

October 8, 2015

Robert Holmes
Director of Mineral Resources
Department of Energy, Mines and Resources
P.O. Box 2703
Whitehorse, YT Y1A 2C6

Dear Mr. Holmes,

As required by Section 3 (d) of the Minto Mine Project QML-0001 – Plan Requirements letter (December 18, 2014), please accept the attached Vegetation Metal Uptake Monitoring Plan for Minto Mine.

Once approved, this plan will be amalgamated into Minto Mine's Environmental Monitoring, Surveillance and Reporting Plan.

If required, a hard copy of the plan will be delivered to your office.

If you have any questions or concerns regarding the attached plan, please do not hesitate to contact me at ryanh@mintomine.com or 604-759-4659.

Regards,

Ryan Herbert
Environmental Specialist
Minto Explorations Ltd.



ACCESS

VEGETATION METAL UPTAKE MONITORING PLAN
FOR MINTO MINE

September 2015

Prepared for:

MINTO EXPLORATIONS LTD.

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1 INTRODUCTION

Heavy metal contamination on mine sites is a common issue due to both the extraction of highly mineralized rock, which is transported, milled and stored in these areas, and the exposure of mined materials to environmental influences. Metals can leach from mining waste into the immediate aquatic environment via direct surface water runoff or infiltration of precipitation (aqueous transport). In terrestrial systems, in-situ soils may already have heightened concentrations of metals due to local mineralization of the surficial parent material. Dust from blasting, ore crushing and waste dumping, can be wind (aeolian) transported to surrounding terrestrial areas, settling on the ground and the surface of plant leaves, stems and fruits. These receiving environments can, over time, accumulate contaminants to the point that biological functioning can be affected in aquatic and terrestrial ecosystems.

The potential for these effects, and the degree to which they occur, are a function of a number of variables, and the accumulation processes can be highly complex. Generally speaking, plants can become intermediaries or vectors in transferring heavy metals to higher trophic levels when consumed by herbivores, which in turn become prey for carnivorous species. Harvesting and consumption of country foods by humans can also present an exposure pathway.

Monitoring of metal uptake in plants in mining areas has been used to assess potential and ongoing risks to these receptors. Understanding this potential can be useful in guiding mine operations.

Access Consulting Group (ACG) was retained by Minto Explorations Ltd (Minto) to develop a Vegetation Metals Uptake (VMU) Monitoring Plan (the Plan). The Plan is required by the Government of Yukon, Department of Energy Mines, and Resources (EMR), to form part of the revised Minto Phase V/VI Environmental, Monitoring, Surveillance and Reporting Plan (EMSRP). Specifically, the VMU Monitoring Plan will meet requirement (d) of EMR's Plan Requirement Letter (December, 2014). to Minto which specifies that the following be submitted:

a program for monitoring and measuring metal uptake in vegetation on the mine site, and in areas surrounding the mine site.

2 PROGRAM OBJECTIVES

The main objective of the VMU Monitoring Program is to develop and execute a plan that monitors and measures metal uptake in vegetation on the mine site and surrounding areas that:

- Utilizes previously established or documented conditions, monitoring results or predictive efforts, where appropriate and possible;
- Establishes a network of plots for monitoring both soil and vegetation metal concentrations; and
- Allows for an ongoing evaluation of the extent and degree that metals from mining activity is affecting vegetation in the proximity of the project site.

3 VMU MONITORING PLAN DEVELOPMENT

A number of tasks were undertaken as part of the development of a VMU Monitoring Plan for the Minto Mine. These tasks were scoped to result in a detailed VMU Monitoring Plan (Section 4) that met the program objectives presented previously in Section 2:

- Review relevant previous work (management plans, monitoring information, predictive modeling) for the mine site;
- Identify a study area based on this previous review;
- Identify potential exposure pathways for metals through vegetation;
- Select vegetation species to monitor based on exposure pathways and documented or expected use;
- Identify metals of concern for focus in the analysis; and
- Formulate a detailed vegetation metal uptake monitoring plan.

The following sections provide more information regarding these tasks and the key aspects considered in the development of a meaningful VMU Monitoring Plan for the Minto Mine.

3.1 DOCUMENT REVIEW

To help inform the development of the VMU Monitoring Plan, ACG reviewed a number of existing documents that were potentially relevant. Table 1 outlines the documents reviewed, and delineates how information was used or incorporated into the Plan.

Table 1: Documents Reviewed

Document Review	Potentially Relevant Information	Use in VMU Monitoring Plan
Access Consulting Group. 2010. Minto Mine Environmental Baseline Ecosystems and Vegetation Report	Ten soil samples were collected from the following ecological plots: M07, M29, M35, M54, M54A, M76A, M80, M84, M85, M90A, and M93. These are permanent plots with full description of ecological parameters.	Some of these plots can be used as controls to determine natural background metal concentrations or sampling sites. Need to revisit previously established ecoplots as per recommendations to monitor ecological changes and collect plant samples.
2010 Reclamation Research Report by Access Consulting Group	Lab analysis of 12 soil samples for metals, nutrient levels and texture. Soil samples from revegetation plots. Metal analysis of grasses used in revegetation and naturally regenerating willows.	Gives metal concentrations of soils within project area, can be used to augment sample size of soil samples taken in VMU program. Gives indication of willow and grass uptake of specific metals in three locations within the project site.
2007, 2008 and 2009 Revegetation Trial Reports by Stu Withers/Access Consulting Group	Two soil samples were collected from the overburden stockpile in late March 2007 and were analyze for texture, metals (ICP Method) and nutrients. The analysis results were similar for both samples, with both looking reasonably good for reclamation purposes. (ACG, 2007)	Additional soils data for metal content, furthers characterization of soils on site.
Minto Mine Phase V/VI, YESAB Project Proposal, Minto Climate Baseline Report, 2014	Provides meteorology data and climate trends, such as; prevailing wind directions, precipitation and temperature.	Important information on which to formulate VMU plan for sampling sites based on dust source locations and prevailing wind direction.
Minto Mine Phase V/VI Reclamation and Closure Plan version 5.1	Reclamation schedule indicates timing of closure for specific dust sources. Health and safety objectives	Guides VMU plan objectives in the future, and contributes an understanding of projected revegetation efforts and waste cover prescriptions, that will reduce dust sources and runoff.
Vegetation Metal Uptake studies completed for Casino baseline, Keno closure and during Red Dog mine operations.	To ensure the degree of detail for VMU is consistent with other mineral extraction projects in northern jurisdictions.	To check VMU procedures and EMR expectations.

3.2 STUDY AREA AND MONITORING NETWORK

The identification of a study area took the following elements into consideration:

1. Area of direct disturbance (and reclamation) by mining activities;
2. Previous monitoring locations;
3. Access – road/ground based access to monitored areas was preferential; and
4. Anticipated dispersal mechanisms and extent of metal contamination.

The proposed VMU monitoring network is presented in Figure 2 in Section 4.1. The VMU sampling sites were selected in the areas anticipated to receive higher density dust fallout, and control or outlying stations were positioned outside of the projected dispersion area. This involved utilizing, where possible and accessible, ecosystem plots established in 2010 where soil and vegetation information data were collected. The stations to be monitored are divided into ‘site’ stations (within or upon the direct mine footprint area) and ‘control’ stations (outside the anticipated zone of influence of the mining activities.)The proposed monitoring station network is presented in Section 4.1.

The meteorological data collected on site, over a five year period, shows that the prevailing winds between April to October are from the northwest and the southeast (Figure 1). The areas that have been observed to generate the greatest loads of dust are the crushing and conveying infrastructure areas near the mill. To a much lesser degree, pit blasting and waste rock dumping would also contribute to dust loading and dispersion. To this end, the VMU sampling sites have been located in vegetated areas near the perimeter of these dust sources and extend roughly along a NW to SE axis.



DATA PERIOD:
Start Date: 10/15/2010 - 00:00
End Date: 7/14/2015 - 08:00

TOTAL COUNT:	CALM WINDS:
23412 hrs.	4.05%

AVG. WIND SPEED:
3.37 m/s

MODELER:LISA KNIGHT

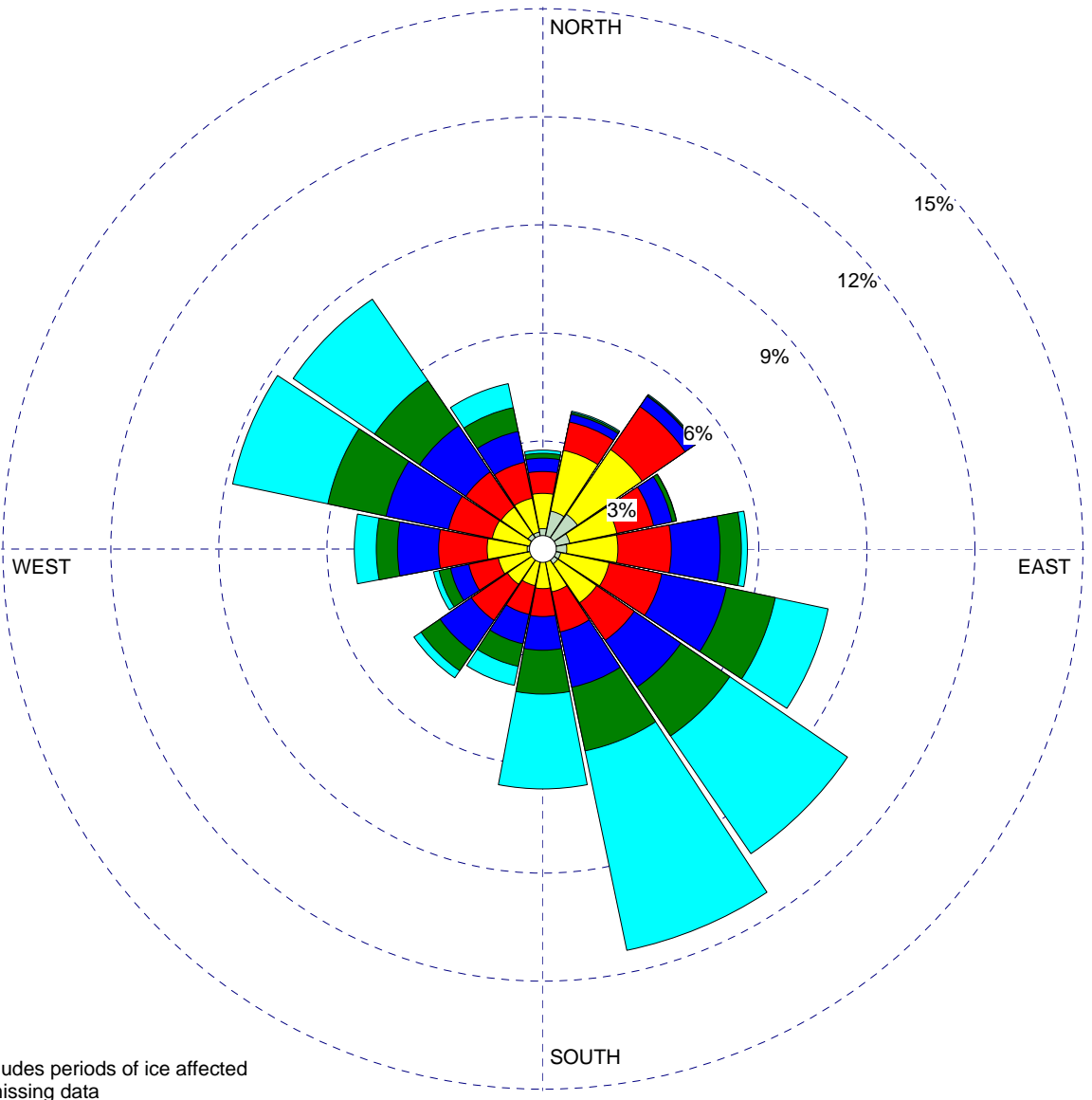
DATE:
7/16/2015

FIGURE 1
Minto Wind Rose Plot
April to October 2010 to
2015 (partial)



DISPLAY:

Wind Speed
Direction (blowing from)



WIND SPEED (m/s)

- >= 5.0
- 4.0 - 5.0
- 3.0 - 4.0
- 2.0 - 3.0
- 1.0 - 2.0
- 0.5 - 1.0

Calms: 4.05%

Excludes periods of ice affected or missing data
 Anemometer height: 10m

3.3 SELECTED TARGET VEGETATION SPECIES

There are numerous plants species that are either known or expected to be consumed directly by wildlife in the study area. To a lesser degree, there are some plant species in the study area which are known to be consumed by humans as part of traditional gathering in other areas. Actual anticipated future use, particularly by humans in traditional gathering is uncertain, however key species in both of these areas of potential exposure have been selected for monitoring. A review of other vegetation metal uptake programs as outlined in Table 1 also informed the species selection. The selected species and the rationale is provided in Table 2 below.

Table 2: Selected Species

Target Plants	Plant Part to be Collected	Rationale for Selection
Willows (<i>Salix</i> spp.)	Leaves	Moose browse
Horsetail (<i>Equisetum</i> spp.)	Plant	Moose browse
Blueberries (<i>Vaccinium</i> spp.) or Soapberries	Fruit	Human gathering/bear forage
Grasses (Species used in revegetation)	Culm and leaves, roots	Used for revegetation, potential for browse for a variety of species

3.4 METALS OF CONCERN

Based on the Canadian Council of Ministry of Environment (CCME), the Yukon Environment Act and U.S. Environmental Protection Agency (U.S. EPA) certain metals are identified Constituents of Potential Concern (COPC), since exposure and/or bioaccumulation to relatively high concentrations of these elements can resulted in damage to plants, aquatic organisms, terrestrial wildlife, and human health. Of these COPC, only the metals that are known to have elevated concentrations as compared to background levels at the Minto site are of interest. It should be noted that toxic effects usually require persistent exposure to high concentrations of the metals listed, and that as a confirmed mineralized area, elevated metals concentrations in soil (and to some degree in vegetation) are indeed expected in the baseline condition in the vicinity of the mine site, as noted previously.

Initial analysis will focus on metals listed below that have been identified as occurring at the Minto mine site during previous soil sampling done in 2009 and 2010 (Appendix B). These metals are considered to be COPC according to CCME. This list may be revised based on the results of the first sampling event as the program proceeds in the future:

Aluminum (Al), Antimony (Sb), Arsenic (As), Cadmium (Cd), Chromium (Cr), Copper (Cu), Iron (Fe), Lead (Pb), Manganese (Mn), Mercury (Hg), Molybdenum (Mo), Nickle (Ni), Silver (Ag), Zinc (Zn), and Selenium (Se).

4 DETAILED VMU MONITORING PLAN

The following sections present the detailed elements of the VMU Monitoring Plan. This section has been developed to allow competent monitors to execute the program using consistent methods that allow for comparison between sampling events.

4.1 MONITORING NETWORK

The network of monitoring stations is presented on Figure 2. Stations are either designated as site (exposure) or control stations. Progression of the mine plan (waste dump covering) and analysis of the monitoring results may result in recommendations for additional monitoring locations. For example, progressive reclamation of waste dumps may allow for areas that have been revegetated to be included into the monitoring network.

Dust dispersal is predicted to be spread unevenly due to local meteorological influences. The two predominant wind directions at site are S to SE and N to NW. Average wind speed is 2.64 m/s at 3 m height and 2.9 m/s at 10 m. In addition, the local topography is varied and different mining sources produce particular matter of different sizes at different rates. Site sampling stations are located in areas anticipated to accumulate the most dust based on meteorological data collected at site.

Three of the four control plots selected for the VMU monitoring network were established during 2010 ecosystem mapping (M07, M80 and M90A). Summaries of these plots ecological characteristics can be found in Appendix A. Also, results of soil analysis for metal concentration, pH, texture and nutrient parameters for these control plots are provided in Appendix B. The fourth control plot selected is adjacent to the water quality station C4 which is approximately two km downstream of the dam on Minto Creek. The control at C4 will need to be established and its ecological properties recorded and soils tested to the same level as the other control plots. A sample Ecosystem Data form is provided in Appendix C.

382500 383000 383500 384000 384500 385000 385500 386000 386500 387000





6946000
6945500
6945000
6944500
6944000
6943500
6943000

VEGETATION METAL UPTAKE MONITORING PLAN







**FIGURE 2
MONITORING NETWORK**

SEPTEMBER 2015

Monitoring Stations

-  Control Plot
-  Survey Plot

Phase V / VI Features

-  Phase V/VI Tailings
-  Phase V/VI Pits
-  Phase V/VI Dumps
-  Phase IV Features
-  Dam
-  Spillway

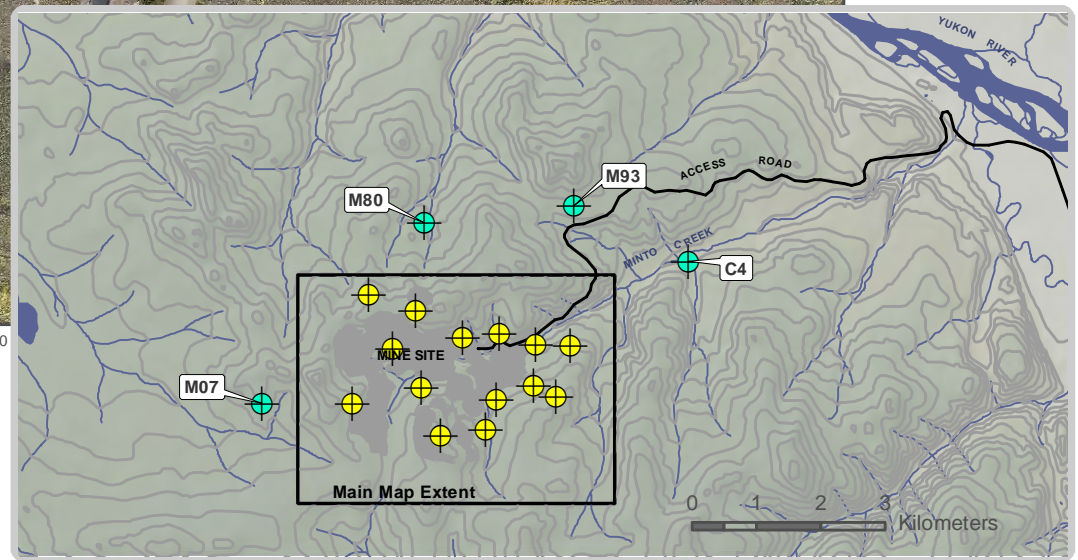


Aerial imagery obtained from Challenger Geomatics. Imagery acquired September 9th 2014. Modelled boundary of annual TSP digitized from the map inset of figure 6 of the Minto Mine Phase V/VI Expansion Project Particulate Matter Dispersion Modelling Report by RWDI Consulting Engineers & Scientists.

Datum: NAD 83 Projection: UTM Zone 8N

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(Last edited by: mdacharme: 9/14/2015 11:01 PM)



0 125 250 500 750 1,000 Meters

0 1 2 3 Kilometers

4.2 METHODOLOGY

Observations and sampling at each station will include the following steps:

1. Selection of an appropriate microsite in the vicinity of the station identified on the map;
2. Generation of a station ID and documenting relevant ecological attributes of the station area (see Appendix C);
3. Soil sampling; and
4. Vegetation sampling.

4.2.1 Microsite Selection

The points provided as UTM coordinates and on the map are meant to guide the sampler to a vicinity not to an exact point. The sampler(s) must use their best judgement of the appropriateness of each microsite based on ground conditions. The following steps and considerations should be followed in selecting and documenting a microsite:

1. Locations that have been disturbed to the extent that soil is exposed and vegetation is damaged should be avoided;
2. The microsite should have at least two of the plant species listed in Table 2;
3. Look around the general location to find a relatively undisturbed site where soil pedon are not fragmented and vegetation is established (early successional communities are fine);
4. Situate the soil pit where the roots of the plants to be sampled are present;
5. Hang two pieces of flagging tape at the plot with the plot number, project, and date to ease relocation for future monitoring.
6. GPS the location with station ID and note coordinates; and
7. Fill out ecological attribute form for station, including:
 - a. Mesoslope position, slope and aspect;
 - b. Dominant vegetation and main cover heights;
 - c. Plant species sampled;
 - d. Successional stage;
 - e. Signs of wildlife diggings, browsing and/or grazing;

- f. Signs of site disturbance;
- g. Distance from possible dust source (can be determined from map); and
- h. Take photographs of soil pit and a representative shot of the site.

4.2.2 Soil Sampling

The depth of soil sampling is contingent upon the drainage properties of soils, amount of precipitation, and migration ability of metal ions. The soil textures common in the Minto area are silty to sandy loams. The area is semi-arid receiving an average annual rainfall of 1.74 cm. Due to these conditions, soil samples should be collected from the top surface layer of mineral soil at a depth of 4–10 cm (within the rooting zone of plants to be sampled) and again at 20-30 cm, where possible, to determine migration potential of specific metals through the pedon. If soils are not deep, try to obtain one sample in the rooting zone and one about 10 cm deeper, if this is still not possible then collect soils in the rooting zone.

The inductively coupled plasma mass spectrometry (ICP-MS) analysis for metal concentrations is sensitive in detecting concentrations in the range of micrograms per kilogram. Due to this level of sensitivity, cross contamination of soil samples needs to be carefully avoided throughout sample collection and shipping or results will be compromised. The following protocol for soil sampling needs to be followed to ensure soil samples are of high quality:

1. If possible, one member of the field sampling team can fill out site data sheets, take photographs and collect vegetation samples, while the other member(s) collects the soil samples.
2. Sample collection activities shall proceed progressively from the least suspected contaminated area to the most suspected contaminated area.
3. Dig a soil pit to a depth of 40 cm. After a soil pit is dug, scrape the vertical surface where soil will be extracted with a clean trowel or knife. This is necessary to minimize the effects of contamination due to smearing of material from other levels. Start with the lower sample depth at 25 cm, clean tools and change gloves before taking the next sample in the rooting zone at 4-10 cm depth.
4. A clean pair of nitrile disposable gloves should be worn each time a different soil sample is collected and digging tools cleaned with deionized water and paper towels prior to each soil sample taken. The gloves should be donned immediately prior to sampling.
5. Put approximately 300 g or four cups of soil in a fresh plastic sample bag which should be labeled with sample site identifier, date, project number and sampler's initials. Labs usually supply these bags. Ensure sample bags are well sealed so no soil can leak out.
6. Sample bags with soils suspected of containing high concentrations of contaminants shall be handled and stored separately from control samples and vegetation samples. And,
7. Keep all samples cool and out of the light. Coolers with ice packs will suffice for storage, but samples should be sent to the lab within five days of collection date.

4.2.3 Vegetation Sampling

Table 2 in Section 3.3 identifies which parts of the plant should be sampled. Vegetation samples should be collected in plastic bags provided by the laboratory, and stored in a cool dark location until shipped. For each vegetation sample a minimum of 150 g should be collected from the plants or approximately four compacted handfuls. Sample only healthy mature leaves or berries, avoid collecting old, dead or damaged leaves.

It is best that the person collecting vegetation samples is not the same person sampling soils, as residual soils can be left on clothing, hair and hands, which could be unintentionally transferred to the plant material. Use fresh nitrile gloves for each plant collection. Leaves can be stripped off branches of willows. Horsetails can be pinched off just above ground level.

Grasses can be also cut (use stainless steel or ceramic knife washed with deionized water prior to each collection) about 2 cm above ground avoid including dead plant material. Grass root samples are to be collected to determine intermediate uptake in the root systems. Shake dirt from roots prior to putting into sample bag. The lab will wash the remaining soil off the roots before analysis.

4.2.4 Laboratory Analysis - Sample Preparation

The evaluation of metal uptake in plants versus metal accumulation on plant surface due to dust dispersal requires that the lab prepare samples in a specific manner. These following directions need to be clearly communicated to the lab on receipt of soil and vegetation samples.

Plant samples (leaves and berries) have been gathered to determine the effects of dust settlement from potential mine sources on nearby vegetation. In order to understand the degree of metal contamination being contribute by dust, each vegetation sample needs to be divided in two (except for root samples). Only one half of each vegetation sample is to be wash prior to ICP-MS analysis. The remaining half of the vegetation sample is not washed or prepared in a manner that would remove surface dust. The unwashed vegetation analysis will then reflect the total amount of contaminates both external and internal. The analysis of the washed half of the sample will reflect only metal contaminants residing within the plant tissues. The difference between the two sets of results will give the amount of contaminants that were dust-borne.

Soil samples will be dealt with as per usual by the lab prior to metal analysis. Other parameters to be obtained for each soil sample by lab analysis include: pH, texture and cation exchange capacity (CEC).

4.3 SCHEDULE

This monitoring should take place in July or early August of any given year before seasonal desiccation of vegetative material occurs. Continued monitoring should occur every three years after initial study, to determine any changes in dust dispersal and vegetation metal uptake.

4.4 QUALITY CONTROL AND QUALITY ASSURANCE (QA/QC)

There are eighteen sites selected for vegetation and soil sampling. At two of these sites duplicate samples should be taken and submitted to the lab under a pseudonym sample number. The lab results will be compared to ensure that the lab procedures and results are consistent. All other QA/QC protocols have been identified in the sampling methodology in the previous section.

4.5 REPORTING AND EVALUATION

Existing and gathered soils and vegetation data will be compiled into a workable data base. Soil and plant tissue metal concentrations results will be compared to CCME guidelines (as a benchmark), and site station data statistics will be compared with the control station data located outside of the zone of influence. Other soil and vegetation metal concentrations taken in previous studies will be used to make the sample pool more robust for comparative analysis and definition of patterns occurring in vegetation metal uptake.

Results will be presented with an interpretation in the Project's Annual Report under the Quartz Mining License.

5 REFERENCES

- Access Consulting Group, 2007. Minto Mine, Reclamation Research Program, Detailed Decommissioning and Reclamation Plan, 2007 Activities. Prepared for Minto Explorations Ltd., a subsidiary of Capstone Mining Ltd.
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APPENDIX A

CONTROL PLOT SUMMARIES

PLOT M07



Status: Permanent (*Control, soil sampled*)

Location: UTM: 0383864E, 6944289N

Vegetation Plot Summary

Shrub species cover	At ₅ Pl ₄ W ₁
Age in years (dominant species)	20
Height in meters (avg dominant species)	8
Soil moisture and nutrient values (SMR/SNR)	3/C
Crown cover for polygon in %	40
Succession Stage	Young forest
Aspect (°)	204
Elevation (m)	890
Slope %	22
Meso slope position	Upper
Drainage	Well
Coarse woody debris%/Snags#	11/2

Site description: South west facing open forest. Fire regeneration. Bare ground ~20% covered with leaf litter. Poorly developed herb layer, 6% grass (*Calamagrostis purpurascens*).

Plant community: Trembling Aspen – Pine - Bunchgrass

Comments: Selected control for mixed aspen/pine forest, southern aspect, outside of mine influences.

PLOT M80



Status: Permanent (Control, soil sampled)

Location: UTM: 0384380E, 6947083N

Vegetation Plot Summary

Shrub species cover	Pl ₅ W ₃ At ₂
Age in years (dominant species)	15
Height in meters (avg dominant species)	5
Soil moisture and nutrient values (SMR/SNR)	3/B
Crown cover for polygon in %	40
Succession Stage	Young forest
Aspect (°)	140
Elevation (m)	817
Slope %	10
Meso slope position	Middle
Drainage	Well
Coarse woody debris%/Snags#	5/0

Site description: South east facing slope, poorly developed herb layer, mainly moss/lichen with bare soil patches, about 10% exposed rocks.

Plant community: Pine - Willow - Aspen

Comments: Helicopter access

PLOT M90A



Status: Permanent (soil sample)

Location: UTM: 0387045E, 6947197N

Vegetation Plot Summary

Plant species cover	At ₅ Sw ₃ Pl ₂
Age in years (dominant species)	75
Height in meters (avg dominant species)	10
Soil moisture and nutrient values (SMR/SNR)	3/C
Crown cover for polygon in %	40
Succession Stage	Mature forest
Aspect (°)	179
Elevation (m)	792
Slope %	22
Meso slope position	Middle
Drainage	Well
Coarse woody debris%/Snags#	2/1

Site description: South facing slope ground cover predominantly kinnikinnick (*Arctostaphylos uva-ursi*) and grass (*Calamagrostis purpurascens*). Large canopy gaps with grassland attributes

Plant community: Aspen - White Spruce - Pine (grassland)

Comments: Minto Road 200m south of plot

APPENDIX B

SOIL AND VEGETATION LAB RESULTS 2009 AND 2010

Your Project #: MIN-09-05 REVEGETATION MONITOR
Your C.O.C. #: 08304612, F143924, F143925

Attention: Colleen Roche
MINTO EXPLORATIONS LTD.
#900 - 999 WEST HASTINGS ST.
VANCOUVER, BC
CANADA V6C2W2

Report Date: 2009/10/06

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: A953654
Received: 2009/09/25, 01:05

Sample Matrix: Soil
Samples Received: 3

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
Cation Exchange Capacity (g)	3	2009/10/02	2009/10/06	EENV SOP-00034	EPA SW846 6010C
Conductivity (Soluble)	3	2009/09/30	2009/10/01	BRN SOP-00267 R3.0	Based Carter 18.3.1
Elements by ICPMS (total)	3	2009/10/01	2009/10/01	BRN SOP-00203 R5.0	Based on EPA 200.8
pH (2:1 DI Water Extract) (g)	3	2009/10/01	2009/10/01	BRN SOP-00266 R6.0	Carter, SSMA 16.2
Saturated Paste	3	2009/09/30	2009/10/01	BRN SOP-00268 R5.0	Carter SSMA 18.2.2
Sublet (ORGANICS) (g)	3	N/A	2009/10/05		
Total Kjeldahl Nitrogen - Soil (g)	3	2009/10/02	2009/10/02	CAL SOP-00072	SM - 4500N
TOC Soil Subcontract (g)	3	2009/10/02	2009/10/02		

Sample Matrix: VEGETABLES
Samples Received: 24

Analyses	Quantity	Date		Laboratory Method	Analytical Method
		Extracted	Analyzed		
Elements by CRC ICPMS (total) - Plant	24	2009/10/02	2009/10/02	BRN SOP-00206 R7.0	Based on EPA 200.8

* Results relate only to the items tested.

- (1) This test was performed by Maxxam Calgary
- (2) This test was performed by Ext. Sublet from Vancouver
- (3) This test was performed by Maxxam Bedford (From Burnaby)
- (4) SCC/CAEAL

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

VIREN THAKER, BBy Customer Service
Email: VIREN.THAKER@MaxxamAnalytics.com
Phone# (604) 444-4808 Ext:232

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Total cover pages: 1

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 8577 Commerce Court V5A 4N5 Telephone(604) 444-4808 Fax(604) 444-4511

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		Q95936		Q95937	Q95938		
Sampling Date		2009/09/21		2009/09/21	2009/09/21		
	Units	TOE OF TAILINGS SOIL	QC Batch	SOIL SAMPLE LOWER IROD	SOIL SAMPLE UPPER IROD	RDL	QC Batch
Misc. Inorganics							
Total Kjeldahl Nitrogen	mg/kg	3500 ⁽¹⁾	3461533	1500 ⁽¹⁾	570 ⁽¹⁾	100	3461533
Parameter							
Subcontract Parameter	N/A	ATTACHED	3463366	ATTACHED	ATTACHED	N/A	3465804
Elements							
Cation exchange capacity	cmol+/Kg	35	3461568	24	16	10	3461568
Soluble Parameters							
Soluble Conductivity	uS/cm	2580	3456164	402	284	1	3456164
Saturation %	%	160	3455655	57	47	1	3455655

N/A = Not Applicable

RDL = Reportable Detection Limit

(1) - Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Job #: A953654
 Report Date: 2009/10/06

 MINTO EXPLORATIONS LTD.
 Client Project #: MIN-09-05 REVEGETATION MONITOR

ELEMENTS BY ATOMIC SPECTROSCOPY (VEGETABLES)

Maxxam ID		Q95926	Q95927	Q95928	Q95929	Q95930	Q95931	Q95932	Q95933	Q95934		
Sampling Date		2009/09/22	2009/09/21	2009/09/21	2009/09/21	2009/09/21	2009/09/21	2009/09/21	2009/09/21	2009/09/21		
	Units	YUKON RIVER PLANE-LEAF WILLOW LEAVES	COPPER KEEL BIRCH TWIGS	COPPER KEEL BIRCH LEAVES	WASTE ROCK DUMP 1ST LEVEL LEAF WILLOW TWIGS	TOE OF WASTE ROCK 1ST LIFT WILLOW TWIGS (LITTLE TREE)	PLANE-LEAF WILLOW TOE OF WASTE ROCK DUMP 1ST LEVEL	TOE OF WASTE ROCK DUMP-WILLOW LEAVES (LITTLE)	YUKON RIVER LITTLE TREE	YUKON RIVER LITTLE TREE WILLOW TWIGS	RDL	QC Batch
Total Metals by ICPMS												
Total Aluminum (Al)	mg/kg	46	27	34	149	158	1740	1120	40	17	1	3461873
Total Antimony (Sb)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	3461873
Total Arsenic (As)	mg/kg	0.10	<0.01	0.01	0.07	0.07	0.66	0.40	0.04	0.02	0.01	3461873
Total Barium (Ba)	mg/kg	14.8	58.9	143	3.9	4.7	20.3	13.9	109	8.9	0.1	3461873
Total Beryllium (Be)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	3461873
Total Bismuth (Bi)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	3461873
Total Boron (B)	mg/kg	50	8	47	12	8	25	26	73	9	5	3461873
Total Cadmium (Cd)	mg/kg	0.51	0.06	0.03	1.15	1.68	2.92	4.78	6.77	0.20	0.01	3461873
Total Calcium (Ca)	mg/kg	28200	6330	20200	6780	3570	41100	19200	31700	6410	10	3461873
Total Chromium (Cr)	mg/kg	1.4	<0.5	<0.5	<0.5	<0.5	1.5	<0.5	<0.5	<0.5	0.5	3461873
Total Cobalt (Co)	mg/kg	0.4	<0.1	<0.1	0.1	0.2	1.0	1.3	0.2	<0.1	0.1	3461873
Total Copper (Cu)	mg/kg	7.7	7.2	6.6	20.4	18.8	145	96.5	3.5	7.5	0.5	3461873
Total Iron (Fe)	mg/kg	97	71	71	199	216	2280	1540	73	33	10	3461873
Total Lead (Pb)	mg/kg	0.19	0.07	0.06	0.08	0.07	0.65	0.48	0.14	0.09	0.01	3461873
Total Magnesium (Mg)	mg/kg	5210	606	1840	1020	692	8880	6400	4180	743	10	3461873
Total Manganese (Mn)	mg/kg	37.9	22.2	107	55.1	83.5	447	954	136	5.8	0.1	3461873
Total Mercury (Hg)	mg/kg	0.02	<0.01	0.01	<0.01	<0.01	0.02	0.02	0.02	<0.01	0.01	3461873
Total Molybdenum (Mo)	mg/kg	1.1	<0.1	0.4	<0.1	0.1	1.3	2.1	1.8	<0.1	0.1	3461873
Total Nickel (Ni)	mg/kg	3.0	0.3	0.2	0.6	0.6	1.7	1.6	0.7	0.8	0.1	3461873
Total Phosphorus (P)	mg/kg	4270	1350	1420	920	890	856	1100	6820	1330	10	3461873
Total Potassium (K)	mg/kg	8270	2410	6090	2710	2330	9460	8170	3700	2560	10	3461873
Total Selenium (Se)	mg/kg	0.89	0.02	0.01	0.99	0.27	3.77	1.00	0.29	0.30	0.01	3461873
Total Silver (Ag)	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3461873
Total Sodium (Na)	mg/kg	10	<10	13	12	11	92	27	<10	<10	10	3461873
Total Strontium (Sr)	mg/kg	113	13.1	31.1	52.8	27.2	293	123	184	29.0	0.1	3461873
Total Thallium (Tl)	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3461873
Total Tin (Sn)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	3461873
Total Titanium (Ti)	mg/kg	2	1	2	5	6	65	44	2	<1	1	3461873
Total Uranium (U)	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05	<0.05	<0.05	0.05	3461873
Total Vanadium (V)	mg/kg	<2	<2	<2	<2	<2	5	3	<2	<2	2	3461873
Total Zinc (Zn)	mg/kg	60.5	97.6	127	70.3	44.9	101	41.4	142	56.5	0.1	3461873

RDL = Reportable Detection Limit

Maxxam Job #: A953654
 Report Date: 2009/10/06

 MINTO EXPLORATIONS LTD.
 Client Project #: MIN-09-05 REVEGETATION MONITOR

ELEMENTS BY ATOMIC SPECTROSCOPY (VEGETABLES)

Maxxam ID		Q95935	Q95939	Q95940	Q95941	Q95942	Q95943	Q95944	Q95945		
Sampling Date		2009/09/21	2009/09/21	2009/09/21	2009/09/21	2009/09/21	2009/09/21	2009/09/21	2009/09/21		
	Units	YUKON RIVER PLANE-LEAF WILLOW TWIGS	TUFTED HAIRGRASS LOWER IROD	SHEEP FESCUE LOWER IROD	VIOLET WHEATGRASS LOWER IROD	R.M. FESCUE LOWER IROD	TUFTED HAIRGRASS TOE OF TAILINGS	VIOLET WHEATGRASS TOE OF TAILINGS	GLAUCOUS BLUEGRASS TOE OF TAILINGS	RDL	QC Batch
Total Metals by ICPMS											
Total Aluminum (Al)	mg/kg	33	1060	978	702	559	1160	795	637	1	3461873
Total Antimony (Sb)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	3461873
Total Arsenic (As)	mg/kg	0.03	0.39	0.31	0.17	0.19	0.21	0.16	0.22	0.01	3461873
Total Barium (Ba)	mg/kg	61.4	76.0	47.6	20.4	25.6	25.0	21.8	73.1	0.1	3461873
Total Beryllium (Be)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	3461873
Total Bismuth (Bi)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	3461873
Total Boron (B)	mg/kg	16	<5	<5	<5	<5	<5	<5	6	5	3461873
Total Cadmium (Cd)	mg/kg	3.81	0.22	0.17	0.09	0.06	0.08	0.09	0.35	0.01	3461873
Total Calcium (Ca)	mg/kg	12400	4480	3630	4000	1880	2810	3500	8690	10	3461873
Total Chromium (Cr)	mg/kg	<0.5	1.0	0.9	0.6	2.1	1.5	1.6	0.7	0.5	3461873
Total Cobalt (Co)	mg/kg	<0.1	0.7	0.6	0.3	0.4	0.7	0.5	0.8	0.1	3461873
Total Copper (Cu)	mg/kg	5.3	100	81.3	58.5	49.9	213	133	113	0.5	3461873
Total Iron (Fe)	mg/kg	54	1750	1570	1000	882	2610	1800	1460	10	3461873
Total Lead (Pb)	mg/kg	0.15	0.49	0.49	0.32	0.33	0.52	0.44	0.47	0.01	3461873
Total Magnesium (Mg)	mg/kg	830	1550	1430	1310	666	1180	1210	3930	10	3461873
Total Manganese (Mn)	mg/kg	35.6	354	366	173	205	150	212	593	0.1	3461873
Total Mercury (Hg)	mg/kg	0.01	0.01	0.01	<0.01	<0.01	0.01	0.01	0.01	0.01	3461873
Total Molybdenum (Mo)	mg/kg	1.0	2.6	1.4	1.0	1.1	1.2	1.1	2.3	0.1	3461873
Total Nickel (Ni)	mg/kg	0.4	2.5	0.9	0.5	1.8	1.2	1.1	1.4	0.1	3461873
Total Phosphorus (P)	mg/kg	1250	830	666	178	604	309	608	1090	10	3461873
Total Potassium (K)	mg/kg	3110	5880	4650	2500	2870	1770	6240	9710	10	3461873
Total Selenium (Se)	mg/kg	0.26	0.24	0.13	0.24	0.12	0.24	0.19	0.21	0.01	3461873
Total Silver (Ag)	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	0.09	0.06	0.06	0.05	3461873
Total Sodium (Na)	mg/kg	<10	23	23	17	14	33	29	31	10	3461873
Total Strontium (Sr)	mg/kg	58.7	24.5	17.5	18.3	10.1	15.6	17.6	42.3	0.1	3461873
Total Thallium (Tl)	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3461873
Total Tin (Sn)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	3461873
Total Titanium (Ti)	mg/kg	1	50	47	29	26	80	56	43	1	3461873
Total Uranium (U)	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3461873
Total Vanadium (V)	mg/kg	<2	4	3	<2	<2	5	3	3	2	3461873
Total Zinc (Zn)	mg/kg	128	55.1	28.0	19.8	24.0	25.3	18.5	123	0.1	3461873

RDL = Reportable Detection Limit

ELEMENTS BY ATOMIC SPECTROSCOPY (VEGETABLES)

Maxxam ID		Q95946		Q95947	Q95948	Q95949	Q95950	Q95951	Q95952		
Sampling Date		2009/09/21		2009/09/21	2009/09/21	2009/09/21	2009/09/21	2009/09/21	2009/09/21		
	Units	R.M. FESCUE TOE OF TAILINGS	QC Batch	SHEEP FESCUE TOE OF TAILINGS	VIOLET WHEATGRASS UPPER IROD	TUFTED HAIRGRASS UPPER IROD	SHEEP FESCUE UPPER IROD	GLAUCOUS BLUEGRASS UPPER IROD	R.M. FESCUE UPPER IROD	RDL	QC Batch
Total Metals by ICPMS											
Total Aluminum (Al)	mg/kg	1320	3461873	601	855	1150	320	363	340	1	3461891
Total Antimony (Sb)	mg/kg	<0.1	3461873	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	3461891
Total Arsenic (As)	mg/kg	0.35	3461873	0.13	0.32	0.48	0.16	0.27	0.16	0.01	3461891
Total Barium (Ba)	mg/kg	90.4	3461873	31.6	71.0	63.6	25.8	151	28.6	0.1	3461891
Total Beryllium (Be)	mg/kg	<0.1	3461873	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	3461891
Total Bismuth (Bi)	mg/kg	<0.1	3461873	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	3461891
Total Boron (B)	mg/kg	<5	3461873	<5	<5	7	<5	6	<5	5	3461891
Total Cadmium (Cd)	mg/kg	0.19	3461873	0.19	0.17	0.26	0.10	0.11	0.03	0.01	3461891
Total Calcium (Ca)	mg/kg	5380	3461873	3630	4010	4260	2690	5410	1700	10	3461891
Total Chromium (Cr)	mg/kg	3.1	3461873	0.9	0.9	1.3	<0.5	<0.5	<0.5	0.5	3461891
Total Cobalt (Co)	mg/kg	1.1	3461873	0.5	0.5	0.8	0.2	0.5	0.2	0.1	3461891
Total Copper (Cu)	mg/kg	233	3461873	108	65.0	114	26.2	39.1	25.0	0.5	3461891
Total Iron (Fe)	mg/kg	2880	3461873	1360	1380	1960	525	729	559	10	3461891
Total Lead (Pb)	mg/kg	0.88	3461873	0.70	0.52	0.65	0.69	0.43	0.20	0.01	3461891
Total Magnesium (Mg)	mg/kg	2600	3461873	1890	1380	1410	1020	2090	634	10	3461891
Total Manganese (Mn)	mg/kg	498	3461873	325	174	136	123	462	121	0.1	3461891
Total Mercury (Hg)	mg/kg	<0.01	3461873	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	3461891
Total Molybdenum (Mo)	mg/kg	1.5	3461873	2.7	1.4	4.8	1.7	1.9	0.9	0.1	3461891
Total Nickel (Ni)	mg/kg	2.7	3461873	0.9	1.0	2.2	1.1	2.5	1.0	0.1	3461891
Total Phosphorus (P)	mg/kg	852	3461873	1080	439	1060	807	1030	585	10	3461891
Total Potassium (K)	mg/kg	4720	3461873	13300	5090	5690	5960	5180	3240	10	3461891
Total Selenium (Se)	mg/kg	0.30	3461873	0.15	0.15	0.21	0.07	0.20	0.07	0.01	3461891
Total Silver (Ag)	mg/kg	0.12	3461873	<0.05	<0.05	<0.05	<0.05	0.05	<0.05	0.05	3461891
Total Sodium (Na)	mg/kg	40	3461873	28	20	29	16	15	19	10	3461891
Total Strontium (Sr)	mg/kg	30.1	3461873	20.9	21.5	21.1	12.5	29.3	9.0	0.1	3461891
Total Thallium (Tl)	mg/kg	<0.05	3461873	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3461891
Total Tin (Sn)	mg/kg	0.1	3461873	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	3461891
Total Titanium (Ti)	mg/kg	91	3461873	45	48	57	16	17	18	1	3461891
Total Uranium (U)	mg/kg	<0.05	3461873	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	3461891
Total Vanadium (V)	mg/kg	6	3461873	3	3	4	<2	<2	<2	2	3461891
Total Zinc (Zn)	mg/kg	89.3	3461873	44.0	13.6	34.7	21.0	98.3	18.8	0.1	3461891

CSR/CCME METALS IN SOIL (SOIL)

Maxxam ID		Q95936	Q95937	Q95938		
Sampling Date		2009/09/21	2009/09/21	2009/09/21		
	Units	TOE OF TAILINGS SOIL	SOIL SAMPLE LOWER IROD	SOIL SAMPLE UPPER IROD	RDL	QC Batch
Misc. Inorganics						
Soluble (2:1) pH	pH Units	5.23	7.04	8.45	0.01	3458063
Total Metals by ICPMS						
Total Aluminum (Al)	mg/kg	15300	14200	12800	100	3459879
Total Antimony (Sb)	mg/kg	0.5	0.5	0.3	0.1	3459879
Total Arsenic (As)	mg/kg	6.5	5.3	6.5	0.2	3459879
Total Barium (Ba)	mg/kg	279	215	183	0.1	3459879
Total Beryllium (Be)	mg/kg	0.5	0.3	0.5	0.1	3459879
Total Bismuth (Bi)	mg/kg	0.1	0.1	<0.1	0.1	3459879
Total Cadmium (Cd)	mg/kg	0.29	0.25	0.15	0.05	3459879
Total Calcium (Ca)	mg/kg	8960	9890	11800	100	3459879
Total Chromium (Cr)	mg/kg	28	29	29	1	3459879
Total Cobalt (Co)	mg/kg	8.3	10.0	11.6	0.3	3459879
Total Copper (Cu)	mg/kg	163	123	59.6	0.5	3459879
Total Iron (Fe)	mg/kg	20900	24900	26100	100	3459879
Total Lead (Pb)	mg/kg	6.3	6.4	5.6	0.1	3459879
Total Magnesium (Mg)	mg/kg	6420	8330	11200	100	3459879
Total Manganese (Mn)	mg/kg	178	460	467	0.2	3459879
Total Mercury (Hg)	mg/kg	<0.05	<0.05	<0.05	0.05	3459879
Total Molybdenum (Mo)	mg/kg	2.1	1.3	0.6	0.1	3459879
Total Nickel (Ni)	mg/kg	23.6	32.1	53.7	0.8	3459879
Total Phosphorus (P)	mg/kg	586	742	858	10	3459879
Total Potassium (K)	mg/kg	787	1130	1470	100	3459879
Total Selenium (Se)	mg/kg	1.0	0.6	0.6	0.5	3459879
Total Silver (Ag)	mg/kg	0.14	0.12	0.09	0.05	3459879
Total Sodium (Na)	mg/kg	217	275	278	100	3459879
Total Strontium (Sr)	mg/kg	59.0	60.3	60.1	0.1	3459879
Total Thallium (Tl)	mg/kg	0.09	0.10	0.11	0.05	3459879
Total Tin (Sn)	mg/kg	0.5	0.5	0.4	0.1	3459879
Total Titanium (Ti)	mg/kg	805	928	682	1	3459879
Total Vanadium (V)	mg/kg	62	64	59	2	3459879
Total Zinc (Zn)	mg/kg	69	71	58	1	3459879
Total Zirconium (Zr)	mg/kg	2.9	3.5	3.0	0.5	3459879

RDL = Reportable Detection Limit

Maxxam Job #: A953654
 Report Date: 2009/10/06

 MINTO EXPLORATIONS LTD.
 Client Project #: MIN-09-05 REVEGETATION MONITOR

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3455655	Saturation %	2009/10/01					<1	%	9.1	25		
3456164	Soluble Conductivity	2009/10/01			98	80 - 120	<1	uS/cm	21.2	N/A		
3458063	Soluble (2:1) pH	2009/10/01			100	96 - 104			0.1	20		
3459879	Total Arsenic (As)	2009/10/01	99	75 - 125	98	75 - 125	<0.2	mg/kg			84	70 - 130
3459879	Total Beryllium (Be)	2009/10/01	113	75 - 125	105	75 - 125	<0.1	mg/kg				
3459879	Total Cadmium (Cd)	2009/10/01	108	75 - 125	100	75 - 125	<0.05	mg/kg			83	70 - 130
3459879	Total Chromium (Cr)	2009/10/01	105	75 - 125	98	75 - 125	<1	mg/kg			93	70 - 130
3459879	Total Cobalt (Co)	2009/10/01	105	75 - 125	101	75 - 125	<0.3	mg/kg			87	70 - 130
3459879	Total Copper (Cu)	2009/10/01	105	75 - 125	102	75 - 125	<0.5	mg/kg			89	70 - 130
3459879	Total Lead (Pb)	2009/10/01	108	75 - 125	95	75 - 125	<0.1	mg/kg	2.0	35	92	70 - 130
3459879	Total Mercury (Hg)	2009/10/01	109	75 - 125	97	75 - 125	<0.05	mg/kg				
3459879	Total Nickel (Ni)	2009/10/01	104	75 - 125	98	75 - 125	<0.8	mg/kg			89	70 - 130
3459879	Total Selenium (Se)	2009/10/01	109	75 - 125	107	75 - 125	<0.5	mg/kg				
3459879	Total Vanadium (V)	2009/10/01	119	75 - 125	113	75 - 125	<2	mg/kg			111	70 - 130
3459879	Total Zinc (Zn)	2009/10/01	NC	75 - 125	105	75 - 125	<1	mg/kg			90	70 - 130
3459879	Total Aluminum (Al)	2009/10/01					<100	mg/kg			105	70 - 130
3459879	Total Antimony (Sb)	2009/10/01					<0.1	mg/kg			93	70 - 130
3459879	Total Barium (Ba)	2009/10/01					<0.1	mg/kg			112	70 - 130
3459879	Total Calcium (Ca)	2009/10/01					<100	mg/kg			91	70 - 130
3459879	Total Iron (Fe)	2009/10/01					<100	mg/kg			98	70 - 130
3459879	Total Magnesium (Mg)	2009/10/01					<100	mg/kg			102	70 - 130
3459879	Total Manganese (Mn)	2009/10/01					<0.2	mg/kg			124	70 - 130
3459879	Total Molybdenum (Mo)	2009/10/01					<0.1	mg/kg			86	70 - 130
3459879	Total Phosphorus (P)	2009/10/01					<10	mg/kg			77	70 - 130
3459879	Total Silver (Ag)	2009/10/01					<0.05	mg/kg			83	70 - 130
3459879	Total Strontium (Sr)	2009/10/01					0.1, RDL=0.1	mg/kg			128	70 - 130
3459879	Total Thallium (Tl)	2009/10/01					<0.05	mg/kg			76	70 - 130
3459879	Total Titanium (Ti)	2009/10/01					<1	mg/kg			111	70 - 130
3459879	Total Bismuth (Bi)	2009/10/01					<0.1	mg/kg				
3459879	Total Potassium (K)	2009/10/01					<100	mg/kg				
3459879	Total Sodium (Na)	2009/10/01					<100	mg/kg				
3459879	Total Tin (Sn)	2009/10/01					<0.1	mg/kg				
3459879	Total Zirconium (Zr)	2009/10/01					<0.5	mg/kg				
3461533	Total Kjeldahl Nitrogen	2009/10/02	NC	75 - 125	104	80 - 120	<10	mg/kg	18.2	35	84	60 - 121
3461568	Cation exchange capacity	2009/10/06							NC	35		
3461873	Total Arsenic (As)	2009/10/02	108	75 - 125	105	75 - 125	<0.01	mg/kg	12.0	35		
3461873	Total Beryllium (Be)	2009/10/02	110	75 - 125	110	75 - 125	<0.1	mg/kg	NC	35		
3461873	Total Cadmium (Cd)	2009/10/02	111	75 - 125	112	75 - 125	<0.01	mg/kg	2.4	35		
3461873	Total Chromium (Cr)	2009/10/02	107	75 - 125	108	75 - 125	<0.5	mg/kg	NC	35		
3461873	Total Cobalt (Co)	2009/10/02	107	75 - 125	108	75 - 125	<0.1	mg/kg	NC	35		

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3461873	Total Copper (Cu)	2009/10/02	106	75 - 125	107	75 - 125	<0.5	mg/kg	0.2	35		
3461873	Total Lead (Pb)	2009/10/02	105	75 - 125	111	75 - 125	<0.01	mg/kg	0.3	35		
3461873	Total Mercury (Hg)	2009/10/02	103	75 - 125	107	75 - 125	0.01, RDL=0.01	mg/kg	NC	35		
3461873	Total Nickel (Ni)	2009/10/02	106	75 - 125	107	75 - 125	<0.1	mg/kg	2.6	35		
3461873	Total Selenium (Se)	2009/10/02	112	75 - 125	114	75 - 125	0.01, RDL=0.01	mg/kg	9.6	35		
3461873	Total Uranium (U)	2009/10/02	110	75 - 125	113	75 - 125	<0.05	mg/kg	NC	35		
3461873	Total Vanadium (V)	2009/10/02	111	75 - 125	107	75 - 125	<2	mg/kg	NC	35		
3461873	Total Zinc (Zn)	2009/10/02	NC	75 - 125	112	75 - 125	<0.1	mg/kg	1.5	35		
3461873	Total Aluminum (Al)	2009/10/02					1, RDL=1	mg/kg	2.2	35		
3461873	Total Antimony (Sb)	2009/10/02					<0.1	mg/kg	NC	35		
3461873	Total Barium (Ba)	2009/10/02					<0.1	mg/kg	2.0	35		
3461873	Total Bismuth (Bi)	2009/10/02					<0.1	mg/kg	NC	35		
3461873	Total Boron (B)	2009/10/02					<5	mg/kg	1.1	35		
3461873	Total Calcium (Ca)	2009/10/02					<10	mg/kg	1.5	35		
3461873	Total Iron (Fe)	2009/10/02					<10	mg/kg	11.2	35		
3461873	Total Magnesium (Mg)	2009/10/02					<10	mg/kg	0.5	35		
3461873	Total Manganese (Mn)	2009/10/02					<0.1	mg/kg	1.9	35		
3461873	Total Molybdenum (Mo)	2009/10/02					<0.1	mg/kg	1.2	35		
3461873	Total Phosphorus (P)	2009/10/02					<10	mg/kg	1.5	35		
3461873	Total Potassium (K)	2009/10/02					<10	mg/kg	0.5	35		
3461873	Total Silver (Ag)	2009/10/02					<0.05	mg/kg	NC	35		
3461873	Total Sodium (Na)	2009/10/02					<10	mg/kg	NC	35		
3461873	Total Strontium (Sr)	2009/10/02					<0.1	mg/kg	1.6	35		
3461873	Total Thallium (Tl)	2009/10/02					<0.05	mg/kg	NC	35		
3461873	Total Tin (Sn)	2009/10/02					<0.1	mg/kg	NC	35		
3461873	Total Titanium (Ti)	2009/10/02					<1	mg/kg	NC	35		
3461891	Total Arsenic (As)	2009/10/02	110	75 - 125	111	75 - 125	<0.01	mg/kg	5.7	35		
3461891	Total Beryllium (Be)	2009/10/02	111	75 - 125	110	75 - 125	<0.1	mg/kg	NC	35		
3461891	Total Cadmium (Cd)	2009/10/02	115	75 - 125	115	75 - 125	<0.01	mg/kg	7.7	35		
3461891	Total Chromium (Cr)	2009/10/02	109	75 - 125	112	75 - 125	<0.5	mg/kg	NC	35		
3461891	Total Cobalt (Co)	2009/10/02	107	75 - 125	110	75 - 125	<0.1	mg/kg	NC	35		
3461891	Total Copper (Cu)	2009/10/02	NC	75 - 125	110	75 - 125	<0.5	mg/kg	0.09	35		
3461891	Total Lead (Pb)	2009/10/02	107	75 - 125	110	75 - 125	<0.01	mg/kg	1	35		
3461891	Total Mercury (Hg)	2009/10/02	104	75 - 125	104	75 - 125	<0.01	mg/kg	NC	35		
3461891	Total Nickel (Ni)	2009/10/02	107	75 - 125	110	75 - 125	<0.1	mg/kg	7.4	35		
3461891	Total Selenium (Se)	2009/10/02	110	75 - 125	114	75 - 125	0.01, RDL=0.01	mg/kg	2.9	35		
3461891	Total Uranium (U)	2009/10/02	110	75 - 125	111	75 - 125	<0.05	mg/kg	NC	35		
3461891	Total Vanadium (V)	2009/10/02	111	75 - 125	111	75 - 125	<2	mg/kg	NC	35		
3461891	Total Zinc (Zn)	2009/10/02	NC	75 - 125	115	75 - 125	<0.1	mg/kg	0.3	35		
3461891	Total Aluminum (Al)	2009/10/02					1, RDL=1	mg/kg	0.08	35		

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3461891	Total Antimony (Sb)	2009/10/02					<0.1	mg/kg	NC	35		
3461891	Total Barium (Ba)	2009/10/02					<0.1	mg/kg	0.4	35		
3461891	Total Bismuth (Bi)	2009/10/02					<0.1	mg/kg	NC	35		
3461891	Total Boron (B)	2009/10/02					<5	mg/kg	NC	35		
3461891	Total Calcium (Ca)	2009/10/02					<10	mg/kg	1.7	35		
3461891	Total Iron (Fe)	2009/10/02					<10	mg/kg	1.6	35		
3461891	Total Magnesium (Mg)	2009/10/02					<10	mg/kg	0.9	35		
3461891	Total Manganese (Mn)	2009/10/02					<0.1	mg/kg	0.4	35		
3461891	Total Molybdenum (Mo)	2009/10/02					<0.1	mg/kg	1	35		
3461891	Total Phosphorus (P)	2009/10/02					<10	mg/kg	0.7	35		
3461891	Total Potassium (K)	2009/10/02					<10	mg/kg	1.5	35		
3461891	Total Silver (Ag)	2009/10/02					<0.05	mg/kg	NC	35		
3461891	Total Sodium (Na)	2009/10/02					<10	mg/kg	NC	35		
3461891	Total Strontium (Sr)	2009/10/02					<0.1	mg/kg	0.3	35		
3461891	Total Thallium (Tl)	2009/10/02					<0.05	mg/kg	NC	35		
3461891	Total Tin (Sn)	2009/10/02					<0.1	mg/kg	NC	35		
3461891	Total Titanium (Ti)	2009/10/02					<1	mg/kg	0.9	35		

N/A = Not Applicable

RDL = Reportable Detection Limit

RPD = Relative Percent Difference

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.

Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.



8577 Commerce Court, Unit 100, Burnaby, BC V5A 4N5
 Phone: (604) 444-4808 Fax: (604) 444-4511
 www.maxxamanalytics.com Toll-Free: 1-800-440-4808

RECORD AND ANALYSIS REQUEST
 08304612
 PAGE 1 OF 13

A953654

COMPANY NAME: Minto Explorations Ltd.		CLIENT PROJECT NO: MIN-09-05 Revegetation Monitoring Sept 09								
COMPANY ADDRESS:		TEL:								
		E-MAIL: <u>scott@accessconsulting.ca</u> <u>colleenr@mintomine.com</u>								
		FAX:								
SAMPLER NAME (PRINT): Stu Withers	PROJECT MANAGER: Scott Keesey/Colleen Roche	LABORATORY CONTACT: Kimberley Webber								
FIELD SAMPLE ID	MAXXAM LAB # <small>(LAB USE ONLY)</small>	MATRIX			SAMPLING		# CONTAINERS	ICP Metals		
		GROUNDWATER	SURFACE WATER	DRINKING WATER	SOIL	OTHER			DATE DDMMYY	TIME
1						x	2009/09/22	16:00	1	x
2						x	2009/09/21	17:00	1	x
3						x	2009/09/21	17:00	1	x
4									1	x
5									1	x
6									1	x
7									1	x
8									1	x
9									1	x
10									1	x
11									1	x
12									1	x

TAT (Turnaround Time) LESS THAN 5 DAY TAT MUST HAVE PRIOR APPROVAL	PO NUMBER OR QUOTE NUMBER: PR 7041	SPECIAL DETECTION LIMITS / CONTAMINANT TYPE:	
* Some exceptions apply - please contact laboratory	ACCOUNTING CONTACT:	SPECIAL REPORTING OR BILLING INSTRUCTIONS:	
STANDARD 5 BUSINESS DAYS <input checked="" type="checkbox"/>	RELINQUISHED BY SAMPLER: S. Withers	DATE: DDMMYY 23/09/09	TIME: 20:00
RUSH 3 BUSINESS DAYS <input type="checkbox"/>	RELINQUISHED BY:	DATE: DDMMYY	TIME:
RUSH 2 BUSINESS DAYS <input type="checkbox"/>			
URGENT 1 BUSINESS DAY <input type="checkbox"/>			
OTHER BUSINESS DAYS _____	RELINQUISHED BY:	DATE: DDMMYY	TIME: 1:05

CUSTODY

LAB USE ONLY MAXXAM JOB #	ANALYSIS REQUEST		LAB USE ONLY COC #
LAB USE ONLY			
ARRIVAL TEMPERATURE °C:			
DUE DATE:		LOG IN CHECK:	
# JARS USED:			
RECEIVED BY:		RECEIVED BY:	
RECEIVED BY LABORATORY:		RECEIVED BY LABORATORY:	



8577 Commerce Court Phone: (604) 444-4808
 Burnaby, BC V5A 4N5 Fax.: (604) 444-4511
 www.maxxamanalytics.com Toll-Free: 1-800-440-4808

CHAIN-OF CUSTODY RECORD AND ANALYSIS REQUEST

COMPANY NAME: Minto Explorations Ltd.
 CLIENT PROJECT NO.: MIN-09-05 Revegetation Monitoring Sept 09
 COMPANY ADDRESS:
 TEL.:
 E-MAIL: scott@accessconsulting.ca
 colleenr@mintomine.com
 FAX:
 SAMPLER NAME (PRINT): Stu Withers
 PROJECT MANAGER: Scott Keesey/Colleen Roche
 LABORATORY CONTACT: Kimberley Webber

FIELD SAMPLE ID	MAXXAM LAB # (LAB USE ONLY)	MATRIX					SAMPLING			ICP Metals	pH/EC	Texture	TOC → BEDV	C:N Ratio → Pacific Soil Subcont	CEC → Calc Sub, calgary	Total N → calgary	Nutrients	Basic fertility package #1 @ P AC FIC SOIL	pH, N, P, K, Ca, Mg, Org. matter
		GROUNDWATER	SURFACE WATER	DRINKING WATER	SOIL	OTHER	DATE DD/MM/YY	TIME	# CONTAINERS										
1					X	09/21/2009	13:00	1	X	X	X	X	X	X	X	X			
2					X	09/21/2009	15:00	1	X	X	X	X	X	X	X	X			
3					X	09/21/2009	11:00	1	X	X	X	X	X	X	X	X			
4					X	09/21/2009	13:00	1	X										
5					X	09/21/2009	13:00	1	X										
6					X	09/21/2009	13:00	1	X										
7					X	09/21/2009	13:00	1	X										
8					X	09/21/2009	13:00	1	X										
9					X	09/21/2009	15:00	1	X										
10					X	09/21/2009	15:00	1	X										
11					X	09/21/2009	15:00	1	X										
12					X	09/21/2009	15:00	1	X										

LAB USE ONLY
 MAXXAM JOB #
 ANALYSIS REQUEST
 LAB USE ONLY
 COC #

ICP Metals
 pH/EC
 Texture
 TOC → BEDV
 C:N Ratio → Pacific Soil Subcont
 CEC → Calc Sub, calgary
 Total N → calgary
 Nutrients
 Basic fertility package #1 @ P AC FIC SOIL
 pH, N, P, K, Ca, Mg, Org. matter

TAT (Turnaround Time)
 LESS THAN 5 DAY TAT MUST HAVE PRIOR APPROVAL
 * Some exceptions apply - please contact laboratory
 STANDARD 5 BUSINESS DAYS
 RUSH 3 BUSINESS DAYS
 RUSH 2 BUSINESS DAYS
 URGENT 1 BUSINESS DAY
 OTHER BUSINESS DAYS _____
CUSTODY RECORD

PO NUMBER OR QUOTE NUMBER: PR 7041
 SPECIAL DETECTION LIMITS / CONTAMINANT TYPE:
 ACCOUNTING CONTACT:
 SPECIAL REPORTING OR BILLING INSTRUCTIONS:
 Bill To Minto Explorations Ltd.
 RELINQUISHED BY SAMPLER: S. Withers
 DATE: 23/09/09
 TIME: 20:00
 RELINQUISHED BY:
 DATE:
 TIME:
 RELINQUISHED BY:
 DATE:
 TIME:

LAB USE ONLY
 CCM
 CSR
 AB TIER 1
 OTHER
 # JARS USED:
 ARRIVAL TEMPERATURE °C:
 DUE DATE:
 LOG IN CHECK:
 RECEIVED BY:
 RECEIVED BY:
 RECEIVED BY LABORATORY:

Your Project #: MIN - 110466
Your C.O.C. #: 08322883, 08322884

Attention: Scott Keeseey
ACCESS CONSULTING GROUP
#3 Calcite
151 Industrial Road
WHITEHORSE, YT
CANADA Y1A 3C8

Report Date: 2010/10/07

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B092008
Received: 2010/09/27, 08:30

Sample Matrix: VEGETATION
Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Elements by CRC ICPMS (total) - Plant	10	2010/09/30	2010/10/05	BRN SOP-00206 R7.0	Based on EPA 200.8

Sample Matrix: Soil
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Cation Exchange Capacity (ϕ)	12	2010/10/01	2010/10/01	AB SOP-00042	EPA 200.7
Conductance - soil	12	2010/10/01	2010/10/01	BRN SOP-00269 R2.0	Based on SM - 18.2.4
Elements by ICPMS (total)	12	2010/09/30	2010/09/30	BRN SOP-00203 R5.0	Based on EPA 200.8
Potassium (Available) (ϕ)	12	2010/10/01	2010/10/01	AB SOP-00042	EPA 200.7
Nitrate-N (Available) (ϕ)	12	2010/10/01	2010/10/01	AB SOP-00023	SM 4110-B
Phosphorus (Available by ICP) (ϕ)	12	2010/10/01	2010/10/01	AB SOP-00042	EPA 200.7
pH (2:1 DI Water Extract)	12	2010/09/30	2010/09/30	BRN SOP-00266 R6.0	Carter, SSMA 16.2
Sublet (Inorganics) (ϕ)	12	N/A	2010/09/30		
Texture by Hydrometer (ϕ)	12	N/A	2010/10/01	CAL SOP-00033	MMFSPA Ch9
Texture Class (ϕ)	12	N/A	2010/10/01	CAL SOP-00033	MMFSPA Ch9

* Results relate only to the items tested.

- (1) This test was performed by Maxxam Calgary
- (2) This test was performed by Ext. Sublet from Vancouver

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

KIMBERLEY WEBBER, BBy Customer Service
Email: kim.webber@maxxamanalytics.com
Phone# (604) 638-3254

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

Maxxam Job #: B092008
Report Date: 2010/10/07

ACCESS CONSULTING GROUP
Client Project #: MIN - 110466

Sampler Initials: LK

NPK(AVAILABLE)

Maxxam ID		X23895	X23896	X23897	X23898	X23899	X23900		
Sampling Date		2010/09/15	2010/09/15	2010/09/15	2010/09/15	2010/09/15	2010/09/15		
	Units	RECLAMATION B TOE OF WASTE ROCK	RECLAMATION F MINTO CR FLAME	RECLAMATION E MINTO RD KM 2	RECLAMATION D TOE OF DAM S.	R1 (IROD) PLOT A	R1 (IROD) PLOT B	RDL	QC Batch
Nutrients									
Available (NH4F) Nitrogen (N)	mg/kg	<2	<2	<2	<2	<2	<2	2	4305435
Available (NH4F) Phosphorus (P)	mg/kg	<1	<1	22	3	<1	<1	1	4305771
Available (NH4OAc) Potassium (K)	mg/kg	73	38	60	40	30	51	2	4305594

Maxxam ID		X23901	X23902	X23903	X23904	X23905	X23906		
Sampling Date		2010/09/15	2010/09/15	2010/09/15	2010/09/15	2010/09/15	2010/09/15		
	Units	R3 TAILINGS DUMP PLOT A	R3 TAILINGS DUMP PLOT B	R3 TAILINGS DUMP PLOT C	R4 MINTO RD KM 3 PLOT A	R4 MINTO RD KM 3 PLOT B	R4 MINTO R KM 3 PLOT C	RDL	QC Batch
Nutrients									
Available (NH4F) Nitrogen (N)	mg/kg	<2	<2	<2	<2	<2	<2	2	4305435
Available (NH4F) Phosphorus (P)	mg/kg	<1	<1	<1	5	23	<1	1	4305771
Available (NH4OAc) Potassium (K)	mg/kg	57	50	47	35	64	33	2	4305594

Maxxam Job #: B092008
 Report Date: 2010/10/07

 ACCESS CONSULTING GROUP
 Client Project #: MIN - 110466

Sampler Initials: LK

ELEMENTS BY ATOMIC SPECTROSCOPY (VEGETATION)

Maxxam ID		X23975	X23976	X23977	X23978	X23979		
Sampling Date		2010/09/15	2010/09/15	2010/09/15	2010/09/15	2010/09/15		
	Units	RECLAMATION (B) TOE OF WASTE ROCK - GRASS FESTUCA OVINA	RECLAMATION (B) TOE OF WASTE ROCK - GRASS AGROPYRON VIOLA	PLOT R1 (IROD) TREMBLING ASPEN	PLOT R1 (IROD) LITTLE TREE WILLOW	PLOT R1 (IROD) GREY LEAF WILLOW	RDL	QC Batch
Total Metals by ICPMS								
Total Aluminum (Al)	mg/kg	669	415	248	663	959	1	4303157
Total Antimony (Sb)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	4303157
Total Arsenic (As)	mg/kg	0.36	0.22	0.13	0.31	0.49	0.01	4303157
Total Barium (Ba)	mg/kg	46.6	36.5	47.7	34.6	26.8	0.1	4303157
Total Beryllium (Be)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	4303157
Total Bismuth (Bi)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	4303157
Total Boron (B)	mg/kg	<5	5	18	37	59	5	4303157
Total Cadmium (Cd)	mg/kg	0.14	0.16	2.80	6.02	2.44	0.01	4303157
Total Calcium (Ca)	mg/kg	4110	4580	23300	25000	16900	10	4303157
Total Chromium (Cr)	mg/kg	4.4	2.1	1.9	0.8	1.8	0.5	4303157
Total Cobalt (Co)	mg/kg	0.5	0.3	1.5	1.9	1.8	0.1	4303157
Total Copper (Cu)	mg/kg	56.7	34.9	20.7	48.0	77.1	0.5	4303157
Total Iron (Fe)	mg/kg	1170	726	477	1140	1620	10	4303157
Total Lead (Pb)	mg/kg	0.36	0.24	0.18	0.46	0.53	0.01	4303157
Total Magnesium (Mg)	mg/kg	1410	1030	2740	8000	4540	10	4303157
Total Manganese (Mn)	mg/kg	406	199	149	787	245	0.1	4303157
Total Mercury (Hg)	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	4303157
Total Molybdenum (Mo)	mg/kg	3.7	1.8	1.2	2.4	1.3	0.1	4303157
Total Nickel (Ni)	mg/kg	2.8	2.0	2.8	10.9	5.6	0.1	4303157
Total Phosphorus (P)	mg/kg	1300	621	3200	8630	4430	10	4303157
Total Potassium (K)	mg/kg	11300	6070	8530	11100	13400	10	4303157
Total Selenium (Se)	mg/kg	0.44	0.27	0.09	0.35	0.12	0.01	4303157
Total Silver (Ag)	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	4303157
Total Sodium (Na)	mg/kg	24	21	17	39	35	10	4303157
Total Strontium (Sr)	mg/kg	29.9	34.4	98.9	97.3	76.9	0.1	4303157
Total Thallium (Tl)	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	4303157
Total Tin (Sn)	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2	0.1	4303157
Total Titanium (Ti)	mg/kg	41	25	10	26	31	1	4303157
Total Uranium (U)	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	4303157
Total Vanadium (V)	mg/kg	2	<2	<2	2	3	2	4303157
Total Zinc (Zn)	mg/kg	23.6	9.8	321	452	248	0.1	4303157

RDL = Reportable Detection Limit

Maxxam Job #: B092008
Report Date: 2010/10/07

ACCESS CONSULTING GROUP
Client Project #: MIN - 110466

Sampler Initials: LK

ELEMENTS BY ATOMIC SPECTROSCOPY (VEGETATION)

Maxxam ID		X23980	X23981	X23982	X23983	X23984		
Sampling Date		2010/09/15	2010/09/15	2010/09/15	2010/09/15	2010/09/15		
	Units	PLOT R3 TAILINGS TOE GREY LEAF WILLOW	PLOT R3 TAILINGS TOE LITTLE TREE WILLOW	PLOT R3 TAILINGS TOE GRASS CALAMAGROSH'S	RECLAMATION F MINTO CR GREY LEAF WILLOW	R4 KM 3 MINTO RD GREY LEAF WILLOW	RDL	QC Batch
Total Metals by ICPMS								
Total Aluminum (Al)	mg/kg	660	314	935	194	197	1	4303157
Total Antimony (Sb)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	4303157
Total Arsenic (As)	mg/kg	0.17	0.09	0.24	0.06	0.06	0.01	4303157
Total Barium (Ba)	mg/kg	19.2	10.2	62.4	22.3	85.5	0.1	4303157
Total Beryllium (Be)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	4303157
Total Bismuth (Bi)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	4303157
Total Boron (B)	mg/kg	36	37	9	56	80	5	4303157
Total Cadmium (Cd)	mg/kg	1.65	1.30	0.11	0.65	1.01	0.01	4303157
Total Calcium (Ca)	mg/kg	18400	15000	5510	20300	14900	10	4303157
Total Chromium (Cr)	mg/kg	1.1	0.7	4.5	0.7	1.0	0.5	4303157
Total Cobalt (Co)	mg/kg	1.2	1.2	0.7	0.9	2.3	0.1	4303157
Total Copper (Cu)	mg/kg	187	86.0	209	39.4	11.0	0.5	4303157
Total Iron (Fe)	mg/kg	1610	744	2230	406	361	10	4303157
Total Lead (Pb)	mg/kg	0.39	0.28	0.48	0.13	0.14	0.01	4303157
Total Magnesium (Mg)	mg/kg	3880	4620	2040	4940	2520	10	4303157
Total Manganese (Mn)	mg/kg	219	395	854	159	553	0.1	4303157
Total Mercury (Hg)	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	4303157
Total Molybdenum (Mo)	mg/kg	2.1	1.8	3.1	0.3	1.9	0.1	4303157
Total Nickel (Ni)	mg/kg	3.3	3.3	2.7	6.6	2.6	0.1	4303157
Total Phosphorus (P)	mg/kg	2130	1840	701	4770	2900	10	4303157
Total Potassium (K)	mg/kg	14700	13500	4940	13100	9620	10	4303157
Total Selenium (Se)	mg/kg	0.24	0.13	0.28	0.06	0.01	0.01	4303157
Total Silver (Ag)	mg/kg	0.07	<0.05	0.14	<0.05	<0.05	0.05	4303157
Total Sodium (Na)	mg/kg	59	88	36	16	24	10	4303157
Total Strontium (Sr)	mg/kg	69.5	51.0	31.1	163	128	0.1	4303157
Total Thallium (Tl)	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	4303157
Total Tin (Sn)	mg/kg	<0.1	<0.1	0.1	0.1	<0.1	0.1	4303157
Total Titanium (Ti)	mg/kg	35	20	59	11	13	1	4303157
Total Uranium (U)	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	4303157
Total Vanadium (V)	mg/kg	3	<2	4	<2	<2	2	4303157
Total Zinc (Zn)	mg/kg	168	104	28.2	101	102	0.1	4303157

RDL = Reportable Detection Limit

Maxxam Job #: B092008

Report Date: 2010/10/07

ACCESS CONSULTING GROUP

Client Project #: MIN - 110466

Sampler Initials: LK

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		X23895	X23896	X23897	X23898	X23899		X23900		
Sampling Date		2010/09/15	2010/09/15	2010/09/15	2010/09/15	2010/09/15		2010/09/15		
	Units	RECLAMATION B TOE OF WASTE ROCK	RECLAMATION F MINTO CR FLAME	RECLAMATION E MINTO RD KM 2	RECLAMATION D TOE OF DAM S.	R1 (IROD) PLOT A	QC Batch	R1 (IROD) PLOT B	RDL	QC Batch
CONVENTIONALS										
Soluble (5:1) Conductivity	uS/cm	105	154	33	70	149	4306513	135	1	4306513
Parameter										
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	ATTACHED	ATTACHED	4311892	ATTACHED	N/A	4311892
Elements										
Cation exchange capacity	cmol+/Kg	14	25	<10	<10	24	4304356	22	10	4304359
Physical Properties										
% sand by hydrometer	%	59	75	76	81	57	4304707	63	2	4304707
% silt by hydrometer	%	22	17	17	11	34	4304707	29	2	4304707
Clay Content	%	19	8	7	8	9	4304707	8	2	4304707
Texture	N/A	SANDY LOAM	SANDY LOAM	SANDY LOAM	LOAMY SAND	SANDY LOAM	4294603	SANDY LOAM	N/A	4294603

Maxxam ID		X23901	X23902	X23903	X23904	X23905	X23906			
Sampling Date		2010/09/15	2010/09/15	2010/09/15	2010/09/15	2010/09/15	2010/09/15			
	Units	R3 TAILINGS DUMP PLOT A	R3 TAILINGS DUMP PLOT B	R3 TAILINGS DUMP PLOT C	R4 MINTO RD KM 3 PLOT A	R4 MINTO RD KM 3 PLOT B	R4 MINTO R KM 3 PLOT C	RDL		QC Batch
CONVENTIONALS										
Soluble (5:1) Conductivity	uS/cm	102	136	105	16	33	17	1		4306513
Parameter										
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	ATTACHED	ATTACHED	ATTACHED	N/A		4311892
Elements										
Cation exchange capacity	cmol+/Kg	23	25	24	<10	19	11	10		4304359
Physical Properties										
% sand by hydrometer	%	52	43	58	69	71	89	2		4304707
% silt by hydrometer	%	39	48	34	22	20	8	2		4304707
Clay Content	%	9	9	8	9	9	3	2		4304707
Texture	N/A	LOAM	LOAM	SANDY LOAM	SANDY LOAM	SANDY LOAM	SAND	N/A		4294603

N/A = Not Applicable

RDL = Reportable Detection Limit

Maxxam Job #: B092008
 Report Date: 2010/10/07

 ACCESS CONSULTING GROUP
 Client Project #: MIN - 110466

Sampler Initials: LK

CSR/CCME METALS IN SOIL (SOIL)

Maxxam ID		X23895	X23896	X23897	X23898	X23899	X23900		
Sampling Date		2010/09/15	2010/09/15	2010/09/15	2010/09/15	2010/09/15	2010/09/15		
	Units	RECLAMATION B TOE OF WASTE ROCK	RECLAMATION F MINTO CR FLAME	RECLAMATION E MINTO RD KM 2	RECLAMATION D TOE OF DAM S.	R1 (IROD) PLOT A	R1 (IROD) PLOT B	RDL	QC Batch
Physical Properties									
Soluble (2:1) pH	pH Units	8.16	8.29	6.00	7.79	7.36	8.13	0.01	4302430
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	13000	9880	11900	10200	12700	13300	100	4302308
Total Antimony (Sb)	mg/kg	0.8	0.3	0.2	0.2	0.4	0.4	0.1	4302308
Total Arsenic (As)	mg/kg	5.7	3.7	2.6	3.3	6.2	7.0	0.2	4302308
Total Barium (Ba)	mg/kg	207	151	181	121	215	254	0.1	4302308
Total Beryllium (Be)	mg/kg	0.5	0.3	0.4	0.4	0.4	0.3	0.1	4302308
Total Bismuth (Bi)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	4302308
Total Cadmium (Cd)	mg/kg	0.46	0.09	0.10	0.09	0.13	0.20	0.05	4302308
Total Calcium (Ca)	mg/kg	7740	8550	2680	5340	9930	13600	100	4302308
Total Chromium (Cr)	mg/kg	21	16	14	12	27	25	1	4302308
Total Cobalt (Co)	mg/kg	10.8	7.1	6.2	7.9	10.3	11.1	0.3	4302308
Total Copper (Cu)	mg/kg	687	23.6	6.7	79.4	79.2	179	0.5	4302308
Total Iron (Fe)	mg/kg	25400	19800	18100	23100	23600	26200	100	4302308
Total Lead (Pb)	mg/kg	7.5	4.2	3.8	3.0	6.1	6.0	0.1	4302308
Total Magnesium (Mg)	mg/kg	7610	6210	4510	6710	8160	9120	100	4302308
Total Manganese (Mn)	mg/kg	488	439	395	586	382	574	0.2	4302308
Total Mercury (Hg)	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	4302308
Total Molybdenum (Mo)	mg/kg	1.9	0.5	0.4	0.6	0.7	0.8	0.1	4302308
Total Nickel (Ni)	mg/kg	24.0	15.1	9.2	11.4	37.7	31.8	0.8	4302308
Total Phosphorus (P)	mg/kg	793	718	527	845	910	957	10	4302308
Total Potassium (K)	mg/kg	2220	1330	1740	2200	1170	2660	100	4302308
Total Selenium (Se)	mg/kg	1.0	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	4302308
Total Silver (Ag)	mg/kg	0.10	0.05	<0.05	<0.05	0.06	0.06	0.05	4302308
Total Sodium (Na)	mg/kg	127	198	<100	103	258	297	100	4302308
Total Strontium (Sr)	mg/kg	50.4	60.7	23.3	24.9	53.3	57.8	0.1	4302308
Total Thallium (Tl)	mg/kg	0.14	0.06	0.07	0.09	0.08	0.12	0.05	4302308
Total Tin (Sn)	mg/kg	0.4	0.3	0.3	0.3	0.4	0.4	0.1	4302308
Total Titanium (Ti)	mg/kg	538	467	484	580	655	832	1	4302308
Total Vanadium (V)	mg/kg	50	41	41	52	55	60	2	4302308
Total Zinc (Zn)	mg/kg	89	54	54	61	54	72	1	4302308
Total Zirconium (Zr)	mg/kg	4.0	1.5	<0.5	1.6	2.6	2.3	0.5	4302308

RDL = Reportable Detection Limit

Maxxam Job #: B092008
 Report Date: 2010/10/07

 ACCESS CONSULTING GROUP
 Client Project #: MIN - 110466

Sampler Initials: LK

CSR/CCME METALS IN SOIL (SOIL)

Maxxam ID		X23901	X23902	X23903	X23904	X23905	X23906		
Sampling Date		2010/09/15	2010/09/15	2010/09/15	2010/09/15	2010/09/15	2010/09/15		
	Units	R3 TAILINGS DUMP PLOT A	R3 TAILINGS DUMP PLOT B	R3 TAILINGS DUMP PLOT C	R4 MINTO RD KM 3 PLOT A	R4 MINTO RD KM 3 PLOT B	R4 MINTO R KM 3 PLOT C	RDL	QC Batch
Physical Properties									
Soluble (2:1) pH	pH Units	7.79	8.04	7.76	6.75	6.13	6.88	0.01	4302430
Total Metals by ICPMS									
Total Aluminum (Al)	mg/kg	11600	11400	10600	7430	9940	10900	100	4302308
Total Antimony (Sb)	mg/kg	0.5	0.5	0.4	0.5	0.3	0.1	0.1	4302308
Total Arsenic (As)	mg/kg	6.0	9.0	6.5	5.2	2.9	1.1	0.2	4302308
Total Barium (Ba)	mg/kg	187	187	185	143	174	131	0.1	4302308
Total Beryllium (Be)	mg/kg	0.4	0.3	0.4	0.3	0.3	0.4	0.1	4302308
Total Bismuth (Bi)	mg/kg	<0.1	0.1	0.1	<0.1	<0.1	<0.1	0.1	4302308
Total Cadmium (Cd)	mg/kg	0.22	0.27	0.25	0.21	0.10	<0.05	0.05	4302308
Total Calcium (Ca)	mg/kg	8780	11400	9280	3550	3250	4570	100	4302308
Total Chromium (Cr)	mg/kg	25	25	23	20	13	8	1	4302308
Total Cobalt (Co)	mg/kg	9.9	10.4	9.7	7.4	5.3	6.5	0.3	4302308
Total Copper (Cu)	mg/kg	96.4	114	422	19.9	9.8	7.5	0.5	4302308
Total Iron (Fe)	mg/kg	22800	23600	22900	17000	17400	19500	100	4302308
Total Lead (Pb)	mg/kg	6.1	6.0	5.9	4.5	3.5	2.4	0.1	4302308
Total Magnesium (Mg)	mg/kg	6910	7130	6320	3240	3670	6060	100	4302308
Total Manganese (Mn)	mg/kg	366	392	493	325	307	519	0.2	4302308
Total Mercury (Hg)	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	4302308
Total Molybdenum (Mo)	mg/kg	0.8	2.0	1.0	0.7	0.4	0.2	0.1	4302308
Total Nickel (Ni)	mg/kg	26.4	27.6	25.6	17.3	9.5	6.2	0.8	4302308
Total Phosphorus (P)	mg/kg	935	964	975	819	489	672	10	4302308
Total Potassium (K)	mg/kg	1140	934	1010	634	1220	1870	100	4302308
Total Selenium (Se)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	4302308
Total Silver (Ag)	mg/kg	0.06	0.07	0.17	0.05	<0.05	<0.05	0.05	4302308
Total Sodium (Na)	mg/kg	256	267	237	<100	<100	<100	100	4302308
Total Strontium (Sr)	mg/kg	48.9	53.4	46.3	23.5	24.8	29.2	0.1	4302308
Total Thallium (Tl)	mg/kg	0.08	0.08	0.07	0.06	0.05	0.06	0.05	4302308
Total Tin (Sn)	mg/kg	0.4	0.3	0.3	0.2	0.3	0.2	0.1	4302308
Total Titanium (Ti)	mg/kg	668	628	580	394	427	562	1	4302308
Total Vanadium (V)	mg/kg	55	55	52	36	38	38	2	4302308
Total Zinc (Zn)	mg/kg	61	59	60	45	40	67	1	4302308
Total Zirconium (Zr)	mg/kg	2.5	3.2	2.4	2.2	0.5	1.7	0.5	4302308

RDL = Reportable Detection Limit

Maxxam Job #: B092008
Report Date: 2010/10/07

ACCESS CONSULTING GROUP
Client Project #: MIN - 110466

Sampler Initials: LK

Package 1	9.0°C
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Each temperature is the average of up to three cooler temperatures taken at receipt

General Comments

Maxxam Job #: B092008
Report Date: 2010/10/07

ACCESS CONSULTING GROUP
Client Project #: MIN - 110466

Sampler Initials: LK

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4302308	Total Arsenic (As)	2010/10/01	103	75 - 125	104	75 - 125	<0.2	mg/kg	1.2	30	91	70 - 130
4302308	Total Beryllium (Be)	2010/10/01	103	75 - 125	107	75 - 125	<0.1	mg/kg	NC	30		
4302308	Total Cadmium (Cd)	2010/10/01	108	75 - 125	110	75 - 125	<0.05	mg/kg	1.5	30	95	70 - 130
4302308	Total Chromium (Cr)	2010/10/01	NC	75 - 125	99	75 - 125	<1	mg/kg	0.3	30	98	70 - 130
4302308	Total Cobalt (Co)	2010/10/01	101	75 - 125	101	75 - 125	<0.3	mg/kg	2.8	30	96	70 - 130
4302308	Total Copper (Cu)	2010/10/01	NC	75 - 125	105	75 - 125	<0.5	mg/kg	0.1	30	91	70 - 130
4302308	Total Lead (Pb)	2010/10/01	NC	75 - 125	106	75 - 125	<0.1	mg/kg	0.1	35	98	70 - 130
4302308	Total Mercury (Hg)	2010/10/01	92	75 - 125	96	75 - 125	<0.05	mg/kg	3.4	35		
4302308	Total Nickel (Ni)	2010/10/01	NC	75 - 125	102	75 - 125	<0.8	mg/kg	1.2	30	98	70 - 130
4302308	Total Selenium (Se)	2010/10/01	105	75 - 125	107	75 - 125	<0.5	mg/kg	NC	30		
4302308	Total Vanadium (V)	2010/10/01	NC	75 - 125	103	75 - 125	<2	mg/kg	0.9	30	100	70 - 130
4302308	Total Zinc (Zn)	2010/10/01	NC	75 - 125	108	75 - 125	<1	mg/kg	1.2	30	91	70 - 130
4302308	Total Aluminum (Al)	2010/10/01					<100	mg/kg	1.9	35	99	70 - 130
4302308	Total Antimony (Sb)	2010/10/01					<0.1	mg/kg	1.0	30	89	70 - 130
4302308	Total Barium (Ba)	2010/10/01					<0.1	mg/kg	2.0	35	106	70 - 130
4302308	Total Calcium (Ca)	2010/10/01					<100	mg/kg	2.3	30	94	70 - 130
4302308	Total Iron (Fe)	2010/10/01					<100	mg/kg	0.09	30	96	70 - 130
4302308	Total Magnesium (Mg)	2010/10/01					<100	mg/kg	1.5	30	96	70 - 130
4302308	Total Manganese (Mn)	2010/10/01					<0.2	mg/kg	0.2	30	97	70 - 130
4302308	Total Molybdenum (Mo)	2010/10/01					<0.1	mg/kg	1.5	35	102	70 - 130
4302308	Total Phosphorus (P)	2010/10/01					<10	mg/kg	2.5	30	98	70 - 130
4302308	Total Silver (Ag)	2010/10/01					<0.05	mg/kg	22.7	35	63 ⁽¹⁾	70 - 130
4302308	Total Strontium (Sr)	2010/10/01					<0.1	mg/kg	0.09	35	91	70 - 130
4302308	Total Thallium (Tl)	2010/10/01					<0.05	mg/kg	NC	30	84	70 - 130
4302308	Total Titanium (Ti)	2010/10/01					<1	mg/kg	1.4	35	100	70 - 130
4302308	Total Bismuth (Bi)	2010/10/01					<0.1	mg/kg	NC	30		
4302308	Total Potassium (K)	2010/10/01					<100	mg/kg	3.2	35		
4302308	Total Sodium (Na)	2010/10/01					<100	mg/kg	NC	35		
4302308	Total Tin (Sn)	2010/10/01					<0.1	mg/kg	2.8	35		
4302308	Total Zirconium (Zr)	2010/10/01					<0.5	mg/kg	NC	30		
4302430	Soluble (2:1) pH	2010/09/30			102	96 - 104			2.1	20		
4303157	Total Aluminum (Al)	2010/10/05					11, RDL=1 ⁽²⁾	mg/kg	7.9	35		
4303157	Total Antimony (Sb)	2010/10/05					<0.1	mg/kg	NC	35		
4303157	Total Arsenic (As)	2010/10/05					<0.01	mg/kg	13.3	35		
4303157	Total Barium (Ba)	2010/10/05					<0.1	mg/kg	4.9	35		
4303157	Total Beryllium (Be)	2010/10/05					<0.1	mg/kg	NC	35		
4303157	Total Bismuth (Bi)	2010/10/05					<0.1	mg/kg	NC	35		
4303157	Total Boron (B)	2010/10/05					<5	mg/kg	NC	35		
4303157	Total Cadmium (Cd)	2010/10/05					<0.01	mg/kg	7.0	35		
4303157	Total Calcium (Ca)	2010/10/05					25, RDL=10 ⁽³⁾	mg/kg	5.3	35		

Maxxam Job #: B092008
Report Date: 2010/10/07

ACCESS CONSULTING GROUP
Client Project #: MIN - 110466

Sampler Initials: LK

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4303157	Total Chromium (Cr)	2010/10/05					<0.5	mg/kg	37.1 ^(1,4)	35		
4303157	Total Cobalt (Co)	2010/10/05					<0.1	mg/kg	NC	35		
4303157	Total Copper (Cu)	2010/10/05					<0.5	mg/kg	11.5	35		
4303157	Total Iron (Fe)	2010/10/05					<10	mg/kg	6.6	35		
4303157	Total Lead (Pb)	2010/10/05					<0.01	mg/kg	9.5	35		
4303157	Total Magnesium (Mg)	2010/10/05					<10	mg/kg	8.0	35		
4303157	Total Manganese (Mn)	2010/10/05					<0.1	mg/kg	3.2	35		
4303157	Total Mercury (Hg)	2010/10/05					<0.01	mg/kg	NC	35		
4303157	Total Molybdenum (Mo)	2010/10/05					<0.1	mg/kg	8.5	35		
4303157	Total Nickel (Ni)	2010/10/05					<0.1	mg/kg	25.2	35		
4303157	Total Phosphorus (P)	2010/10/05					<10	mg/kg	5.0	35		
4303157	Total Potassium (K)	2010/10/05					<10	mg/kg	6.0	35		
4303157	Total Selenium (Se)	2010/10/05					<0.01	mg/kg	1.3	35		
4303157	Total Silver (Ag)	2010/10/05					<0.05	mg/kg	NC	35		
4303157	Total Sodium (Na)	2010/10/05					<10	mg/kg	NC	35		
4303157	Total Strontium (Sr)	2010/10/05					<0.1	mg/kg	6.0	35		
4303157	Total Thallium (Tl)	2010/10/05					<0.05	mg/kg	NC	35		
4303157	Total Tin (Sn)	2010/10/05					<0.1	mg/kg	NC	35		
4303157	Total Titanium (Ti)	2010/10/05					<1	mg/kg	4.6	35		
4303157	Total Uranium (U)	2010/10/05					<0.05	mg/kg	NC	35		
4303157	Total Vanadium (V)	2010/10/05					<2	mg/kg	NC	35		
4303157	Total Zinc (Zn)	2010/10/05					<0.1	mg/kg	2.7	35		
4304356	Cation exchange capacity	2010/10/01							NC	35		
4304359	Cation exchange capacity	2010/10/01							NC	35		
4304707	% sand by hydrometer	2010/10/01							1.9	35	110	89 - 111
4304707	% silt by hydrometer	2010/10/01							2.3	35	93	78 - 122
4304707	Clay Content	2010/10/01							NC	35	93	86 - 114
4305435	Available (NH ₄ F) Nitrogen (N)	2010/10/01	100	80 - 120	109	90 - 111	<2	mg/kg	NC	35		
4305594	Available (NH ₄ OAc) Potassium (K)	2010/10/01			95	80 - 120	<2	mg/kg	3.4	35	111	75 - 125

Maxxam Job #: B092008
Report Date: 2010/10/07

ACCESS CONSULTING GROUP
Client Project #: MIN - 110466

Sampler Initials: LK

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4305771	Available (NH4F) Phosphorus (P)	2010/10/01			99	80 - 120	<1	mg/kg	NC	35		
4306513	Soluble (5:1) Conductivity	2010/10/01			100	80 - 120	1, RDL=1	uS/cm	2.3	35		

N/A = Not Applicable

RDL = Reportable Detection Limit

RPD = Relative Percent Difference

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.

Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

- (1) - Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.
- (2) - Blank outside acceptance criteria . All results higher than 10x Blank concentration.
- (3) - Blank outside acceptance criteria. All results higher than 20x Blank concentration.
- (4) - Duplicate RPD above control limit - Non-homogenous sample - Increased variability of results

Analytical Report

Bill To: Maxxam Analytics
 Report To: Maxxam Analytics
 4606 Canada Way
 Burnaby, BC, Canada
 V5G 1K5
 Attn: Kimberley Webber
 Sampled By:
 Company:

Project:
 ID: Job #B092008
 Name:
 Location:
 LSD:
 P.O.:
 Acct code:

Lot ID: **765203**
 Control Number:
 Date Received: Sep 29, 2010
 Date Reported: Oct 4, 2010
 Report Number: 1361913

	Reference Number	765203-1	765203-2	765203-3		
	Sample Date	Sep 15, 2010	Sep 15, 2010	Sep 15, 2010		
	Sample Time	NA	NA	NA		
	Sample Location					
	Sample Description	X23895-01R \	X23896-01R \	X23897-01R \		
	Matrix	Reclamation Soil	Reclamation Soil	Reclamation Soil		
Analyte	Units	Results	Results	Results	Nominal Detection Limit	
Classification						
C:N Ratio		29	25	26	0.1	
Nitrogen	Total	%	0.03	0.10	0.07	0.01
Organic Matter	Total	%	1.66	4.97	3.52	
Carbon	Total Organic	%	0.83	2.49	1.76	0.02

Analytical Report

Bill To: Maxxam Analytics
 Report To: Maxxam Analytics
 4606 Canada Way
 Burnaby, BC, Canada
 V5G 1K5
 Attn: Kimberley Webber
 Sampled By:
 Company:

Project:
 ID: Job #B092008
 Name:
 Location:
 LSD:
 P.O.:
 Acct code:

Lot ID: **765203**
 Control Number:
 Date Received: Sep 29, 2010
 Date Reported: Oct 4, 2010
 Report Number: 1361913

Reference Number	765203-4	765203-5	765203-6
Sample Date	Sep 15, 2010	Sep 15, 2010	Sep 15, 2010
Sample Time	NA	NA	NA
Sample Location			
Sample Description	X23898-01R \ Reclamation	X23899-01R \ R1 (IROD) Plot	X23900-01R \ R1 (IROD) Plot
Matrix	Soil	Soil	Soil

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Classification						
C:N Ratio			>50	23.0	17.9	0.1
Nitrogen	Total	%	<0.01	0.14	0.12	0.01
Organic Matter	Total	%	0.95	6.50	4.38	
Carbon	Total Organic	%	0.48	3.25	2.19	0.02

Analytical Report

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 Report To: Maxxam Analytics
 4606 Canada Way
 Burnaby, BC, Canada
 V5G 1K5
 Attn: Kimberley Webber
 Sampled By:
 Company:

Project:
 ID: Job #B092008
 Name:
 Location:
 LSD:
 P.O.:
 Acct code:

Lot ID: **765203**
 Control Number:
 Date Received: Sep 29, 2010
 Date Reported: Oct 4, 2010
 Report Number: 1361913

	Reference Number	765203-7	765203-8	765203-9	
	Sample Date	Sep 15, 2010	Sep 15, 2010	Sep 15, 2010	
	Sample Time	NA	NA	NA	
	Sample Location				
	Sample Description	X23901-01R \ R3	X23902-01R \ R3	X23903-01R \ R3	
	Matrix	Tailings D Soil	Tailings D Soil	Tailings D Soil	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Classification					
C:N Ratio		17.3	13.7	16.4	0.1
Nitrogen	Total %	0.22	0.18	0.17	0.01
Organic Matter	Total %	7.63	4.87	5.59	
Carbon	Total Organic %	3.82	2.44	2.79	0.02

Analytical Report

Bill To: Maxxam Analytics
 Report To: Maxxam Analytics
 4606 Canada Way
 Burnaby, BC, Canada
 V5G 1K5
 Attn: Kimberley Webber
 Sampled By:
 Company:

Project:
 ID: Job #B092008
 Name:
 Location:
 LSD:
 P.O.:
 Acct code:

Lot ID: **765203**
 Control Number:
 Date Received: Sep 29, 2010
 Date Reported: Oct 4, 2010
 Report Number: 1361913

	Reference Number	765203-10	765203-11	765203-12	
	Sample Date	Sep 15, 2010	Sep 15, 2010	Sep 15, 2010	
	Sample Time	NA	NA	NA	
	Sample Location				
	Sample Description	X23904-01R \ R4 Minto Rd K	X23905-01R \ R4 Minto Rd K	X23906-01R \ R4 Minto R KM	
	Matrix	Soil	Soil	Soil	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Classification					
C:N Ratio		>20	16.6	>10	0.1
Nitrogen	Total %	<0.01	0.24	<0.01	0.01
Organic Matter	Total %	0.49	7.84	0.22	
Carbon	Total Organic %	0.24	3.92	0.11	0.02

Approved by: 
 Andrew Garrard, BSc
 General Manager

Methodology and Notes

Bill To: Maxxam Analytics	Project:	Lot ID: 765203
Report To: Maxxam Analytics	ID: Job #B092008	Control Number:
4606 Canada Way	Name:	Date Received: Sep 29, 2010
Burnaby, BC, Canada	Location:	Date Reported: Oct 4, 2010
V5G 1K5	LSD:	Report Number: 1361913
Attn: Kimberley Webber	P.O.:	
Sampled By:	Acct code:	
Company:		

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Total Carbon, Nitrogen & Sulfur by Leco Combustion	SSSA Book Series 5	* Nitrogen-Total, Ch 37	01-Oct-10	Exova Surrey
Total Carbon, Nitrogen & Sulfur by Leco Combustion	SSSA Book Series 5	* Total Carbon, Organic Carbon, and Organic Matter, Ch 34	01-Oct-10	Exova Surrey

** Reference Method Modified*

Comments:

Please direct any inquiries regarding this report to our Client Services group.
Results relate only to samples as submitted.

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Maxxam Job #: B079893
 Report Date: 2010/09/15

 Your P.O. #: MN-110466
 Sampler Initials: LK

RESULTS OF CHEMICAL ANALYSES OF SOIL

Maxxam ID		W68609	W68610	W68611	W68612				
Sampling Date		2010/07/19	2010/07/22	2010/07/18	2010/07/20				
	Units	M07	M029	M035	M54A	RDL	QC Batch		
Parameter									
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	ATTACHED	N/A	4091595		
Elements									
Cation exchange capacity	cmol+/kg	<10	19	12	<10	10	4248901		

Maxxam ID		W68613	W68614	W68615	W68616	W68617	W68618		
Sampling Date		2010/07/21	2010/07/21	2010/07/21	2010/07/21	2010/07/22	2010/07/22		
	Units	M76A	M80	M85	M87	M90	M93	RDL	QC Batch
Parameter									
Subcontract Parameter	N/A	ATTACHED	ATTACHED	ATTACHED	ATTACHED	ATTACHED	ATTACHED	N/A	4091595
Elements									
Cation exchange capacity	cmol+/kg	<10	<10	<10	11	<10	11	10	4248901

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		W68609	W68610	W68611	W68612	W68613	W68614	W68615	W68616	W68617	W68618		
Sampling Date		2010/07/19	2010/07/22	2010/07/18	2010/07/20	2010/07/21	2010/07/21	2010/07/21	2010/07/21	2010/07/22	2010/07/22		
	Units	M07	M029	M035	M54A	M76A	M80	M85	M87	M90	M93	RDL	QC Batch
Total Metals by ICP													
Total Sulphur (S)	mg/kg	45	65	52	67	65	42	47	82	53	36	5	4255008

 N/A - Not Applicable
 RDL - Reportable Detection Limit

Maxxam Job #: B078893
 Report Date: 2010/09/15

Your P.O. #: MN-110466
 Sampler Initials: LK

CSR/CCME METALS IN SOIL (SOIL)

Maxxam ID		W68618		
Sampling Date		2010/07/22		
	Units	MSD	RDL	QC Batch
Misc. Inorganics				
Soluble (2:1) pH	pH Units	5.68	0.01	4244124
Total Metals by ICPMS				
Total Aluminum (Al)	mg/kg	12900	100	4244137
Total Antimony (Sb)	mg/kg	0.4	0.1	4244137
Total Arsenic (As)	mg/kg	5.1	0.2	4244137
Total Barium (Ba)	mg/kg	138	0.1	4244137
Total Beryllium (Be)	mg/kg	0.3	0.1	4244137
Total Bismuth (Bi)	mg/kg	<0.1	0.1	4244137
Total Cadmium (Cd)	mg/kg	<0.05	0.05	4244137
Total Calcium (Ca)	mg/kg	3150	100	4244137
Total Chromium (Cr)	mg/kg	26	1	4244137
Total Cobalt (Co)	mg/kg	6.5	0.3	4244137
Total Copper (Cu)	mg/kg	14.9	0.5	4244137
Total Iron (Fe)	mg/kg	20900	100	4244137
Total Lead (Pb)	mg/kg	5.7	0.1	4244137
Total Magnesium (Mg)	mg/kg	4740	100	4244137
Total Manganese (Mn)	mg/kg	219	0.2	4244137
Total Mercury (Hg)	mg/kg	<0.05	0.05	4244137
Total Molybdenum (Mo)	mg/kg	0.4	0.1	4244137
Total Nickel (Ni)	mg/kg	14.9	0.8	4244137
Total Phosphorus (P)	mg/kg	252	10	4244137
Total Potassium (K)	mg/kg	563	100	4244137
Total Selenium (Se)	mg/kg	<0.5	0.5	4244137
Total Silver (Ag)	mg/kg	<0.05	0.05	4244137
Total Sodium (Na)	mg/kg	<100	100	4244137
Total Strontium (Sr)	mg/kg	25.7	0.1	4244137
Total Thallium (Tl)	mg/kg	<0.05	0.05	4244137
Total Tin (Sn)	mg/kg	0.3	0.1	4244137
Total Titanium (Ti)	mg/kg	753	1	4244137
Total Vanadium (V)	mg/kg	52	2	4244137
Total Zinc (Zn)	mg/kg	43	1	4244137
Total Zirconium (Zr)	mg/kg	2.8	0.5	4244137

RDL = Reportable Detection Limit



Maxxam Job #: B079893
Report Date: 2010/08/15

Your P.O. #: MN-110466
Sampler Initials: LK

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4244124	Soluble (2-1) pH	2010/09/10			102	96 - 104			0.9	20		
4244137	Total Arsenic (As)	2010/09/10	101	75 - 125	97	75 - 125	<0.2	mg/kg	1.7	30	98	70 - 130
4244137	Total Beryllium (Be)	2010/09/10	100	75 - 125	95	75 - 125	<0.1	mg/kg	NC	30		
4244137	Total Cadmium (Cd)	2010/09/10	105	75 - 125	100	75 - 125	<0.05	mg/kg	NC	30	93	70 - 130
4244137	Total Chromium (Cr)	2010/09/10	100	75 - 125	96	75 - 125	<1	mg/kg	1.8	30	99	70 - 130
4244137	Total Cobalt (Co)	2010/09/10	100	75 - 125	96	75 - 125	<0.3	mg/kg	3.4	30	95	70 - 130
4244137	Total Copper (Cu)	2010/09/10	100	75 - 125	101	75 - 125	<0.5	mg/kg	1.9	30	90	70 - 130
4244137	Total Lead (Pb)	2010/09/10	101	75 - 125	99	75 - 125	<0.1	mg/kg	3.5	35	98	70 - 130
4244137	Total Mercury (Hg)	2010/09/10	85	75 - 125	85	75 - 125	<0.05	mg/kg	NC	35		
4244137	Total Nickel (Ni)	2010/09/10	99	75 - 125	98	75 - 125	<0.8	mg/kg	1.8	30	93	70 - 130
4244137	Total Selenium (Se)	2010/09/10	101	75 - 125	102	75 - 125	<0.5	mg/kg	NC	30		
4244137	Total Vanadium (V)	2010/09/10	NC	75 - 125	98	75 - 125	<2	mg/kg	0.9	30	101	70 - 130
4244137	Total Zinc (Zn)	2010/09/10	NC	75 - 125	105	75 - 125	<1	mg/kg	4.1	30	89	70 - 130
4244137	Total Aluminum (Al)	2010/09/10					<100	mg/kg	6.9	35	98	70 - 130
4244137	Total Antimony (Sb)	2010/09/10					<0.1	mg/kg	NC	30	107	70 - 130
4244137	Total Barium (Ba)	2010/09/10					<0.1	mg/kg	2.4	35	104	70 - 130
4244137	Total Calcium (Ca)	2010/09/10					<100	mg/kg	6.1	30	93	70 - 130
4244137	Total Iron (Fe)	2010/09/10					<100	mg/kg	2.6	30	95	70 - 130
4244137	Total Magnesium (Mg)	2010/09/10					<100	mg/kg	8.7	30	95	70 - 130
4244137	Total Manganese (Mn)	2010/09/10					<0.2	mg/kg	2.9	30	101	70 - 130
4244137	Total Molybdenum (Mo)	2010/09/10					<0.1	mg/kg	NC	35	103	70 - 130
4244137	Total Phosphorus (P)	2010/09/10					<10	mg/kg	4.3	30	90	70 - 130
4244137	Total Silver (Ag)	2010/09/10					<0.05	mg/kg	NC	35	78	70 - 130
4244137	Total Strontium (Sr)	2010/09/10					<0.1	mg/kg	3.7	35	96	70 - 130
4244137	Total Thallium (Tl)	2010/09/10					<0.05	mg/kg	NC	30	86	70 - 130
4244137	Total Titanium (Ti)	2010/09/10					<1	mg/kg	3.3	35	99	70 - 130
4244137	Total Bismuth (Bi)	2010/09/10					<0.1	mg/kg	NC	30		
4244137	Total Potassium (K)	2010/09/10					<100	mg/kg	1.1	35		
4244137	Total Sodium (Na)	2010/09/10					<100	mg/kg	NC	35		
4244137	Total Tin (Sn)	2010/09/10					<0.1	mg/kg	NC	35		
4244137	Total Zirconium (Zr)	2010/09/10					<0.5	mg/kg	NC	30		

Maxxam Job #: B079893
 Report Date: 2010/09/15

 Your P.O. #: MN-110466
 Sampler Initials: LK

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
4248901	Cation exchange capacity	2010/09/10							NC	35		
4255008	Total Sulphur (S)	2010/09/13					<5	mg/kg	7.8	30		

N/A = Not Applicable

RPD = Relative Percent Difference

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.

Spiked Blank: A blank matrix to which a known amount of the analyte has been added. Used to evaluate analyte recovery.

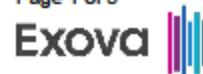
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

Exova
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 V3S 8P8, Canada

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 W: www.exova.com



Analytical Report

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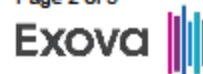
Project:
 ID:
 Name:
 Location:
 LSD:
 P.O.: B079893
 Acct code:

Lot ID: **760926**
 Control Number:
 Date Received: Sep 3, 2010
 Date Reported: Sep 14, 2010
 Report Number: 1355314

	Reference Number	760926-1	760926-2	760926-3	
	Sample Date	Aug 19, 2010	Aug 22, 2010	Aug 18, 2010	
	Sample Time	NA	NA	NA	
	Sample Location				
	Sample Description	W68609-01R \ M07	W68610-01R \ M029	W68611-01R \ M035	
	Matrix	Soil	Soil	Soil	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Classification					
C:N Ratio		40	15	>50	0.1
Nitrogen	Total	% 0.02	0.04	<-0.01	0.01
Organic Matter	Total	% 1.25	1.35	1.08	
Carbon	Total Organic	% 0.62	0.68	0.54	0.02

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 Company:

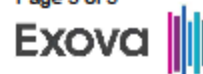
Project:
 ID:
 Name:
 Location:
 LSD:
 P.O.: B079893
 Acct code:

Lot ID: **760926**
 Control Number:
 Date Received: Sep 3, 2010
 Date Reported: Sep 14, 2010
 Report Number: 1355314

	Reference Number	760926-4	760926-5	760926-6		
	Sample Date	Aug 20, 2010	Aug 21, 2010	Aug 21, 2010		
	Sample Time	NA	NA	NA		
	Sample Location					
	Sample Description	W68612-01R \ M54A	W68613-01R \ M76A	W68614-01R \ M80		
	Matrix	Soil	Soil	Soil		
Analyte	Units	Results	Results	Results	Nominal Detection Limit	
Classification						
C:N Ratio		45	25	31	0.1	
Nitrogen	Total	%	0.04	0.05	0.04	0.01
Organic Matter	Total	%	3.98	2.38	2.22	
Carbon	Total Organic	%	1.99	1.19	1.11	0.02

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 V5G 1K5
 Attn: Kimberley Webber
 Sampled By:
 Company:

Project:
 ID:
 Name:
 Location:
 LSD:
 P.O.: B079893
 Acct code:

Lot ID: **760926**
 Control Number:
 Date Received: Sep 3, 2010
 Date Reported: Sep 14, 2010
 Report Number: 1355314

	Reference Number	760926-7	760926-8	760926-9		
	Sample Date	Aug 21, 2010	Aug 21, 2010	Aug 22, 2010		
	Sample Time	NA	NA	NA		
	Sample Location					
	Sample Description	W68615-D1R \ M85	W68616-D1R \ M87	W68617-D1R \ M90		
	Matrix	Soil	Soil	Soil		
Analyte	Units	Results	Results	Results	Nominal Detection Limit	
Classification						
C:N Ratio		28	30	27	0.1	
Nitrogen	Total	%	0.03	0.06	0.03	0.01
Organic Matter	Total	%	1.78	3.59	1.81	
Carbon	Total Organic	%	0.89	1.79	0.90	0.02

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Analytical Report

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V5G 1K5
Attn: Kimberley Webber
Sampled By:
Company:

Project:
ID:
Name:
Location:
LSD:
P.O.: B079893
Acct code:

Lot ID: **760926**
Control Number:
Date Received: Sep 3, 2010
Date Reported: Sep 14, 2010
Report Number: 1355314

Reference Number 760926-10
Sample Date Aug 22, 2010
Sample Time NA
Sample Location
Sample Description W68618-D1R \ M93
Matrix Soil

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Classification						
C:N Ratio			28			0.1
Nitrogen	Total	%	0.02			0.01
Organic Matter	Total	%	1.15			
Carbon	Total Organic	%	0.57			0.02

Approved by: 
Andrew Garrard, BSc
General Manager

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Methodology and Notes

Bill To: Maxxam Analytics	Project:	Lot ID: 760926
Report To: Maxxam Analytics	ID:	Control Number:
4606 Canada Way	Name:	Date Received: Sep 3, 2010
Burnaby, BC, Canada	Location:	Date Reported: Sep 14, 2010
VSG 1K5	LSD:	Report Number: 1355314
Attn: Kimberley Webber	P.O.: B079893	
Sampled By:	Acct code:	
Company:		

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Total Carbon, Nitrogen & Sulfur by Leco Combustion	SSSA Book Series 5	* Nitrogen-Total, Ch 37	09-Sep-10	Exova Surrey
Total Carbon, Nitrogen & Sulfur by Leco Combustion	SSSA Book Series 5	* Total Carbon, Organic Carbon, and Organic Matter, Ch 34	09-Sep-10	Exova Surrey

** Reference Method Modified*

Comments:

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APPENDIX C

ACCESS ECOSYSTEM FORM



ACCESS
CONSULTING GROUP

PROJECT ID:

WEATHER:

PLOT #:	SURVEYORS:	DATE:	START TIME:	END TIME:
TYPE/ # OF SAMPLES:		PHOTO #'S:		

GPS ZONE	E N
ASPECT (°)	
SLOPE (%)	
ELEVATION (m)	

HUMUS FORM (ENTER X, if trained)	
MOR	MO
MORMODER	MM
MODER	MD
MULLMODER	MR
MULL	MU
SOIL COLOUR (ENTER X)	
DARK	D
MEDIUM	M
LIGHT	L
NOT APPLICABLE	N/A

SOIL DRAINAGE		SNR	
VR	VERY RAPIDLY	A	VERY POOR
R	RAPIDLY	B	POOR
W	WELL	C	MEDIUM
MW	MODERATELY WELL	D	RICH
I	IMPERFECTLY	E	VERY RICH
P	POORLY	F	SALINE
VP	VERY POORLY	SMR (if trained)	
SEEPAGE		0	VERY XERIC
P	PRESENT	1	XERIC
A	ABSENT	2	SUBXERIC
Open Water Present (%)		3	SUBMESIC
Plot		4	MESIC
		5	SUBHYGRIC
ROCKY SUBSTRATES (%)		6	HYGRIC
COBBLES/ STONES		7	SUBHYDRIC
BEDROCK		8	HYDRIC
		9	AQUATIC
SITE CLASSIFICATION			
←UNIFORM TO VARIABLE →			
1	2	3	4
			5

SURFACE SHAPE		MICROTOPOGRAPHY			PLOT POSITION MESO			
CV	CONCAVE	SM	SMOOTH		C	CREST		
CX	CONVEX	MO	MOD. MOUNDED		UP	UPPER SLOPE		
ST	STRAIGHT	ST	STRONGLY MOUNDED		MS	MID SLOPE		
UN	UNDULATING	EX	EXTREMELY MOUNDED		LS	LOWER SLOPE		
SURFACE COMPOSITION (MUST EQUAL 100%)						T	TOE	
ROCK	COBBLE	GRAVEL	SOIL	VEG	ORG.	CWD	D	DEPRESSION
							L	LEVEL

COMMENTS/ SITE DISTURBANCES/ SAMPLES

VEGETATION COVER	%
TREE LAYER (A)	
SHRUB LAYER (B)	
HERB LAYER (C)	
MOSS LAYER (D)	

WILDLIFE SIGN (SCAT, TRACKS, BROWSE, CALL, ENCOUNTER, DEN, ETC.) (EMPHASIZE BROWSE, GRAZING OR ROOT DIGGING)

TREE LAYER (A)									
SPECIES	A1 (ht ____m) Dominant %	A2 (ht ____m) Main Cover %	A3 (ht ____m) Sub-canopy %	SPECIES	A1 (ht ____m) Dominant %	A2(ht ____m) Main Cover %	A3 (ht ____m) Sub-canopy %		
SHRUB LAYER (B)									
SPECIES	B1 (2m – 10m) %	B2 (<2m) %	SPECIES	B1 (2m – 10m) %	B2 (<2m) %				
TREE REGENERATION <1m									
SPECIES			%		SPECIES			%	
HERB LAYER (C)					MOSS LAYER			LICHEN LAYER	
SPECIES	%	SPECIES	%	SPECIES	%	SPECIES	%	SPECIES	%
HEIGHT (M)		SUCCESSIONAL STAGE			STRUCTURAL STAGE				

SITE SKETCH: (1 cm = _____) (JUST DOMINANT PLANTS, SHRUBS AND TREES)