate doses to members of the working public, people who hunt, fish or live in the surrounding area, and to non-human biota (aquatic and terrestrial receptors) present in the area. Utilizing findings of baseline studies of environmental media and receptors (Stantec 2010c), test-run laboratory results of mine wastes (SGS 2011); mathematical modelling of air dispersion (RWDI 2011) and water dispersion modelling (Section 6.4.2 of the DAR), the potential risks to both the human and ecological populations were assessed.

Dose Coefficients (DCs) were used to estimate the doses to human receptors as a result of ingestion and inhalation exposure. The incremental doses were then compared to the dose constraint of 0.3 millisieverts per year (300 μSv/y) recommended by Health Canada in the Canadian NORM Guidelines (Health Canada 2000). Doses below this level are considered as "unrestricted" and no further action is needed to control doses or materials. Since the appropriate comparison benchmark is incremental, the estimated doses exclude background. The estimated doses to both the site worker and Aboriginal peoples were well below the dose constraint.

The results of the initial pathways assessment showed that the dose to aquatic biota were below the accepted benchmark dose. A range of values of relative biological effectiveness (RBE) for alpha radiation were used in the assessment to account for the uncertainty associated with the choice of RBE. The results showed that no adverse effects on aquatic biota are expected from the release of low levels of radionuclides to the water.

Similar to the approach adopted for aquatic biota, a range of RBE and dose benchmarks were used in the assessment of terrestrial biota. The results showed that no adverse effects on terrestrial biota are expected from the release of low levels of radionuclides to the air and water. Considering the conservative nature of the calculations, it is unlikely that there would be any environmental effects resulting from exposure to radioactivity from the Thor Lake site.

Subsequent to submission of the DAR to the MVEIRB, SENES completed the radioactivity pathways assessment and Avalon is pleased to provide this report, entitled *Radioactivity Pathways Assessment for the Thor Lake Project, Northwest Territories* to the MVEIRB as Attachment 8 to this response document.

As noted in this more comprehensive SENES report, all airborne particulates (dust) were conservatively assumed on a worst case basis to be ore, the raw mine material most enriched in radionuclides (processed ore concentrate will be wet, and/or restricted from becoming airborne). Using radionuclide concentrations determined from previous ore characterization studies (shown in Table 2.4 of the SENES report), incremental concentrations of airborne uranium and thorium were estimated at 9.6×10^{-5} $\mu g/m^3$ and 5.2×10^{-4} $\mu g/m^3$ respectively. Using the assumption of secular equilibrium (parent and progeny radionuclide activities are approximately constant through time), concentrations of uranium and thorium series radionuclides were determined (Table 4.1 in the SENES report).

These concentrations were applied to the INTAKE pathways model for the inhalation pathway and for determination of soil and vegetation concentrations. The INTAKE model has been applied to several uranium mining projects in northern Saskatchewan to simulate radiological and non-radiological constituent fate and transport in the environment and the subsequent evaluation of exposures to ecological species and humans. The dose estimates are then compared to dose limits in the risk assessment to identify any areas of concern.

Radionuclides of potential concern include the thorium series radionuclides (including thorium-232, radium-228 and thorium-228) and the uranium series radionuclides (including uranium-238, thorium-230, radium-226, lead-210 and polonium-210). Thor Lake has uranium levels that are higher than an average granite but far below those of even very low grade uranium deposits. The thorium levels in the Nechalacho deposit are anomalous, although thorium has about one quarter the radioactive effect of uranium at the same concentration level.

All trophic levels were included in the pathways assessment. The aquatic receptors assessed included:

- Aquatic plants;
- Phytoplankton (e.g. Chlorophyta);
- Zooplankton (e.g. Cladocerans);
- Benthic invertebrates (e.g. Chironomidae);
- Primary consumers (e.g. whitefish); and
- Tertiary consumers (e.g. lake trout).

The terrestrial receptors assessed included:

- Barren-ground caribou;
- Moose;
- Black bear;
- Wolf;
- Snowshoe hare;
- Peregrine falcon;
- Spruce grouse;
- Merganser;
- Mallard; and
- Scaup.

The Screening Index (SI) values were calculated using baseline + project values, and all SI values were below 1. Thus no adverse effects on any of the environmental receptors are expected to occur.

The pathways that were considered in the human health assessment include inhalation, water ingestion and the intake of hare, moose, caribou, duck, fish, and berries. Using conservative assumptions of pathways, the predicted total incremental dose to camp workers was 0.9 μSv/y. First Nations persons using the site were calculated to have a

total incremental dose of 12 μSv/y for an adult and 45 μSv/y for a toddler. The estimated doses are primarily affected by the assumed air emissions from the site.

A very conservative approach was taken where all of the dust generated at the site was assumed to have the same radionuclide content as the ore. Even considering this very conservative approach, the predicted doses were well below Health Canada's 300 μSv/y dose constraint, and no adverse effects on humans are expected to occur.

Reference:

SENES Consultants Limited. 2011. Radioactivity Pathways Assessment for the Thor Lake Project, Northwest Territories. Report prepared for Avalon Rare Metals Incorporated. July 2011.

MVEIRB Request #44

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

1e. Include a discussion on expected emission levels for and impacts related to dioxins and furans from waste incineration.

The information need identified by the Review Board is as follows:

The scope of air quality assessment in Section 6.2.2.1 of the DAR did not consider dioxin and furan emissions from waste incineration as a source of criteria air contaminants (CACs) from the both project sites. Waste incineration is given a rank of "minor" in Table 6.2-9, Emissions Sources. Dioxins and furans, however, are not included as CACs in waste incineration and have therefore not been assessed. Please include dioxins and furans as a CAC in the effects assessment of waste incineration at the TLP.

Avalon Response #44

Dioxins and furans in the environment can be attributed to three principal sources: point source discharges (to water, air and soil), contamination from in situ dioxins and furans, and loadings from long-range transboundary air pollution (CCME 2003). In particular, dioxins and furans are created as by-products in high-temperature processes, such as waste burning and metallurgical industries.

Dioxins and furans are managed under the *Canadian Environmental Protection Act* (CEPA), the federal *Toxic Substances Management Policy* and the Canadian Council of Ministers of the Environment's (CCME) *Policy for the Management of Toxic Substances* (CCME 2003). Canada-wide Standards were developed by CCME in 2001 for waste incineration, including municipal solid waste, hazardous waste, sewage sludge, and medical waste.

In addition, Environment Canada's (2009) *Technical Document for Batch Waste Incineration* and CCME's (1989) *Operating and Emission Guideline for Municipal Solid Waste Incinerators* provide guidance on appropriate incineration equipment and operating practices that,

if followed, should minimize the release of contaminants, including dioxins and furans, from waste incineration (MVLWB 2011).

Dioxins and furans are classified as Persistent Organic Pollutants (and not Criteria Air Contaminants) by Environment Canada (2011a). Persistent Organic Pollutants (POPs) include organic compounds that are resistant to environmental degradation and have been associated with adverse effects on human health and the environment.

Waste incineration has historically contributed significantly to dioxin and furan emissions across Canada. In an effort to reduce emissions, new facilities are required to meet stringent limits and existing facilities require retrofitting with control technology efficient at destroying dioxins and furans (Environment Canada 2010). Environment Canada (2011b) states that between 1990 and 2009, "dioxins and furan emissions decreased by 89%, primarily due to large reductions from incineration activities, the iron and steel sector, and the pulp and paper sector."

For the Thor Lake Project, Avalon will use generally available incineration and emission control technology and accepted waste diversion practices. The waste incinerator to be employed at the Nechalacho Mine site will be engineered and operated to meet the Canada-wide Standards for dioxins and furans (CCME 2001), and will be sized to meet the demand of the construction and operations workforce at the Nechalacho Mine site.

As stated in Sections 4.7.3.5, 4.8.3.3, and 11.2.8 of the DAR, garbage will be collected daily and incinerated once per day at the Nechalacho mine site in a manner consistent with current industry good management practices and in compliance with regulatory requirements. Hazardous materials waste will be disposed of in accordance with current GNWT hazardous waste management guidelines using standard best management practices.

Based on the application of these mitigation measures, it is anticipated that the potential effects from waste incineration will continue to be classified as minor.

References:

Canadian Council of Ministers of the Environment (CCME). 2001. Canada-Wide Standards for Dioxins and Furans. Winnipeg, MB.

Canadian Council of Ministers of the Environment (CCME). 2003. Canada-Wide Standards for Dioxins and Furans: Conical Waste Combustion of Municipal Waste. Retrieved from http://www.ccme.ca/assets/pdf/d_f_conicalwaste_cws_e.pdf

Canadian Council of Ministers of the Environment (CCME). 2009. Canada-Wide Standards for Dioxins and Furans: Pulp and Paper Boilers Burning Salt Laden Wood, Waste Incineration, Iron Sintering Plants, Steel Manufacturing Electric Arc Furnaces and Conical Municipal Waste Combustion Progress Report. Retrieved from http://www.ccme.ca/ass

Environment Canada. 2010. Incineration. Retrieved from http://www.ec.gc.ca/toxiques-toxics/Default.asp?lang=En&n=C5039DE5-1&xml=0D129B0A-2248-411A-BC8E-3ED508F3A44C

Environment Canada. 2011a. Glossary: Persistent Organic Pollutants (POPs). Retrieved from http://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=9264E929-1#POP

Environment Canada. 2011b. 2009 Air Pollutant Emission Summaries and Historical Emission Trends. Retrieved from http://www.ec.gc.ca/inrp-npri/default.asp?lang=En&n=2DAFE231-1#Highlightsets/pdf/df_2009_prgs_rpt_e.pdf

Mackenzie Valley Land and Water Board (MVLWB). 2011. Guidelines for Developing a Waste Management Plan. Retrieved from http://www.mvlwb.ca/WGDocs/MVLWB_Guidelines_Developing_Waste_Mgmt_Plan-Mar2011.pdf

6.0 SECTION 3.3.10 BIOPHYSICAL ENVIRONMENTAL MONITORING AND MANAGEMENT PLANS

MVEIRB Request #45

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

Not provided.

The information need identified by the Review Board is as follows:

Please provide conceptual monitoring and management plans during the EA phase according to the following Waste Management Plan guideline:

- ***Guidelines for Developing a Waste Management Plan*. March 31, 2011. Published by the MVLWB.**

Avalon Response #45

Waste management plans are required as part of applications for both land use permits and water licences. In preparation for the application, Avalon has provided its approach to developing the waste management plan. It is anticipated that once an application is approved, that the land use permits and water licences may contain conditions that require revisions to the waste management plan.

The Thor Lake Project Waste Management Plans (the Plans) will be guided by the Mackenzie Valley Land and Water Board's (MVLWB 2011) *Guidelines for Developing a Waste Management Plan*. The Plans will outline waste management activities and methods, particularly specifying how Avalon has considered pollution prevention/ minimization during the planning process. Avalon envisions preparing several management plans:

- Hazardous materials management plan;
- Non-hazardous, solid waste and sewage management plan; and
- Tailings management and waste rock management plan.

The Plans will be developed based on applicable legislation, regulations and guidelines.

Waste management activities anticipated to occur at the Thor Lake Project include waste reduction, collection, handling, separation, storage, recycling, reusing, transport and disposal.

Anticipated waste streams may include:

- Tailings and waste rock;
- Sewage and greywater;
- Kitchen waste;
- Domestic refuse;
- Used lubricants, grease and solvents, and contaminated water;
- Electronics and batteries; and
- Recyclables, including beverage containers and tires.

According to MVLWB (2011), the Plans should include the following components:

- Corporate and project information, including company name, environmental policy, and site name and location;
- Effective date of the plan;
- Purpose and scope of the plan, including waste management goals and objectives that consider environmental, social, economic and regulatory factors;
- Project description;
- Location of waste management activities;
- Site description, including physical, surface and subsurface characteristics, geotechnical characteristics and site water management;
- Waste types, including a description of each waste type's characteristics, source of generation, estimated volume/mass produced, and potential environmental effects;

- Management of each waste type, including a description of the management activities and rationale for the methods used, and an explanation of how the waste management hierarchy was considered; and
- Infrastructure requirements for waste management, and as per MVLWB (2011), specific descriptions are required depending on the type of infrastructure proposed for use.

Reference:

Mackenzie Valley Land and Water Board (MVLWB). 2011. Guidelines for Developing a Waste Management Plan. Retrieved from http://www.mvlwb.ca/WGDocs/MVLWB_Guidelines_Developing_Waste_Mgmt_Plan-Mar2011.pdf

MVEIRB Request #46

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

Not provided.

The information need identified by the Review Board is as follows:

Please provide conceptual monitoring and management plans during the EA phase according to the following Aquatic Effects Monitoring Program guideline:

- ***Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories: Recommended Procedures for Developing Detailed Designs for Aquatic Effects Monitoring Programs*. 2008. Indian and Northern Affairs Canada.**

Avalon Response #46

The comprehensive Aquatic Effects Monitoring Plan (AEMP) for the Avalon Project will be guided by the INAC *Guidelines for Designing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories*. Specifically, this will be achieved by adopting the environmental effects monitoring (EEM) requirements of the Metal Mining Effluent Regulations (MMER) as the primary elements of the AEMP. A summary description of the MMER and its prescribed effluent and EEM requirements are provided in Section 6.14.1.2 of the DAR.

The frequencies, methods, and elements monitored as part of regular effluent testing will adhere to the requirements of the MMER and the Mackenzie Valley Land and Water Board (MVLWB), and must be approved in advance by Environment Canada (for the purposes of the MMER). Specifically, such monitoring will include:

- **Deleterious substance and pH testing** according to the MMER sampling schedule (MMER Part 2, Division 2, Sections 12 and 13);
- **Acute lethality testing**, as prescribed in the MMER Part 2, Division 2, Sections 14 to16; and
- **Daphnia magna monitoring tests** (MMER, Part 2, Division 2, Section 17).

The above sampling will occur at the final discharge point(s), as determined following completion of the mine plan, namely the control structure outlet from the Tailings Management Facility (TMF), which leads to Drizzle Lake. The substances analyzed as part of the water quality testing program will include, at a minimum, those identified in the MMER, namely: arsenic, copper, cyanide, lead, nickel, zinc, total suspended solids, and radium 226. The sampling frequency for these substances will be determined by the results of the first year of monitoring.

In addition, regular EEM studies will be undertaken according the prescribed schedules of the MMER. Specifically, these testing programs will include:

- **Effluent characterization**, involves sampling and analyses conducted four times per year, at a minimum, for: hardness, alkalinity, aluminum, cadmium, iron, mercury, molybdenum, ammonia, and nitrate (MMER Schedule 5, Part 1, Section 4);
- **Sub-lethal toxicity testing**, involves the testing of survival in aliquots of effluent of a fish species, an invertebrate species, a plant species, and an algal species (MMER Schedule 5, Part 1, Section 5);
- **Water quality monitoring**, involves conducting monitoring four times per year in a natural waterbody within the exposure area surrounding the point of entry of effluent from each final discharge point (i.e., within the inlet to Drizzle Lake), and in sampling areas within reference and downstream exposure areas of natural waterbodies identified and approved by Environment Canada and the MVLWB (MMER, Schedule 5, Part 1, Section 7). Analyses would include, at a minimum: hardness, alkalinity, aluminum, cadmium, iron, mercury, molybdenum, ammonia, and nitrate. Although the specific locations for testing will be determined in consultation with Environment Canada and the MVLWB, it is assumed that these would include, at a minimum, the lakes and streams along the potential effluent pathway, namely: Drizzle, Murky, Thor, Long, Fred, and A lakes; the streams connecting these lakes; the inlet from this system to Great Slave Lake; and Kinnikinnick and Redemption lakes (reference lakes); and
- **Biological monitoring studies**, prescribed in Part 2 of the MMER, involve site characterization, fish population estimation, fish tissue analysis, and benthic community studies. These studies would be carried out according to the schedule provided in Part 2, Division 1, Sections 14-16 of the MMER. Study designs must be submitted and approved by Environment Canada prior to the initiation of field sampling. Study locations would be similar to those described for the water quality

monitoring program above. In addition to the study elements listed above, the biological monitoring study would also include sediment and water quality analyses of samples collected at the same locations as approved for invertebrate sampling.

MVEIRB Request #47

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

Not provided.

The information need identified by the Review Board is as follows:

Please provide conceptual monitoring and management plans during the EA phase according to the following Adaptive Management Plan guideline:

- ***Guidelines for Adaptive Management – A Response Framework for Aquatic Effects Monitoring.*** **October 17, 2010 (draft). MVLWB.**

Avalon Response #47

The intensive effluent, water, and biological sampling programs undertaken by Avalon in accordance with the MMER and MVLWB requirements, will:

- detect exceedances of regulated levels of substances identified in the Water Licence and/or the MMER;
- identify trends in water quality, water flow and biological parameters;
- permit comparisons with Canadian Council of Ministers of the Environment (CCME) guidelines for the protection of aquatic resources; and
- provide early detection of adverse effects on downstream biota.

Adaptive management involves the preparation for unexpected adverse effects and the ability to learn from the results of Project mitigation techniques and from experiences at other northern mine sites to improve remedial measures. Avalon will therefore prepare contingency plans in the event that trends point toward potential negative changes in environmental indicators. Early indicators may include water chemistry parameters and/or shifts in lower trophic level organisms and community structure, which have short generation times and react rapidly to changing environmental conditions.

Importantly, the adaptive management program will integrate considerations of water chemistry, hydrologic, and biological factors that combine to determine environmental effects. For example, the identification of effluent water chemistry alone is not sufficient to determine downstream effects, since valued environmental components may be affected by a variety of chemical, physical and biological characteristics, which interact to influence species composition, abundance, and health.

As described in the DAR Section 6.4.2.6, modelling predicts that the MMER effluent criteria for all parameters will be met over the entire 20 year simulation period, in each of the lakes within the Thor Lake system. However, nutrient modelling identifies the possibility that seasonally increased primary and secondary production of the system may occur as a result of potential inputs of additional nitrogen from the TMF decant water. Nitrogen additions might not significantly affect lower trophic level community structure and composition due to the limitation of primary production by phosphorous. However, this potential effect must be carefully assessed and will therefore be a particular focus of the biological and water quality monitoring program. Trends toward higher levels of nitrogen coupled with changes in phytoplankton species composition and abundance (through analysis of species richness, diversity, evenness, etc.) will assist in the identification and implementation of additional mitigation measures, if determined to be necessary.

7.0 SECTION 3.4 HUMAN ENVIRONMENT

MVEIRB Request #48

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

K4b Traditional Land Use and Wildlife Harvesting

32. Describe...changes in all-season access from potentially affected communities due to the Thor Lake mine site-Great Slave Lake access road and any changes in access by non-resident hunters.

The information need identified by the Review Board is as follows:

It is unclear how or if access will be controlled along the Thor Lake access road from Great Slave Lake to the minesite. Please describe if and how public access will be controlled at the barge landing site and along the access road during various seasons of operation.

Avalon Response #48

As discussed in the DAR, the existing 5 km access road that extends from the north shore of Great Slave Lake to the proposed Nechalacho Flotation Plant site will be upgraded for the safe transport of concentrate and supplies. Avalon is aware that the existing barge landing area and access road have and continue to be used by a few hunters and trappers to access the land from time to time.

During operations, Avalon is required to ensure the safety of its employees, contractors, consultants and visitors. Visitation during operations will be allowed through pre-approval processes to ensure appropriate manpower is available to escort visitors during planned visitation events throughout all seasons. Should a non-employee or recreational emergency event occur near Avalon's Project site, then

Avalon would assist local authorities in responding appropriately. Planned visitors arriving at the site from Great Slave Lake or the airstrip will be required to report to the security depot that will be established at the site to be registered and to be given directions and assistance as necessary to ensure safe passage.

MVEIRB Request #49

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

33. For visual and audible changes from Great Slave Lake

a. describe and illustrate any potential visual impacts to the viewshed as seen from Great Slave Lake.

b. describe any other points along remainder of Great Slave Lake and islands where the project will be visible or audible, illustrate and describe how it will look and sound.

c. describe any measures taken to minimize theses sensory disturbances.

The information need identified by the Review Board is as follows:

The developer was asked to illustrate visual and auditory changes from this development as experienced by someone in a boat on Great Slave Lake from the barge landing site and adjacent laydown and container storage areas on shore. An illustrated analysis of viewshed impacts at the barge landing site and its impacts on traditional activities has not been provided. Please provide a viewshed analysis including illustrations of visual changes as seen from Great Slave Lake 1 kilometre from both docking sites. Please include measures proposed to mitigate adverse impacts on visual and auditory impacts as seen and heard from the lake and describe any residual impacts.

Avalon Response #49

As requested, Avalon is pleased to provide two new figures that illustrate the general shoreline views that will be seen by passing boats at the Nechalacho dock site (Figure 1) and the Pine Point dock site (Figure 2). To minimize visual and auditory impacts, Avalon is committed to maintaining existing tree cover and buffer areas in and around both dock sites and associated laydown areas to the extent possible. Avalon also anticipates that both of the seasonal dock sites may be used on occasion by boaters that may be in the general area seeking refuge and comfort from storms.

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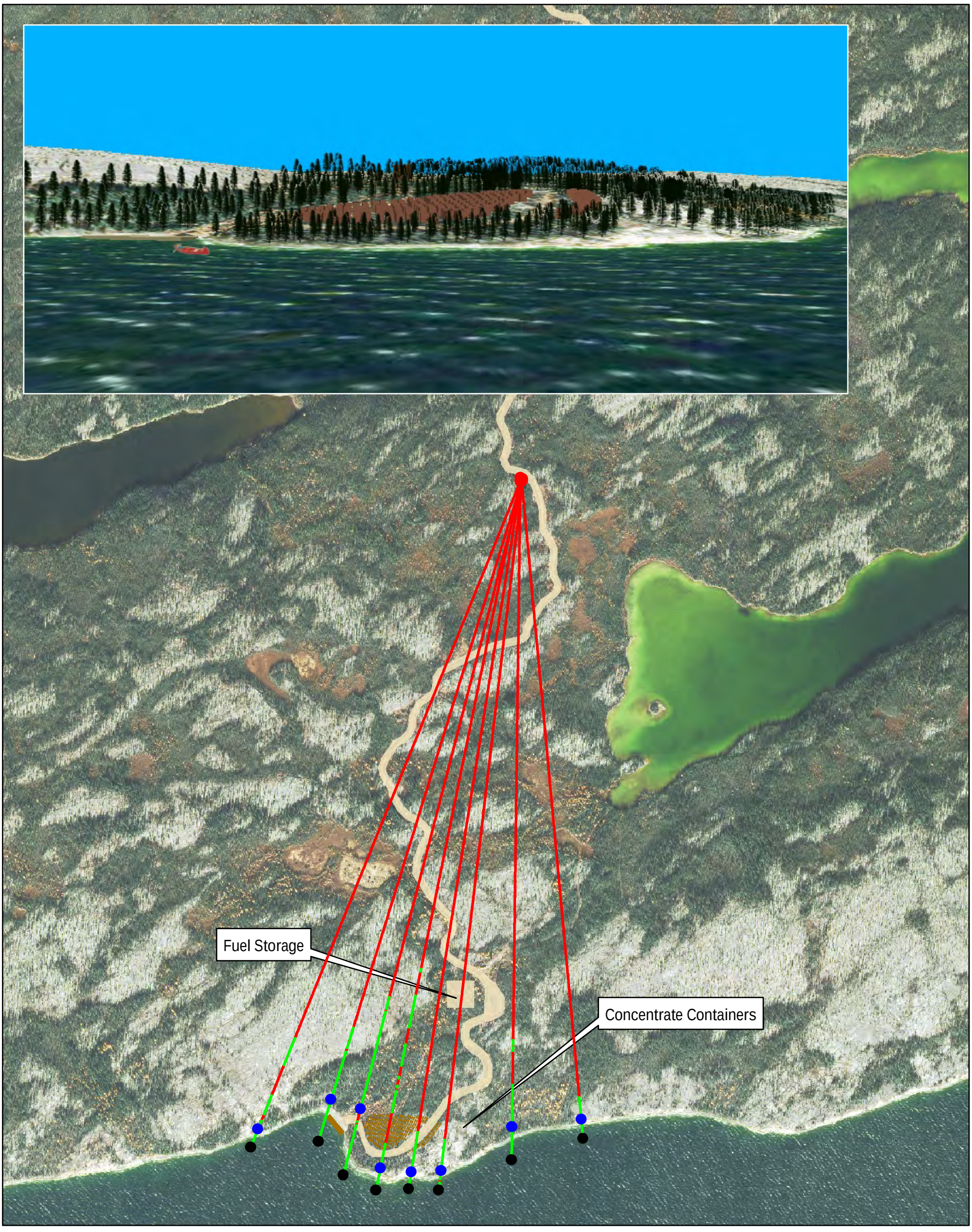

LEGEND

- Observer Location
- Obstruction Point
- Target Location
- Obstructed Area
- Visible Area

N
W E
S

NOTES
Base data source: NTS 1:50,000

ISSUED FOR USE

THOR LAKE PROJECT

Nechalacho Mine Site Docking Area
Line of Sight from Water

PROJECTION	DATUM
UTM Zone 12	NAD83

EBA Engineering Consultants Ltd. eba

AVALON RARE METALS INC.

FILE NO.
V15101007_DAR_IR_Map001_Nech-Dock-LineofSight.mxd

PROJECT NO.	DWN	CKD	REV
V15101007.006	KMW	RH	0

OFFICE	DATE
EBA-VANC	September 22, 2011

Figure 1

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LEGEND

- Observer Location
- Obstruction Point
- Target Location
- Obstructed Area
- Visible Area

N
W E
S

NOTES
Base data source: NTS 1:50,000

ISSUED FOR USE

THOR LAKE PROJECT

Hydrometallurgical Plant Site Docking Area Line of Sight from Water

PROJECTION	DATUM
UTM Zone 12	NAD83

EBA Engineering Consultants Ltd. eba

AVALON RARE METALS INC.

FILE NO.
V15101007_DAR_IR_Map002_HydroMet-Dock-LineofSight.mxd

PROJECT NO.	DWN	CKD	REV
V15101007.006	KMW	RH	0

OFFICE	DATE
EBA-VANC	September 22, 2011

Figure 2

MVEIRB Request #50

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

K5 Human Environment Monitoring and Management Plans

39a. How access along the Thor Lake mine site-Great Slave Lake access roads at both sites will be monitored and, if feasible, managed.

The information need identified by the Review Board is as follows:

This requirement in the Terms of Reference is related to line item #33 above. Please describe how access along the Thor Lake mine site – Great Slave Lake access road and the Pine Point – Great Slave Lake access road will be monitored and managed.

Avalon Response #50

Avalon proposes a security building at the confluence of the road and laydown area at the Nechalacho dock site. The building will be used during the barging season. Avalon will also ensure that the roads are monitored by Avalon security personnel as a routine duty within their daily tasks. Avalon security personnel will travel the main roads at both the Thor Lake and Pine Point industrial sites to and from the docking facilities on a daily basis to ensure that authorized traffic is using the road in a safe manner.

MVEIRB Request #51

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

Appendix H: Traditional Knowledge Study Communication/Consultation Logs

The information need identified by the Review Board is as follows:

This Appendix provides the consultation logs associated with TK Studies. Are the TK Studies complete? Will Avalon be providing the TK Studies to the Review Board?

Avalon Response #51

Three traditional knowledge studies were conducted in 2010 and the reports completed in January and February 2011. The studies include:

- Traditional Knowledge Study Summary Report, Community of Fort Resolution: Deninu Ku'e First Nation & Fort Resolution Metis Council (January 2011);
- Traditional Knowledge Study Summary Report: Lutsel K'e Dene First Nation (February 2011); and
- Traditional Knowledge Study Summary Report: Yellowknives Dene First Nation (January 2011).

The reports were not provided in the DAR due to agreements between Avalon and each Aboriginal group regarding distribution and confidentiality of the documents; however, key results from the traditional knowledge studies were incorporated into the DAR.

8.0 SECTION 3.5 ACCIDENTS AND MALFUNCTIONS

MVEIRB Request #52

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

For this section, the developer will first discuss impacts to a valued component from an accident or malfunction as though it has happened, then discuss the associated probability of the event. For water quality related accidents or malfunctions, Avalon will provide analysis of potential impacts to water quality with the same depth and breadth of analysis as similar line items under that key-line-of-inquiry section.

3. *Discuss what could leach from Avalon's frozen-concentrate transport container if left to thaw over a summer season or during a temporary shutdown of operations. Also discuss the likelihood of that happening over the course of a transport season and suggested mitigations to prevent any impacts.*

The information need identified by the Review Board is as follows:

Please provide a response to this line item.

Avalon Response #52

As discussed in Section 4.7.2.5 of the DAR, the concentrate produced at the Nechalacho Mine and Flotation Plant site will be stored in custom-designed, covered containers with removable lids. The containers will be half-height intermodal containers with external dimensions of 6.1 m long (20 ft) by 2.4 m wide (8 ft) by 1.3 m high (4 ft 3 in). The custom design will incorporate a solid, sealed bottom to ensure that moisture build-up that may occur during thawing of a container is managed to ensure no impacts to the surrounding environment. Furthermore, it must be emphasized that the concentrates contained in each container are inert to the surrounding environment.

9.0 SECTION 3.7 CLOSURE AND RECLAMATION

MVEIRB Request #53

The original Terms of Reference (MVEIRB 2011a) for this item was as follows:

2. *In the Conceptual Closure and Reclamation Plan, discuss management and monitoring programs for any materials/locations (including the underground works) that may cause acid rock drainage or metals leaching. Include:*

    c. *the likely rate of movement of water (including groundwater) through the tailings, mine rock management area and underground workings, associated uptake of acids, metals or any other contaminants into groundwater or surface waters, and monitoring location requirements and contingency plans for greater than expected rates of contaminant release.*

The information need identified by the Review Board is as follows:

The DAR does not address post-closure water movement through the tailings or the underground workings; associated uptake of acids, metals or any other contaminants into groundwater or surface waters; post-closure monitoring requirements or contingency plans. Please provide a response to this line item for both sites through all project phases.

Avalon Response #53

As requested by the Review Board, Avalon has structured the following response by Project site.

Nechalacho Mine and Flotation Plant Site

The conceptual reclamation strategies for the Tailings Management Facility (TMF) and the underground workings at the Nechalacho Mine site were presented in Section 11.2 of the DAR.

As indicated, the TMF will be capped with overburden and stockpiled organics and will be re-vegetated. Surface runoff channels and permanent spillways will be constructed as required to provide sustainable surface runoff conditions. Based on the environmental characterization of the waste rock, tailings ore and concentrate, as discussed in Section 4.7.3.1 of the DAR and in the updated SGS Final Report (dated August 30, 2011), it is apparent that neither acid rock drainage or significant metal leaching can be expected to occur at the Nechalacho Mine site at any time.

Regarding the underground workings, as indicated in the DAR, during the operational life of the mine all excess mine water from the underground operations will be pumped to surface for use in the Flotation Plant and will report to the Tailings Management Facility (TMF). During the closure and post-closure periods, the current mine plan estimates that

95% of the void space of the underground mine will eventually be filled with waste rock or paste backfill. The remaining void space will be flooded with groundwater.

As discussed in Section 6.5.1.4 of the DAR, based on the estimated void volume and the simulated mine inflows, the underground mine will be flooded in approximately 5.3 years after mine closure assuming the lower inflow projections. If the higher inflow projections are applied, the underground mine will be flooded more rapidly (1.6 years). Once the water level in the mine reaches the pre-development or natural level, seepage inflow will cease and the groundwater regime will return to pre-development conditions.

As also indicated in the DAR, Avalon is committed to surface and groundwater monitoring throughout the life of the mine, including post-closure monitoring to confirm that completed closure measures are meeting expectations and that contamination of the surface or groundwater of the area does not occur.

Hydrometallurgical Plant Site

The conceptual reclamation strategies for the Hydrometallurgical Plant site, including the Hydrometallurgical Tailings Facility (HTF) are presented in Section 11.3 of the DAR. As indicated, the main objective for closure and reclamation activities for the HTF will be to transform the historic L-37 open pit into a more natural condition to the greatest degree possible. Reclamation strategies will focus on utilizing nearby waste and overburden material to stabilize and cover exposed tailings. Re-vegetation options may be considered, provided site conditions are suitable.

As discussed in Section 4.8.3.1 of the DAR and as noted in several previous responses provided, during the operations phase, the Hydrometallurgical Plant tailings stream will initially be directed into the L-37 tailings facility (HTF) where the solids component of the tailings will settle.

Excess supernatant water collected in the northern portion of the L-37 pit will then be pumped by pipeline to the N-42 historic open pit for infiltration into the Presqu'ile aquifer. As has been previously noted, a comparison of the projected chemical properties of the tailings water with the historically documented groundwater quality results shows that the concentrations of all metals parameters in the HTF tailings water will be well below the applicable MMER criteria and lower than or within the same range of concentrations for these parameters in the existing groundwater of the area. In particular, the concentrations of arsenic, mercury, iron, lead and zinc are expected to be lower, and the concentrations of copper and nickel will be within the same range as existing conditions.

The pH of the tailings water is expected to be slightly above neutral (7.7), while conductivity, sodium, chloride and other parameters that contribute to water hardness, including calcium, magnesium and sulphate will be elevated compared to current background conditions.

However, these elevated levels are expected to rapidly diffuse and dilute to natural background values within the Presqu'ile Formation. The radionuclide parameters including ^{226}Ra, ^{228}Ra and ^{210}Pb are all expected to be at or below detection limits.

During the closure and post closure period, the residual HTF tailings water remaining in Pit L-37 and Pit N-42 will continue to be diluted due to surface precipitation and remaining water in either pit will continue to infiltrate into the Presqu'ile aquifer.

As previously stated in Section 4.8.3.1 of the DAR, the principle objective of the HTF design is to ensure protection of the environment during operations and in the long-term (after closure) to achieve effective reclamation. The design takes into account the following requirements:

- Permanent, secure and total confinement of all tailings solids within an historic open pit with adequate capacity and stability;
- Removal of excess supernatant water from the HTF for infiltration into the Presqu'ile aquifer through the N-42 historic open pit; and
- Inclusion of monitoring features for all aspects of the facility to ensure performance goals are achieved and that design criteria and assumptions are met.

Avalon is committed to surface and groundwater monitoring throughout the life of the Project, including post-closure monitoring to confirm that completed closure measures are meeting expectations.

Since the projected concentrations of all of the parameters of potential concern will be lower than or within the range of existing groundwater quality conditions, the anticipated effects on groundwater quality in the Pine Point area for the life of the Project are expected to be insignificant.

ATTACHMENTS

Attachment 4: Memorandum: Thor Lake Project – Pine Point Site Groundwater and Surface Water Quality Test Results. Project No. NB11-00232. Prepared for Avalon Rare Metals Inc. May 20, 2011.

Attachment 5: Thor Lake Rare Earth Metals Baseline Project Environmental Baseline Report: Volume 3 – Aquatics and Fisheries (Final Report). Prepared by Stantec Inc. for Avalon Rare Metals Inc. January 2011.

Attachment 6: Tailing Testing – Thor Lake Project Northwest Territories. Prepared by Golder Paste Technology Ltd. for Avalon Rare Metals Inc. March 4, 2011.

Attachment 7: H3D Model Validation. Prepared by EBA, A Tetra Tech Company.

Attachment 8: Radioactivity Pathways Assessment for the Thor Lake Project, Northwest Territories. Prepared by SENES for Avalon Rare Metals Inc. July 2011.

Attachment 4

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MEMORANDUM

To:	Mr. David Swisher	Date:	May 10, 2011
Copy To:	Jordin Barclay	File No.:	NB101-390/2-A.01
From:	Kevin Hawton	Cont. No.:	NB11-00232
Re:	Thor Lake Project – Pine Point Site Groundwater and Surface Water Quality Test Results		

Six (6) groundwater monitoring wells were installed near the proposed hydrometallurgical facilities for the Thor Lake Project, near the historic town of Pine Point, NWT. The wells were developed and water samples were taken from them by Maskwa Engineering Ltd. (Maskwa) between February 22 and March 4, 2011 in general accordance per the Groundwater Field Procedures provided in memo, Ref. No. NB10-00624 issued on November 26, 2010. Additionally during the field program select surface water locations were sampled on February 28 and March 12, 2011 for the purposes of collecting baseline water quality data. Figure 1 shows the locations of the monitoring wells and surface water sampling locations.

A total of 13 water samples (including 6 groundwater samples and 7 surface water samples) were sent to ALS Laboratory Group (ALS) in Edmonton by Maskwa for completion of a complete suite of analytical tests including:

- Physical Tests
- Anions and Nutrients
- Cyanides
- Total metals
- Dissolved metals (groundwater only)

The results from the laboratory testing are summarized on Table 1. The laboratory results from ALS are included in Appendix A. Copies of the Chain-of Custody (CoC) forms from the sampling event are included in Appendix B. It should be noted that test results were not received for well 2010-04. According to Maskwa this well was sampled and sent to ALS; however, upon reviewing the CoC forms, these samples are not listed, so it is suspected that they were never actually sent to the lab.

Planning for the next sampling event (Spring Event) should start soon. We understand that this should be carried out in late May or early June, 2011. Please advise how you would like us to proceed. Should you have any questions, please do not hesitate to ask.

Signed:

Ryan Weir, E.I.T
Geological Engineering

Approved:

Kevin Hawton, P.Eng.
Senior Engineer

Attachments:

Table 1 Rev 0	Water Sample Laboratory Test Results Summary
Figure 1 Rev 0	Location of Wells and Surface Water Sampling Sites
Appendix A	Laboratory Certificates of Analysis
Appendix B	Chain-of-Custody Form (Event #1)

/rdw

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TABLE 1

AVALON RARE METALS INC.
THOR LAKE PROJECT

PINE POINT SURFACE AND GROUNDWATER QUALITY
WATER SAMPLE LABORATORY TEST RESULTS SUMMARY

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				GROUNDWATER							SURFACE WATER						
Date Sampled				04-Mar-11	27-Feb-11	27-Feb-11	27-Feb-11	-	04-Mar-11	28-Feb-11	28-Feb-11	28-Feb-11	28-Feb-11	28-Feb-11	28-Feb-11	28-Feb-11	12-Mar-11
Lab ID				L983741	L982653	L982653	L982653	-	L983741	L2982653	L2982653	L2982653	L2982653	L2982653	L2982653	L2982653	L987687
Samples	**Sample Type**	**Units**	**MDL**	**DH-2010-01**	**2010-02S**	**2010-02D**	**2010-03**	**2010-04**	**DH-2010-05**	**2010-05**	**SW1**	**SW2**	**SW3**	**SW4**	**SW5**	**SW6**	**SW7**
Physical Tests	Colour, True	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Conductivity	uS/cm	0.20	1080	860	825	1030	-	856	373	1510	960	1550	1660	1520	2810	1610
	Hardness (as CaCO3)	mg/L	-	193	491	436	586	-	544	212	940	530	919	1080	935	2110	973
	pH	pH	0.10	7.87	7.81	7.85	7.77	-	8.01	8.08	8.07	8.00	7.71	8.03	8.08	7.92	8.08
	Total Suspended Solids	mg/L	3.0	61.0	56.0	44.0	20.0	-	478	84.0	<3.0	<3.0	<3.0	<3.0	3.0	8.0	<3.0
	Total Dissolved Solids	mg/L	-	556	537	508	661	-	566	203	1130	662	1110	1310	1150	2560	1210
	Turbidity	-	0.10	86.8	94.2	36.4	12.9	-	564	131	0.11	0.24	0.21	0.55	0.59	1.14	0.48
Anions and Nutrients	Acidity (as CaCO3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Alkalinity, Bicarbonate (as CaCO3)	mg/L	5.0	396	372	344	418	-	322	232	242	159	458	219	208	211	252
	Alkalinity, Carbonate (as CaCO3)	mg/L	5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Alkalinity, Hydroxide (as CaCO3)	mg/L	5.0	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	Alkalinity, Total (as CaCO3)	mg/L	5.0	325	305	282	343	-	264	190	198	130	375	180	170	173	206
	Ammonia-N, Total	-	-	-	-	-	-	-	-	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Bromide (Br)	-	1.0	<1.0	<1.0	<1.0	<1.0	-	<1.0	<0.10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	Chloride (Cl)	mg/L	0.50	3.23	3.38	4.25	3.16	-	1.21	<0.50	5.89	4.02	3.25	2.86	12.5	12.8	5.57
	Nitrate (as N)	mg/L	0.050	<0.050	<0.050	<0.050	<0.050	-	<0.050	0.171	<0.050	<0.050	0.055	<0.050	<0.050	<0.050	<0.050
	Nitrate and Nitrite as N	mg/L	0.071	<0.071	<0.071	<0.071	<0.071	-	<0.071	0.171	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071	<0.071
	Nitrite (as N)	mg/L	0.050	<0.050	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Total Kjeldahl Nitrogen	-	-	-	-	-	-	-	-	-	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.2
	Total Nitrogen	-	-	-	-	-	-	-	-	-	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.21
	Orthophosphate-Dissolved (as P)	-	0.010	<0.010	<0.010	<0.010	<0.010	-	<0.01	<0.0020	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Total Phosphate as P	-	0.020	0.021	<0.020	<0.020	<0.020	-	0.088	<0.010	-	-	-	-	-	-	-
	Sulfate (SO4)	mg/L	0.50	292	182	173	250	-	218	12.5	684	390	561	820	701	1730	740
Cyanides	Cyanide, Total	mg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	-	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Total Metals	Aluminum (Al)-Total	mg/L	0.010	0.980	0.713	0.492	0.052	-	5.79	1.10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
	Antimony (Sb)-Total	mg/L	0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	0.00043	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
	Arsenic (As)-Total	mg/L	0.00040	0.00155	0.00247	0.00655	0.00543	-	0.0114	0.00044	0.00073	0.00071	0.0037	0.00392	0.00156	0.00079	0.00084
	Barium (Ba)-Total	mg/L	0.0030	0.0112	0.0514	0.0758	0.0401	-	0.168	0.0685	0.0147	0.0789	0.0127	0.0195	0.0355	0.0161	0.0344
	Beryllium (Be)-Total	mg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Boron (B)-Total	mg/L	0.050	<0.050	<0.050	<0.050	<0.050	-	<0.050	<0.050	0.154	<0.050	<0.050	<0.050	0.157	<0.050	0.052
	Cadmium (Cd)-Total	mg/L	0.000050	0.000114	<0.000050	<0.000050	<0.000050	-	0.000221	0.000176	<0.000050	0.0001	0.000401	0.000591	0.000174	0.000227	0.000091
	Calcium (Ca)-Total	mg/L	0.50	41.1	124	131	157	-	231	72.9	211	150	252	271	225	453	254
	Chromium (Cr)-Total	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	0.0114	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
	Cobalt (Co)-Total	mg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	-	0.0036	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total	mg/L	0.0010	0.0013	0.0039	0.0013	<0.0010	-	0.0088	0.0031	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Iron (Fe)-Total	mg/L	0.010	1.35	3.02	1.51	0.718	-	9.48	1.22	0.013	0.012	0.028	0.052	0.024	0.184	0.037
	Lead (Pb)-Total	mg/L	0.00010	0.0167	0.00902	0.00511	0.0039	-	0.0192	0.0101	0.00114	0.0107	0.0175	0.0204	0.00512	0.0142	0.00156
	Lithium (Li)-Total	mg/L	0.010	<0.010	<0.010	<0.010	<0.010	-	0.022	<0.010	0.019	<0.010	<0.010	<0.010	0.027	0.012	0.017
	Magnesium (Mg)-Total	mg/L	0.10	16.0	51.9	59.7	65.1	-	93.6	21.0	97.2	43.6	85.0	92.6	92.9	206	88.8
	Manganese (Mn)-Total	mg/L	0.0020	0.0148	0.0491	0.0620	0.0141	-	0.206	0.0158	<0.0020	<0.0020	<0.0020	0.0261	<0.0020	0.0386	0.0093
	Mercury (Hg)-Total	mg/L	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Molybdenum (Mo)-Total	mg/L	0.0050	<0.0050	<0.0050	0.0050	0.0057	-	0.0150	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050

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TABLE 1

AVALON RARE METALS INC.
THOR LAKE PROJECT

PINE POINT SURFACE AND GROUNDWATER QUALITY
WATER SAMPLE LABORATORY TEST RESULTS SUMMARY

Print May/10/11 15:28:20

				GROUNDWATER							SURFACE WATER						
Date Sampled				04-Mar-11	27-Feb-11	27-Feb-11	27-Feb-11	-	04-Mar-11	28-Feb-11	28-Feb-11	28-Feb-11	28-Feb-11	28-Feb-11	28-Feb-11	28-Feb-11	12-Mar-11
Lab ID				L983741	L982653	L982653	L982653	-	L983741	L2982653	L2982653	L2982653	L2982653	L2982653	L2982653	L2982653	L987687
Samples	**Sample Type**	**Units**	**MDL**	**DH-2010-01**	**2010-02S**	**2010-02D**	**2010-03**	**2010-04**	**DH-2010-05**	**2010-05**	**SW1**	**SW2**	**SW3**	**SW4**	**SW5**	**SW6**	**SW7**
Total Metals (cont'd)	Nickel (Ni)-Total	mg/L	0.0020	0.0024	0.0024	0.0030	0.0046	-	0.0182	0.0046	0.0024	0.002	0.0274	0.0190	0.0064	0.0174	0.0075
	Potassium (K)-Total	mg/L	0.10	0.79	1.37	2.83	1.44	-	4.96	1.27	3.02	2.30	2.00	1.78	3.47	3.43	2.78
	Selenium (Se)-Total	mg/L	0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	0.00046	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040
	Silver (Ag)-Total	mg/L	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Strontium (Sr)-Total	mg/L	-	-	-	-	-	-	-	-	2.19	0.248	0.620	0.129	4.38	0.333	0.9
	Sodium (Na)-Total	mg/L	1.0	1.2	2.9	12.0	3.2	-	4.7	1.3	10.0	2.2	3.7	1.9	15.5	6.6	7.9
	Thallium (Tl)-Total	mg/L	0.00010	<0.00010	<0.00010	<0.00010	0.00013	-	0.00191	<0.00010	<0.00010	<0.00010	0.00123	0.00012	0.00027	<0.00010	0.00016
	Tin (Sn)-Total	mg/L	0.050	<0.050	<0.050	<0.050	<0.050	-	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
	Titanium (Ti)-Total	mg/L	0.0010	0.0271	0.0191	0.0114	0.0019	-	0.140	0.0352	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Uranium (U)-Total	mg/L	0.00010	0.00267	0.00332	0.0117	0.0128	-	0.0215	0.00082	0.00138	0.00419	0.00945	0.00503	0.00335	0.0257	0.0063
	Vanadium (V)-Total	mg/L	0.0010	0.0016	0.0013	<0.0010	<0.0010	-	0.0097	0.0020	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Zinc (Zn)-Total	mg/L	0.0040	0.143	0.0305	0.0153	0.0776	-	0.112	0.0464	0.227	0.595	3.81	3.57	1.02	3.60	0.632
Dissolved Metals	Aluminum (Al)-Dissolved	mg/L	0.010	<0.010	<0.010	<0.010	<0.010	-	0.124	0.022	-	-	-	-	-	-	-
	Antimony (Sb)-Dissolved	mg/L	0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	<0.00040	-	-	-	-	-	-	-
	Arsenic (As)-Dissolved	mg/L	0.00040	0.00167	0.00059	0.00406	0.00354	-	0.00859	<0.00040	-	-	-	-	-	-	-
	Barium (Ba)-Dissolved	mg/L	0.0030	0.0045	0.0458	0.0733	0.0383	-	0.0391	0.0580	-	-	-	-	-	-	-
	Beryllium (Be)-Dissolved	mg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	-	-	-	-	-	-	-
	Bismuth (Bi)-Dissolved	mg/L	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	-	<0.000050	<0.000050	-	-	-	-	-	-	-
	Boron (B)-Dissolved	mg/L	0.050	<0.050	<0.050	<0.050	<0.050	-	<0.050	<0.050	-	-	-	-	-	-	-
	Cadmium (Cd)-Dissolved	mg/L	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	-	<0.000050	<0.000050	-	-	-	-	-	-	-
	Calcium (Ca)-Dissolved	mg/L	0.50	48.2	117	104	140	-	129	56.3	215	145	237	277	225	489	246
	Chromium (Cr)-Dissolved	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	-	<0.0050	<0.0050	-	-	-	-	-	-	-
	Cobalt (Co)-Dissolved	mg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	-	<0.0020	<0.0020	-	-	-	-	-	-	-
	Copper (Cu)-Dissolved	mg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	0.0015	-	-	-	-	-	-	-
	Iron (Fe)-Dissolved	mg/L	0.010	0.248	<0.010	<0.010	<0.010	-	1.03	0.012	-	-	-	-	-	-	-
	Lead (Pb)-Dissolved	mg/L	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	0.00125	0.00023	-	-	-	-	-	-	-
	Lithium (Li)-Dissolved	mg/L	0.0030	<0.0030	0.0041	0.0047	<0.0030	-	0.0076	<0.0030	-	-	-	-	-	-	-
	Magnesium (Mg)-Dissolved	mg/L	0.10	17.7	48.2	42.9	57.4	-	54.0	17.3	97.9	40.8	79.4	93.9	90.6	217	87.2
	Manganese (Mn)-Dissolved	mg/L	0.0020	0.0071	<0.0020	0.0239	0.0105	-	0.0386	<0.0020	-	-	-	-	-	-	-
	Mercury (Hg)-Dissolved	mg/L	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	-	-	-	-	-	-	-
	Molybdenum (Mo)-Dissolved	mg/L	0.0050	<0.0050	<0.0050	<0.0050	0.0059	-	0.0120	<0.0050	-	-	-	-	-	-	-
	Nickel (Ni)-Dissolved	mg/L	0.0020	<0.0020	<0.0020	<0.0020	0.0048	-	0.0048	<0.0020	-	-	-	-	-	-	-
	Potassium (K)-Dissolved	mg/L	0.50	<0.50	1.01	2.75	1.32	-	1.46	0.63	3.09	2.2	1.84	1.85	3.44	3.59	3.13
	Selenium (Se)-Dissolved	mg/L	0.00040	<0.00040	<0.00040	<0.00040	<0.00040	-	<0.00040	0.00052	-	-	-	-	-	-	-
	Silver (Ag)-Dissolved	mg/L	0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	-	-	-	-	-	-	-
	Strontium (Sr)-Dissolved	mg/L	0.00010	0.0238	0.0699	0.111	0.0844	-	0.120	0.0458	-	-	-	-	-	-	-
	Sodium (Na)-Dissolved	mg/L	1.0	<1.0	2.6	11.4	3.0	-	4.0	1.2	10.3	2.1	3.5	1.8	15.2	6.8	8.5
	Thallium (Tl)-Dissolved	mg/L	0.00010	<0.00010	<0.00010	<0.00010	0.00011	-	<0.00010	<0.00010	-	-	-	-	-	-	-
	Tin (Sn)-Dissolved	mg/L	0.050	<0.050	<0.050	<0.050	<0.050	-	<0.050	<0.050	-	-	-	-	-	-	-
	Titanium (Ti)-Dissolved	mg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	0.0044	<0.0010	-	-	-	-	-	-	-
	Uranium (U)-Dissolved	mg/L	0.00010	0.00326	0.00331	0.0116	0.0134	-	0.0159	0.00067	-	-	-	-	-	-	-
	Vanadium (V)-Dissolved	mg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	-	-	-	-	-	-	-
	Zinc (Zn)-Dissolved	mg/L	0.0020	0.0968	0.0126	0.0108	0.0718	-	0.0274	0.0200	-	-	-	-	-	-	-
	Ion Balance	%	-	30.5	99.6	99.2	97.8	-	113	106	105	99.1	96.3	105	106	107	101

I:\1\01\00390\02\A\Correspondence\NB11-00232 - Pine Point Water Sample Results\[Table 1.xls]Table 1

NOTES:

1. NO TEST RESULTS RECEIVED FOR WELL 2010-04; NO RECORD ON COC FORMS AND NO RECORD OF LABORATORY RECEIPT.

REV	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D
0	10MAY'11	ISSUED WITH MEMO NB 11-00232	ML	RDW	KEH

SAVED: I:\1\01\00390\002\AVAcad\FIGS\B65_r0 , 5/10/2011 4:03:03 PM , SRICHARD PRINTED: 5/10/2011 4:03:31 PM, Layout1, SRICHARD
XREF FILE(S): 2010-11-25 DHS; 2010-11-26 SWS IMAGE FILE(S): pine_point_sw2_file3 pine_point_sw2_file5

637 000 E | 638 000 E | 639 000 E | 640 000 E | 641 000 E | 642 000 E | 643 000 E | 644 000 E

6 758 000 N | 6 757 000 N | 6 756 000 N | 6 755 000 N | 6 754 000 N | 6 753 000 N | 6 752 000 N | 6 751 000 N | 6 750 000 N | 6 749 000 N | 6 748 000 N | 6 747 000 N

N

SW1

T-37 PIT

DH-2010-05

N32 PIT

DH-2010-03

DH-2010-04

DH-2010-02D

DH-2010-02S

SW2

L-37 PIT

SW3

0-32 PIT

SW4

P-31 PIT

P-32 PIT

I-46 PIT

J-44 PIT

SW5

DH-2010-01

SW6

N-42 PIT

SW7

0-42 PIT

SURFACE WATER SAMPLES		
POINT	NORTHING	EASTING
SW1	6 758 121.42	641 149.68
SW2	6 750 752.87	641 330.47
SW3	6 750 301.52	641 292.24
SW4	6 750 397.46	643 711.45
SW5	6 749 905.12	638 244.34
SW6	6 748 713.66	639 507.61
SW7	6 748 113.30	639 370.63

GROUNDWATER MONITORING WELLS		
POINT	NORTHING	EASTING
DH-2010-01	6 749 627.44	640 377.12
DH-2010-02D	6 750 914.34	641 104.85
DH-2010-02S	6 750 909.69	641 116.01
DH-2010-03	6 751 244.20	642 924.81
DH-2010-04	6 751 145.51	640 635.08
DH-2010-05	6 753 510.95	641 707.06

300 150 0 500 1000 1500 m
SCALE A

LEGEND:

- SURFACE WATER SAMPLING SITE
- GROUNDWATER MONITORING WELL

NOTES:

1. COORDINATE GRID IS UTM NAD83 ZONE 11N.
2. IMAGE PROVIDED BY PINE POINT COMBINED SURVEY, NOVEMBER 1, 2010.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	CHK'D	APP'D
0	10MAY'11	ISSUED WITH MEMO	RDW	SIR	CLS	KEH

AVALON RARE METALS INC.

THOR LAKE PROJECT

LOCATION OF WELLS AND SURFACE WATER SAMPLING SITES

Knight Piésold CONSULTING

P/A NO. NB101-390/2 | REF NO. NB11-00232

FIGURE 1 | REV 0

KNIGHT PIESOLD LTD.
ATTN: KEVIN HAWTON
1650 Main street west
north bay ON p1b 8g5

Date Received: 02-MAR-11
Report Date: 20-APR-11 16:35 (MT)
Version: FINAL REV. 2

Client Phone: 705-476-2165

Certificate of Analysis

Lab Work Order #: L982653
Project P.O. #: NOT SUBMITTED
Job Reference: 321-184
Legal Site Desc: PINE POINT GROWND WATER SAMPLING
C of C Numbers: 08-011999, 08-012000

Comments: ADDITIONAL 15-APR-11 11:34

20-APR-11: ADDITIONAL ANALYSIS

Jessica Spira
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-1 2010-02S							
Sampled By: N/A on 27-FEB-11							
Matrix: WATER							
Dissolved Metals - CCME							
Diss. Fe in Water by ICPOES (Low Level)							
Iron (Fe)-Dissolved	<0.010		0.010	mg/L		18-APR-11	R2176765
Diss. Metals in Water by ICPMS (Low)							
Aluminum (Al)-Dissolved	<0.010		0.010	mg/L		18-APR-11	R2177739
Antimony (Sb)-Dissolved	<0.00040		0.00040	mg/L		18-APR-11	R2177739
Arsenic (As)-Dissolved	0.00059		0.00040	mg/L		18-APR-11	R2177739
Barium (Ba)-Dissolved	0.0458		0.0030	mg/L		18-APR-11	R2177739
Beryllium (Be)-Dissolved	<0.0010		0.0010	mg/L		18-APR-11	R2177739
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L		18-APR-11	R2177739
Boron (B)-Dissolved	<0.050		0.050	mg/L		18-APR-11	R2177739
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L		18-APR-11	R2177739
Chromium (Cr)-Dissolved	<0.0050		0.0050	mg/L		18-APR-11	R2177739
Cobalt (Co)-Dissolved	<0.0020		0.0020	mg/L		18-APR-11	R2177739
Copper (Cu)-Dissolved	<0.0010		0.0010	mg/L		18-APR-11	R2177739
Lead (Pb)-Dissolved	<0.00010		0.00010	mg/L		18-APR-11	R2177739
Lithium (Li)-Dissolved	0.0041		0.0030	mg/L		18-APR-11	R2177739
Molybdenum (Mo)-Dissolved	<0.0050		0.0050	mg/L		18-APR-11	R2177739
Nickel (Ni)-Dissolved	<0.0020		0.0020	mg/L		18-APR-11	R2177739
Selenium (Se)-Dissolved	<0.00040		0.00040	mg/L		18-APR-11	R2177739
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L		18-APR-11	R2177739
Strontium (Sr)-Dissolved	0.0699		0.00010	mg/L		18-APR-11	R2177739
Thallium (Tl)-Dissolved	<0.00010		0.00010	mg/L		18-APR-11	R2177739
Tin (Sn)-Dissolved	<0.050		0.050	mg/L		18-APR-11	R2177739
Titanium (Ti)-Dissolved	<0.0010		0.0010	mg/L		18-APR-11	R2177739
Uranium (U)-Dissolved	0.00331		0.00010	mg/L		18-APR-11	R2177739
Vanadium (V)-Dissolved	<0.0010		0.0010	mg/L		18-APR-11	R2177739
Zinc (Zn)-Dissolved	0.0126		0.0020	mg/L		18-APR-11	R2177739
Diss. Mn in Water by ICPOES (Low Level)							
Manganese (Mn)-Dissolved	<0.0020		0.0020	mg/L		18-APR-11	R2176765
Mercury (Hg) - Dissolved							
Mercury (Hg)-Dissolved	<0.00010		0.00010	mg/L		16-APR-11	R2177293
Miscellaneous Parameters							
Bromide (Br)	<1.0	DLM	1.0	mg/L		15-APR-11	R2176425
Cyanide, Total	<0.0020		0.0020	mg/L		20-APR-11	R2178681
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		15-APR-11	R2177027
Phosphorus (P)-Total	<0.020		0.020	mg/L	18-APR-11	19-APR-11	R2178445
Total Suspended Solids	56.0		3.0	mg/L		18-APR-11	R2177684
Turbidity	94.2		0.10	NTU		17-APR-11	R2177371
Routine Water Analysis							
Chloride by IC							
Chloride (Cl)	3.38		0.50	mg/L		07-MAR-11	R2025948
Dissolved Metals in Water by ICPOES							
Calcium (Ca)-Dissolved	117		0.50	mg/L		07-MAR-11	R2027703
Magnesium (Mg)-Dissolved	48.2		0.10	mg/L		07-MAR-11	R2027703
Potassium (K)-Dissolved	1.01		0.50	mg/L		07-MAR-11	R2027703
Sodium (Na)-Dissolved	2.6		1.0	mg/L		07-MAR-11	R2027703
Ion Balance Calculation							
Ion Balance	99.6			%		08-MAR-11	
TDS (Calculated)	537			mg/L		08-MAR-11	
Hardness (as CaCO3)	491			mg/L		08-MAR-11	
Nitrate as N by IC							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-1 2010-02S							
Sampled By: N/A on 27-FEB-11							
Matrix: WATER							
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.071		0.071	mg/L		08-MAR-11	
Nitrite as N by IC							
Nitrite (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Sulfate by IC							
Sulfate (SO4)	182		0.50	mg/L		07-MAR-11	R2025948
pH, Conductivity and Total Alkalinity							
pH	7.81		0.10	pH		07-MAR-11	R2026384
Conductivity (EC)	860		0.20	uS/cm		07-MAR-11	R2026384
Bicarbonate (HCO3)	372		5.0	mg/L		07-MAR-11	R2026384
Carbonate (CO3)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Hydroxide (OH)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Alkalinity, Total (as CaCO3)	305		5.0	mg/L		07-MAR-11	R2026384
L982653-2 2010-02D							
Sampled By: N/A on 27-FEB-11							
Matrix: WATER							
Dissolved Metals - CCME							
Diss. Fe in Water by ICPOES (Low Level)							
Iron (Fe)-Dissolved	<0.010		0.010	mg/L		18-APR-11	R2176765
Diss. Metals in Water by ICPMS (Low)							
Aluminum (Al)-Dissolved	<0.010		0.010	mg/L		18-APR-11	R2177739
Antimony (Sb)-Dissolved	<0.00040		0.00040	mg/L		18-APR-11	R2177739
Arsenic (As)-Dissolved	0.00406		0.00040	mg/L		18-APR-11	R2177739
Barium (Ba)-Dissolved	0.0733		0.0030	mg/L		18-APR-11	R2177739
Beryllium (Be)-Dissolved	<0.0010		0.0010	mg/L		18-APR-11	R2177739
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L		18-APR-11	R2177739
Boron (B)-Dissolved	<0.050		0.050	mg/L		18-APR-11	R2177739
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L		18-APR-11	R2177739
Chromium (Cr)-Dissolved	<0.0050		0.0050	mg/L		18-APR-11	R2177739
Cobalt (Co)-Dissolved	<0.0020		0.0020	mg/L		18-APR-11	R2177739
Copper (Cu)-Dissolved	<0.0010		0.0010	mg/L		18-APR-11	R2177739
Lead (Pb)-Dissolved	<0.00010		0.00010	mg/L		18-APR-11	R2177739
Lithium (Li)-Dissolved	0.0047		0.0030	mg/L		18-APR-11	R2177739
Molybdenum (Mo)-Dissolved	<0.0050		0.0050	mg/L		18-APR-11	R2177739
Nickel (Ni)-Dissolved	<0.0020		0.0020	mg/L		18-APR-11	R2177739
Selenium (Se)-Dissolved	<0.00040		0.00040	mg/L		18-APR-11	R2177739
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L		18-APR-11	R2177739
Strontium (Sr)-Dissolved	0.111		0.00010	mg/L		18-APR-11	R2177739
Thallium (Tl)-Dissolved	<0.00010		0.00010	mg/L		18-APR-11	R2177739
Tin (Sn)-Dissolved	<0.050		0.050	mg/L		18-APR-11	R2177739
Titanium (Ti)-Dissolved	<0.0010		0.0010	mg/L		18-APR-11	R2177739
Uranium (U)-Dissolved	0.0116		0.00010	mg/L		18-APR-11	R2177739
Vanadium (V)-Dissolved	<0.0010		0.0010	mg/L		18-APR-11	R2177739
Zinc (Zn)-Dissolved	0.0108		0.0020	mg/L		18-APR-11	R2177739
Diss. Mn in Water by ICPOES (Low Level)							
Manganese (Mn)-Dissolved	0.0239		0.0020	mg/L		18-APR-11	R2176765
Mercury (Hg) - Dissolved							
Mercury (Hg)-Dissolved	<0.00010		0.00010	mg/L		16-APR-11	R2177293
Miscellaneous Parameters							
Bromide (Br)	<1.0	DLM	1.0	mg/L		15-APR-11	R2176425

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-2 2010-02D							
Sampled By: N/A on 27-FEB-11							
Matrix: WATER							
Cyanide, Total	<0.0020		0.0020	mg/L		20-APR-11	R2178681
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		15-APR-11	R2177027
Phosphorus (P)-Total	<0.020		0.020	mg/L	18-APR-11	19-APR-11	R2178445
Total Suspended Solids	44.0		3.0	mg/L		18-APR-11	R2177684
Turbidity	36.4		0.10	NTU		17-APR-11	R2177371
Routine Water Analysis							
Chloride by IC							
Chloride (Cl)	4.25		0.50	mg/L		07-MAR-11	R2025948
Dissolved Metals in Water by ICPOES							
Calcium (Ca)-Dissolved	104		0.50	mg/L		07-MAR-11	R2027703
Magnesium (Mg)-Dissolved	42.9		0.10	mg/L		07-MAR-11	R2027703
Potassium (K)-Dissolved	2.75		0.50	mg/L		07-MAR-11	R2027703
Sodium (Na)-Dissolved	11.4		1.0	mg/L		07-MAR-11	R2027703
Ion Balance Calculation							
Ion Balance	99.2			%		08-MAR-11	
TDS (Calculated)	508			mg/L		08-MAR-11	
Hardness (as CaCO3)	436			mg/L		08-MAR-11	
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.071		0.071	mg/L		08-MAR-11	
Nitrite as N by IC							
Nitrite (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Sulfate by IC							
Sulfate (SO4)	173		0.50	mg/L		07-MAR-11	R2025948
pH, Conductivity and Total Alkalinity							
pH	7.85		0.10	pH		07-MAR-11	R2026384
Conductivity (EC)	825		0.20	uS/cm		07-MAR-11	R2026384
Bicarbonate (HCO3)	344		5.0	mg/L		07-MAR-11	R2026384
Carbonate (CO3)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Hydroxide (OH)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Alkalinity, Total (as CaCO3)	282		5.0	mg/L		07-MAR-11	R2026384
L982653-3 2010-03							
Sampled By: N/A on 27-FEB-11							
Matrix: WATER							
Dissolved Metals - CCME							
Diss. Fe in Water by ICPOES (Low Level)							
Iron (Fe)-Dissolved	<0.010		0.010	mg/L		18-APR-11	R2176765
Diss. Metals in Water by ICPMS (Low)							
Aluminum (Al)-Dissolved	<0.010		0.010	mg/L		18-APR-11	R2177739
Antimony (Sb)-Dissolved	<0.00040		0.00040	mg/L		18-APR-11	R2177739
Arsenic (As)-Dissolved	0.00354		0.00040	mg/L		18-APR-11	R2177739
Barium (Ba)-Dissolved	0.0383		0.0030	mg/L		18-APR-11	R2177739
Beryllium (Be)-Dissolved	<0.0010		0.0010	mg/L		18-APR-11	R2177739
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L		18-APR-11	R2177739
Boron (B)-Dissolved	<0.050		0.050	mg/L		18-APR-11	R2177739
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L		18-APR-11	R2177739
Chromium (Cr)-Dissolved	<0.0050		0.0050	mg/L		18-APR-11	R2177739
Cobalt (Co)-Dissolved	<0.0020		0.0020	mg/L		18-APR-11	R2177739
Copper (Cu)-Dissolved	<0.0010		0.0010	mg/L		18-APR-11	R2177739
Lead (Pb)-Dissolved	<0.00010		0.00010	mg/L		18-APR-11	R2177739
Lithium (Li)-Dissolved	<0.0030		0.0030	mg/L		18-APR-11	R2177739

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-3 2010-03							
Sampled By: N/A on 27-FEB-11							
Matrix: WATER							
Diss. Metals in Water by ICPMS (Low)							
Molybdenum (Mo)-Dissolved	0.0059		0.0050	mg/L		18-APR-11	R2177739
Nickel (Ni)-Dissolved	0.0048		0.0020	mg/L		18-APR-11	R2177739
Selenium (Se)-Dissolved	<0.00040		0.00040	mg/L		18-APR-11	R2177739
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L		18-APR-11	R2177739
Strontium (Sr)-Dissolved	0.0844		0.00010	mg/L		18-APR-11	R2177739
Thallium (Tl)-Dissolved	0.00011		0.00010	mg/L		18-APR-11	R2177739
Tin (Sn)-Dissolved	<0.050		0.050	mg/L		18-APR-11	R2177739
Titanium (Ti)-Dissolved	<0.0010		0.0010	mg/L		18-APR-11	R2177739
Uranium (U)-Dissolved	0.0134		0.00010	mg/L		18-APR-11	R2177739
Vanadium (V)-Dissolved	<0.0010		0.0010	mg/L		18-APR-11	R2177739
Zinc (Zn)-Dissolved	0.0718		0.0020	mg/L		18-APR-11	R2177739
Diss. Mn in Water by ICPOES (Low Level)							
Manganese (Mn)-Dissolved	0.0105		0.0020	mg/L		18-APR-11	R2176765
Mercury (Hg) - Dissolved							
Mercury (Hg)-Dissolved	<0.00010		0.00010	mg/L		16-APR-11	R2177293
Miscellaneous Parameters							
Bromide (Br)	<1.0	DLM	1.0	mg/L		15-APR-11	R2176425
Cyanide, Total	<0.0020		0.0020	mg/L		20-APR-11	R2178681
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		15-APR-11	R2177027
Phosphorus (P)-Total	<0.020		0.020	mg/L	18-APR-11	19-APR-11	R2178445
Total Suspended Solids	20.0		3.0	mg/L		18-APR-11	R2177684
Turbidity	12.9		0.10	NTU		17-APR-11	R2177371
Routine Water Analysis							
Chloride by IC							
Chloride (Cl)	3.16		0.50	mg/L		07-MAR-11	R2025948
Dissolved Metals in Water by ICPOES							
Calcium (Ca)-Dissolved	140		0.50	mg/L		07-MAR-11	R2027703
Magnesium (Mg)-Dissolved	57.4		0.10	mg/L		07-MAR-11	R2027703
Potassium (K)-Dissolved	1.32		0.50	mg/L		07-MAR-11	R2027703
Sodium (Na)-Dissolved	3.0		1.0	mg/L		07-MAR-11	R2027703
Ion Balance Calculation							
Ion Balance	97.8			%		08-MAR-11	
TDS (Calculated)	661			mg/L		08-MAR-11	
Hardness (as CaCO3)	586			mg/L		08-MAR-11	
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.071		0.071	mg/L		08-MAR-11	
Nitrite as N by IC							
Nitrite (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Sulfate by IC							
Sulfate (SO4)	250		0.50	mg/L		07-MAR-11	R2025948
pH, Conductivity and Total Alkalinity							
pH	7.77		0.10	pH		07-MAR-11	R2026384
Conductivity (EC)	1030		0.20	uS/cm		07-MAR-11	R2026384
Bicarbonate (HCO3)	418		5.0	mg/L		07-MAR-11	R2026384
Carbonate (CO3)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Hydroxide (OH)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Alkalinity, Total (as CaCO3)	343		5.0	mg/L		07-MAR-11	R2026384

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-4 2010-02S (METAL)							
Sampled By: N/A on 27-FEB-11							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2032823
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	0.713		0.010	mg/L		07-MAR-11	R2033403
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Arsenic (As)-Total	0.00247		0.00040	mg/L		07-MAR-11	R2033403
Barium (Ba)-Total	0.0514		0.0030	mg/L		07-MAR-11	R2033403
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L		07-MAR-11	R2033403
Boron (B)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		07-MAR-11	R2033403
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		07-MAR-11	R2033403
Copper (Cu)-Total	0.0039		0.0010	mg/L		07-MAR-11	R2033403
Lead (Pb)-Total	0.00902		0.00010	mg/L		07-MAR-11	R2033403
Lithium (Li)-Total	<0.010		0.010	mg/L		07-MAR-11	R2033403
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Nickel (Ni)-Total	0.0024		0.0020	mg/L		07-MAR-11	R2033403
Selenium (Se)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Silver (Ag)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Strontium (Sr)-Total	0.0728		0.00020	mg/L		07-MAR-11	R2033403
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Tin (Sn)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Titanium (Ti)-Total	0.0191		0.0010	mg/L		07-MAR-11	R2033403
Uranium (U)-Total	0.00332		0.00010	mg/L		07-MAR-11	R2033403
Vanadium (V)-Total	0.0013		0.0010	mg/L		07-MAR-11	R2033403
Zinc (Zn)-Total	0.0305		0.0040	mg/L		07-MAR-11	R2033403
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	124		0.50	mg/L		07-MAR-11	R2027706
Iron (Fe)-Total	3.02		0.010	mg/L		07-MAR-11	R2027706
Magnesium (Mg)-Total	51.9		0.10	mg/L		07-MAR-11	R2027706
Manganese (Mn)-Total	0.0491		0.0020	mg/L		07-MAR-11	R2027706
Potassium (K)-Total	1.37		0.10	mg/L		07-MAR-11	R2027706
Sodium (Na)-Total	2.9		1.0	mg/L		07-MAR-11	R2027706
L982653-5 2010-02D (METAL)							
Sampled By: N/A on 27-FEB-11							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2032823
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	0.492		0.010	mg/L		07-MAR-11	R2033403
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Arsenic (As)-Total	0.00655		0.00040	mg/L		07-MAR-11	R2033403
Barium (Ba)-Total	0.0758		0.0030	mg/L		07-MAR-11	R2033403
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L		07-MAR-11	R2033403
Boron (B)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		07-MAR-11	R2033403
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-5 2010-02D (METAL)							
Sampled By: N/A on 27-FEB-11							
Matrix: WATER							
Total Metals in Water by ICPMS (Low)							
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		07-MAR-11	R2033403
Copper (Cu)-Total	0.0013		0.0010	mg/L		07-MAR-11	R2033403
Lead (Pb)-Total	0.00511		0.00010	mg/L		07-MAR-11	R2033403
Lithium (Li)-Total	<0.010		0.010	mg/L		07-MAR-11	R2033403
Molybdenum (Mo)-Total	0.0050		0.0050	mg/L		07-MAR-11	R2033403
Nickel (Ni)-Total	0.0030		0.0020	mg/L		07-MAR-11	R2033403
Selenium (Se)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Silver (Ag)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Strontium (Sr)-Total	0.114		0.00020	mg/L		07-MAR-11	R2033403
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Tin (Sn)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Titanium (Ti)-Total	0.0114		0.0010	mg/L		07-MAR-11	R2033403
Uranium (U)-Total	0.0117		0.00010	mg/L		07-MAR-11	R2033403
Vanadium (V)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Zinc (Zn)-Total	0.0153		0.0040	mg/L		07-MAR-11	R2033403
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	131		0.50	mg/L		07-MAR-11	R2027706
Iron (Fe)-Total	1.51		0.010	mg/L		07-MAR-11	R2027706
Magnesium (Mg)-Total	59.7		0.10	mg/L		07-MAR-11	R2027706
Manganese (Mn)-Total	0.0620		0.0020	mg/L		07-MAR-11	R2027706
Potassium (K)-Total	2.83		0.10	mg/L		07-MAR-11	R2027706
Sodium (Na)-Total	12.0		1.0	mg/L		07-MAR-11	R2027706
L982653-6 2010-03 (METAL)							
Sampled By: N/A on 27-FEB-11							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2032823
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	0.052		0.010	mg/L		07-MAR-11	R2033403
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Arsenic (As)-Total	0.00543		0.00040	mg/L		07-MAR-11	R2033403
Barium (Ba)-Total	0.0401		0.0030	mg/L		07-MAR-11	R2033403
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L		07-MAR-11	R2033403
Boron (B)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		07-MAR-11	R2033403
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		07-MAR-11	R2033403
Copper (Cu)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Lead (Pb)-Total	0.00390		0.00010	mg/L		07-MAR-11	R2033403
Lithium (Li)-Total	<0.010		0.010	mg/L		07-MAR-11	R2033403
Molybdenum (Mo)-Total	0.0057		0.0050	mg/L		07-MAR-11	R2033403
Nickel (Ni)-Total	0.0046		0.0020	mg/L		07-MAR-11	R2033403
Selenium (Se)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Silver (Ag)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Strontium (Sr)-Total	0.0866		0.00020	mg/L		07-MAR-11	R2033403
Thallium (Tl)-Total	0.00013		0.00010	mg/L		07-MAR-11	R2033403
Tin (Sn)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Titanium (Ti)-Total	0.0019		0.0010	mg/L		07-MAR-11	R2033403

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-6 2010-03 (METAL)							
Sampled By: N/A on 27-FEB-11							
Matrix: WATER							
Total Metals in Water by ICPMS (Low)							
Uranium (U)-Total	0.0128		0.00010	mg/L		07-MAR-11	R2033403
Vanadium (V)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Zinc (Zn)-Total	0.0776		0.0040	mg/L		07-MAR-11	R2033403
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	157		0.50	mg/L		07-MAR-11	R2027706
Iron (Fe)-Total	0.718		0.010	mg/L		07-MAR-11	R2027706
Magnesium (Mg)-Total	65.1		0.10	mg/L		07-MAR-11	R2027706
Manganese (Mn)-Total	0.0141		0.0020	mg/L		07-MAR-11	R2027706
Potassium (K)-Total	1.44		0.10	mg/L		07-MAR-11	R2027706
Sodium (Na)-Total	3.2		1.0	mg/L		07-MAR-11	R2027706
L982653-7 SW1							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia-N	<0.050		0.050	mg/L		18-APR-11	R2177573
Bromide (Br)	<1.0	DLM	1.0	mg/L		15-APR-11	R2176425
Cyanide, Total	<0.0020		0.0020	mg/L		20-APR-11	R2178681
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		18-APR-11	R2177940
Total Suspended Solids	<3.0		3.0	mg/L		18-APR-11	R2177684
Turbidity	0.11		0.10	NTU		17-APR-11	R2177371
Total Nitrogen							
Nitrogen, Total							
Nitrogen, Total	<0.20		0.20	mg/L		19-APR-11	
Total Kjeldahl Nitrogen							
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	18-APR-11	18-APR-11	R2177888
Routine Water Analysis							
Chloride by IC							
Chloride (Cl)	5.89		0.50	mg/L		07-MAR-11	R2025948
Dissolved Metals in Water by ICPOES							
Calcium (Ca)-Dissolved	215		0.50	mg/L		07-MAR-11	R2027703
Magnesium (Mg)-Dissolved	97.9		0.10	mg/L		07-MAR-11	R2027703
Potassium (K)-Dissolved	3.09		0.50	mg/L		07-MAR-11	R2027703
Sodium (Na)-Dissolved	10.3		1.0	mg/L		07-MAR-11	R2027703
Ion Balance Calculation							
Ion Balance	105			%		08-MAR-11	
TDS (Calculated)	1130			mg/L		08-MAR-11	
Hardness (as CaCO3)	940			mg/L		08-MAR-11	
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.071		0.071	mg/L		08-MAR-11	
Nitrite as N by IC							
Nitrite (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Sulfate by IC							
Sulfate (SO4)	684		0.50	mg/L		07-MAR-11	R2025948
pH, Conductivity and Total Alkalinity							
pH	8.07		0.10	pH		07-MAR-11	R2026384
Conductivity (EC)	1510		0.20	uS/cm		07-MAR-11	R2026384
Bicarbonate (HCO3)	242		5.0	mg/L		07-MAR-11	R2026384
Carbonate (CO3)	<5.0		5.0	mg/L		07-MAR-11	R2026384

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-7 SW1							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Hydroxide (OH)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Alkalinity, Total (as CaCO3)	198		5.0	mg/L		07-MAR-11	R2026384
L982653-8 SW2							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia-N	<0.050		0.050	mg/L		18-APR-11	R2177573
Bromide (Br)	<1.0	DLM	1.0	mg/L		15-APR-11	R2176425
Cyanide, Total	<0.0020		0.0020	mg/L		20-APR-11	R2178681
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		15-APR-11	R2177027
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	18-APR-11	18-APR-11	R2177888
Total Suspended Solids	<3.0		3.0	mg/L		18-APR-11	R2177684
Turbidity	0.24		0.10	NTU		17-APR-11	R2177371
Total Nitrogen							
Nitrogen, Total							
Nitrogen, Total	<0.20		0.20	mg/L		19-APR-11	
Routine Water Analysis							
Chloride by IC							
Chloride (Cl)	4.02		0.50	mg/L		07-MAR-11	R2025948
Dissolved Metals in Water by ICPOES							
Calcium (Ca)-Dissolved	145		0.50	mg/L		07-MAR-11	R2027703
Magnesium (Mg)-Dissolved	40.8		0.10	mg/L		07-MAR-11	R2027703
Potassium (K)-Dissolved	2.20		0.50	mg/L		07-MAR-11	R2027703
Sodium (Na)-Dissolved	2.1		1.0	mg/L		07-MAR-11	R2027703
Ion Balance Calculation							
Ion Balance	99.1			%		08-MAR-11	
TDS (Calculated)	662			mg/L		08-MAR-11	
Hardness (as CaCO3)	530			mg/L		08-MAR-11	
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.071		0.071	mg/L		08-MAR-11	
Nitrite as N by IC							
Nitrite (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Sulfate by IC							
Sulfate (SO4)	390		0.50	mg/L		07-MAR-11	R2025948
pH, Conductivity and Total Alkalinity							
pH	8.00		0.10	pH		07-MAR-11	R2026384
Conductivity (EC)	960		0.20	uS/cm		07-MAR-11	R2026384
Bicarbonate (HCO3)	159		5.0	mg/L		07-MAR-11	R2026384
Carbonate (CO3)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Hydroxide (OH)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Alkalinity, Total (as CaCO3)	130		5.0	mg/L		07-MAR-11	R2026384
L982653-9 SW3							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia-N	<0.050		0.050	mg/L		18-APR-11	R2177573
Bromide (Br)	<1.0	DLM	1.0	mg/L		15-APR-11	R2176425
Cyanide, Total	<0.0020		0.0020	mg/L		20-APR-11	R2178681

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-9 SW3							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		15-APR-11	R2177027
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	18-APR-11	18-APR-11	R2177888
Total Suspended Solids	<3.0		3.0	mg/L		18-APR-11	R2177684
Turbidity	0.21		0.10	NTU		17-APR-11	R2177371
Total Nitrogen							
Nitrogen, Total							
Nitrogen, Total	<0.20		0.20	mg/L		19-APR-11	
Routine Water Analysis							
Chloride by IC							
Chloride (Cl)	3.25		0.50	mg/L		07-MAR-11	R2025948
Dissolved Metals in Water by ICPOES							
Calcium (Ca)-Dissolved	237		0.50	mg/L		07-MAR-11	R2027703
Magnesium (Mg)-Dissolved	79.4		0.10	mg/L		07-MAR-11	R2027703
Potassium (K)-Dissolved	1.84		0.50	mg/L		07-MAR-11	R2027703
Sodium (Na)-Dissolved	3.5		1.0	mg/L		07-MAR-11	R2027703
Ion Balance Calculation							
Ion Balance	96.3			%		08-MAR-11	
TDS (Calculated)	1110			mg/L		08-MAR-11	
Hardness (as CaCO3)	919			mg/L		08-MAR-11	
Nitrate as N by IC							
Nitrate (as N)	0.055		0.050	mg/L		07-MAR-11	R2025948
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.071		0.071	mg/L		08-MAR-11	
Nitrite as N by IC							
Nitrite (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Sulfate by IC							
Sulfate (SO4)	561		0.50	mg/L		07-MAR-11	R2025948
pH, Conductivity and Total Alkalinity							
pH	7.71		0.10	pH		07-MAR-11	R2026384
Conductivity (EC)	1550		0.20	uS/cm		07-MAR-11	R2026384
Bicarbonate (HCO3)	458		5.0	mg/L		07-MAR-11	R2026384
Carbonate (CO3)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Hydroxide (OH)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Alkalinity, Total (as CaCO3)	375		5.0	mg/L		07-MAR-11	R2026384
L982653-10 SW4							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia-N	<0.050		0.050	mg/L		18-APR-11	R2177573
Bromide (Br)	<1.0	DLM	1.0	mg/L		15-APR-11	R2176425
Cyanide, Total	<0.0020		0.0020	mg/L		20-APR-11	R2178681
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		15-APR-11	R2177027
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	18-APR-11	18-APR-11	R2177888
Total Suspended Solids	<3.0		3.0	mg/L		18-APR-11	R2177684
Turbidity	0.55		0.10	NTU		17-APR-11	R2177371
Total Nitrogen							
Nitrogen, Total							
Nitrogen, Total	<0.20		0.20	mg/L		19-APR-11	
Routine Water Analysis							
Chloride by IC							
Chloride (Cl)	2.86		0.50	mg/L		07-MAR-11	R2025948
Dissolved Metals in Water by ICPOES							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-10 SW4							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Dissolved Metals in Water by ICPOES							
Calcium (Ca)-Dissolved	277		0.50	mg/L		07-MAR-11	R2027703
Magnesium (Mg)-Dissolved	93.9		0.10	mg/L		07-MAR-11	R2027703
Potassium (K)-Dissolved	1.85		0.50	mg/L		07-MAR-11	R2027703
Sodium (Na)-Dissolved	1.8		1.0	mg/L		07-MAR-11	R2027703
Ion Balance Calculation							
Ion Balance	105			%		08-MAR-11	
TDS (Calculated)	1310			mg/L		08-MAR-11	
Hardness (as CaCO3)	1080			mg/L		08-MAR-11	
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.071		0.071	mg/L		08-MAR-11	
Nitrite as N by IC							
Nitrite (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Sulfate by IC							
Sulfate (SO4)	820		0.50	mg/L		07-MAR-11	R2025948
pH, Conductivity and Total Alkalinity							
pH	8.03		0.10	pH		07-MAR-11	R2026384
Conductivity (EC)	1660		0.20	uS/cm		07-MAR-11	R2026384
Bicarbonate (HCO3)	219		5.0	mg/L		07-MAR-11	R2026384
Carbonate (CO3)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Hydroxide (OH)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Alkalinity, Total (as CaCO3)	180		5.0	mg/L		07-MAR-11	R2026384
L982653-11 SW5							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia-N	<0.050		0.050	mg/L		18-APR-11	R2177573
Bromide (Br)	<1.0	DLM	1.0	mg/L		15-APR-11	R2176425
Cyanide, Total	<0.0020		0.0020	mg/L		20-APR-11	R2178681
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		15-APR-11	R2177027
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	18-APR-11	18-APR-11	R2177888
Total Suspended Solids	3.0		3.0	mg/L		18-APR-11	R2177684
Turbidity	0.59		0.10	NTU		17-APR-11	R2177371
Total Nitrogen							
Nitrogen, Total							
Nitrogen, Total	<0.20		0.20	mg/L		19-APR-11	
Routine Water Analysis							
Chloride by IC							
Chloride (Cl)	12.5		0.50	mg/L		07-MAR-11	R2025948
Dissolved Metals in Water by ICPOES							
Calcium (Ca)-Dissolved	225		0.50	mg/L		07-MAR-11	R2027703
Magnesium (Mg)-Dissolved	90.6		0.10	mg/L		07-MAR-11	R2027703
Potassium (K)-Dissolved	3.44		0.50	mg/L		07-MAR-11	R2027703
Sodium (Na)-Dissolved	15.2		1.0	mg/L		07-MAR-11	R2027703
Ion Balance Calculation							
Ion Balance	106			%		08-MAR-11	
TDS (Calculated)	1150			mg/L		08-MAR-11	
Hardness (as CaCO3)	935			mg/L		08-MAR-11	
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-11 SW5							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.071		0.071	mg/L		08-MAR-11	
Nitrite as N by IC							
Nitrite (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Sulfate by IC							
Sulfate (SO4)	701		0.50	mg/L		07-MAR-11	R2025948
pH, Conductivity and Total Alkalinity							
pH	8.08		0.10	pH		07-MAR-11	R2026384
Conductivity (EC)	1520		0.20	uS/cm		07-MAR-11	R2026384
Bicarbonate (HCO3)	208		5.0	mg/L		07-MAR-11	R2026384
Carbonate (CO3)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Hydroxide (OH)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Alkalinity, Total (as CaCO3)	170		5.0	mg/L		07-MAR-11	R2026384
L982653-12 SW6							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia-N	<0.050		0.050	mg/L		18-APR-11	R2177573
Bromide (Br)	<1.0	DLM	1.0	mg/L		07-MAR-11	R2025948
Cyanide, Total	<0.0020		0.0020	mg/L		20-APR-11	R2178681
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		15-APR-11	R2177027
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	18-APR-11	18-APR-11	R2177888
Total Suspended Solids	8.0		3.0	mg/L		18-APR-11	R2177684
Turbidity	1.14		0.10	NTU		17-APR-11	R2177371
Total Nitrogen							
Nitrogen, Total							
Nitrogen, Total	<0.20		0.20	mg/L		19-APR-11	
Routine Water Analysis							
Chloride by IC							
Chloride (Cl)	12.8		0.50	mg/L		07-MAR-11	R2025948
Dissolved Metals in Water by ICPOES							
Calcium (Ca)-Dissolved	489		0.50	mg/L		08-MAR-11	R2033243
Magnesium (Mg)-Dissolved	217		0.10	mg/L		07-MAR-11	R2027703
Potassium (K)-Dissolved	3.59		0.50	mg/L		07-MAR-11	R2027703
Sodium (Na)-Dissolved	6.8		1.0	mg/L		07-MAR-11	R2027703
Ion Balance Calculation							
Ion Balance	107			%		08-MAR-11	
TDS (Calculated)	2560			mg/L		08-MAR-11	
Hardness (as CaCO3)	2110			mg/L		08-MAR-11	
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.071		0.071	mg/L		08-MAR-11	
Nitrite as N by IC							
Nitrite (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Sulfate by IC							
Sulfate (SO4)	1730	DLA	5.0	mg/L		07-MAR-11	R2025948
pH, Conductivity and Total Alkalinity							
pH	7.92		0.10	pH		07-MAR-11	R2026384
Conductivity (EC)	2810		0.20	uS/cm		07-MAR-11	R2026384
Bicarbonate (HCO3)	211		5.0	mg/L		07-MAR-11	R2026384
Carbonate (CO3)	<5.0		5.0	mg/L		07-MAR-11	R2026384

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-12 SW6							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
pH, Conductivity and Total Alkalinity							
Hydroxide (OH)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Alkalinity, Total (as CaCO3)	173		5.0	mg/L		07-MAR-11	R2026384
L982653-13 SW1 (METAL)							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2032823
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	<0.010		0.010	mg/L		07-MAR-11	R2033403
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Arsenic (As)-Total	0.00073		0.00040	mg/L		07-MAR-11	R2033403
Barium (Ba)-Total	0.0147		0.0030	mg/L		07-MAR-11	R2033403
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L		07-MAR-11	R2033403
Boron (B)-Total	0.154		0.050	mg/L		07-MAR-11	R2033403
Cadmium (Cd)-Total	<0.000050		0.000050	mg/L		07-MAR-11	R2033403
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		07-MAR-11	R2033403
Copper (Cu)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Lead (Pb)-Total	0.00114		0.00010	mg/L		07-MAR-11	R2033403
Lithium (Li)-Total	0.019		0.010	mg/L		07-MAR-11	R2033403
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Nickel (Ni)-Total	0.0024		0.0020	mg/L		07-MAR-11	R2033403
Selenium (Se)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Silver (Ag)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Strontium (Sr)-Total	2.19		0.00020	mg/L		07-MAR-11	R2033403
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Tin (Sn)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Uranium (U)-Total	0.00138		0.00010	mg/L		07-MAR-11	R2033403
Vanadium (V)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Zinc (Zn)-Total	0.227		0.0040	mg/L		07-MAR-11	R2033403
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	211		0.50	mg/L		07-MAR-11	R2027706
Iron (Fe)-Total	0.013		0.010	mg/L		07-MAR-11	R2027706
Magnesium (Mg)-Total	97.2		0.10	mg/L		07-MAR-11	R2027706
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		07-MAR-11	R2027706
Potassium (K)-Total	3.02		0.10	mg/L		07-MAR-11	R2027706
Sodium (Na)-Total	10.0		1.0	mg/L		07-MAR-11	R2027706
L982653-14 SW2 (METAL)							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2032823
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	<0.010		0.010	mg/L		07-MAR-11	R2033403
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Arsenic (As)-Total	0.00071		0.00040	mg/L		07-MAR-11	R2033403

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-14 SW2 (METAL)							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Total Metals in Water by ICPMS (Low)							
Barium (Ba)-Total	0.0789		0.0030	mg/L		07-MAR-11	R2033403
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L		07-MAR-11	R2033403
Boron (B)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Cadmium (Cd)-Total	0.000100		0.000050	mg/L		07-MAR-11	R2033403
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		07-MAR-11	R2033403
Copper (Cu)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Lead (Pb)-Total	0.0107		0.00010	mg/L		07-MAR-11	R2033403
Lithium (Li)-Total	<0.010		0.010	mg/L		07-MAR-11	R2033403
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Nickel (Ni)-Total	0.0020		0.0020	mg/L		07-MAR-11	R2033403
Selenium (Se)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Silver (Ag)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Strontium (Sr)-Total	0.248		0.00020	mg/L		07-MAR-11	R2033403
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Tin (Sn)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Uranium (U)-Total	0.00419		0.00010	mg/L		07-MAR-11	R2033403
Vanadium (V)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Zinc (Zn)-Total	0.595		0.0040	mg/L		07-MAR-11	R2033403
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	150		0.50	mg/L		07-MAR-11	R2027706
Iron (Fe)-Total	0.012		0.010	mg/L		07-MAR-11	R2027706
Magnesium (Mg)-Total	43.6		0.10	mg/L		07-MAR-11	R2027706
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		07-MAR-11	R2027706
Potassium (K)-Total	2.30		0.10	mg/L		07-MAR-11	R2027706
Sodium (Na)-Total	2.2		1.0	mg/L		07-MAR-11	R2027706
L982653-15 SW3 (METAL)							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2032823
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	<0.010		0.010	mg/L		07-MAR-11	R2033403
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Arsenic (As)-Total	0.00370		0.00040	mg/L		07-MAR-11	R2033403
Barium (Ba)-Total	0.0127		0.0030	mg/L		07-MAR-11	R2033403
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L		07-MAR-11	R2033403
Boron (B)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Cadmium (Cd)-Total	0.000401		0.000050	mg/L		07-MAR-11	R2033403
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		07-MAR-11	R2033403
Copper (Cu)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Lead (Pb)-Total	0.0175		0.00010	mg/L		07-MAR-11	R2033403
Lithium (Li)-Total	<0.010		0.010	mg/L		07-MAR-11	R2033403
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Nickel (Ni)-Total	0.0274		0.0020	mg/L		07-MAR-11	R2033403

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-15 SW3 (METAL)							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Total Metals in Water by ICPMS (Low)							
Selenium (Se)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Silver (Ag)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Strontium (Sr)-Total	0.620		0.00020	mg/L		07-MAR-11	R2033403
Thallium (Tl)-Total	0.00123		0.00010	mg/L		07-MAR-11	R2033403
Tin (Sn)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Uranium (U)-Total	0.00945		0.00010	mg/L		07-MAR-11	R2033403
Vanadium (V)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Zinc (Zn)-Total	3.81		0.0040	mg/L		07-MAR-11	R2033403
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	252		0.50	mg/L		07-MAR-11	R2027706
Iron (Fe)-Total	0.028		0.010	mg/L		07-MAR-11	R2027706
Magnesium (Mg)-Total	85.0		0.10	mg/L		07-MAR-11	R2027706
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		07-MAR-11	R2027706
Potassium (K)-Total	2.00		0.10	mg/L		07-MAR-11	R2027706
Sodium (Na)-Total	3.7		1.0	mg/L		07-MAR-11	R2027706
L982653-16 SW4 (METAL)							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2032823
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	<0.010		0.010	mg/L		07-MAR-11	R2033403
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Arsenic (As)-Total	0.00392		0.00040	mg/L		07-MAR-11	R2033403
Barium (Ba)-Total	0.0195		0.0030	mg/L		07-MAR-11	R2033403
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L		07-MAR-11	R2033403
Boron (B)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Cadmium (Cd)-Total	0.000591		0.000050	mg/L		07-MAR-11	R2033403
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		07-MAR-11	R2033403
Copper (Cu)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Lead (Pb)-Total	0.0204		0.00010	mg/L		07-MAR-11	R2033403
Lithium (Li)-Total	<0.010		0.010	mg/L		07-MAR-11	R2033403
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Nickel (Ni)-Total	0.0190		0.0020	mg/L		07-MAR-11	R2033403
Selenium (Se)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Silver (Ag)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Strontium (Sr)-Total	0.129		0.00020	mg/L		07-MAR-11	R2033403
Thallium (Tl)-Total	0.00012		0.00010	mg/L		07-MAR-11	R2033403
Tin (Sn)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Uranium (U)-Total	0.00503		0.00010	mg/L		07-MAR-11	R2033403
Vanadium (V)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Zinc (Zn)-Total	3.57		0.0040	mg/L		07-MAR-11	R2033403
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	271		0.50	mg/L		07-MAR-11	R2027706
Iron (Fe)-Total	0.052		0.010	mg/L		07-MAR-11	R2027706

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-16 SW4 (METAL)							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Total Metals in Water by ICPOES (Low)							
Magnesium (Mg)-Total	92.6		0.10	mg/L		07-MAR-11	R2027706
Manganese (Mn)-Total	0.0261		0.0020	mg/L		07-MAR-11	R2027706
Potassium (K)-Total	1.78		0.10	mg/L		07-MAR-11	R2027706
Sodium (Na)-Total	1.9		1.0	mg/L		07-MAR-11	R2027706
L982653-17 SW5 (METAL)							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2032823
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	<0.010		0.010	mg/L		07-MAR-11	R2033403
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Arsenic (As)-Total	0.00156		0.00040	mg/L		07-MAR-11	R2033403
Barium (Ba)-Total	0.0355		0.0030	mg/L		07-MAR-11	R2033403
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L		07-MAR-11	R2033403
Boron (B)-Total	0.157		0.050	mg/L		07-MAR-11	R2033403
Cadmium (Cd)-Total	0.000174		0.000050	mg/L		07-MAR-11	R2033403
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		07-MAR-11	R2033403
Copper (Cu)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Lead (Pb)-Total	0.00512		0.00010	mg/L		07-MAR-11	R2033403
Lithium (Li)-Total	0.027		0.010	mg/L		07-MAR-11	R2033403
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Nickel (Ni)-Total	0.0064		0.0020	mg/L		07-MAR-11	R2033403
Selenium (Se)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Silver (Ag)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Strontium (Sr)-Total	4.38		0.00020	mg/L		07-MAR-11	R2033403
Thallium (Tl)-Total	0.00027		0.00010	mg/L		07-MAR-11	R2033403
Tin (Sn)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Uranium (U)-Total	0.00335		0.00010	mg/L		07-MAR-11	R2033403
Vanadium (V)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Zinc (Zn)-Total	1.02		0.0040	mg/L		07-MAR-11	R2033403
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	225		0.50	mg/L		07-MAR-11	R2027706
Iron (Fe)-Total	0.024		0.010	mg/L		07-MAR-11	R2027706
Magnesium (Mg)-Total	92.9		0.10	mg/L		07-MAR-11	R2027706
Manganese (Mn)-Total	<0.0020		0.0020	mg/L		07-MAR-11	R2027706
Potassium (K)-Total	3.47		0.10	mg/L		07-MAR-11	R2027706
Sodium (Na)-Total	15.5		1.0	mg/L		07-MAR-11	R2027706
L982653-18 SW6 (METAL)							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2032823
Total Metals in Water by ICPMS (Low)							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-18 SW6 (METAL)							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	<0.010		0.010	mg/L		07-MAR-11	R2033403
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Arsenic (As)-Total	0.00079		0.00040	mg/L		07-MAR-11	R2033403
Barium (Ba)-Total	0.0161		0.0030	mg/L		07-MAR-11	R2033403
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L		07-MAR-11	R2033403
Boron (B)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Cadmium (Cd)-Total	0.000227		0.000050	mg/L		07-MAR-11	R2033403
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		07-MAR-11	R2033403
Copper (Cu)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Lead (Pb)-Total	0.0142		0.00010	mg/L		07-MAR-11	R2033403
Lithium (Li)-Total	0.012		0.010	mg/L		07-MAR-11	R2033403
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Nickel (Ni)-Total	0.0174		0.0020	mg/L		07-MAR-11	R2033403
Selenium (Se)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Silver (Ag)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Strontium (Sr)-Total	0.333		0.00020	mg/L		07-MAR-11	R2033403
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Tin (Sn)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Uranium (U)-Total	0.0257		0.00010	mg/L		07-MAR-11	R2033403
Vanadium (V)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Zinc (Zn)-Total	3.60		0.0040	mg/L		07-MAR-11	R2033403
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	453		0.50	mg/L		08-MAR-11	R2033247
Iron (Fe)-Total	0.184		0.010	mg/L		07-MAR-11	R2027706
Magnesium (Mg)-Total	206		0.10	mg/L		07-MAR-11	R2027706
Manganese (Mn)-Total	0.0386		0.0020	mg/L		07-MAR-11	R2027706
Potassium (K)-Total	3.43		0.10	mg/L		07-MAR-11	R2027706
Sodium (Na)-Total	6.6		1.0	mg/L		07-MAR-11	R2027706
L982653-19 2010-05							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Dissolved Metals - CCME							
Diss. Fe in Water by ICPOES (Low Level)							
Iron (Fe)-Dissolved	0.012		0.010	mg/L		18-APR-11	R2176765
Diss. Metals in Water by ICPMS (Low)							
Aluminum (Al)-Dissolved	0.022		0.010	mg/L		18-APR-11	R2177739
Antimony (Sb)-Dissolved	<0.00040		0.00040	mg/L		18-APR-11	R2177739
Arsenic (As)-Dissolved	<0.00040		0.00040	mg/L		18-APR-11	R2177739
Barium (Ba)-Dissolved	0.0580		0.0030	mg/L		18-APR-11	R2177739
Beryllium (Be)-Dissolved	<0.0010		0.0010	mg/L		18-APR-11	R2177739
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L		18-APR-11	R2177739
Boron (B)-Dissolved	<0.050		0.050	mg/L		18-APR-11	R2177739
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L		18-APR-11	R2177739
Chromium (Cr)-Dissolved	<0.0050		0.0050	mg/L		18-APR-11	R2177739
Cobalt (Co)-Dissolved	<0.0020		0.0020	mg/L		18-APR-11	R2177739
Copper (Cu)-Dissolved	0.0015		0.0010	mg/L		18-APR-11	R2177739
Lead (Pb)-Dissolved	0.00023		0.00010	mg/L		18-APR-11	R2177739

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-19 2010-05							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Diss. Metals in Water by ICPMS (Low)							
Lithium (Li)-Dissolved	<0.0030		0.0030	mg/L		18-APR-11	R2177739
Molybdenum (Mo)-Dissolved	<0.0050		0.0050	mg/L		18-APR-11	R2177739
Nickel (Ni)-Dissolved	<0.0020		0.0020	mg/L		18-APR-11	R2177739
Selenium (Se)-Dissolved	0.00052		0.00040	mg/L		18-APR-11	R2177739
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L		18-APR-11	R2177739
Strontium (Sr)-Dissolved	0.0458		0.00010	mg/L		18-APR-11	R2177739
Thallium (Tl)-Dissolved	<0.00010		0.00010	mg/L		18-APR-11	R2177739
Tin (Sn)-Dissolved	<0.050		0.050	mg/L		18-APR-11	R2177739
Titanium (Ti)-Dissolved	<0.0010		0.0010	mg/L		18-APR-11	R2177739
Uranium (U)-Dissolved	0.00067		0.00010	mg/L		18-APR-11	R2177739
Vanadium (V)-Dissolved	<0.0010		0.0010	mg/L		18-APR-11	R2177739
Zinc (Zn)-Dissolved	0.0200		0.0020	mg/L		18-APR-11	R2177739
Diss. Mn in Water by ICPOES (Low Level)							
Manganese (Mn)-Dissolved	<0.0020		0.0020	mg/L		18-APR-11	R2176765
Mercury (Hg) - Dissolved							
Mercury (Hg)-Dissolved	<0.00010		0.00010	mg/L		16-APR-11	R2177293
Miscellaneous Parameters							
Bromide (Br)	<0.10		0.10	mg/L		07-MAR-11	R2025948
Cyanide, Total	<0.0020		0.0020	mg/L		20-APR-11	R2178681
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		15-APR-11	R2177027
Phosphorus (P)-Total	0.026		0.020	mg/L	18-APR-11	19-APR-11	R2178445
Total Suspended Solids	84.0		3.0	mg/L		18-APR-11	R2177684
Turbidity	131		0.10	NTU		17-APR-11	R2177371
Routine Water Analysis							
Chloride by IC							
Chloride (Cl)	<0.50		0.50	mg/L		07-MAR-11	R2025948
Dissolved Metals in Water by ICPOES							
Calcium (Ca)-Dissolved	56.3		0.50	mg/L		07-MAR-11	R2027703
Magnesium (Mg)-Dissolved	17.3		0.10	mg/L		07-MAR-11	R2027703
Potassium (K)-Dissolved	0.63		0.50	mg/L		07-MAR-11	R2027703
Sodium (Na)-Dissolved	1.2		1.0	mg/L		07-MAR-11	R2027703
Ion Balance Calculation							
Ion Balance	106			%		08-MAR-11	
TDS (Calculated)	203			mg/L		08-MAR-11	
Hardness (as CaCO3)	212			mg/L		08-MAR-11	
Nitrate as N by IC							
Nitrate (as N)	0.171		0.050	mg/L		07-MAR-11	R2025948
Nitrate+Nitrite							
Nitrate and Nitrite as N	0.171		0.071	mg/L		08-MAR-11	
Nitrite as N by IC							
Nitrite (as N)	<0.050		0.050	mg/L		07-MAR-11	R2025948
Sulfate by IC							
Sulfate (SO4)	12.5		0.50	mg/L		07-MAR-11	R2025948
pH, Conductivity and Total Alkalinity							
pH	8.08		0.10	pH		07-MAR-11	R2026384
Conductivity (EC)	373		0.20	uS/cm		07-MAR-11	R2026384
Bicarbonate (HCO3)	232		5.0	mg/L		07-MAR-11	R2026384
Carbonate (CO3)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Hydroxide (OH)	<5.0		5.0	mg/L		07-MAR-11	R2026384
Alkalinity, Total (as CaCO3)	190		5.0	mg/L		07-MAR-11	R2026384

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L982653-20 2010-05 (METAL)							
Sampled By: N/A on 28-FEB-11							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2032823
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	1.10		0.010	mg/L		07-MAR-11	R2033403
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		07-MAR-11	R2033403
Arsenic (As)-Total	0.00044		0.00040	mg/L		07-MAR-11	R2033403
Barium (Ba)-Total	0.0685		0.0030	mg/L		07-MAR-11	R2033403
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		07-MAR-11	R2033403
Bismuth (Bi)-Total	<0.00020		0.00020	mg/L		07-MAR-11	R2033403
Boron (B)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Cadmium (Cd)-Total	0.000176		0.000050	mg/L		07-MAR-11	R2033403
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		07-MAR-11	R2033403
Copper (Cu)-Total	0.0031		0.0010	mg/L		07-MAR-11	R2033403
Lead (Pb)-Total	0.0101		0.00010	mg/L		07-MAR-11	R2033403
Lithium (Li)-Total	<0.010		0.010	mg/L		07-MAR-11	R2033403
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		07-MAR-11	R2033403
Nickel (Ni)-Total	0.0046		0.0020	mg/L		07-MAR-11	R2033403
Selenium (Se)-Total	0.00046		0.00040	mg/L		07-MAR-11	R2033403
Silver (Ag)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Strontium (Sr)-Total	0.0583		0.00020	mg/L		07-MAR-11	R2033403
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		07-MAR-11	R2033403
Tin (Sn)-Total	<0.050		0.050	mg/L		07-MAR-11	R2033403
Titanium (Ti)-Total	0.0352		0.0010	mg/L		07-MAR-11	R2033403
Uranium (U)-Total	0.00082		0.00010	mg/L		07-MAR-11	R2033403
Vanadium (V)-Total	0.0020		0.0010	mg/L		07-MAR-11	R2033403
Zinc (Zn)-Total	0.0464		0.0040	mg/L		07-MAR-11	R2033403
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	72.9		0.50	mg/L		07-MAR-11	R2027706
Iron (Fe)-Total	1.22		0.010	mg/L		07-MAR-11	R2027706
Magnesium (Mg)-Total	21.0		0.10	mg/L		07-MAR-11	R2027706
Manganese (Mn)-Total	0.0158		0.0020	mg/L		07-MAR-11	R2027706
Potassium (K)-Total	1.27		0.10	mg/L		07-MAR-11	R2027706
Sodium (Na)-Total	1.3		1.0	mg/L		07-MAR-11	R2027706

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Sulfate (SO4)	MS-B	L982653-1, -10, -11, -12, -19, -2, -3, -7, -8, -9
Matrix Spike	Orthophosphate-Dissolved (as P)	MS-B	L982653-7
Matrix Spike	Phosphorus (P)-Total	MS-B	L982653-1, -19, -2, -3

Qualifiers for Individual Samples Listed:

Sample Numbe	Client ID	Qualifier	Description
L982653-1	2010-02S	SP	TP - Sample was Preserved at the laboratory
L982653-10	SW4	SP	TKN, NH4 - Sample was Preserved at the laboratory
L982653-11	SW5	SP	TKN, NH4 - Sample was Preserved at the laboratory
L982653-12	SW6	SP	TKN, NH4 - Sample was Preserved at the laboratory
L982653-19	2010-05	SP	TP - Sample was Preserved at the laboratory
L982653-2	2010-02D	SP	TP - Sample was Preserved at the laboratory
L982653-3	2010-03	SP	TP - Sample was Preserved at the laboratory
L982653-7	SW1	SP	TKN, NH4 - Sample was Preserved at the laboratory
L982653-8	SW2	SP	TKN, NH4 - Sample was Preserved at the laboratory
L982653-9	SW3	SP	TKN, NH4 - Sample was Preserved at the laboratory

Sample Parameter Qualifier Key:

Qualifier	Description
DLA	Detection Limit Adjusted For required dilution
DLM	Detection Limit Adjusted For Sample Matrix Effects
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BR-IC-ED	Water	Bromide by IC	APHA 4110 B-ION CHROMATOGRAPHY
CL-IC-ED	Water	Chloride by IC	APHA 4110 B-ION CHROMATOGRAPHY
CN-TOT-WP	Water	Cyanide, Total	APHA 4500 CN-O

Total Cyanide in Water: Simple cyanides are converted to hydrogen cyanide (HCN) by distillation. Complex cyanides are not easily decomposed. Low power UV radiation is used to break down organic, metallic and alkali complexed compounds to free cyanide. The dislillation step isolates HCN from simple cyanides under specific acidic conditions. The liberated HCN is converted to cyanogen chloride with chloramine-T. This further reacts with barbituric acid and isonicotinic acid to form a highly coloured complex.

ETL-N-TOT-CALC-ED	Water	Nitrogen, Total	APHA 4500 N-Calculated
FE-D-L-ICP-ED	Water	Diss. Fe in Water by ICPOES (Low Level)	APHA 3120 B-ICP-OES
HG-D-CVAA-ED	Water	Mercury (Hg) - Dissolved	EPA 245.7 / EPA 245.1
HG-T-CVAA-ED	Water	Mercury (Hg) - Total	EPA 245.7 / EPA 245.1
IONBALANCE-ED	Water	Ion Balance Calculation	APHA 1030E
MET-D-ICP-ED	Water	Dissolved Metals in Water by ICPOES	APHA 3120 B-ICP-OES
MET-D-L-MS-ED	Water	Diss. Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
MET-T-L-ICP-ED	Water	Total Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-T-L-MS-ED	Water	Total Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
MN-D-L-ICP-ED	Water	Diss. Mn in Water by ICPOES (Low Level)	APHA 3120 B ICP-OES
N-TOTKJ-ED	Water	Total Kjeldahl Nitrogen	APHA 4500N-C -Dig.-Auto-Colorimetry
NH4-ED	Water	Ammonia-N	APHA4500NH3F Colorimetry
NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-ED	Water	Nitrite as N by IC	APHA 4110 B-ION CHROMATOGRAPHY
NO3-IC-ED	Water	Nitrate as N by IC	APHA 4110 B-ION CHROMATOGRAPHY
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320
PO4-DO-COL-ED	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.			
SO4-IC-ED	Water	Sulfate by IC	APHA 4110 B-ION CHROMATOGRAPHY
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

08-011999 08-012000

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

COC # 08-011999

Page 2 of 2

Report to:	Distribution	Service Requested: (rush subject to availability)
Company: Knight Piesold	Standard: X Other:	Regular (Default)
Contact: Matthew Partitt	Select: PDF X Excel Digital	X Priority (2-3 Business Days) - 50% Surcharge
Address: 1650 Main Street west, North Bay, ON P1B 8G5	Email 1: mpartit@knightpiesold.com	Emergency (1 Business Day) - 100% Surcharge
	Email 2:	For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone: 705 476 2165 Fax: 705 474 8095		Analysis Request
Invoice To: Same as Report ? Yes / No ?	Client / Project Information:	(Indicate Filtered or Preserved: F/P)
Company: Maskwa Engineering	Job #: 321-184	
Contact: Richard ~~Toth~~ Johnstone	PO / AFE:	
Address: 425 Mackenzie Highway Hay River NT, X0E 0R8	Legal Site Description: Pine Point ground water sampling	
Phone: 867 874-2207 Fax: 867 874-2763	Quote #:	
Lab Work Order # (lab use only): L982653	ALS Contact:	Sampler:

Sample #	Sample Identification (This description will appear on the report)	Date	Time	Sample Type	Number of Containers
13	SW 1 (metal)	Feb 28			P
14	SW 2 (metal)	28			P
15	SW 3 (metal)	28			P
16	SW 4 (metal)	28			P
17	SW 5 (metal)	28			P
18	SW 6 (metal)	28			P
19	SW 7 (metal)	28			

Special Instructions / Regulations / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)		SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)		
Released by:	Date & Time:	Received by: TCB	Date: 2-Mar-11	Time: 11:40	Temperature: 05°C	Verified by:	Date & Time:	Observations: Yes / No ? If Yes attach SIF

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - REPORT COPY PINK - FILE COPY YELLOW - CLIENT COPY

GENF 18.00 Front

Samples partially frozen

KNIGHT PIESOLD LTD.
ATTN: MATTHEW PARFITT
1650 MAIN STREET WEST
NORTH BAY ON P1B 8G5

Date Received: 07-MAR-11
Report Date: 02-MAY-11 15:06 (MT)
Version: FINAL REV. 3

Client Phone: 705-476-2165

Certificate of Analysis

Lab Work Order #: L983741
Project P.O. #: NOT SUBMITTED
Job Reference: 10-204
Legal Site Desc:
C of C Numbers: 10-040422

Comments: ADDITIONAL 26-APR-11 16:40

21-APR-11: ..
02-MAY-11: ADDITIONAL ANALYSIS
L983741-1: TURBIDITY-ED, PO4-DO-COL-ED, ED-BI-D-MS, ED-SR-D-MS, P-T-COL-ED, BR-IC-ED
L983741-2: TURBIDITY-ED, PO4-DO-COL-ED,
ED-BI-D-MS, ED-SR-D-MS, P-T-COL-ED, BR-IC-ED

Jessica Spira
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L983741-1 DH-2010-01							
Sampled By: N/A on 04-MAR-11							
Matrix: WATER							
Dissolved Metals - CCME							
Diss. Metals in Water by ICPMS (Low)							
Aluminum (Al)-Dissolved	<0.010		0.010	mg/L		09-MAR-11	R2043403
Antimony (Sb)-Dissolved	<0.00040		0.00040	mg/L		09-MAR-11	R2043403
Arsenic (As)-Dissolved	0.00167		0.00040	mg/L		09-MAR-11	R2043403
Barium (Ba)-Dissolved	0.0045		0.0030	mg/L		09-MAR-11	R2043403
Beryllium (Be)-Dissolved	<0.0010		0.0010	mg/L		09-MAR-11	R2043403
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L		09-MAR-11	R2043403
Boron (B)-Dissolved	<0.050		0.050	mg/L		09-MAR-11	R2043403
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L		09-MAR-11	R2043403
Chromium (Cr)-Dissolved	<0.0050		0.0050	mg/L		09-MAR-11	R2043403
Cobalt (Co)-Dissolved	<0.0020		0.0020	mg/L		09-MAR-11	R2043403
Copper (Cu)-Dissolved	<0.0010		0.0010	mg/L		09-MAR-11	R2043403
Lead (Pb)-Dissolved	<0.00010		0.00010	mg/L		09-MAR-11	R2043403
Lithium (Li)-Dissolved	<0.0030		0.0030	mg/L		09-MAR-11	R2043403
Molybdenum (Mo)-Dissolved	<0.0050		0.0050	mg/L		09-MAR-11	R2043403
Nickel (Ni)-Dissolved	<0.0020		0.0020	mg/L		09-MAR-11	R2043403
Selenium (Se)-Dissolved	<0.00040		0.00040	mg/L		09-MAR-11	R2043403
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L		09-MAR-11	R2043403
Strontium (Sr)-Dissolved	0.0238		0.00010	mg/L		09-MAR-11	R2043403
Thallium (Tl)-Dissolved	<0.00010		0.00010	mg/L		09-MAR-11	R2043403
Tin (Sn)-Dissolved	<0.050		0.050	mg/L		09-MAR-11	R2043403
Titanium (Ti)-Dissolved	<0.0010		0.0010	mg/L		09-MAR-11	R2043403
Uranium (U)-Dissolved	0.00326		0.00010	mg/L		09-MAR-11	R2043403
Vanadium (V)-Dissolved	<0.0010		0.0010	mg/L		09-MAR-11	R2043403
Zinc (Zn)-Dissolved	0.0968		0.0020	mg/L		09-MAR-11	R2043403
Dissolved Metals in Water by ICPOES							
Calcium (Ca)-Dissolved	48.2	RRV	0.50	mg/L		09-MAR-11	R2036524
Iron (Fe)-Dissolved	0.248	RRV	0.030	mg/L		09-MAR-11	R2036524
Magnesium (Mg)-Dissolved	17.7	RRV	0.10	mg/L		09-MAR-11	R2036524
Manganese (Mn)-Dissolved	0.0071	RRV	0.0050	mg/L		09-MAR-11	R2036524
Potassium (K)-Dissolved	<0.50	RRV	0.50	mg/L		09-MAR-11	R2036524
Sodium (Na)-Dissolved	<1.0	RRV	1.0	mg/L		09-MAR-11	R2036524
Mercury (Hg) - Dissolved							
Mercury (Hg)-Dissolved	<0.00010		0.00010	mg/L		11-MAR-11	R2048425
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		11-MAR-11	R2048425
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	0.980		0.010	mg/L		09-MAR-11	R2043803
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		09-MAR-11	R2043803
Arsenic (As)-Total	0.00155		0.00040	mg/L		09-MAR-11	R2043803
Barium (Ba)-Total	0.0112		0.0030	mg/L		09-MAR-11	R2043803
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		09-MAR-11	R2043803
Boron (B)-Total	<0.050		0.050	mg/L		09-MAR-11	R2043803
Cadmium (Cd)-Total	0.000114		0.000050	mg/L		09-MAR-11	R2043803
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		09-MAR-11	R2043803
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		09-MAR-11	R2043803
Copper (Cu)-Total	0.0013		0.0010	mg/L		09-MAR-11	R2043803
Lead (Pb)-Total	0.0167		0.00010	mg/L		09-MAR-11	R2043803
Lithium (Li)-Total	<0.010		0.010	mg/L		09-MAR-11	R2043803
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		09-MAR-11	R2043803
Nickel (Ni)-Total	0.0024		0.0020	mg/L		09-MAR-11	R2043803

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L983741-1 DH-2010-01							
Sampled By: N/A on 04-MAR-11							
Matrix: WATER							
Total Metals in Water by ICPMS (Low)							
Selenium (Se)-Total	<0.00040		0.00040	mg/L		09-MAR-11	R2043803
Silver (Ag)-Total	<0.00010		0.00010	mg/L		09-MAR-11	R2043803
Thallium (Tl)-Total	<0.00010		0.00010	mg/L		09-MAR-11	R2043803
Tin (Sn)-Total	<0.050		0.050	mg/L		09-MAR-11	R2043803
Titanium (Ti)-Total	0.0271		0.0010	mg/L		09-MAR-11	R2043803
Uranium (U)-Total	0.00267		0.00010	mg/L		09-MAR-11	R2043803
Vanadium (V)-Total	0.0016		0.0010	mg/L		09-MAR-11	R2043803
Zinc (Zn)-Total	0.143		0.0040	mg/L		09-MAR-11	R2043803
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	41.1		0.50	mg/L		09-MAR-11	R2042323
Iron (Fe)-Total	1.35		0.010	mg/L		09-MAR-11	R2042323
Magnesium (Mg)-Total	16.0		0.10	mg/L		09-MAR-11	R2042323
Manganese (Mn)-Total	0.0148		0.0020	mg/L		09-MAR-11	R2042323
Potassium (K)-Total	0.79		0.10	mg/L		09-MAR-11	R2042323
Sodium (Na)-Total	1.2		1.0	mg/L		09-MAR-11	R2042323
Miscellaneous Parameters							
Bromide (Br)	<1.0	DLM	1.0	mg/L		27-APR-11	R2181054
Cyanide, Total	<0.0020		0.0020	mg/L		24-MAR-11	R2101843
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		27-APR-11	R2181159
Phosphorus (P)-Total	0.021		0.020	mg/L	28-APR-11	28-APR-11	R2182693
Total Suspended Solids	61.0		3.0	mg/L		11-MAR-11	R2048543
Turbidity	86.8		0.10	NTU		27-APR-11	R2180988
Routine Water Analysis							
Chloride by IC							
Chloride (Cl)	3.23	RRV	0.50	mg/L		09-MAR-11	R2037583
Ion Balance Calculation							
Ion Balance	30.5	BL:INT		%		10-MAR-11	
TDS (Calculated)	556			mg/L		10-MAR-11	
Hardness (as CaCO3)	193			mg/L		10-MAR-11	
Nitrate as N by IC							
Nitrate (as N)	<0.050	RRV	0.050	mg/L		08-MAR-11	R2034243
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.071		0.071	mg/L		10-MAR-11	
Nitrite as N by IC							
Nitrite (as N)	<0.050	RRV	0.050	mg/L		08-MAR-11	R2034243
Sulfate by IC							
Sulfate (SO4)	292	RRV	0.50	mg/L		08-MAR-11	R2034243
pH, Conductivity and Total Alkalinity							
pH	7.87		0.10	pH		08-MAR-11	R2031583
Conductivity (EC)	1080		0.20	uS/cm		08-MAR-11	R2031583
Bicarbonate (HCO3)	396		5.0	mg/L		08-MAR-11	R2031583
Carbonate (CO3)	<5.0		5.0	mg/L		08-MAR-11	R2031583
Hydroxide (OH)	<5.0		5.0	mg/L		08-MAR-11	R2031583
Alkalinity, Total (as CaCO3)	325		5.0	mg/L		08-MAR-11	R2031583
L983741-2 DH-2010-05							
Sampled By: N/A on 04-MAR-11							
Matrix: WATER							
Dissolved Metals - CCME							
Diss. Metals in Water by ICPMS (Low)							
Aluminum (Al)-Dissolved	0.124		0.010	mg/L		09-MAR-11	R2043403
Antimony (Sb)-Dissolved	<0.00040		0.00040	mg/L		09-MAR-11	R2043403

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L983741-2 DH-2010-05							
Sampled By: N/A on 04-MAR-11							
Matrix: WATER							
Diss. Metals in Water by ICPMS (Low)							
Arsenic (As)-Dissolved	0.00859		0.00040	mg/L		09-MAR-11	R2043403
Barium (Ba)-Dissolved	0.0391		0.0030	mg/L		09-MAR-11	R2043403
Beryllium (Be)-Dissolved	<0.0010		0.0010	mg/L		09-MAR-11	R2043403
Bismuth (Bi)-Dissolved	<0.000050		0.000050	mg/L		09-MAR-11	R2043403
Boron (B)-Dissolved	<0.050		0.050	mg/L		09-MAR-11	R2043403
Cadmium (Cd)-Dissolved	<0.000050		0.000050	mg/L		09-MAR-11	R2043403
Chromium (Cr)-Dissolved	<0.0050		0.0050	mg/L		09-MAR-11	R2043403
Cobalt (Co)-Dissolved	<0.0020		0.0020	mg/L		09-MAR-11	R2043403
Copper (Cu)-Dissolved	<0.0010		0.0010	mg/L		09-MAR-11	R2043403
Lead (Pb)-Dissolved	0.00125		0.00010	mg/L		09-MAR-11	R2043403
Lithium (Li)-Dissolved	0.0076		0.0030	mg/L		09-MAR-11	R2043403
Molybdenum (Mo)-Dissolved	0.0120		0.0050	mg/L		09-MAR-11	R2043403
Nickel (Ni)-Dissolved	0.0048		0.0020	mg/L		09-MAR-11	R2043403
Selenium (Se)-Dissolved	<0.00040		0.00040	mg/L		09-MAR-11	R2043403
Silver (Ag)-Dissolved	<0.00010		0.00010	mg/L		09-MAR-11	R2043403
Strontium (Sr)-Dissolved	0.120		0.00010	mg/L		09-MAR-11	R2043403
Thallium (Tl)-Dissolved	<0.00010		0.00010	mg/L		09-MAR-11	R2043403
Tin (Sn)-Dissolved	<0.050		0.050	mg/L		09-MAR-11	R2043403
Titanium (Ti)-Dissolved	0.0044		0.0010	mg/L		09-MAR-11	R2043403
Uranium (U)-Dissolved	0.0159		0.00010	mg/L		09-MAR-11	R2043403
Vanadium (V)-Dissolved	<0.0010		0.0010	mg/L		09-MAR-11	R2043403
Zinc (Zn)-Dissolved	0.0274		0.0020	mg/L		09-MAR-11	R2043403
Dissolved Metals in Water by ICPOES							
Calcium (Ca)-Dissolved	129		0.50	mg/L		09-MAR-11	R2036524
Iron (Fe)-Dissolved	1.03		0.030	mg/L		09-MAR-11	R2036524
Magnesium (Mg)-Dissolved	54.0		0.10	mg/L		09-MAR-11	R2036524
Manganese (Mn)-Dissolved	0.0386		0.0050	mg/L		09-MAR-11	R2036524
Potassium (K)-Dissolved	1.46		0.50	mg/L		09-MAR-11	R2036524
Sodium (Na)-Dissolved	4.0		1.0	mg/L		09-MAR-11	R2036524
Mercury (Hg) - Dissolved							
Mercury (Hg)-Dissolved	<0.00010		0.00010	mg/L		11-MAR-11	R2048425
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		11-MAR-11	R2048425
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	5.79		0.010	mg/L		09-MAR-11	R2043803
Antimony (Sb)-Total	0.00043		0.00040	mg/L		09-MAR-11	R2043803
Arsenic (As)-Total	0.0114		0.00040	mg/L		09-MAR-11	R2043803
Barium (Ba)-Total	0.168		0.0030	mg/L		09-MAR-11	R2043803
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		09-MAR-11	R2043803
Boron (B)-Total	<0.050		0.050	mg/L		09-MAR-11	R2043803
Cadmium (Cd)-Total	0.000221		0.000050	mg/L		09-MAR-11	R2043803
Chromium (Cr)-Total	0.0114		0.0050	mg/L		09-MAR-11	R2043803
Cobalt (Co)-Total	0.0036		0.0020	mg/L		09-MAR-11	R2043803
Copper (Cu)-Total	0.0088		0.0010	mg/L		09-MAR-11	R2043803
Lead (Pb)-Total	0.0192		0.00010	mg/L		09-MAR-11	R2043803
Lithium (Li)-Total	0.022		0.010	mg/L		09-MAR-11	R2043803
Molybdenum (Mo)-Total	0.0150		0.0050	mg/L		09-MAR-11	R2043803
Nickel (Ni)-Total	0.0182		0.0020	mg/L		09-MAR-11	R2043803
Selenium (Se)-Total	<0.00040		0.00040	mg/L		09-MAR-11	R2043803
Silver (Ag)-Total	<0.00010		0.00010	mg/L		09-MAR-11	R2043803
Thallium (Tl)-Total	0.00191		0.00010	mg/L		09-MAR-11	R2043803

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L983741-2 DH-2010-05							
Sampled By: N/A on 04-MAR-11							
Matrix: WATER							
Total Metals in Water by ICPMS (Low)							
Tin (Sn)-Total	<0.050		0.050	mg/L		09-MAR-11	R2043803
Titanium (Ti)-Total	0.140		0.0010	mg/L		09-MAR-11	R2043803
Uranium (U)-Total	0.0215		0.00010	mg/L		09-MAR-11	R2043803
Vanadium (V)-Total	0.0097		0.0010	mg/L		09-MAR-11	R2043803
Zinc (Zn)-Total	0.112		0.0040	mg/L		09-MAR-11	R2043803
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	231		0.50	mg/L		09-MAR-11	R2042323
Iron (Fe)-Total	9.48		0.010	mg/L		09-MAR-11	R2042323
Magnesium (Mg)-Total	93.6		0.10	mg/L		09-MAR-11	R2042323
Manganese (Mn)-Total	0.206		0.0020	mg/L		09-MAR-11	R2042323
Potassium (K)-Total	4.96		0.10	mg/L		09-MAR-11	R2042323
Sodium (Na)-Total	4.7		1.0	mg/L		09-MAR-11	R2042323
Miscellaneous Parameters							
Bromide (Br)	<1.0	DLM	1.0	mg/L		27-APR-11	R2181054
Cyanide, Total	<0.0020		0.0020	mg/L		24-MAR-11	R2101843
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		27-APR-11	R2181159
Phosphorus (P)-Total	0.088		0.020	mg/L	28-APR-11	28-APR-11	R2182693
Total Suspended Solids	478		3.0	mg/L		11-MAR-11	R2048543
Turbidity	564		0.10	NTU		27-APR-11	R2180988
Routine Water Analysis							
Chloride by IC							
Chloride (Cl)	1.21		0.50	mg/L		08-MAR-11	R2034243
Ion Balance Calculation							
Ion Balance	113	BL:INT		%		10-MAR-11	
TDS (Calculated)	566			mg/L		10-MAR-11	
Hardness (as CaCO3)	544			mg/L		10-MAR-11	
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		08-MAR-11	R2034243
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.071		0.071	mg/L		10-MAR-11	
Nitrite as N by IC							
Nitrite (as N)	<0.050		0.050	mg/L		08-MAR-11	R2034243
Sulfate by IC							
Sulfate (SO4)	218		0.50	mg/L		08-MAR-11	R2034243
pH, Conductivity and Total Alkalinity							
pH	8.01		0.10	pH		08-MAR-11	R2031583
Conductivity (EC)	856		0.20	uS/cm		08-MAR-11	R2031583
Bicarbonate (HCO3)	322		5.0	mg/L		08-MAR-11	R2031583
Carbonate (CO3)	<5.0		5.0	mg/L		08-MAR-11	R2031583
Hydroxide (OH)	<5.0		5.0	mg/L		08-MAR-11	R2031583
Alkalinity, Total (as CaCO3)	264		5.0	mg/L		08-MAR-11	R2031583

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Duplicate	Chloride (Cl)	DLA	L983741-2
Duplicate	Sulfate (SO4)	DLM	L983741-1, -2
Matrix Spike	Orthophosphate-Dissolved (as P)	MS-B	L983741-1, -2

Qualifiers for Individual Samples Listed:

Sample Numbe	Client ID	Qualifier	Description
L983741-1	DH-2010-01	SP	TP - Sample was Preserved at the laboratory
L983741-2	DH-2010-05	SP	TP - Sample was Preserved at the laboratory

Sample Parameter Qualifier Key:

Qualifier	Description
BL:INT	Balance Reviewed: Interference Or Non-Measured Component
DLA	Detection Limit Adjusted For required dilution
DLM	Detection Limit Adjusted For Sample Matrix Effects
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BR-IC-ED	Water	Bromide by IC	APHA 4110 B-ION CHROMATOGRAPHY
CL-IC-ED	Water	Chloride by IC	APHA 4110 B-ION CHROMATOGRAPHY
CN-TOT-WP	Water	Cyanide, Total	APHA 4500 CN-O
Total Cyanide in Water: Simple cyanides are converted to hydrogen cyanide (HCN) by distillation. Complex cyanides are not easily decomposed. Low power UV radiation is used to break down organic, metallic and alkali complexed compounds to free cyanide. The dislillation step isolates HCN from simple cyanides under specific acidic conditions. The liberated HCN is converted to cyanogen chloride with chloramine-T. This further reacts with barbituric acid and isonicotinic acid to form a highly coloured complex.			
HG-D-CVAA-ED	Water	Mercury (Hg) - Dissolved	EPA 245.7 / EPA 245.1
HG-T-CVAA-ED	Water	Mercury (Hg) - Total	EPA 245.7 / EPA 245.1
IONBALANCE-ED	Water	Ion Balance Calculation	APHA 1030E
MET-D-ICP-ED	Water	Dissolved Metals in Water by ICPOES	APHA 3120 B-ICP-OES
MET-D-L-MS-ED	Water	Diss. Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
MET-T-L-ICP-ED	Water	Total Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-T-L-MS-ED	Water	Total Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-ED	Water	Nitrite as N by IC	APHA 4110 B-ION CHROMATOGRAPHY
NO3-IC-ED	Water	Nitrate as N by IC	APHA 4110 B-ION CHROMATOGRAPHY
P-T-COL-ED	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.			
PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320
PO4-DO-COL-ED	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.			
SO4-IC-ED	Water	Sulfate by IC	APHA 4110 B-ION CHROMATOGRAPHY
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

10-040422

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

KNIGHT PIESOLD LTD.
ATTN: MATTHEW PARFITT
1650 MAIN STREET WEST
NORTH BAY ON P1B 8G5

Date Received: 21-MAR-11
Report Date: 03-MAY-11 14:31 (MT)
Version: FINAL REV. 3

Client Phone: 705-476-2165

Certificate of Analysis

Lab Work Order #: L987687
Project P.O. #: NOT SUBMITTED
Job Reference: 10-204
Legal Site Desc:
C of C Numbers: 08-011995

Comments: ADDITIONAL 26-APR-11 16:42

21-APR-11: ..
03-MAY-11: ADDITIONAL ANALYSIS
L987687-1 SOLIDS-TOTSUS-ED, TURBIDITY-ED, NH3-CFA-ED, BR-IC-ED, TKN-CFA-ED, N-TOT-ED,
PO4-DO-COL-ED, CN-TOT-WP
L987687-2: Strontium

Jessica Spira
Senior Account Manager

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L987687-1 SW7 STANDARD							
Sampled By: N/A on 17-MAR-11							
Matrix: WATER							
Miscellaneous Parameters							
Ammonia (as N)	<0.050		0.050	mg/L		28-APR-11	R2181872
Bromide (Br)	<1.0	DLM	1.0	mg/L		27-APR-11	R2181054
Cyanide, Total	<0.0020		0.0020	mg/L		29-APR-11	R2183363
Orthophosphate-Dissolved (as P)	<0.010		0.010	mg/L		27-APR-11	R2181159
Total Kjeldahl Nitrogen	<0.20		0.20	mg/L	03-MAY-11	03-MAY-11	R2184014
Total Suspended Solids	<3.0		3.0	mg/L		27-APR-11	R2181109
Turbidity	0.48		0.10	NTU		27-APR-11	R2180988
Total Nitrogen							
Total Nitrogen (Calculation)							
Total Nitrogen	<0.21		0.21	mg/L		03-MAY-11	
Routine Water Analysis							
Chloride by IC							
Chloride (Cl)	5.57		0.50	mg/L		23-MAR-11	R2096663
Dissolved Metals in Water by ICPOES							
Calcium (Ca)-Dissolved	246		0.50	mg/L		23-MAR-11	R2094743
Magnesium (Mg)-Dissolved	87.2		0.10	mg/L		23-MAR-11	R2094743
Potassium (K)-Dissolved	3.13		0.50	mg/L		23-MAR-11	R2094743
Sodium (Na)-Dissolved	8.5		1.0	mg/L		23-MAR-11	R2094743
Ion Balance Calculation							
Ion Balance	101			%		24-MAR-11	
TDS (Calculated)	1210			mg/L		24-MAR-11	
Hardness (as CaCO3)	973			mg/L		24-MAR-11	
Nitrate as N by IC							
Nitrate (as N)	<0.050		0.050	mg/L		23-MAR-11	R2096663
Nitrate+Nitrite							
Nitrate and Nitrite as N	<0.071		0.071	mg/L		24-MAR-11	
Nitrite as N by IC							
Nitrite (as N)	<0.050		0.050	mg/L		23-MAR-11	R2096663
Sulfate by IC							
Sulfate (SO4)	740		0.50	mg/L		23-MAR-11	R2096663
pH, Conductivity and Total Alkalinity							
pH	8.08		0.10	pH		23-MAR-11	R2093003
Conductivity (EC)	1610		0.20	uS/cm		23-MAR-11	R2093003
Bicarbonate (HCO3)	252		5.0	mg/L		23-MAR-11	R2093003
Carbonate (CO3)	<5.0		5.0	mg/L		23-MAR-11	R2093003
Hydroxide (OH)	<5.0		5.0	mg/L		23-MAR-11	R2093003
Alkalinity, Total (as CaCO3)	206		5.0	mg/L		23-MAR-11	R2093003
L987687-2 SW7 METALS							
Sampled By: N/A on 17-MAR-11							
Matrix: WATER							
Total Metals - CCME							
Mercury (Hg) - Total							
Mercury (Hg)-Total	<0.00010		0.00010	mg/L		24-MAR-11	R2101044
Total Metals in Water by ICPMS (Low)							
Aluminum (Al)-Total	<0.010		0.010	mg/L		23-MAR-11	R2098143
Antimony (Sb)-Total	<0.00040		0.00040	mg/L		23-MAR-11	R2098143
Arsenic (As)-Total	0.00084		0.00040	mg/L		23-MAR-11	R2098143
Barium (Ba)-Total	0.0344		0.0030	mg/L		23-MAR-11	R2098143
Beryllium (Be)-Total	<0.0010		0.0010	mg/L		23-MAR-11	R2098143
Boron (B)-Total	0.052		0.050	mg/L		23-MAR-11	R2098143
Cadmium (Cd)-Total	0.000091		0.000050	mg/L		23-MAR-11	R2098143

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L987687-2 SW7 METALS							
Sampled By: N/A on 17-MAR-11							
Matrix: WATER							
Total Metals in Water by ICPMS (Low)							
Chromium (Cr)-Total	<0.0050		0.0050	mg/L		23-MAR-11	R2098143
Cobalt (Co)-Total	<0.0020		0.0020	mg/L		23-MAR-11	R2098143
Copper (Cu)-Total	<0.0010		0.0010	mg/L		23-MAR-11	R2098143
Lead (Pb)-Total	0.00156		0.00010	mg/L		23-MAR-11	R2098143
Lithium (Li)-Total	0.017		0.010	mg/L		23-MAR-11	R2098143
Molybdenum (Mo)-Total	<0.0050		0.0050	mg/L		23-MAR-11	R2098143
Nickel (Ni)-Total	0.0075		0.0020	mg/L		23-MAR-11	R2098143
Selenium (Se)-Total	<0.00040		0.00040	mg/L		23-MAR-11	R2098143
Silver (Ag)-Total	<0.00010		0.00010	mg/L		23-MAR-11	R2098143
Strontium (Sr)-Total	0.900		0.00020	mg/L		23-MAR-11	R2098143
Thallium (Tl)-Total	0.00016		0.00010	mg/L		23-MAR-11	R2098143
Tin (Sn)-Total	<0.050		0.050	mg/L		23-MAR-11	R2098143
Titanium (Ti)-Total	<0.0010		0.0010	mg/L		23-MAR-11	R2098143
Uranium (U)-Total	0.00630		0.00010	mg/L		23-MAR-11	R2098143
Vanadium (V)-Total	<0.0010		0.0010	mg/L		23-MAR-11	R2098143
Zinc (Zn)-Total	0.632		0.0040	mg/L		23-MAR-11	R2098143
Total Metals in Water by ICPOES (Low)							
Calcium (Ca)-Total	254		0.50	mg/L		23-MAR-11	R2094745
Iron (Fe)-Total	0.037		0.010	mg/L		23-MAR-11	R2094745
Magnesium (Mg)-Total	88.8		0.10	mg/L		23-MAR-11	R2094745
Manganese (Mn)-Total	0.0093		0.0020	mg/L		23-MAR-11	R2094745
Potassium (K)-Total	2.78		0.10	mg/L		23-MAR-11	R2094745
Sodium (Na)-Total	7.9		1.0	mg/L		23-MAR-11	R2094745

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Calcium (Ca)-Dissolved	E	L987687-1
Matrix Spike	Orthophosphate-Dissolved (as P)	MS-B	L987687-1

Qualifiers for Individual Samples Listed:

Sample Numbe	Client ID	Qualifier	Description
L987687-1	SW7 STANDARD	SP	NH3 - Sample was Preserved at the laboratory

Sample Parameter Qualifier Key:

Qualifier	Description
DLM	Detection Limit Adjusted For Sample Matrix Effects
E	Matrix Spike recovery outside ALS DQO due to analyte background in sample.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
BR-IC-ED	Water	Bromide by IC	APHA 4110 B-ION CHROMATOGRAPHY
CL-IC-ED	Water	Chloride by IC	APHA 4110 B-ION CHROMATOGRAPHY
CN-TOT-WP	Water	Cyanide, Total	APHA 4500 CN-O
Total Cyanide in Water: Simple cyanides are converted to hydrogen cyanide (HCN) by distillation. Complex cyanides are not easily decomposed. Low power UV radiation is used to break down organic, metallic and alkali complexed compounds to free cyanide. The dislillation step isolates HCN from simple cyanides under specific acidic conditions. The liberated HCN is converted to cyanogen chloride with chloramine-T. This further reacts with barbituric acid and isonicotinic acid to form a highly coloured complex.			
HG-T-CVAA-ED	Water	Mercury (Hg) - Total	EPA 245.7 / EPA 245.1
IONBALANCE-ED	Water	Ion Balance Calculation	APHA 1030E
MET-D-ICP-ED	Water	Dissolved Metals in Water by ICPOES	APHA 3120 B-ICP-OES
MET-T-L-ICP-ED	Water	Total Metals in Water by ICPOES (Low)	APHA 3120 B-ICP-OES
MET-T-L-MS-ED	Water	Total Metals in Water by ICPMS (Low)	SW 846 - 6020-ICPMS
N-T-CALC-ED	Water	Total Nitrogen (Calculation)	APHA 4500 N-Calculated
Total Nitrogen is a calculated parameter. Total Nitrogen = Total Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)]			
NH3-CFA-ED	Water	Ammonia in Water by Colour	APHA 4500 NH3-NITROGEN (AMMONIA)
This analysis is carried out using procedures adapted from APHA Method 4500 NH3 "NITROGEN (AMMONIA)". Ammonia is determined using the automated phenate colourimetric method.			
NO2+NO3-CALC-ED	Water	Nitrate+Nitrite	CALCULATION
NO2-IC-ED	Water	Nitrite as N by IC	APHA 4110 B-ION CHROMATOGRAPHY
NO3-IC-ED	Water	Nitrate as N by IC	APHA 4110 B-ION CHROMATOGRAPHY
PH/EC/ALK-ED	Water	pH, Conductivity and Total Alkalinity	APHA 4500-H, 2510, 2320
PO4-DO-COL-ED	Water	Diss. Orthophosphate in Water by Colour	APHA 4500-P PHOSPHORUS
This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Dissolved Orthophosphate is determined colourimetrically on a sample that has been lab or field filtered through a 0.45 micron membrane filter.			
SO4-IC-ED	Water	Sulfate by IC	APHA 4110 B-ION CHROMATOGRAPHY
SOLIDS-TOTSUS-ED	Water	Total Suspended Solids	APHA 2540 D-Gravimetric
TKN-CFA-ED	Water	TKN in Water by Colour	APHA 4500-NORG (TKN)
This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 celcius with analysis using an automated colourimetric finish.			
TURBIDITY-ED	Water	Turbidity	APHA 2130 B-Nephelometer

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**

Laboratory Definition Code	Laboratory Location
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA
WP	ALS ENVIRONMENTAL - WINNIPEG, MANITOBA, CANADA

Chain of Custody Numbers:

08-011995

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Laboratory Group

Environmental Division

COC # 08-

Page of

Report to	
Company:	Knight Piesold
Contact:	Matt Parfitt
Address:	1650 main street west, North Bay ON, P1B 8G5
Phone:	705-476-2165 Fax 705-474-8095
Invoice To: Same as Report ? Yes / No	
Company:	Maskwa Engineering
Contact:	Richard Johnstone
Address:	425 Mackenzie Highway Hay River NOE OR3
Phone:	867 874-2207 Fax 867-874-2763
Lab Work Order # (lab use only)	L987687

Report Format / Distribution	
Standard:	X Other:
Select PDF:	X Excel Digital
Email 1:	mparfitt@knightpiesold.com
Email 2:	richard.johnstone@maskwa engineering.ca
Client / Project Information:	
Job #:	~~10-204~~ 10-204
PO / AFE:	
Legal Site Description:	
Quote #:	
ALS Contact:	Sampler:

Service Requested: (rush - subject to availability)

- X Regular (Default)
- Priority (2-3 Business Days) - 50% Surcharge
- Emergency (1 Business Day) - 100% Surcharge
- For Emergency < 1 Day, ASAP or Weekend - Contact ALS

Analysis Request

(Indicate Filtered or Preserved: F/P)

Sample #	Sample Identification (This description will appear on the report)	Date	Time	Sample Type	Standard Total metals	Number of Containers
1	SW7 Standard	Mar 17/11				
2	GW7 metals	" "			P	

Special Instructions / Regulations / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)		SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)		
Released by:	Date & Time:	Received by:	Date:	Time:	Temperature:	Verified by:	Date & Time:	Observations: Yes / No? If Yes, add SIF
Richard Johnstone	Mar 18/11	Catherine Leclerc	21-03-11	10:20	9°C			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - REPORT COPY PINK - FILE COPY YELLOW - CLIENT COPY

Knight Piésold
CONSULTING

APPENDIX B

CHAIN-OF-CUSTODY FORM (EVENT #1)

(Page B-1)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Chain of Custody / Analytical Request Form
Canada Toll Free: 1 800 668 9878
www.alsglobal.com

10-040422

Page ___ of ___

Report To		Report Format / Distribution		Service Requested: (Rush subject to availability)	
Company:	Mo Knight Piesold	Standard:	X Other (specify):	X	Regular (Standard Turnaround Times))
Contact:	Matt Partitt	Select: PDF	X Excel Digital Fax		Priority, Date Req'd: _____ (Surcharges apply)
Address:	1650 Main Street west North Bay ON, P1B 8G5 ~~8G5~~	Email 1:	mpartitt@Knightpiesold.com		Emergency (1 Business Day) - 100% Surcharge
		Email 2:	richard.johnstone@mackwaengineering.ca		For Emergency < 1 Day, ASAP or Weekend - Contact ALS
Phone:	705-476-2165 Fax: 705-474-8095			Analysis Request	
Invoice To	Same as Report ? (circle) Yes or No (If No, provide details)	Client / Project Information		(Indicate Filtered or Preserved, F/P)	
	Copy of Invoice with Report? (circle) Yes or No	Job #:	10-204		
Company:	MacKwa Engineering	PO / AFE:			
Contact:	Richard Johnstone	LSD:			
Address:	925 MacKenzie Hwy NOE 0R3				
Phone:	867 874-2207 Fax: 867-874-2763	Quote #:			
Lab Work Order # (lab use only)	L983741	ALS Contact:	Sampler:		

Sample #	Sample Identification (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type			Number of Containers
1	DH-2010-01						
2	DH-2010-01 (metals / filtered)				P	F	
3	DH-2010-01 (metals)				P		
4	DH-2010-05						
5	DH-2010-05 (metals/ filtered)				P	F	
6	DH-2010-05 (metals)				P		

Special Instructions / Regulations / Hazardous Details

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY.

By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

SHIPMENT RELEASE (client use)			SHIPMENT RECEPTION (lab use only)				SHIPMENT VERIFICATION (lab use only)			
Released by:	Date:	Time:	Received by:	Date:	Time:	Temperature:	Verified by	Date:	Time:	Observations: Yes / No ? If Yes add SIF
Richard Johnstone	Mar 4/11		TCB	07-03-11	10:30	3.5 °C				

B-1 of 1

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION | WHITE - LABORATORY COPY | YELLOW - CLIENT COPY | GENF 18.01 Front

Attachment 5

Attachment 5 is provided to the MVEIRB separately as an updated Appendix Volume I, to replace the current Appendix A.1 of the Developer's Assessment Report.