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**Existing and Proposed Landfill  
NE ¼ Sec 12 Twp 112 Rge 23 W4M  
Garden River, AB**

**Groundwater Characterization Report**

**PARKS CANADA AGENCY**

**February 10, 2015**

**SLR Project No. 200.02005.00000**



**GROUNDWATER CHARACTERIZATION REPORT  
GARDEN RIVER LANDFILL  
NE1/4 SEC 7, TWP 112, RGE 23 W4M, NEAR GARDEN RIVER, AB**

**SLR Project No. 200.02005.00000**

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## EXECUTIVE SUMMARY

SLR Consulting (Canada) Ltd. (SLR) was retained by the Parks Canada Agency (PCA) to conduct a hydrogeological assessment for the proposed construction of two new landfill cells and at the east end of the community airstrip near Garden River, Alberta (AB) on the west side of Wood Buffalo National Park. The new landfill cells will be located in NE-12-112-23W4M (herein referred to as “the landfill site”). Groundwater monitoring wells were also installed at the east end of the community air strip (herein referred to as “the air strip site”) located approximately 2 kilometres (km) east of the landfill site.

Parks Canada had requested that the design of the new landfill cells should “*to the extent that is practicable and feasible*”, adhere to all of the requirements outlined in the Alberta Environment Standards for Landfills in Alberta (herein referred to as “the Standards”), dated February 2010.

Borehole drilling and well installation was completed on March 18 to 21, 2014. Groundwater monitoring and sampling was carried out in March, May, July, September, and completed in November 2014.

Stratigraphy encountered at the landfill site consists of a thin covering of topsoil overlying sand which in turn overlies clay to the maximum depth of investigation of 15.2 metres (m). Depth to groundwater in the wells installed at the landfill ranged from 9.2 m below ground surface (bgs) to 9.9 m bgs in 2014. Groundwater elevations ranged from 231.4 m above sea level (asl) to 231.6 masl. Groundwater elevations remained relatively constant over the nine month monitoring period with a maximum of 5 centimetre (cm) in elevation change. Groundwater flow direction was indicated to be to the southwest during all five monitoring events under a gradient of 0.001 m/m during all monitoring events.

Groundwater quality results suggest that groundwater at the landfill site has not been impacted by the current operations of disposal pits. The presence of thick unsaturated sand deposits between the waste and the water table, coupled with the low precipitation and infiltration, likely restricts downward migration of leachate from the landfill. This could be confirmed by conducting unsaturated groundwater flow modelling.

Concentrations of phenols, total ammonia, arsenic, cadmium, iron, manganese, mercury, and selenium exceeding guidelines were noted in samples collected in 2014. Concentrations of cadmium, iron, and manganese exceeding guideline were also noted in a well at the air strip site, installed in a similar geological setting and in wells located upgradient of the existing disposal area. Arsenic and selenium were also detected above guidelines in upgradient wells. Concentrations of arsenic, cadmium, iron, manganese, and selenium above guidelines are commonly encountered in shallow groundwater and often in areas with no identifiable human activity in Alberta.

Based on the geological and hydrogeological investigation undertaken, the site would not satisfy the siting requirement from the Standards, which require a 5 m thick clayey layer to be present immediately beneath the lowest point of the waste. Therefore, the landfill design will include a composite liner to provide an equivalent level of protection.

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## **1.0 INTRODUCTION**

SLR Consulting (Canada) Ltd. (SLR) was retained by the Parks Canada Agency (Parks Canada) to conduct a hydrogeological assessment for the proposed construction of two new landfill cells and at the east end of the community airstrip near Garden River, Alberta on the west side of Wood Buffalo National Park. The new landfill cell will be located in NE-12-112-23W4M (herein referred to as “the landfill site”). Groundwater monitoring wells were also installed at the east end of the community air strip (herein referred to as “the air strip site”) located approximately 2 kilometres (km) east of the landfill site. The location of the site is shown on Drawing 1. The location of the boreholes completed as part of this assessment are shown on Drawings 2 and 3. Photographs of the landfill site are included in the Photograph section.

This report summarizes the investigation methods, field observations, and results of the program. Tables and drawings follow the text for reference. Borehole logs, water well search results, geotechnical laboratory reports, groundwater laboratory analytical reports, and hydraulic conductivity test results for the site are included in Appendices A through E, respectively.

The borehole drilling and well installation was completed on March 18 to 21, 2014. Groundwater monitoring and sampling was carried out in March, May, July, September, and completed in November 2014.

## **2.0 OBJECTIVE**

The primary objective of the program was to assess the current soil and groundwater conditions at the site prior to the construction of new landfill cells at the landfill site. A secondary objective was to provide background information on groundwater quality in the community through the installation of monitoring wells at the air strip site.

## **3.0 SCOPE OF WORK**

The scope of work consisted of the following activities:

- Review of previous hydrogeological and geotechnical assessments for the site;
- Preparation of a health and safety plan (HASP);
- Identification of all public and private underground utilities. Public utilities were identified by Alberta First Call and private utilities were located by Altus Geomatics;
- Drilling of 12 boreholes, of which nine were completed as monitoring wells;
- Collection of samples for geotechnical analysis including disturbed samples and composite samples;
- Analysis of selected soil samples for geotechnical parameters including moisture content, grain size distribution, and Proctor density;
- Completion of five groundwater monitoring events at newly installed monitoring wells;
- Conduct hydraulic conductivity testing on three of the new installed monitoring wells;

- Contract a third party to complete a topographic survey of the proposed landfill development area;
- Completion of a horizontal and vertical survey of all new monitoring wells; and
- Prepare a report summarizing the methodology and results of the program.

## **4.0 BACKGROUND AND REGIONAL SETTING**

### **4.1 Previous Environmental Reports**

Previous environmental reports applicable to the Garden River landfill and airstrip sites include:

- Spencer Environmental Management Services Ltd. 2006. Garden River Wastewater Treatment Facility EIA. Project Number (EP-222);
- EBA Engineering Consultants Ltd. 2009. Contaminated Site Assessment, Initial and Detailed Testing Programs, Wood Buffalo National Park, Various Locations in the Community of Garden River, Alberta. Project Number C22101178; and
- EBA, A Tetra Tech Company. 2013. Garden River, AB Community Airstrip and Old Landfill Reports Review and Remediation Options Analysis. File E22103088-01.

Publicly available geological and hydrogeological information for the site and surrounding area was also reviewed including:

- Alberta Geological Survey. 1999. Geological Map of Alberta; and
- Alberta Geological Survey. 2013. Surficial Geology of Alberta, Map 601.

### **4.2 Physiography and Topography**

#### **4.2.1 Regional Physiography and Topography**

The site is located in the Central Mixedwood natural subregion of the Boreal Forest Region of Alberta<sup>1</sup>. The terrain of the Central Mixedwood subregion is described as consisting predominantly of undulating plains with some hummocky uplands. Vegetation in the Central Mixedwood subregion consists of closed canopy mixedwood (aspen, white spruce, jack pine and black spruce, depending on soil conditions and age of growth). Soils in the Central Mixedwood region consist of orthic grey luvisols and brunisols on sands.

Regionally, ground elevations in the vicinity of the site are approximately 230 to 250 metres above sea level (masl). The terrain is flat with maximum relief of less than approximately 3 m.

The topography surrounding the site is shown on Drawing 1.

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<sup>1</sup> Natural Regions Committee. 2006. Natural Regions and Subregions of Alberta. Compiled by D.J. Downing and W.W. Pettapiece. Government of Alberta. Pub No. T/852.

#### **4.2.2 Site Topography**

The topography at the Garden River landfill site is generally level with maximum surface elevation change of 3 m across the site. Surface elevations within the proposed and existing landfill development area range from approximately 241 masl to 243 masl. The topography of the proposed landfill development area is shown on Drawing 4, based on a topographic survey of the area.

#### **4.3 Climate**

The climate in the area of the site is classified (using the Koppen climate classification) as subarctic (Dfc) described as having long, very cold winters, and short cool to mild summers. The nearest weather station to the site with available climate normal data is located at High Level approximately 190 km west of the site. The annual temperature averaged -1.0 degrees Celsius (°C) with a mean monthly temperature reaching a high of 16.5°C in July, and dropping to a low of -20.4°C in January. Mean annual precipitation was recorded as 372 millimetre (mm) during the period of 1981 to 2010.

#### **4.4 Regional Geology and Hydrogeology**

##### **4.4.1 Regional Surficial Geology**

The surficial geology in the vicinity of Garden River consists of fluvial deposits deposited by the Peace River. Fluvial deposits consist of poorly to well sorted, stratified to massive sand, gravel, silt, clay and organic sediments in channel or overbank deposits. Surficial deposits in the vicinity of the site are generally less than 30 m in thickness.

##### **4.4.2 Bedrock Geology**

Bedrock in the vicinity of Garden River consists of the Upper Devonian Ireton Formation composed of greenish grey marine shale, calcareous shale and siltstone.

A review of available water well logs in the Alberta Environment and Sustainable Resource Development (AESRD) Water Well Information Database was conducted on March 7, 2014 to determine the depth to the bedrock surface in the vicinity of the site. Bedrock was not encountered in any of the wells to a maximum depth of 17 m below ground surface (bgs). The location of wells within 5 km of the site is shown on Drawing 5.

##### **4.4.3 Regional Hydrogeology**

Regional hydrogeological mapping is not available for the vicinity of the site. Previous environmental assessments completed for the community of Garden River identified that groundwater flow in the surficial deposits is expected to be towards the Peace River.

The base of groundwater protection for the site is 169.62 masl (<https://www3.eub.gov.ab.ca/Eub/COM/BGP/UI/BGP-Main.aspx#>). The deepest protected geological unit is the base of the surficial deposits.

#### **4.5 Regional Water Users**

The community of Garden River is serviced by a municipal water distribution system sourced from the Peace River.

A search conducted of the AESRD Water Well Information Database identified a total of seven water well records within 5 km of the landfill site. One of the records was for a dry hole that was abandoned without a well being installed. Four of the remaining six records listed an intended use of domestic, one had an intended use of dewatering and one had an unknown use.

Information on surface casing installations were available for six of the wells. Five of the six wells were completed as large diameter culvert type wells installed with a backhoe or by boring to a maximum depth of 15 m bgs. One of the wells was installed using a rotary drill rig to a depth of 16.8 m bgs. Lithological descriptions on the well records indicate that the wells were completed in the surficial deposits consisting of clay, sand and/or gravel.

Copies of the available water well records are provided in Appendix B and a map indicating the location of the water well users within a 5 km radius of the site is provided in Drawing 5.

#### **4.6 Regional Hydrology**

The nearest surface water body identified in proximity to the site is Garden Creek located approximately 470 m south of the landfill site. Garden Creek flows from west to east generally parallel to the Peace River in the vicinity of the landfill site. The Peace River is located 1,450 m south of the site. Surface water flows from the site to the south towards Garden Creek. Garden Creek joins the Peace River at a point approximately 2,000 m east of the landfill site, in the community of Garden River.

#### **4.7 Surrounding Land Use**

Land use within 800 m of the landfill site was reviewed as summarized below and shown on Drawing 1:

- South, West, and East: Forested natural areas; and
- North: Highway 58 followed by forested natural area.

The nearest residence to the proposed landfill development area is located greater than 1,000 m to the southeast in the community of Garden River.

#### **5.0 REGULATORY CRITERIA**

The community of Garden River is currently located within Wood Buffalo National Park. It is understood that the community and surrounding land, including the landfill and air strip sites are to be transferred to the Little Red River Cree First Nation. As part of the land transfer process, it is understood that the land will temporarily be transferred to the Province of Alberta.

## 5.1 Landfill Siting Criteria

As outlined in the scope of work for the current project, the design of the new landfill at the site was to conform as much as practical to the Standards for Landfills in Alberta (herein referred to as “the Standards”), dated February 2010, prepared by Alberta Environment now AESRD).

The requirements for natural environmental separation for new landfill or a laterally expanding landfill are outlined in Section 2 of the Standards. Requirements related to geological separation from Section 2.1 are reproduced below:

- (c) *A new landfill or the new waste footprint of a laterally expanding landfill shall not be situated at a location where there exists one or more of the following conditions:*
  - (i) *the area is situated within a ravine, coulee or gully;*
  - (ii) *there is less than 30 metre of geologic materials with an equivalent hydraulic conductivity greater than  $1 \times 10^{-8}$  metres/second between the bottom of the liner, or where no liner is required, immediately beneath where waste will be deposited, excluding sumps or leachate pipe trenches, and an exceptional underlying aquifer; or*
  - (iii) *the geological materials within 10 metres below the bottom of the liner, excluding sumps or leachate pipe trenches, include fractured non-porous bedrock or karst features.*
- (d) *A new landfill or the waste footprint of a laterally expanding landfill, shall only be situated at a location where:*
  - (i) *there is a 5 metre thick layer of a clayey deposit having an equivalent hydraulic conductivity less than  $1 \times 10^{-8}$  metres per second immediately beneath the lowest part of the liner, or where no liner is required, immediately beneath where waste will be deposited, excluding sumps or leachate pipe trenches; and*
  - (ii) *the geologic materials immediately beneath the clayey deposits required in 2.1 (d)(i) or 2.1(d)(ii) consist of at least 3 metres of material providing equivalent or better protection to the requirements in 2.1 (d)(i).*

Prior to the start of the site investigation program, it was acknowledged that the proposed site would not meet the siting requirements due to the lack of clayey soils in close proximity to the community of Garden River. Therefore, as outlined in the draft preliminary design for the new landfill site (SLR, September 2014), the proposed landfill design incorporates a composite liner to provide an equivalent level of environmental protection as the geological materials prescribed by the Standards.

## 5.2 Groundwater Guidelines

Typically at sites under the care and custody of federal agencies, such as Parks Canada, applicable guidelines for comparison of groundwater quality are the Federal Contaminated Sites Action Plan (FCSAP) Federal Interim Groundwater Quality Guidelines and the Health Canada Canadian Drinking Water Quality Guidelines. For the current report, groundwater results have also been compared to the AESRD Tier 1 and 2 Groundwater Remediation Guidelines.

As such, groundwater quality results have been compared to the following guidelines:

- Health Canada, October 2014, Guidelines for Canadian Drinking Water Quality;
- FCSAP, November 2012, Federal Interim Groundwater Quality Guidelines for Contaminated Sites (FIGQG); and
- AESRD, May 2014, Tier 1 and 2 Soil and Groundwater Remediation Guidelines.

Specifically, results are compared to the AESRD Tier 1 Guidelines for Natural Area Land Use with coarse grained soil, and the FIGQG Tier 2 Guidelines for Agricultural Land Use for coarse grained soil with all pathways except Marine Life, Irrigation and Livestock Watering considered operative at the sites. Agricultural guidelines were used for the FIGQG as the most sensitive land use for which guidelines were calculated. This approach is consistent with guidance provided by Parks Canada at other national parks.

The nearest surface water body to the landfill site is located greater than 300 m from the site; however, the Darcy groundwater velocity estimated for the site is greater than  $3 \times 10^{-7}$  m/s (as noted in Section 7.2.2), and therefore the protection of freshwater life guidelines have been considered to be applicable in assessing groundwater quality at the landfill site.

## **6.0 SUBSURFACE ASSESSMENT METHODS**

### **6.1 Drilling Assessment and Soil Sampling**

Borehole drilling was conducted on March 18 to 21, 2014, utilizing a track mounted drill rig equipped with 150 mm diameter solid stem augers and 200 mm diameter hollow stem augers supplied and operated by Frontier Enviro-Drilling Ltd. of Grande Prairie, Alberta.

Twelve boreholes were drilled at the landfill and air strip sites to depths ranging from 6.1 m to 15.2 m bgs as follows:

- Landfill Downgradient: MW14-101, BH14-102A, MW14-102B, MW14-103, BH14-104A, and MW14-104B;
- Landfill Upgradient: MW14-105, BH14-106A, and MW14-106B; and
- Air Strip: MW14-107, MW14-108, and MW14-109.

Locations of boreholes at the landfill were selected to provide geologic and hydrogeological information for the area of the current and proposed landfill development and to provide a long term monitoring well network suitable for use during landfill operations. Locations of the monitoring wells installed at the east end of the air strip were provided by the Environmental Services Group of the Royal Military College, to assess background groundwater quality and determine if groundwater impacts were present at the east end of the air strip due to previously reported hydrocarbon contamination in soil.

Locations of these boreholes are presented on Drawings 2 and 3. The borehole logs are provided in Appendix A.

Soil samples were collected directly from the auger flights as disturbed samples. Soil samples were collected at ground surface and at approximately 0.8 m depth intervals or stratigraphic changes and sealed in plastic bags from all boreholes. A composite sample was made from the soil encountered in the upper 3.0 m in boreholes at the landfill for determination of the suitability of the soil for use in landfill cell construction.

## **6.2 Monitoring Installation**

Monitoring wells were installed in nine of the boreholes drilled. Difficult drilling conditions encountered prevented the installation of monitoring wells in BH14-102A, BH14-104A, and BH14-106A. Monitoring wells were designed and placed to define groundwater flow and water quality below the surface of the new and existing landfill facilities and to allow collection of groundwater samples at the air strip.

The monitoring wells were constructed of 50 mm diameter schedule 40 polyvinyl chloride (PVC) pipe with threaded joints. The screened portion of the well was comprised of 0.25 mm horizontal slots (010 slot) and the annulus was backfilled with silica sand from the bottom of the screen to approximately 0.3 m above the top of the screen. A hydrated bentonite chip seal was placed around the annulus of the solid section of pipe above the screened section and/or to within approximately 0.5 m of ground surface. A 50 mm diameter slip cap was placed on the bottom of the well and a 50 mm diameter threaded cap with coupler was placed on the top of the piezometer. An above ground lockable steel protective casing was placed above the top of the wells. Well construction details are provided in the borehole logs presented in Appendix A. Drawing 2 presents the locations of the wells installed at the landfill and Drawing 3 presents the locations of the well installed at the east end of the air strip.

## **6.3 Groundwater Monitoring and Sampling**

Groundwater monitoring events were conducted on March 20 to 22, 2014, May 21, 2014, July 29, 2014, September 9, 2014, and November 18, 2014. The wells were monitored for standpipe combustible vapour concentrations (CVCs), depth to groundwater and apparent LNAPL thickness. CVC monitoring was conducted using an Eagle RKI hydrocarbon vapour analyzer with methane elimination switch enabled. Depth to groundwater and apparent LNAPL thickness were measured using a Heron interface probe. Monitoring wells were purged a minimum of three well volumes, or until dry, prior to sampling. Water samples were collected from the monitoring well using a dedicated disposable polyethylene bailer after at least 80% of the original well volume had recovered. The water sampled was transferred from the bailer into sample bottles using a VOC sample tube. Water samples were placed in appropriate sample containers provided by the laboratory. Preservative supplied by the laboratory was added to all of the samples, except routine sample bottles, during each monitoring event and all containers were filled to capacity with no headspace. Samples collected for dissolved metals analysis were filtered at the time of collection.

During all monitoring events, except the March 2014 event, field measurements for temperature, conductivity, and pH were collected during sampling. During the March 2014 event, the field meters were not functioning properly due to cold ambient air conditions.

## **6.4 Hydraulic Conductivity Testing**

To evaluate hydraulic conductivity of the soil at the landfill site, rising head tests were performed on MW14-102B, MW14-104B, and MW14-106B on September 9, 2014. Each rising head test

involved measuring the static water level in the well, and then rapidly inducing a change in groundwater elevation, either by removing a bailer of water or using a manufactured slug. Immediately after inducing a water level change, the water levels were measured versus time initially at approximately 30-second intervals and increasing in time between measurements until appropriate recovery of the static water level was reached (>80%).

In addition to the manual readings, a level logger was used to record water elevations during the rising head test. The hydraulic conductivity analysis was conducted using the Bouwer - Rice method of analysis. The hydraulic conductivity analyses are presented in Appendix C.

## **6.5 Laboratory Program**

### **6.5.1 Geotechnical Laboratory Program**

Selected samples were submitted for geotechnical laboratory testing. Samples were submitted to ParklandGEO in Grande Prairie, Alberta for analysis of:

- Moisture content;
- Grain size distribution; and
- Proctor density.

Copies of the geotechnical laboratory testing reports are provided in Appendix D.

### **6.5.2 Groundwater Analysis**

Groundwater samples were collected from all wells with sufficient water during sampling events conducted on March 22, 2014, May 22, 2014, July 29, 2014, September 9, 2014, and November 18, 2014 for laboratory analysis. The groundwater samples were submitted to the laboratory for analysis of the following parameters:

- General and inorganic parameters: pH, total dissolved solids (TDS), alkalinity, ammonia, total Kjeldahl nitrogen, electrical conductivity, hardness;
- Major Ions: chloride, calcium, magnesium, sodium, potassium, sulphate, nitrate-N, nitrite-N;
- Dissolved organic carbon and phenols;
- Petroleum hydrocarbons: benzene, toluene, ethylbenzene, xylenes (BTEX), petroleum hydrocarbon (PHC) fractions (F)1 and F2;
- Dissolved Metals: arsenic, barium, beryllium, boron, cadmium, chromium, copper, iron, lead, lithium, manganese, molybdenum, mercury, nickel, phosphorus, silicon, silver, strontium, thallium, tin, vanadium, uranium, zinc; and
- Volatile organic compounds: including methylene chloride, vinyl chloride, trichloroethylene (TCE), tetrachloroethylene (PCE).

The laboratory analysis reports and chain-of-custody documents are presented in Appendix E.

## **6.6 Site Survey**

All new boreholes and piezometers were surveyed by Altus Geomatics Limited Partnership of High Level, Alberta. Monitoring well locations were determined using survey grade GPS equipment and recorded in UTM coordinates to NAD 83 datum. Vertical elevations for top of casing and ground surface at each piezometer location were determined relative to mean sea level.

## **6.7 Quality Assurance and Quality Control (QA and QC)**

A QA/QC program was included as part of the groundwater monitoring and sampling program to evaluate if the sampling methods and analytical data are reliable based on current industry standards. The QA/QC program consisted of two stages, with one stage completed by the laboratory and the other as part of the standard field procedures performed by SLR.

### **6.7.1 Laboratory QA/QC Program**

All groundwater samples were analyzed by Maxxam Analytics (Maxxam) in Grande Prairie and Edmonton, Alberta. Maxxam is a Canadian Association of Laboratory Accreditation Inc. (CALA) accredited laboratory that uses Ministry of Environment recognized methods to conduct laboratory analysis. As conveyed by the laboratory, method blanks, control standards samples, certified reference material standards, method spikes, replicates, duplicates and instrument blanks are routinely analyzed as part of their QA/QC programs.

### **6.7.2 Field QA/QC Program**

Field procedures were implemented to minimize the potential of cross contamination between sampling locations. Sample handling protocols are established to track and maintain the integrity of the samples. Field handling of groundwater samples is minimized by transferring samples directly into containers from the groundwater sampling device. Disposable nitrile gloves were used at all times and changed between samples.

To verify the reproducibility of the laboratory analyses and to demonstrate that the field sampling techniques utilized by SLR personnel are capable of yielding reproducible results, SLR collected one blind field duplicate (BFD) samples during each sampling event. In addition, for volatile groundwater parameters a trip blank, prepared by the analytical laboratory accompanied every set of samples collected at the site. One field (equipment) blank was prepared for each sampling event by passing organic free water (for organic parameters) or de-ionized water (for inorganic parameters) through a clean set of sampling equipment to simulate sample collection conditions.

Based on the results of the BFD analysis, the relative percent difference (RPD) were calculated as a measure of the QA/QC. RPD is defined as the difference between the duplicate results divided by the mean of the results, expressed as a percentage. Analytical error increases near the method detection limit (MDL); therefore, the RPD is not normally calculated unless the concentrations of both the original and duplicate samples are greater than five times the MDL. If the RPD for a sample and its duplicate do not meet SLR's RPD standards for groundwater (60% for most organic parameters, 40% for inorganic parameters) for the parameters analyzed, an explanation is required to qualify the difference in values.

## **7.0 DISCUSSION OF RESULTS**

### **7.1 Site Stratigraphy**

#### **7.1.1 Landfill Site**

Stratigraphy encountered at the landfill site consists of a thin covering of topsoil overlying sand which in turn overlies clay to the maximum depth of investigation of 15.2 m in MW14-102A, MW14-104A, and MW14-106A. A stratigraphic cross section showing the geology encountered at the site during the current site investigations is presented in Drawing 6.

A thin layer of topsoil or organic material 25 mm in thickness was encountered in all boreholes.

Sand was encountered below the topsoil in all boreholes except MW14-102A where a silt layer was encountered to a depth of 1.1 m bgs overlying the sand. The sand ranged from fine to coarse grained and had varying amounts of silt and gravel with depth. Clay lenses (<25 mm in thickness) were encountered in MW14-101 at 6.4 m, MW14-102B at 6.9 m, MW14-103 at 8.8 m, MW14-105 at 5.6 m, and MW14-106B at 8.1 m. Photographs of the sand as exposed in the waste disposal pit that was used at the time of the assessment work are shown in Photographs 9 and 10.

Beneath the sand, clay was encountered in BH14-102A, BH14-104A, and BH14-106A at depths of 13.3 m bgs, 12.8 m bgs, and 11.3 m bgs, respectively. The clay was described as being grey, silty, soft with medium to high plasticity, and wet.

Bedrock was not encountered in any of the boreholes completed at the landfill site.

#### **7.1.2 Air Strip**

The surface elevation at the east end of the air strip decreased from 241.58 m at MW14-109 to 234.48 m at MW14-107, reflecting a change in topography associated with an erosional feature of a historic channel of the Peace River. As a result, the stratigraphy encountered in the three boreholes varied.

MW14-109 completed at the higher elevation encountered sand from beneath a thin layer of topsoil to the maximum depth of investigation of 12.2 m. The sand was consistent with the sand encountered at the landfill site.

MW14-107 and MW14-108 completed at the bottom of the slope at a lower elevation encountered clay beneath a thin layer of topsoil to the maximum depth of investigation of 6.1 m in MW14-107 and 7.6 m in MW14-108. The clay ranged from having no silt to silty having low to medium plasticity.

### **7.2 Hydrogeology**

#### **7.2.1 Groundwater Elevations**

A summary of the groundwater monitoring conducted as part of this investigation is included in Table 1.

### *7.2.1.1 Landfill*

Depth to groundwater in the wells installed at the landfill ranged from 9.21 m bgs in MW14-106B on March 21, 2014 and May 21, 2014 to 9.90 m bgs in MW14-102B on November 18, 2014. Groundwater elevations ranged from 231.35 m asl in MW14-101 and MW14-102B on November 18, 2014 to 231.61 m asl in MW14-105 on March 21 and May 21, 2014. Groundwater elevations remained relatively constant over the nine month monitoring period with a maximum of 5 cm in elevation change.

Groundwater flow direction was indicated to be to the southwest during all five monitoring events under a gradient of 0.001 m/m during all monitoring events.

### *7.2.1.2 Air Strip*

Depth to groundwater in the wells installed at the east end of the air strip ranged from 5.59 m bgs in MW14-107 on May 21, 2014 to 9.71 m bgs in MW14-109 on November 18, 2014. MW14-107 and MW14-108 were dry during the September and November 2014 monitoring events and had limited water during the May and July 2014 monitoring events.

Insufficient information was available to determine groundwater flow directions in the air strip wells.

## **7.2.2 Hydraulic Conductivity Analyses**

Hydraulic conductivity testing was completed during the September 2014 monitoring event on monitoring wells MW14-102B, MW14-104B and MW14-106B located at the landfill site. Multiple tests were completed on MW14-102B and MW14-104B due to rapid recoveries recorded. The results obtained from the tests are summarized below and analysis records are included in Appendix C:

- MW14-102B:  $4 \times 10^{-4}$  m/s,  $3 \times 10^{-4}$  m/s,  $4 \times 10^{-4}$  m/s;
- MW14-104B:  $5 \times 10^{-4}$  m/s,  $3 \times 10^{-4}$  m/s,  $3 \times 10^{-4}$  m/s; and
- MW14-106B:  $3 \times 10^{-4}$  m/s.

On the basis of the hydraulic conductivity values measured at the landfill site and hydraulic gradient, the Darcy velocity estimated for the landfill site is  $1 \times 10^{-6}$  m/s assuming an effective porosity of 0.3.

## **7.2.3 Groundwater Chemistry**

### *7.2.3.1 Field Parameters*

Field parameters were measured during groundwater sampling during all events except during the March 2014 event when the multi-meter was not functioning due to extremely low ambient air temperatures. The pH values recorded during the July 2014 event are also considered to reflect issues with calibration of the pH function of the multi-meter and do not accurately reflect groundwater pH values. Field parameters recorded during the sampling events are summarized in Table 2.

The pH values recorded during the sampling events (not including July) ranged from 7.0 in monitoring well MW14-103 on September 9, 2014 to 7.7 in monitoring well MW14-103 on November 18, 2014. Groundwater electrical conductivity (EC) values ranged from 595 micro-Siemens per centimetre ( $\mu\text{S}/\text{cm}$ ) in MW14-102B on July 29, 2014 to 819  $\mu\text{S}/\text{cm}$  in MW14-101 on November 18, 2014. Groundwater temperatures ranged from 2.5°C in monitoring well MW14-104B on November 18, 2014 to 10.4°C in monitoring well MW14-102B on July 29, 2014.

#### *7.2.3.2 Landfill*

Groundwater samples were collected from all six wells completed at the landfill on each of the five monitoring events conducted. Analytical results are summarized in Tables 3 to 6. Laboratory reports are presented in Appendix E.

#### Routine Parameters

All routine parameters (major ions, TDS, EC, pH, etc.) analyzed were below guidelines at all the landfill wells during all sampling events.

Overall mineralization of the groundwater samples from the wells completed at the landfill was low, with TDS concentrations ranging from 350 mg/L in MW14-104B on March 20, 2014 to 430 mg/L in MW14-101 in May 22, 2014. Chloride concentrations ranged from 3.7 mg/L in MW14-104B on July 29, 2014 to 6.8 mg/L in MW14-102B on May 22, 2014.

Total ammonia concentrations exceeded guideline in MW14-101 (all sampling events), MW14-102B (all sampling events), and MW14-105 (all sampling events except July). It is noted that the guideline for ammonia is dependent on the pH and temperature of a surface water body. For conservativeness, the maximum temperature and pH of the groundwater samples collected during the five sampling events was used to calculate the guidelines. Future sampling events should include measurement of field parameters (pH and temperature) in Garden Creek, so that site specific guidelines for ammonia can be calculated.

#### Phenols

Phenols concentrations above the guideline value were observed in samples collected from all monitoring wells at the landfill on at least one occasion.

- MW14-101: 0.0066 mg/L on March 20, 2014, 0.0045 mg/L on July 29, 2014 and September 9, 2014;
- MW14-102B: 0.0053 mg/L in duplicate only on March 20, 2014, 0.0044 mg/L on July 29, 2014, and 0.0055 mg/L in duplicate only on September 9, 2014;
- MW14-103: 0.0075 mg/L on March 20, 2014, and 0.0045 mg/L on September 9, 2014;
- MW14-104B: 0.0050 mg/L on March 20, 2014, and 0.0045 mg/L on July 29, 2014;
- MW14-105: 0.0041 mg/L on July 29, 2014; and
- MW14-106B: 0.0055 mg/L on March 22, 2014.

All of the phenols concentrations observed that exceeded guideline were close (less than five times) to the laboratory detection limit of 0.0020 mg/L.

### Hydrocarbons

Concentrations of BTEX, F1 and F2 were generally below the laboratory detection limit at all wells during all sampling events, with the exception of a F1 concentration of 0.15 mg/L in monitoring well MW14-103 during the September 2014 sampling event. This concentration was less than five times the laboratory detection limit and below the guideline value of 0.81 mg/L.

### Dissolved Metals

Dissolved metals concentrations were below guidelines for most metal parameters. Individual metals with exceedences of guidelines are summarized below:

- Arsenic concentrations were measured to range from below the laboratory detection limit to a maximum of 0.017 mg/L in MW14-101 on July 29, 2014. Concentrations exceeded guideline in the following wells:
  - MW14-101 (all sampling events);
  - MW14-102B and its duplicate (all sampling events);
  - MW14-103 (July 29, 2014, September 9, 2014, and November 18, 2014);
  - MW14-105 (July 29, 2014 and November 18, 2014); and
  - MW14-106B (November 18, 2014).
- Cadmium concentrations were measured to range from below the laboratory detection limit to a maximum of 0.000059 mg/L in MW14-105 on July 29, 2014. Concentrations exceeded guideline in the following wells:
  - MW14-101 (March 20, 2014 and May 22, 2014 [lab detection limits were raised above guideline for the September 2014 and November 2014 events]);
  - MW14-102B (March 20, 2014, May 22, 2014, July 29, 2014 duplicate [lab detection limits were raised above guideline for the September 2014 and November 2014 events]);
  - MW14-103 (all sampling events);
  - MW14-104B (all sampling events);
  - MW14-105 (March 22, 2014, May 22, 2014, July 29, 2014, September 9, 2014 [lab detection limits were raised above guideline for the November 2014 events]); and
  - MW14-106B (all sampling events).

It is noted that the CCME freshwater guideline was revised to range from 0.00009 mg/L to 0.00037 mg/L dependent on water hardness, for long term exposure. These revised guidelines

had not been incorporated into the FIGQG at the time of this report. All concentrations recorded at the landfill site would be below the revised cadmium guideline.

- Iron concentrations were measured to range from below the laboratory detection limit to a maximum of 12 mg/L in MW14-101 on July 29, 2014 and November 18, 2014. Concentrations exceeded guideline in all wells during multiple sampling events.
- Manganese concentrations were measured to range from 0.02 mg/L in MW14-104B on May 22, 2014 to 0.53 mg/L in MW14-101 on July 29, 2014. Concentrations exceeded guidelines in all wells during all sampling events, with the exception of MW14-104B on May 22, 2014.
- Mercury concentrations exceeded guideline in MW14-101 on July 29, 2014. Detectable mercury concentrations were also recorded on May 22, 2014. During the remaining sampling events, the concentration in this well was below the laboratory detection limit.
- Selenium concentrations were measured to range from below the laboratory detection limit to a maximum of 0.0034 mg/L in MW14-104B on May 22, 2014. Concentrations exceeded guideline in the following wells:
  - MW14-103 (March 20, 2014 and May 22, 2014);
  - MW14-104B (all sampling events);
  - MW14-105 (March 22, 2014, May 22, 2014, and September 9, 2014); and
  - MW14-106B (March 22, 2014 and May 22, 2014).

#### Volatile Organic Compounds (VOCs)

VOC concentrations were below laboratory detection limits for all parameters at all landfill wells sampled during all sampling events.

#### *7.2.3.3 Air Strip*

#### Routine Parameters

All routine parameters (major ions, TDS, EC, pH, etc.) analyzed were below guidelines at the air strip wells during all sampling events, with the exception of TDS in MW14-107 (630 mg/L) and MW14-108 (1,200 mg/L) on May 22, 2014. Both of these wells were completed in clay and the elevated TDS likely reflect slower groundwater movement through the soil at these locations. Chloride concentrations in these wells were 6.6 mg/L (MW14-107) and 5.2 mg/L (MW14-108).

TDS concentrations in MW14-109 completed in the sand were 370 mg/L during all sampling events, with chloride concentrations between 3.5 mg/L and 4.2 mg/L. Total ammonia concentrations exceeded guideline in MW14-107 (May) and MW14-108 (May).

### Phenols

A phenols concentration (0.0110 mg/L) above guideline was recorded in MW14-109 on March 22, 2014. Phenols concentrations in samples from other monitoring events and from MW14-107 and MW14-108 were below guideline.

### Hydrocarbons

Concentrations of BTEX, F1 and F2 were below the laboratory detection limit at the wells at the air strip during all sampling events.

### Dissolved Metals

Dissolved metals concentrations were below guidelines for most metal parameters. Individual metals with exceedences of guidelines are summarized below:

- Arsenic concentration (0.011 mg/L) exceeded guideline in monitoring well MW14-108 on May 22, 2014.
- Cadmium concentrations ranged from 0.000022 mg/L in MW14-109 on November 18, 2014 to 0.000033 mg/L in MW14-109 on March 22, 2014 exceeded guideline in all samples collected at the air strip. It is noted that the CCME freshwater guideline was revised to range from 0.00009 mg/L to 0.00037 mg/L dependent on water hardness for long term exposure. These revised guidelines had not been incorporated into the FIGQG at the time of this report. All concentrations recorded at the air strip site would be below the revised cadmium guideline.
- Iron concentrations in all samples except MW14-107 on May 22, 2014, exceeded guidelines with concentrations ranging from 0.74 mg/L in MW14-109 on May 22, 2014 to 40 mg/L in MW14-108 on May 22, 2014.
- Manganese concentrations in all samples exceeded guidelines with concentrations ranging from 0.3 mg/L in MW14-109 on May 22, 2014 to 1.4 mg/L in MW14-108 on May 22, 2014.

### Volatile Organic Compounds (VOC)

VOC concentrations were below laboratory detection limits for all parameters at all air strip wells sampled during all sampling events.

## **7.3 Geotechnical Laboratory Results**

Geotechnical laboratory reports are included in Appendix D.

Grain size distribution was determined on five samples of the soil encountered in MW14-106B at depths of 1.5 m, 3.0 m, 4.5 m, 6.0 m, and 7.5 m. The samples collected at 3.0 m, 6.0 m, and 7.5 m indicated a relatively uniform gradation with approximately 90% of the particles having diameters between 0.08 mm and 0.6 mm corresponding to a fine grained sand. The samples from 1.5 m and 4.5 m indicated an increased proportion of fine grained particles with 67.4% and 80.5%, respectively, of particles passing a 0.08 mm sieve.

Gravimetric moisture content was determined on all samples from MW14-106B and from the clay samples collected below 12.2 m in BH14-106A. Gravimetric moisture content in the sand ranged from 3.2% in the unsaturated zone to 21.8% below the water table. Gravimetric moisture content in the clay ranged from 23.6% to 33.2%.

A bulk sample of the sand from 0 m to 3.0 m bgs was analyzed to determine its suitability for use in the construction of berms or other site infrastructure if required. The Proctor density of the sample was determined to be a dry density of 1,805 kg/m<sup>3</sup> at an optimum moisture content of 14.2%.

On the basis of the geotechnical laboratory results, SLR concludes that the native sand would be suitable as a bulk fill for construction purposes. It is possible that due to the relatively narrow grain size distribution it may be difficult to achieve effective compaction on this material which may limit its usefulness in applications requiring structural fill.

#### **7.4 Quality Assurance/Quality Control (QA/QC)**

A QA/QC program was conducted to evaluate if the sampling and analytical data were reliable based on current industry standards. The QA/QC program consisted of two components, with one stage completed by the laboratory and the other as part of the standard field procedures performed by SLR. Copies of the laboratory certificates are included in Appendix E.

##### **7.4.1 Laboratory QA/QC Program**

Maxxam is a CALA accredited laboratory that uses Ministry of Environment recognized methods to conduct laboratory analyses. As conveyed by the laboratory, method blanks, control standards samples, certified reference material standards, method spikes, replicates, duplicates and instrument blanks are routinely analyzed as part of their QA/QC programs.

Maxxam identified the following deviations from their standard QA/QC criteria over the five sampling events:

- March:
  - Ion balance in MW14-101 was 1.2, exceeding the lab control limits. The sample was re-analyzed yielding the same results; and
  - The spiked blank sample recorded dissolved antimony recovery was below control limits.
- May:
  - The matrix spike for total Kjeldahl nitrogen recovery was below control limits.
- July:
  - The spiked blank recovery of trichlorofluoromethane and chloromethane was below control limits.

- September:
  - The matrix spike dissolved antimony recovery was below control limits.
- November:
  - The method blank recovery for the O-terphenyl surrogate exceeded control limits; and
  - The matrix spike dissolved antimony was below control limits.

Maxxam stated on all the above occasions that the overall quality control for the analysis meets acceptability criteria.

#### **7.4.2 Field QA/QC Program**

To verify the reproducibility of the laboratory analyses and to demonstrate that the field sampling techniques utilized by SLR personnel are capable of yielding reproducible results, SLR collected BFD groundwater samples during each sampling event. These BFDs were submitted for laboratory analysis of all parameters. The RPD for all parameters greater than five times the MDL was less than 60%, and meets SLR QA/QC standards.

All field blank and trip blank samples for BTEX, F1, F2, and VOCs were below laboratory detection limits during all sampling events. All field blanks for metals were below laboratory detection limits during all sampling events. Routine parameters in the field blank samples were generally below detection limit, with the following exceptions:

- Concentrations of total alkalinity, bicarbonate, electrical conductivity, ammonia, and dissolved organic carbon were detected on one or more occasion, however, the concentrations were less than two times the laboratory detection limit;
- The pH in all field blank samples were below guideline range, likely due to the formation of carbonic acid in the sample during exposure to the atmosphere; and
- Phenols were detected in July (0.0031 mg/L) and September 2014 (0.0043 mg/L); however, the concentrations were less than three times the laboratory detection limit.

### **8.0 SUMMARY AND RECOMMENDATIONS**

Stratigraphy encountered at the landfill site consists of a thin covering of topsoil overlying sand extending to 11.3 m to 13.3 m bgs. Clay was encountered beneath the sand. The site would not satisfy the siting requirement from the Standards, which require a 5 m thick clayey layer to be present immediately beneath the lowest point of the waste. Therefore, the landfill design will include a composite liner to provide an equivalent level of protection.

The depth to groundwater at the site during 2014 has ranged from 9.2 m to 9.9 m bgs. The proposed landfill design assumes that the base of the landfill will be greater than 5 m above the maximum groundwater level encountered. The base of the landfill cells will be limited to depths of 4 m bgs.

Groundwater quality results suggest that groundwater at the landfill site has not been impacted by the current operations. The presence of thick unsaturated sand deposits between the waste and the water table, coupled with the low precipitation and infiltration, likely restricts downward migration of leachate from the landfill. This could be confirmed by conducting unsaturated groundwater flow modelling.

Concentrations of phenols, total ammonia, arsenic, cadmium, iron, manganese, mercury, and selenium exceeding guidelines were noted in samples collected in 2014.

Concentrations of cadmium, iron, and manganese were also noted in MW14-109 at the air strip site, installed in a similar geological setting and in MW14-105 and MW14-106B located upgradient of the existing disposal area. Arsenic and selenium were also detected above guideline in MW14-105 (arsenic and selenium) and MW14-106B (selenium only). Concentrations of arsenic, cadmium, iron, manganese, and selenium above guideline are commonly encountered in shallow groundwater in Alberta.

Mercury was only detected above guideline in MW14-101 on one occasion, after which the concentrations in this well were below laboratory detection limit. Phenols above guidelines were detected both in MW14-109 at the air strip and in MW14-105 and MW14-106B upgradient of the existing disposal area. Concentrations fluctuated from above guideline to below laboratory detection limit and generally were less than five times the laboratory detection limit. Laboratory accuracy decreases as concentrations approach the detection limit. Total ammonia concentrations above guidelines were detected both in downgradient wells MW14-101, MW14-102B, an upgradient well MW14-105, and both wells (MW14-107 and MW14-108) completed in the clay at the airstrip. The guideline for total ammonia is dependent on the pH and temperature of a surface water body. Site specific information on water pH and temperature in Garden Creek (the closest surface water body to the landfill) is recommended to be collected to determine the risk associated with the measured ammonia concentrations.

The monitoring well network that was installed at the landfill site can be used for long term monitoring to detect potential groundwater impacts from landfill operations. Long term groundwater monitoring at the site should be conducted in accordance with the requirements of the Standards. In addition to the existing monitoring wells, it is recommended that two wells be installed on the north side of Highway No. 58 to provide additional background groundwater quality information.

Under the Standards, semi-annual groundwater monitoring would be required during the operational life of the landfill. Three more events should be conducted for the full list of parameters analyzed for in the 2014 monitoring, after which the groundwater monitoring program can be reduced to the detection level parameters outlined in Table 5.2 for the Standards, consisting of routine parameters (general and inorganic parameters plus major ions), dissolved iron and manganese, and dissolved organic carbon. Sampling in future years should also include collection of surface water samples from Garden Creek south of the site for analysis of routine parameter, in order to allow for calculation of site specific guidelines for parameters such as ammonia.

Groundwater results collected during the active life of the landfill should be compared to the groundwater performance standards below:

- Groundwater quality should not display an increasing trend;

- Groundwater parameters should not exceed the control limits established using an accepted control chart methodology; and
- Concentration of parameters not naturally present in the groundwater (such as BTEX or other VOCs) should not be detected in three consecutive sampling events.

It is recommended that once data from a sufficient number of groundwater monitoring and sampling events are available for each of the wells, upper and lower control limits be established for parameters that may be indicative of impact from the landfill (such as chloride, TDS, and sulphate). The Shewhart-CUSUM control chart methodology as outlined in the United States Environmental Protection Agency document *Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities* (March 2009) is recommended for the establishment of control limits. The Shewhart-CUSUM control chart methodology requires eight sampling events be completed prior to the establishment of control limits.

## **9.0 STATEMENT OF LIMITATIONS**

This report has been prepared and the work referred to in this report has been undertaken by SLR Consulting (Canada) Ltd. (SLR) for Parks Canada Agency, hereafter referred to as the "Client". It is intended for the sole and exclusive use of Parks Canada Agency. Other than by the Client and as set out herein, copying or distribution of this report or use of or reliance on the information contained herein, in whole or in part, is not permitted without the express written permission of SLR.

This report has been prepared for specific application to this site and site conditions existing at the time work for the report was completed. Any conclusions or recommendations made in this report reflect SLR's professional opinion based on limited investigations including: visual observation of the site, surface and subsurface investigation at discrete locations and depths, and laboratory analysis of specific chemical parameters. The results cannot be extended to previous or future site conditions, portions of the site that were unavailable for direct investigation, subsurface locations which were not investigated directly, or chemical parameters and materials that were not addressed. Substances other than those addressed by the investigation may exist within the site; and substances addressed by the investigation may exist in areas of the site not investigated in concentrations that differ from those reported. SLR does not warranty information from third party sources used in the development of investigations and subsequent reporting.

Nothing in this report is intended to constitute or provide a legal opinion. SLR expresses no warranty to the accuracy of laboratory methodologies and analytical results. SLR makes no representation as to the requirements of compliance with environmental laws, rules, regulations or policies established by federal, provincial or local government bodies. Revisions to the regulatory standards referred to in this report may be expected over time. As a result, modifications to the findings, conclusions and recommendations in this report may be necessary.

The Client may submit this report to Alberta Environment and Sustainable Resource Development and/or related Alberta or Canada environmental regulatory authorities or persons for review and comment purposes.

## **TABLES**

Groundwater Characterization Report  
Landfill and Air Strip  
Garden River, Alberta  
SLR Project No. 200.20022.00000

**Table 1**  
**Summary of Groundwater Monitoring**

Monitoring Well	Date dd-mmm-yyyy	TOC Elevation (m)	Standpipe Vapour Concentration* (ppm)	Apparent LNAPL Thickness** (mm)	Depth to Groundwater (m BTOC)	Depth to Groundwater (m bgs)	Groundwater Elevation*** (masl)	Comments
<b>Landfill Wells</b>								
MW14-101	20-Mar-2014	241.86	5	0	10.46	9.70	231.40	Water Sampled
	21-May-2014	241.86	0	0	10.46	9.70	231.40	Water Sampled
	29-Jul-2014	241.86	5	0	10.48	9.71	231.38	Water Sampled
	9-Sep-2014	241.86	5	0	10.49	9.72	231.37	Water Sampled
	18-Nov-2014	241.86	0	0	10.51	9.74	231.35	Water Sampled
MW14-102B	20-Mar-2014	241.92	5	0	10.53	9.85	231.39	Water Sampled
	21-May-2014	241.92	0	0	10.53	9.85	231.39	Water Sampled
	29-Jul-2014	241.92	80	0	10.55	9.87	231.37	Water Sampled
	9-Sep-2014	241.92	0	0	10.55	9.88	231.37	Water Sampled
	18-Nov-2014	241.92	0	0	10.57	9.90	231.35	Water Sampled
MW14-103	20-Mar-2014	241.92	5	0	10.39	9.63	231.53	Water Sampled
	21-May-2014	241.92	0	0	10.39	9.62	231.53	Water Sampled
	29-Jul-2014	241.92	0	0	10.42	9.65	231.51	Water Sampled
	9-Sep-2014	241.92	0	0	10.43	9.66	231.50	Water Sampled
	18-Nov-2014	241.92	0	0	10.44	9.67	231.48	Water Sampled
MW14-104B	20-Mar-2014	241.56	0	0	10.11	9.30	231.45	Water Sampled
	21-May-2014	241.56	0	0	10.11	9.30	231.45	Water Sampled
	29-Jul-2014	241.56	15	0	10.13	9.32	231.43	Water Sampled
	9-Sep-2014	241.56	0	0	10.14	9.33	231.42	Water Sampled
	18-Nov-2014	241.56	0	0	10.15	9.34	231.41	Water Sampled
MW14-105	21-Mar-2014	241.97	0	0	10.36	9.61	231.61	Water Sampled
	21-May-2014	241.97	0	0	10.36	9.61	231.61	Water Sampled
	29-Jul-2014	241.97	0	0	10.38	9.63	231.59	Water Sampled
	9-Sep-2014	241.97	0	0	10.39	9.64	231.58	Water Sampled
	18-Nov-2014	241.97	0	0	10.41	9.66	231.56	Water Sampled
MW14-106B	21-Mar-2014	241.48	5	0	9.97	9.21	231.51	Water Sampled
	21-May-2014	241.48	0	0	9.98	9.21	231.50	Water Sampled
	29-Jul-2014	241.48	5	0	10.00	9.23	231.49	Water Sampled
	9-Sep-2014	241.48	0	0	10.00	9.24	231.48	Water Sampled
	18-Nov-2014	241.48	0	0	10.02	9.26	231.46	Water Sampled
<b>Air Strip Wells</b>								
MW14-107	21-May-2014	235.21	0	0	6.32	5.59	228.89	Water Sampled
	29-Jul-2014	235.21	0	0	6.67	5.94	228.54	Insufficient water to sample
	9-Sep-2014	235.21	0	0	dry	n/a	n/a	Dry
	18-Nov-2014	235.21	0	0	dry	n/a	n/a	Dry
	21-May-2014	235.38	0	0	7.69	6.91	227.69	Water Sampled
MW14-108	29-Jul-2014	235.38	0	0	8.31	7.54	227.07	Insufficient water to sample
	9-Sep-2014	235.38	0	0	dry	n/a	n/a	Dry
	18-Nov-2014	235.38	0	0	dry	n/a	n/a	Dry
	21-Mar-2014	242.29	5	0	10.39	9.68	231.91	Water Sampled
	21-May-2014	242.29	0	0	10.36	9.65	231.93	Water Sampled
MW14-109	29-Jul-2014	242.29	25	0	10.38	9.67	231.91	Water Sampled
	9-Sep-2014	242.29	0	0	10.40	9.69	231.89	Water Sampled
	18-Nov-2014	242.29	0	0	10.42	9.71	231.87	Water Sampled

**Notes:**

m - metres

TOC - Top of Casing

ppm - part per million

mm - millimetres

m BTOC - metres Below Top of Casing

m bgs - metres below ground surface

LNAPL - Light Non-Aqueous Phase Liquid

masl - metres above sea level

n/a - not applicable

\* Standpipe vapour concentrations were measured using an EAGLE RKI vapour analyzer calibrated to methane.

\*\* Apparent LNAPL thickness was measured using a Heron or ORS interface probe.

\*\*\* Groundwater Elevation is corrected for LNAPL thickness with an assumed specific gravity of 0.8 kg/L.

**Table 2**  
**Summary of Field Parameters**

Monitor Well	Date (dd-mmm-yyyy)	pH	Electrical Conductivity (µS/cm)	Temperature (°C)
MW14-101	22-May-2014	7.2	809	5.0
	29-Jul-2014	6.0	704	7.9
	9-Sep-2014	7.2	764	4.4
	18-Nov-2014	7.6	819	3.1
MW14-102B	22-May-2014	7.2	678	6.3
	29-Jul-2014	6.3	595	10.4
	9-Sep-2014	7.3	672	4.3
	18-Nov-2014	7.4	764	2.5
MW14-103	22-May-2014	7.4	742	5.5
	29-Jul-2014	5.7	654	6.8
	9-Sep-2014	7.0	682	5.5
	18-Nov-2014	7.7	806	3.4
MW14-104B	22-May-2014	7.4	671	5.9
	29-Jul-2014	5.8	612	7.6
	9-Sep-2014	7.2	630	4.6
	18-Nov-2014	---	739	2.5
MW14-105	22-May-2014	7.4	697	5.8
	29-Jul-2014	6.2	637	7.4
	9-Sep-2014	7.2	662	4.4
	18-Nov-2014	7.4	758	2.8
MW14-106B	22-May-2014	7.4	709	5.0
	29-Jul-2014	6.2	632	7.4
	9-Sep-2014	7.2	685	4.2
	18-Nov-2014	7.4	767	2.6
MW14-107	22-May-2014	Not Enough Water		
	29-Jul-2014	Dry		
	9-Sep-2014	Dry		
	18-Nov-2014	Dry		
MW14-108	22-May-2014	Not Enough Water		
	29-Jul-2014	Dry		
	9-Sep-2014	Dry		
	18-Nov-2014	Dry		
MW14-109	22-May-2014	7.5	673	5.9
	29-Jul-2014	6.2	597	7.5
	9-Sep-2014	7.2	638	4.4
	18-Nov-2014	7.6	706	3.0

Notes:

mS/cm - milliSiemens per centimetre

°C - degrees Celsius

"---" - value not recorded

Field parameters measured using a YSI multimeter

*Italics* - pH readings reflect poor calibration of the pH meter

Table 3  
Summary of Groundwater Analytical Results - Routine Parameters & Phenols

Location		Overall Guideline	Landfill														
Monitoring Well  Date (dd-mmm-yyyy)			MW14-101					MW14-102B									
			20-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014	20-Mar-2014	Dup1 (20-Mar-2014)	22-May-2014	Dup1 (22-May-2014)	29-Jul-2014	Dup1 (29-Jul-2014)	9-Sep-2014	MW13-101 (9-Sep-2014)	18-Nov-2014	Dup1 (18-Nov-2014)
Parameter	Unit																
pH		6.5 - 8.5	7.63	7.54	7.49	8.26	7.95	7.69	7.69	7.72	7.86	7.69	7.75	8.12	8.30	8.08	7.88
Alkalinity (PP as CaCO3)	mg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Anion Sum	meq/L	NG	7.7	8.2	8.2	7.9	7.8	7.1	6.9	7.5	7.5	7.6	7.5	7.2	7.3	7.3	7.9
Cation Sum	meq/L	NG	9.0	9.0	8.0	8.1	8.7	7.8	7.9	8.0	8.0	8.2	8.3	7.5	7.9	7.8	7.7
Ion Balance	N/A	NG	1.2	1.1	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0
Dissolved Nitrate (NO3)	mg/L	13	0.120	0.081	0.160	0.054	0.085	0.085	0.096	0.092	0.096	0.099	0.089	0.058	0.063	0.046	0.049
Dissolved Nitrite (NO2)	mg/L	0.197	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Total Alkalinity	mg/L CaCO <sub>3</sub>	NG	340	370	360	350	350	330	320	350	360	360	360	340	340	340	370
Bicarbonate	mg/L	NG	420	450	440	420	430	400	400	430	430	440	440	410	420	420	460
Carbonate	mg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hydroxide	mg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Electrical Conductivity	µS/cm	NG	710	720	730	720	720	660	660	660	660	670	670	660	660	680	670
Chloride	mg/L	120	5.5	6.3	5.6	5.6	5.5	6.4	6.3	6.8	6.7	6.0	6.0	6.2	6.0	6.2	6.3
Sulphate	mg/L	429	37	35	36	37	30	15	13	11	12	10	10	11	11	11	10
Dissolved Calcium	mg/L	NG	120	110	97	100	110	100	100	100	100	110	110	96	100	98	98
Dissolved Magnesium	mg/L	NG	26	27	24	25	26	24	24	25	25	26	26	23	24	24	24
Dissolved Sodium	mg/L	200	14	14	14	13	14	13	13	12	13	14	14	14	14	14	14
Dissolved Potassium	mg/L	NG	2.7	3	2.6	2.6	2.9	2.8	2.8	3.2	3.2	3.4	3.3	2.8	2.6	3	3
Total Hardness	mg/L CaCO <sub>3</sub>	NG	400	390	340	360	370	350	360	360	360	370	380	340	350	350	340
Calculated Total Dissolved Solids	mg/L	500	410	430	410	400	410	360	360	380	380	380	390	360	370	370	380
Nitrite + Nitrate	mg/L	NG	0.028	0.018	0.036	0.012	0.019	0.019	0.022	0.021	0.022	0.022	0.02	0.013	0.014	0.01	0.011
Nitrate as N	mg/L	2.9	0.028	0.018	0.036	0.012	0.019	0.019	0.022	0.021	0.022	0.022	0.02	0.013	0.014	0.01	0.011
Nitrite as N	mg/L	0.06	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Ammonia - N	mg/L	0.282	0.59	0.91	0.71	0.66	0.65	0.38	0.34	0.38	0.38	0.32	0.34	0.41	0.41	0.31	0.33
Dissolved Organic Carbon	mg/L	NG	16	18	17	14	16	11	10	12	11	13	11	10	10	12	12
Total Kjeldahl Nitrogen	mg/L	NG	1.10	1.50	0.76	6.10	1.50	1.10	0.96	0.97	1.3	1.5	1.2	0.9	1.2	0.9	0.9
Dissolved Phosphorus	mg/L	NG	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols	mg/L	0.004	0.0066	<0.0020	0.0045	0.0045	<0.0020	<0.0020	0.0053	<0.0020	<0.0020	0.0044	0.0033	0.0034	0.0055	<0.0020	<0.0020

Notes:

mg/L - milligrams per litre

< - Indicates sample concentration less than laboratory method detection limit (MDL).

"---" - sample not analyzed for indicated parameter

NG - No guideline

Laboratory reports detail detection limits, testing protocols, and quality assurance/quality control procedures.

**Bold/Underline** Indicates the sample concentration exceeds the referenced guideline concentration.

Table 3 (Continued)  
Summary of Groundwater Analytical Results - Routine Parameters & Phenols

Location		Overall Guideline	Landfill									
Monitoring Well			MW14-103					MW14-104B				
Date (dd-mmm-yyyy)			20-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014	20-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014
Parameter	Unit											
pH		6.5 - 8.5	7.73	7.81	7.72	8.25	7.87	7.67	7.77	7.72	8.26	7.85
Alkalinity (PP as CaCO3)	mg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Anion Sum	meq/L	NG	7.2	7.5	7.5	7.6	7.5	6.6	7.3	7.1	7.0	7.0
Cation Sum	meq/L	NG	8.1	8.0	7.1	8.1	7.9	7.6	7.2	7.9	7.7	7.5
Ion Balance	N/A	NG	1.1	1.1	1.0	1.1	1.1	1.1	1.0	1.1	1.1	1.1
Dissolved Nitrate (NO3)	mg/L	13	0.200	0.240	0.080	<0.044	0.094	0.190	0.200	0.170	0.120	0.140
Dissolved Nitrite (NO2)	mg/L	0.197	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033
Total Alkalinity	mg/L CaCO <sub>3</sub>	NG	290	320	320	320	320	280	310	310	300	300
Bicarbonate	mg/L	NG	360	390	390	390	390	350	380	370	370	370
Carbonate	mg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Hydroxide	mg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Electrical Conductivity	µS/cm	NG	680	660	690	700	700	660	640	650	650	660
Chloride	mg/L	120	4.5	4.7	4.4	4.8	4.6	4.2	4.7	3.7	4.4	4.2
Sulphate	mg/L	429	55	47	44	54	46	41	43	41	44	40
Dissolved Calcium	mg/L	NG	110	110	91	110	100	100	98	100	100	98
Dissolved Magnesium	mg/L	NG	25	26	23	26	25	24	24	26	24	24
Dissolved Sodium	mg/L	200	10	10	11	11	12	9	7	9	10	10
Dissolved Potassium	mg/L	NG	2.6	2.8	2.4	2.8	2.8	2.2	2.3	2.5	2.1	2.4
Total Hardness	mg/L CaCO <sub>3</sub>	NG	370	370	320	370	360	360	340	370	350	340
Calculated Total Dissolved Solids	mg/L	500	380	390	370	400	390	350	370	370	370	360
Nitrite + Nitrate	mg/L	NG	0.045	0.055	0.018	<0.010	0.021	0.044	0.045	0.039	0.026	0.032
Nitrate as N	mg/L	2.9	0.045	0.055	0.018	<0.010	0.021	0.044	0.045	0.039	0.026	0.032
Nitrite as N	mg/L	0.06	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Ammonia - N	mg/L	0.282	0.18	0.21	0.072	0.25	0.28	0.18	0.061	0.069	0.18	0.18
Dissolved Organic Carbon	mg/L	NG	6.30	8.20	9.70	8.70	11.00	5.70	3.30	7.90	7.5	9.3
Total Kjeldahl Nitrogen	mg/L	NG	1.10	<0.50	0.72	0.93	0.86	0.50	<0.50	0.80	<0.50	0.92
Dissolved Phosphorus	mg/L	NG	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols	mg/L	0.004	0.0075	<0.0020	0.0040	0.0045	<0.0020	0.0050	<0.0020	0.0045	0.0033	<0.0020

Notes:  
mg/L - milligrams per litre  
< - Indicates sample concentration less than laboratory method detection limit (MDL).  
"---" - sample not analyzed for indicated parameter  
NG - No guideline  
Laboratory reports detail detection limits, testing protocols, and quality assurance/quality control procedures.

**Bold/Underline** Indicates the sample concentration exceeds the referenced guideline concentration.

Table 3 (Continued) Summary of Groundwater Analytical Results - Routine Parameters & Phenols																			
Location		Overall Guideline	Landfill										Airstrip						
Monitoring Well			MW14-105					MW14-106B					MW14-107	MW14-108	MW14-109				
Date (dd-mmm-yyyy)			22-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014	22-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014	22-May-2014	22-May-2014	22-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014
Parameter	Unit																		
pH		6.5 - 8.5	7.57	7.96	7.70	8.26	7.83	7.55	7.79	7.63	8.25	7.86	7.38	7.61	7.70	-	7.80	8.30	7.88
Alkalinity (PP as CaCO3)	mg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50
Anion Sum	meq/L	NG	6.9	7.3	7.4	7.1	7.3	6.7	7.2	7.4	7.4	7.2	12.0	20.0	6.8	-	6.9	6.9	6.9
Cation Sum	meq/L	NG	7.8	7.5	8.3	7.6	7.7	7.5	7.2	8.0	7.6	7.9	12.0	21.0	7.7	-	7.9	7.3	7.4
Ion Balance	N/A	NG	1.1	1.0	1.1	1.1	1.0	1.1	1.0	1.1	1.0	1.1	1.0	1.0	1.1	-	1.1	1.1	1.1
Dissolved Nitrate (NO3)	mg/L	13	0.200	0.280	0.079	0.077	0.100	0.290	0.290	0.093	0.100	0.150	<0.044	<0.044	0.150	-	0.098	0.065	0.071
Dissolved Nitrite (NO2)	mg/L	0.197	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	<0.033	-	<0.033	<0.033	<0.033
Total Alkalinity	mg/L CaCO <sub>3</sub>	NG	300	330	340	320	330	290	310	320	320	310	390	600	260	-	270	260	260
Bicarbonate	mg/L	NG	370	400	410	390	410	350	370	400	390	380	480	730	320	-	340	320	320
Carbonate	mg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50
Hydroxide	mg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50
Electrical Conductivity	µS/cm	NG	660	640	670	660	670	640	630	670	670	670	990	1,700	650	-	640	640	640
Chloride	mg/L	120	4.9	5.2	4.5	5.1	4.6	4.8	5.0	4.9	5.3	5.2	6.6	5.2	4.2	-	3.5	4.1	4.1
Sulphate	mg/L	429	30	30	29	30	27	43	45	37	41	36	170	390	71	-	61	72	72
Dissolved Calcium	mg/L	NG	100	99	110	100	98	100	96	100	99	99	170	280	100	99	100	98	97
Dissolved Magnesium	mg/L	NG	24	24	26	24	24	24	24	26	24	25	36	59	25	26	27	25	25
Dissolved Sodium	mg/L	200	10	9	12	10	11	10	8	12	11	13	10	14	8	6	7	6	7
Dissolved Potassium	mg/L	NG	2.6	2.5	3	2.2	2.5	2.7	2.8	3.1	2.4	2.8	3.4	1.7	2.4	2.2	2.3	1.7	2.1
Total Hardness	mg/L CaCO <sub>3</sub>	NG	360	350	370	350	340	350	340	370	350	350	560	950	360	-	370	350	350
Calculated Total Dissolved Solids	mg/L	500	360	370	390	370	370	360	360	380	380	380	630	1,200	370	-	370	370	370
Nitrite + Nitrate	mg/L	NG	0.044	0.062	0.018	0.017	0.023	0.066	0.065	0.021	0.023	0.034	<0.010	<0.010	0.033	-	0.022	0.015	0.016
Nitrate as N	mg/L	2.9	0.044	0.062	0.018	0.017	0.023	0.066	0.065	0.021	0.023	0.034	<0.010	<0.010	0.033	-	0.022	0.015	0.016
Nitrite as N	mg/L	0.06	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010
Ammonia - N	mg/L	0.282	0.4	0.32	0.24	0.57	0.44	0.14	0.23	0.08	0.089	0.18	1.1	0.94	0.16	0.15	0.11	0.13	0.13
Dissolved Organic Carbon	mg/L	NG	5.30	6.70	11.00	9.1	11	3.20	3.10	8.70	7.2	12	-	7.30	4.60	4.80	3.90	3.8	4.5
Total Kjeldahl Nitrogen	mg/L	NG	1.60	0.58	0.62	0.66	1.30	0.91	1.7	0.3	<0.5	0.8	6.3	1.6	1.1	0.66	0.80	<0.5	1.40
Dissolved Phosphorus	mg/L	NG	<0.10	<0.10	0.11	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	-	0.24	<0.10	<0.10	0.11	<0.10	<0.10
Phenols	mg/L	0.004	0.0034	<0.0020	0.0041	0.0040	<0.0020	0.0055	<0.0020	0.0038	0.0022	<0.0020	<0.0020	0.0022	0.0110	<0.0020	0.0037	0.0031	<0.0020

Notes:  
mg/L - milligrams per litre  
< - Indicates sample concentration less than laboratory method detection limit (MDL).  
"---" - sample not analyzed for indicated parameter  
NG - No guideline  
Laboratory reports detail detection limits, testing protocols, and quality assurance/quality control procedures.

Bold/Underline

Indicates the sample concentration exceeds the referenced guideline concentration.

Table 3 (Continued)  
Summary of Groundwater Analytical Results - Routine Parameters & Phenols

Location		Overall Guideline	QA/QC					Overall Guideline	Health Canada <sup>1</sup>		Federal Interim Groundwater Quality Guidelines <sup>2</sup> - Tier 2				AESRD Tier 1 Guidelines <sup>3</sup>
Monitoring Well			Field Blank						MAC	Other Guideline	Inhalation	Soil Organisms Direct Contact	Freshwater Aquatic Life	Wildlife Watering	
Date (dd-mmm-yyyy)			22-Mar-2014 (labelled Dup2)	22-May-2014 (labelled Dup2)	29-Jul-2014 (labelled Dup2)	9-Sep-2014 (labelled MW13-102)	18-Nov-2014 (labelled Dup-2)								
Parameter	Unit														
pH		6.5 - 8.5	5.60	5.55	4.91	5.28	5.44	6.5 - 8.5	NG	6.5 - 8.5	NG	NG	6.5 - 9	NG	6.5 - 8.5
Alkalinity (PP as CaCO3)	mg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	NG	NG	NG	NG	NG	NG	NG	NG
Anion Sum	meq/L	NG	0.016	0.000	0.000	0.000	0.011	NG	NG	NG	NG	NG	NG	NG	NG
Cation Sum	meq/L	NG	0.003	0.003	0.018	0.011	0.004	NG	NG	NG	NG	NG	NG	NG	NG
Ion Balance	N/A	NG	NG	NC	NC	NC	NC	NG	NG	NG	NG	NG	NG	NG	NG
Dissolved Nitrate (NO3)	mg/L	13	<0.044	<0.044	<0.044	<0.044	<0.044	13	45	NG	NG	NG	13	NG	13
Dissolved Nitrite (NO2)	mg/L	0.197	<0.033	<0.033	<0.033	<0.033	<0.033	0.197	3	NG	NG	NG	0.197	NG	0.197**
Total Alkalinity	mg/L CaCO <sub>3</sub>	NG	0.79	<0.50	<0.50	<0.50	0.53	NG	NG	NG	NG	NG	NG	NG	NG
Bicarbonate	mg/L	NG	0.97	<0.50	<0.50	<0.50	0.65	NG	NG	NG	NG	NG	NG	NG	NG
Carbonate	mg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	NG	NG	NG	NG	NG	NG	NG	NG
Hydroxide	mg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	NG	NG	NG	NG	NG	NG	NG	NG
Electrical Conductivity	µS/cm	NG	<1.0	1.5	<1.0	<1.0	<1.0	NG	NG	NG	NG	NG	NG	NG	NG
Chloride	mg/L	120	<1.0	<1.0	<1.0	<1.0	<1.0	120	NG	250 <sup>AO</sup>	NG	NG	120	NG	120
Sulphate	mg/L	429	<1.0	<1.0	<1.0	<1.0	<1.0	429	NG	500 <sup>AO</sup>	NG	NG	100	NG	429***
Dissolved Calcium	mg/L	NG	<0.30	<0.30	<0.30	<0.30	<0.30	NG	NG	NG	NG	NG	NG	NG	NG
Dissolved Magnesium	mg/L	NG	<0.20	<0.20	<0.20	<0.20	<0.20	NG	NG	NG	NG	NG	NG	NG	NG
Dissolved Sodium	mg/L	200	<0.50	<0.50	<0.50	<0.50	<0.50	200	NG	200 <sup>AO</sup>	NG	NG	NG	NG	200
Dissolved Potassium	mg/L	NG	<0.30	<0.30	<0.30	<0.30	<0.30	NG	NG	NG	NG	NG	NG	NG	NG
Total Hardness	mg/L CaCO <sub>3</sub>	NG	<0.50	<0.50	<0.50	<0.50	<0.50	NG	NG	NG	NG	NG	NG	NG	NG
Calculated Total Dissolved Solids	mg/L	500	<10	<10	<10	<10	<10	500	NG	500 <sup>AO</sup>	NG	NG	NG	NG	500
Nitrite + Nitrate	mg/L	NG	<0.010	<0.010	<0.010	<0.010	<0.010	NG	NG	NG	NG	NG	NG	NG	NG
Nitrate as N	mg/L	2.9	<0.010	<0.010	<0.010	<0.010	<0.010	2.9	10	NG	NG	NG	2.9	NG	3
Nitrite as N	mg/L	0.06	<0.010	<0.010	<0.010	<0.010	<0.010	0.06	1	NG	NG	NG	0.06	NG	0.06**
Ammonia - N	mg/L	0.282	<0.050	<0.050	0.086	0.085	<0.050	0.282	NG	NG	NG	NG	0.282*	NG	0.282*
Dissolved Organic Carbon	mg/L	NG	0.95	<0.50	<0.50	<0.50	<0.50	NG	NG	NG	NG	NG	NG	NG	NG
Total Kjeldahl Nitrogen	mg/L	NG	<0.050	<0.050	<0.050	0.083	<0.050	NG	NG	NG	NG	NG	NG	NG	NG
Dissolved Phosphorus	mg/L	NG	<0.10	<0.10	<0.10	<0.10	<0.10	NG	NG	NG	NG	NG	NG	NG	NG
Phenols	mg/L	0.004	<0.0020	<0.0020	0.0031	0.0043	<0.0020	0.004	NG	NG	3,700	150	0.004	NG	0.0040

Notes:  
mg/L - milligrams per litre  
< - Indicates sample concentration less than laboratory method detection limit (MDL).  
"----" - sample not analyzed for indicated parameter  
NG - No guideline  
Laboratory reports detail detection limits, testing protocols, and quality assurance/quality control procedures.

**Bold/Underline** Indicates the sample concentration exceeds the referenced guideline concentration.

<sup>1</sup> - Health Canada, October 2014, Guidelines for Canadian Drinking Water Quality Summary Table  
<sup>2</sup> - Federal Contaminated Sites Action Plan, November 2014, Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites  
<sup>3</sup> - Alberta Environment and Sustainable Resource Development, May 2014, Alberta Tier 1 Soil and Groundwater Remediation Guidelines  
\* based on a receiving body temperature of 10 °C and pH of 8.5  
\*\* based on a chloride concentration in the receiving water body between 4 and 6 mg/L  
\*\*\* based on water hardness of 180 - 250 mg/L

**Table 4**  
**Summary of Groundwater Analytical Results - Petroleum Hydrocarbons**

Monitoring Well	Date (dd-mmm-yyyy)	Benzene (mg/L)	Toluene (mg/L)	Ethylbenzene (mg/L)	Total Xylenes (mg/L)	F1-BTEX (C <sub>6</sub> -C <sub>10</sub> ) (mg/L)	F2 (C <sub>10</sub> -C <sub>16</sub> ) (mg/L)
<b>Overall Guideline</b>		<b>0.005</b>	<b>0.021</b>	<b>0.0016</b>	<b>0.02</b>	<b>0.81</b>	<b>1.1</b>
Landfill							
MW14-101	20-Mar-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	22-May-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	29-Jul-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	9-Sep-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	18-Nov-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
MW14-102B	20-Mar-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	Dup1 (20-Mar-2014)	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	22-May-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	Dup1 (22-May-2014)	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	29-Jul-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	Dup1 (29-Jul-2014)	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	9-Sep-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	MW13-102 (9-Sep-2014)	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	18-Nov-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	Dup1 (18-Nov-2014)	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
MW14-103	20-Mar-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	22-May-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	29-Jul-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	9-Sep-2014	<0.00040	<0.00040	<0.00040	<0.00080	0.15	<0.10
	18-Nov-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
MW14-104B	20-Mar-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	22-May-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	29-Jul-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	9-Sep-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	18-Nov-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
MW14-105	22-Mar-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	22-May-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	29-Jul-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	9-Sep-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	18-Nov-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
MW14-106B	22-Mar-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	22-May-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	29-Jul-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	9-Sep-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	18-Nov-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
Air Strip							
MW14-107	22-May-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
MW14-108	22-May-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
MW14-109	22-Mar-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	22-May-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	29-Jul-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	9-Sep-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	18-Nov-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
QA/QC							
Field Blank	22-Mar-2014 (Dup2)	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	22-May-2014 (Dup2)	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	29-Jul-2014 (Dup2)	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	09-Sep-2014 (MW13-102)	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	18-Nov-2014 (Dup2)	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
Trip Blank	22-Mar-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	22-May-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	-
	29-Jul-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
	9-Sep-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	-
	18-Nov-2014	<0.00040	<0.00040	<0.00040	<0.00080	<0.10	<0.10
<b>Overall Guideline</b>		<b>0.005</b>	<b>0.021</b>	<b>0.0016</b>	<b>0.02</b>	<b>0.81</b>	<b>1.1</b>
Health Canada <sup>1</sup>	MAC	0.005	0.06	0.14	0.09	NG	NG
	Other	NG	0.024 <sup>AO</sup>	0.0016 <sup>AO</sup>	0.02 <sup>AO</sup>	NG	NG
Federal Interim Groundwater Quality Guidelines <sup>2</sup> - Tier 2	Inhalation	0.14	74	16	3.9	0.81	1.5
	Soil Organisms Direct Contact	61	59	20	31	7.1	1.8
	Freshwater Life	0.69	0.083	41	18	9.8	1.3
	Wildlife Watering	0.14	180	NG	NG	NG	NG
<b>AESRD Tier 1 Guidelines<sup>3</sup></b>		<b>0.005</b>	<b>0.021</b>	<b>0.0024</b>	<b>0.3</b>	<b>2.2</b>	<b>1.1</b>

**Notes:**

mg/L - milligrams per litre

< - Indicates sample concentration less than laboratory method detection limit (MDL).

"-" - sample not analyzed f Indicates the sample concentration exceeds the referenced guideline concentration.

NG - No guideline

Standards for Shallow

**Bold/Underline** indicates the sample concentration exceeds the referenced guideline concentration.

<sup>1</sup> - Health Canada, October 2014, Guidelines for Canadian Drinking Water Quality Summary Table

<sup>2</sup> - Federal Contaminated Sites Action Plan, November 2014, Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites

<sup>3</sup> - Alberta Environment and Sustainable Resource Development, May 2014, Alberta Tier 1 Soil and Groundwater Remediation Guidelines

Table 5  
Summary of Groundwater Analytical Results - Dissolved Metals

Location		Overall Guideline	Landfill														
Monitoring Well  Date (dd-mmm-yyyy)			MW14-101					MW14-102B									
			20-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014	20-Mar-2014	Dup1 (20-Mar-2014)	22-May-2014	Dup1 (22-May-2014)	29-Jul-2014	Dup1 (29-Jul-2014)	9-Sep-2014	MW13-101 (9-Sep-2014)	18-Nov-2014	Dup1 (18-Nov-2014)
Parameter	Unit																
Aluminum	mg/L	0.05	0.026	0.013	0.0053	0.01	0.0063	<0.0030	<0.0030	0.0054	0.003	0.003	0.0094	<0.0030	<0.0030	<0.0030	<0.0030
Antimony	mg/L	0.006	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0078	0.012	0.017	0.011	0.013	0.0053	0.0056	0.0055	0.006	0.0076	0.0075	0.01	0.01	0.0085	0.0083
Barium	mg/L	1	0.55	0.53	0.58	0.49	0.54	0.46	0.46	0.43	0.44	0.44	0.44	0.43	0.44	0.44	0.44
Beryllium	mg/L	0.0053	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.5	0.065	0.069	0.076	0.051	0.06	0.06	0.059	0.053	0.05	0.063	0.059	0.054	0.056	0.057	0.058
Cadmium	mg/L	0.000017	0.000025	0.000021	0.0000097	<0.000020	<0.000020	0.000022	0.00002	0.000023	0.000023	0.00001	0.000018	<0.000020	<0.000020	<0.000020	<0.000020
Chromium	mg/L	0.0089	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	NG	0.0020	0.0011	0.002	0.0013	0.0011	0.0011	0.0011	0.0007	0.00074	0.00078	0.00083	0.00078	0.00076	0.00062	0.00057
Copper	mg/L	0.002	0.00099	0.0014	0.0012	0.00086	0.00054	0.00037	0.0004	0.00074	0.00066	0.00056	0.00051	0.00065	0.00089	0.00034	0.00034
Iron	mg/L	0.3	8.9	11	12	8.6	12	2.8	2.9	1.2	1.3	2.2	2.2	4	4.1	4.6	4.7
Lead	mg/L	0.007	0.00035	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	NG	0.024	0.02	0.02	<0.020	<0.020	<0.020	0.021	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Manganese	mg/L	0.05	0.52	0.43	0.53	0.38	0.44	0.29	0.3	0.22	0.23	0.25	0.25	0.26	0.26	0.26	0.26
Mercury	mg/L	0.000005	<0.0000050	0.0000032	0.0000064	<0.0000020	<0.0000020	<0.0000050	<0.0000050	<0.0000020	<0.0000020	<0.0000020	0.0000025	<0.0000020	<0.0000020	<0.0000020	<0.0000020
Molybdenum	mg/L	0.073	0.0019	0.0025	0.0028	0.0024	0.0023	0.0027	0.0028	0.0029	0.003	0.0033	0.0034	0.0034	0.0035	0.0032	0.003
Nickel	mg/L	0.025	0.0028	0.0023	0.0034	0.0021	0.0019	0.0017	0.0018	0.0016	0.0016	0.0017	0.0016	0.0015	0.0014	0.0012	0.001
Selenium	mg/L	0.001	0.00051	0.0007	0.00034	0.00072	0.00040	0.00042	0.00048	0.00081	0.00071	0.00054	0.00059	0.00043	0.00045	0.00033	0.00032
Silicon	mg/L	NG	9.5	8	8.5	7.3	7.6	8.2	8.1	6.9	6.9	7.2	7.3	6.8	7.4	6.7	6.7
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	NG	0.42	0.4	0.44	0.37	0.41	0.35	0.34	0.33	0.34	0.35	0.35	0.33	0.34	0.34	0.34
Sulphur	mg/L	NG	12	11	11	11	10	4.0	4.1	3.8	3.7	3.7	3.7	3.4	3.4	3.4	3.4
Thallium	mg/L	0.0008	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0023	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	0.1	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.015	0.0022	0.0017	0.0014	0.0018	0.0013	0.0027	0.003	0.0038	0.0037	0.0033	0.0033	0.0027	0.0027	0.0025	0.0023
Vanadium	mg/L	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.03	<0.0030	0.011	0.0042	<0.0030	0.0033	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.0036	<0.0030	<0.0030	<0.0030	<0.0030

Notes:  
mg/L - milligrams per litre  
< - Indicates sample concentration less than laboratory method detection limit (MDL).  
"---" - sample not analyzed for indicated parameter  
NG - No guideline  
Laboratory reports detail detection limits, testing protocols, and quality assurance/quality control procedures.

<b>Bold/Underline</b>	Indicates the sample concentration exceeds the referenced guideline concentration.
<i>Italics</i>	indicates the laboratory detection limit exceeds the referenced guideline concentration

Table 5 (Continued)  
Summary of Groundwater Analytical Results - Dissolved Metals

Location		Overall Guideline	Landfill														
Monitoring Well			MW14-103					MW14-104B					MW14-105				
Date (dd-mmm-yyyy)			20-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014	20-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014	22-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014
Parameter	Unit																
Aluminum	mg/L	0.05	<0.0030	<0.0030	0.015	0.0062	<0.0030	0.0088	0.0033	<0.0030	0.0031	<0.0030	<0.0030	0.0032	0.0049	<0.0030	<0.0030
Antimony	mg/L	0.006	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.0021	0.0016	0.0058	0.0054	0.0056	0.0012	<0.00020	0.0022	0.0041	0.0039	0.0025	0.0023	0.0058	0.004	0.0051
Barium	mg/L	1	0.25	0.21	0.21	0.2	0.19	0.33	0.33	0.31	0.28	0.29	0.37	0.34	0.33	0.32	0.33
Beryllium	mg/L	0.0053	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.5	0.051	0.051	0.059	0.052	0.058	0.046	0.031	0.047	0.045	0.048	0.051	0.04	0.057	0.046	0.051
Cadmium	mg/L	0.000017	0.000033	0.000035	0.000055	0.000038	0.000045	0.000026	0.000024	0.000022	0.000032	0.000024	0.000026	0.000029	0.000059	0.000027	<0.000020
Chromium	mg/L	0.0089	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	NG	0.0016	0.001	0.0015	0.0011	0.0011	0.00093	<0.00030	0.0013	0.0015	0.001	0.0017	0.00072	0.001	0.001	0.00084
Copper	mg/L	0.002	0.00043	0.00067	0.0015	0.00047	0.00077	0.0018	0.0016	0.0017	0.0012	0.0012	0.00055	0.0007	0.00094	0.00084	0.00046
Iron	mg/L	0.3	0.99	0.57	3.4	3.1	4.0	0.66	<0.060	1	2.6	3.3	0.9	1.6	5.4	3.3	5.3
Lead	mg/L	0.007	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	NG	0.021	<0.020	<0.020	<0.020	<0.020	0.020	<0.020	<0.020	<0.020	<0.020	0.021	<0.020	<0.020	<0.020	<0.020
Manganese	mg/L	0.05	0.29	0.22	0.35	0.27	0.30	0.16	0.02	0.22	0.3	0.27	0.75	0.31	0.44	0.32	0.39
Mercury	mg/L	0.000005	<0.0000050	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000050	0.0000026	<0.0000020	<0.0000020	<0.0000020	<0.0000050	0.0000022	<0.0000020	<0.0000020	<0.0000020
Molybdenum	mg/L	0.073	0.0023	0.0025	0.003	0.0027	0.0026	0.002	0.0017	0.0024	0.0026	0.0023	0.0038	0.0023	0.0028	0.0026	0.0026
Nickel	mg/L	0.025	0.0024	0.0024	0.0028	0.002	0.0018	0.0038	0.0011	0.0023	0.0024	0.0016	0.0037	0.0021	0.0021	0.002	0.0015
Selenium	mg/L	0.001	0.0016	0.0013	0.00065	0.001	0.00064	0.0015	0.0034	0.0017	0.0012	0.0011	0.0013	0.0022	0.00075	0.0012	0.00057
Silicon	mg/L	NG	7.1	6.3	7.1	6.8	6.4	7.2	6.1	6.7	7	6.4	7.5	6.6	7.5	7.2	6.8
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	NG	0.37	0.38	0.41	0.39	0.39	0.34	0.32	0.36	0.36	0.36	0.35	0.33	0.37	0.34	0.35
Sulphur	mg/L	NG	18	18	19	17	16	14	13	15	14	14	10	10	9.6	9.3	9.1
Thallium	mg/L	0.0008	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	0.1	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.015	0.0032	0.0032	0.0024	0.0025	0.0021	0.003	0.0034	0.0028	0.0023	0.0022	0.0053	0.0037	0.0023	0.0029	0.0022
Vanadium	mg/L	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.03	<0.0030	<0.0030	0.0045	<0.0030	<0.0030	0.0045	<0.0030	0.0044	<0.0030	0.0038	<0.0030	<0.0030	0.0082	0.0041	<0.0030

Notes:  
mg/L - milligrams per litre  
< - Indicates sample concentration less than laboratory method detection limit (MDL).  
"---" - sample not analyzed for indicated parameter  
NG - No guideline  
Laboratory reports detail detection limits, testing protocols, and quality assurance/quality control procedures.

<b>Bold/Underline</b>	Indicates the sample concentration exceeds the referenced guideline concentration.
<i>Italics</i>	indicates the laboratory detection limit exceeds the referenced guideline concentration

Table 5 (Continued)  
Summary of Groundwater Analytical Results - Dissolved Metals

Location		Overall Guideline	Landfill					Air Strip						
Monitoring Well  Date (dd-mmm-yyyy)			MW14-106B					MW14-107	MW14-108	MW14-109				
			22-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014	22-May-2014	22-May-2014	22-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014
Parameter	Unit													
Aluminum	mg/L	0.05	<0.0030	0.0034	<0.0030	0.012	0.0043	-	0.0053	<0.0030	0.0032	0.005	0.0062	<0.0030
Antimony	mg/L	0.006	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	-	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060
Arsenic	mg/L	0.005	0.00088	0.0004	0.0038	0.0033	0.0075	-	0.011	0.0022	0.001	0.0023	0.002	0.003
Barium	mg/L	1	0.44	0.39	0.47	0.45	0.49	-	0.048	0.35	0.31	0.32	0.3	0.33
Beryllium	mg/L	0.0053	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron	mg/L	1.5	0.037	0.03	0.047	0.042	0.047	-	0.12	0.031	0.024	0.031	0.026	0.029
Cadmium	mg/L	0.000017	0.000025	0.000026	0.000047	0.000034	0.000024	-	0.000028	0.000033	0.000027	0.000028	0.000032	0.000022
Chromium	mg/L	0.0089	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Cobalt	mg/L	NG	0.00077	0.00043	0.0012	0.00084	0.00054	-	0.0029	0.0025	0.00068	0.0017	0.0019	0.0016
Copper	mg/L	0.002	0.00087	0.0015	0.00078	0.0011	0.00042	-	0.001	0.0005	0.00061	0.0011	0.00044	0.00054
Iron	mg/L	0.3	0.086	<0.060	1.6	1.7	6.1	0.066	40	0.88	0.74	2.1	1.5	2.9
Lead	mg/L	0.007	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Lithium	mg/L	NG	0.021	<0.020	<0.020	<0.020	<0.020	-	0.05	<0.020	<0.020	<0.020	<0.020	<0.020
Manganese	mg/L	0.05	0.16	0.061	0.3	0.24	0.36	1.1	1.4	0.6	0.3	0.37	0.35	0.45
Mercury	mg/L	0.000005	<0.0000050	0.0000022	0.0000027	<0.0000020	0.0000057	-	<0.0000020	<0.0000050	0.0000031	0.0000023	<0.0000020	<0.0000020
Molybdenum	mg/L	0.073	0.0019	0.0015	0.0023	0.002	0.0021	-	0.00074	0.0022	0.0015	0.0017	0.0016	0.0017
Nickel	mg/L	0.025	0.0017	0.0014	0.0022	0.0017	0.0011	-	0.0059	0.0034	0.0016	0.0023	0.0021	0.0022
Selenium	mg/L	0.001	0.0026	0.003	0.0009	0.00089	0.00036	-	<0.00020	0.00077	0.00093	0.00052	0.00057	0.00026
Silicon	mg/L	NG	6.9	5.8	7	6.9	6.9	-	7.2	6.9	6.1	6.6	6.4	6.1
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Strontium	mg/L	NG	0.30	0.28	0.34	0.32	0.35	-	0.66	0.30	0.28	0.29	0.28	0.28
Sulphur	mg/L	NG	14	12	14	13	11	-	140	24	23	24	22	23
Thallium	mg/L	0.0008	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Tin	mg/L	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Titanium	mg/L	0.1	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Uranium	mg/L	0.015	0.0062	0.0059	0.0039	0.0041	0.0025	-	0.0008	0.0027	0.0029	0.0026	0.0027	0.0022
Vanadium	mg/L	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Zinc	mg/L	0.03	<0.0030	0.0079	<0.0030	0.0034	<0.0030	-	0.012	<0.0030	<0.0030	0.0097	<0.0030	0.003

Notes:

mg/L - milligrams per litre

< - Indicates sample concentration less than laboratory method detection limit (MDL).

"---" - sample not analyzed for indicated parameter

NG - No guideline

Laboratory reports detail detection limits, testing protocols, and quality assurance/quality control procedures.

<b>Bold/Underline</b>	Indicates the sample concentration exceeds the referenced guideline concentration.
<i>Italics</i>	indicates the laboratory detection limit exceeds the referenced guideline concentration

Table 5 (Continued)  
Summary of Groundwater Analytical Results - Dissolved Metals

Location		Overall Guideline	QA/QC					Overall Guideline	Health Canada <sup>1</sup>		Federal Interim Groundwater Quality Guidelines <sup>2</sup> - Tier 2				AESRD Tier 1 Guidelines <sup>3</sup>
Monitoring Well			Field Blank						MAC	Other Guideline	Inhalation	Soil Organisms Direct Contact	Freshwater Aquatic Life	Wildlife Watering	
Date (dd-mmm-yyyy)			22-Mar-2014 (labelled Dup2)	22-May-2014 (labelled Dup2)	29-Jul-2014 (labelled Dup2)	9-Sep-2014 (labelled MW13-102)	18-Nov-2014 (labelled Dup-2)								
Parameter	Unit														
Aluminum	mg/L	0.05	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.05	NG	0.1/0.2 <sup>OG</sup>	NG	NG	0.1	NG	0.05*
Antimony	mg/L	0.006	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.006	0.006	NG	NG	NG	2	NG	0.006
Arsenic	mg/L	0.005	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.005	0.010	NG	NG	NG	0.005	NG	0.005
Barium	mg/L	1	<0.010	<0.010	<0.010	<0.010	<0.010	1	1.0	NG	NG	NG	2.9	NG	1
Beryllium	mg/L	0.0053	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0053	NG	NG	NG	NG	0.0053	NG	NG
Boron	mg/L	1.5	<0.020	<0.020	<0.020	<0.020	<0.020	1.5	5	NG	NG	NG	NG	NG	1.5
Cadmium	mg/L	0.000017	<0.0000050	<0.0000050	<0.0000050	<0.000020	<0.020	0.000017	0.005	NG	NG	NG	0.000017	NG	0.00037
Chromium	mg/L	0.0089	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0089	0.05	NG	NG	NG	0.0089	NG	NG
Cobalt	mg/L	NG	<0.0030	<0.00030	<0.00030	<0.00030	<0.00030	NG	NG	NG	NG	NG	NG	NG	NG
Copper	mg/L	0.002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.002	NG	1.0 <sup>AO</sup>	NG	NG	0.002	NG	0.007
Iron	mg/L	0.3	<0.060	<0.060	<0.060	<0.060	<0.060	0.3	NG	0.3 <sup>AO</sup>	NG	NG	0.3	NG	0.3
Lead	mg/L	0.007	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.007	0.010	NG	NG	NG	NG	NG	0.007
Lithium	mg/L	NG	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG	NG	NG	NG	NG	NG	NG
Manganese	mg/L	0.05	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	0.05	NG	0.05 <sup>AO</sup>	NG	NG	NG	NG	0.05
Mercury	mg/L	0.000005	<0.0000050	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.000005	0.001	NG	NG	NG	0.000026	NG	0.000005
Molybdenum	mg/L	0.073	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.073	NG	NG	NG	NG	0.073	NG	NG
Nickel	mg/L	0.025	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.025	NG	NG	NG	NG	0.025	NG	0.13**
Selenium	mg/L	0.001	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.001	0.05	NG	NG	NG	0.001	NG	0.001
Silicon	mg/L	NG	<0.10	<0.10	<0.10	<0.10	<0.10	NG	NG	NG	NG	NG	NG	NG	NG
Silver	mg/L	0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.0001	NG	NG	NG	NG	0.0001	NG	0.0001
Strontium	mg/L	NG	<0.020	<0.020	<0.020	<0.020	<0.020	NG	NG	NG	NG	NG	NG	NG	NG
Sulphur	mg/L	NG	<0.20	<0.20	<0.20	<0.20	<0.20	NG	NG	NG	NG	NG	NG	NG	NG
Thallium	mg/L	0.0008	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0008	NG	NG	NG	NG	0.0008	NG	NG
Tin	mg/L	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	NG	NG	NG	NG	NG	NG	NG	NG
Titanium	mg/L	0.1	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.1	NG	NG	NG	NG	0.1	NG	NG
Uranium	mg/L	0.015	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.015	0.02	NG	NG	NG	0.015	NG	0.015
Vanadium	mg/L	NG	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	NG	NG	NG	NG	NG	NG	NG	NG
Zinc	mg/L	0.03	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	0.03	NG	5.0 <sup>AO</sup>	NG	NG	0.03	NG	0.03

Notes:  
mg/L - milligrams per litre  
< - Indicates sample concentration less than laboratory method detection limit (MDL).  
"---" - sample not analyzed for indicated parameter  
NG - No guideline  
AO - Aesthetic objective  
OG - Operational guideline  
Laboratory reports detail detection limits, testing protocols, and quality assurance/quality control procedures.

<b>Bold/Underline</b>	Indicates the sample concentration exceeds the referenced guideline concentration.
<i>Italics</i>	indicates the laboratory detection limit exceeds the referenced guideline concentration

<sup>1</sup> - Health Canada, October 2014, Guidelines for Canadian Drinking Water Quality Summary Table  
<sup>2</sup> - Federal Contaminated Sites Action Plan, November 2014, Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites  
<sup>3</sup> - Alberta Environment and Sustainable Resource Development, May 2014, Alberta Tier 1 Soil and Groundwater Remediation Guidelines

\* assumes pH of receiving water body is 8.0  
\*\* assumes hardness of receiving water body is 305 mg/L

Table 6  
Summary of Groundwater Analytical Results - Volatile Organic Compounds

Location		Overall Guideline	Landfill														
Monitoring Well			MW14-101					MW14-102B									
Date (dd-mmm-yyyy)			20-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014	20-Mar-2014	Dup1 (20-Mar-2014)	22-May-2014	Dup1 (22-May-2014)	29-Jul-2014	Dup1 (29-Jul-2014)	9-Sep-2014	MW13-101 (9-Sep-2014)	18-Nov-2014	Dup1 (18-Nov-2014)
Parameter	Unit																
Total Trihalomethanes	µg/L	100	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bromodichloromethane	µg/L	8,500	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromoform	µg/L	380	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromomethane	µg/L	6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Carbon tetrachloride	µg/L	0.56	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	µg/L	1.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorodibromomethane	µg/L	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	µg/L	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	µg/L	1.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloromethane	µg/L	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-dibromoethane	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-dichlorobenzene	µg/L	0.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-dichlorobenzene	µg/L	150	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-dichlorobenzene	µg/L	1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-dichloroethane	µg/L	320	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-dichloroethane	µg/L	5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-dichloroethene	µg/L	3.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-dichloroethene	µg/L	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-dichloroethene	µg/L	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichloromethane	µg/L	50.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-dichloropropane	µg/L	16	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-dichloropropene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,3-dichloropropene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl methacrylate	µg/L	470.00	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether (MTBE)	µg/L	15	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	µg/L	72	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-tetrachloroethane	µg/L	3.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2,2-tetrachloroethane	µg/L	3.2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene	µg/L	5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,3-trichlorobenzene	µg/L	8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-trichlorobenzene	µg/L	15	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3,5-trichlorobenzene	µg/L	14	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-trichloroethane	µg/L	640	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-trichloroethane	µg/L	4.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene	µg/L	5.00	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-trimethylbenzene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3,5-trimethylbenzene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl chloride	µg/L	1.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Notes:  
µg/L - micrograms per litre  
< - Indicates sample concentration less than laboratory method detection limit (MDL)  
"---"- sample not analyzed for indicated parameter  
NG - No guideline  
Laboratory reports detail detection limits, testing protocols, and quality assurance/quality control procedures.

**Bold/Underline** Indicates the sample concentration exceeds the referenced guideline concentration.

Table 6 (Continued)  
Summary of Groundwater Analytical Results - Volatile Organic Compounds

Location		Overall Guideline	Landfill									
Monitoring Well			MW14-103					MW14-104B				
Date (dd-mmm-yyyy)			20-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014	20-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014
Parameter	Unit											
Total Trihalomethanes	µg/L	100	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bromodichloromethane	µg/L	8,500	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromoform	µg/L	380	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromomethane	µg/L	6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Carbon tetrachloride	µg/L	0.56	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	µg/L	1.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorodibromomethane	µg/L	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	µg/L	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	µg/L	1.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloromethane	µg/L	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-dibromoethane	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-dichlorobenzene	µg/L	0.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-dichlorobenzene	µg/L	150	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-dichlorobenzene	µg/L	1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-dichloroethane	µg/L	320	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-dichloroethane	µg/L	5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-dichloroethene	µg/L	3.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-dichloroethene	µg/L	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-dichloroethene	µg/L	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichloromethane	µg/L	50.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-dichloropropane	µg/L	16	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-dichloropropene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,3-dichloropropene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl methacrylate	µg/L	470.00	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether (MTBE)	µg/L	15	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	µg/L	72	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-tetrachloroethane	µg/L	3.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2,2-tetrachloroethane	µg/L	3.2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene	µg/L	5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,3-trichlorobenzene	µg/L	8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-trichlorobenzene	µg/L	15	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3,5-trichlorobenzene	µg/L	14	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-trichloroethane	µg/L	640	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-trichloroethane	µg/L	4.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene	µg/L	5.00	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-trimethylbenzene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3,5-trimethylbenzene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl chloride	µg/L	1.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Notes:

µg/L - micrograms per litre

< - Indicates sample concentration less than laboratory method detection limit (MDL)

"---": sample not analyzed for indicated parameter

NG - No guideline

Laboratory reports detail detection limits, testing protocols, and quality assurance/quality control procedures.

**Bold/Underline**

Indicates the sample concentration exceeds the referenced guideline concentration.

Table 6 (Continued)  
Summary of Groundwater Analytical Results - Volatile Organic Compounds

Location		Overall Guideline	Landfill									
Monitoring Well			MW14-105					MW14-106B				
Date (dd-mmm-yyyy)			22-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014	22-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014
Parameter	Unit											
Total Trihalomethanes	µg/L	100	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bromodichloromethane	µg/L	8,500	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromoform	µg/L	380	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromomethane	µg/L	6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Carbon tetrachloride	µg/L	0.56	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	µg/L	1.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorodibromomethane	µg/L	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	µg/L	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	µg/L	1.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloromethane	µg/L	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-dibromoethane	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-dichlorobenzene	µg/L	0.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-dichlorobenzene	µg/L	150	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-dichlorobenzene	µg/L	1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-dichloroethane	µg/L	320	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-dichloroethane	µg/L	5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-dichloroethene	µg/L	3.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-dichloroethene	µg/L	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-dichloroethene	µg/L	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichloromethane	µg/L	50.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-dichloropropane	µg/L	16	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-dichloropropene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,3-dichloropropene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl methacrylate	µg/L	470.00	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether (MTBE)	µg/L	15	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	µg/L	72	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-tetrachloroethane	µg/L	3.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1,1,2,2-tetrachloroethane	µg/L	3.2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene	µg/L	5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,3-trichlorobenzene	µg/L	8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-trichlorobenzene	µg/L	15	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3,5-trichlorobenzene	µg/L	14	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-trichloroethane	µg/L	640	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-trichloroethane	µg/L	4.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene	µg/L	5.00	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-trimethylbenzene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3,5-trimethylbenzene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl chloride	µg/L	1.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Notes:

µg/L - micrograms per litre

< - Indicates sample concentration less than laboratory method detection limit (MDL)

"---"- sample not analyzed for indicated parameter

NG - No guideline

Laboratory reports detail detection limits, testing protocols, and quality assurance/quality control procedures.

**Bold/Underline**

Indicates the sample concentration exceeds the referenced guideline concentration.

Table 6 (Continued)  
Summary of Groundwater Analytical Results - Volatile Organic Compounds

Location		Overall Guideline	Air Strip							QA/QC				
Monitoring Well			MW14-107	MW14-108	MW14-109				Field Blank					
Date (dd-mmm-yyyy)			22-May-2014	22-May-2014	22-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014	22-Mar-2014 (labelled Dup2)	22-May-2014 (labelled Dup2)	29-Jul-2014 (labelled Dup2)	9-Sep-2014 (labelled MW13-102)	18-Nov-2014 (labelled Dup-2)
Parameter	Unit													
Total Trihalomethanes	µg/L	100	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Bromodichloromethane	µg/L	8,500	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromoform	µg/L	380	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromomethane	µg/L	6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Carbon tetrachloride	µg/L	0.56	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorobenzene	µg/L	1.3	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorodibromomethane	µg/L	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroethane	µg/L	NG	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	µg/L	1.8	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloromethane	µg/L	NG	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-dibromoethane	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-dichlorobenzene	µg/L	0.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-dichlorobenzene	µg/L	150	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-dichlorobenzene	µg/L	1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-dichloroethane	µg/L	320	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-dichloroethane	µg/L	5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-dichloroethene	µg/L	3.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-dichloroethene	µg/L	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,2-dichloroethene	µg/L	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Dichloromethane	µg/L	50.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-dichloropropane	µg/L	16	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-dichloropropene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
trans-1,3-dichloropropene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl methacrylate	µg/L	470.00	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether (MTBE)	µg/L	15	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Styrene	µg/L	72	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-tetrachloroethane	µg/L	3.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2,2-tetrachloroethane	µg/L	3.2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Tetrachloroethene	µg/L	5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,3-trichlorobenzene	µg/L	8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2,4-trichlorobenzene	µg/L	15	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,3,5-trichlorobenzene	µg/L	14	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-trichloroethane	µg/L	640	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-trichloroethane	µg/L	4.7	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene	µg/L	5.00	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2,4-trimethylbenzene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3,5-trimethylbenzene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl chloride	µg/L	1.1	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Notes:

µg/L - micrograms per litre

< - Indicates sample concentration less than laboratory method detection limit (MDL)

"---"- sample not analyzed for indicated parameter

NG - No guideline

Laboratory reports detail detection limits, testing protocols, and quality assurance/quality control procedures.

**Bold/Underline** Indicates the sample concentration exceeds the referenced guideline concentration.

Table 6 (Continued)  
Summary of Groundwater Analytical Results - Volatile Organic Compounds

Location Monitoring Well		Overall Guideline	QA/QC Trip Blank					Overall Guideline	Health Canada <sup>1</sup>		Federal Interim Groundwater Quality Guidelines <sup>2</sup> - Tier 2				AESRD Tier 1 Guidelines <sup>3</sup>
Date (dd-mmm-yyyy)			22-Mar-2014	22-May-2014	29-Jul-2014	9-Sep-2014	18-Nov-2014		MAC	Other Guideline	Inhalation	Soil Organisms Direct Contact	Freshwater Aquatic Life	Wildlife Watering	
Parameter	Unit														
Total Trihalomethanes	µg/L	100	<2.0	<2.0	<2.0	<2.0	<2.0	100	100	NG	NG	NG	NG	NG	100
Bromodichloromethane	µg/L	8,500	<0.50	<0.50	<0.50	<0.50	<0.50	8,500	NG	NG	NG	NG	8,500	NG	NG
Bromoform	µg/L	380	<0.50	<0.50	<0.50	<0.50	<0.50	380	NG	NG	380	NG	3,700	NG	NG
Bromomethane	µg/L	6	<2.0	<2.0	<2.0	<2.0	<2.0	6	NG	NG	5.6	NG	400	NG	NG
Carbon tetrachloride	µg/L	0.56	<0.50	<0.50	<0.50	<0.50	<0.50	0.56	2	NG	0.56	NG	13	NG	2
Chlorobenzene	µg/L	1.3	<0.50	<0.50	<0.50	<0.50	<0.50	1.3	NG	NG	14	NG	1.3	NG	1.3
Chlorodibromomethane	µg/L	NG	<1.0	<1.0	<1.0	<1.0	<1.0	NG	NG	NG	NG	NG	NG	NG	NG
Chloroethane	µg/L	NG	<1.0	<1.0	<1.0	<1.0	<1.0	NG	NG	NG	NG	NG	NG	NG	NG
Chloroform	µg/L	1.8	<0.50	<0.50	<0.50	<0.50	<0.50	1.8	NG	NG	3	NG	1.8	NG	1.8
Chloromethane	µg/L	NG	<2.0	<2.0	<2.0	<2.0	<2.0	NG	NG	NG	NG	NG	NG	NG	NG
1,2-dibromoethane	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	NG	NG	NG	NG	NG	NG	NG	NG
1,2-dichlorobenzene	µg/L	0.7	<0.50	<0.50	<0.50	<0.50	<0.50	0.7	200	3 <sup>AO</sup>	5,400	NG	0.7	NG	0.7
1,3-dichlorobenzene	µg/L	150	<0.50	<0.50	<0.50	<0.50	<0.50	150	NG	NG	NG	NG	150	NG	NG
1,4-dichlorobenzene	µg/L	1	<0.50	<0.50	<0.50	<0.50	<0.50	1	5	1 <sup>AO</sup>	220	NG	2.6	NG	1
1,1-dichloroethane	µg/L	320	<0.50	<0.50	<0.50	<0.50	<0.50	320	NG	NG	320	NG	260,000	NG	NG
1,2-dichloroethane	µg/L	5	<0.50	<0.50	<0.50	<0.50	<0.50	5	5	NG	10	NG	10	NG	5
1,1-dichloroethene	µg/L	3.9	<0.50	<0.50	<0.50	<0.50	<0.50	3.9	14	NG	3.9	NG	NG	NG	14
cis-1,2-dichloroethene	µg/L	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	NG	NG	1.6	NG	14,000	NG	NG
trans-1,2-dichloroethene	µg/L	1.6	<0.50	<0.50	<0.50	<0.50	<0.50	1.6	NG	NG	1.6	NG	28,000	NG	NG
Dichloromethane	µg/L	50.0	<2.0	<2.0	<2.0	<2.0	<2.0	50.0	50	NG	3,400	NG	98	NG	50
1,2-dichloropropane	µg/L	16	<0.50	<0.50	<0.50	<0.50	<0.50	16	NG	NG	16	NG	7,200	NG	NG
cis-1,3-dichloropropene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	NG	NG	NG	NG	NG	NG	NG	NG
trans-1,3-dichloropropene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	NG	NG	NG	NG	NG	NG	NG	NG
Methyl methacrylate	µg/L	470.00	<0.50	<0.50	<0.50	<0.50	<0.50	470.00	NG	NG	840	NG	NG	NG	470
Methyl tert-butyl ether (MTBE)	µg/L	15	<0.50	<0.50	<0.50	<0.50	<0.50	15	NG	15 <sup>AO</sup>	340	NG	10,000	NG	15
Styrene	µg/L	72	<0.50	<0.50	<0.50	<0.50	<0.50	72	NG	NG	NG	NG	NG	NG	72
1,1,1,2-tetrachloroethane	µg/L	3.3	<2.0	<2.0	<2.0	<2.0	<2.0	3.3	NG	NG	3.3	NG	2,500	NG	NG
1,1,2,2-tetrachloroethane	µg/L	3.2	<2.0	<2.0	<2.0	<2.0	<2.0	3.2	NG	NG	3.2	NG	3,000	NG	NG
Tetrachloroethene	µg/L	5	<0.50	<0.50	<0.50	<0.50	<0.50	5	30	NG	110	NG	110	NG	5
1,2,3-trichlorobenzene	µg/L	8	<1.0	<1.0	<1.0	<1.0	<1.0	8	NG	NG	32	NG	8	NG	8
1,2,4-trichlorobenzene	µg/L	15	<1.0	<1.0	<1.0	<1.0	<1.0	15	NG	NG	28	NG	24	NG	15
1,3,5-trichlorobenzene	µg/L	14	<0.50	<0.50	<0.50	<0.50	<0.50	14	NG	NG	15	NG	NG	NG	14
1,1,1-trichloroethane	µg/L	640	<0.50	<0.50	<0.50	<0.50	<0.50	640	NG	NG	640	NG	1,100	NG	NG
1,1,2-trichloroethane	µg/L	4.7	<0.50	<0.50	<0.50	<0.50	<0.50	4.7	NG	NG	4.7	NG	12,000	NG	NG
Trichloroethene	µg/L	5.00	<0.50	<0.50	<0.50	<0.50	<0.50	5.00	5	NG	20	5,000	270	NG	5
Trichlorofluoromethane	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	NG	NG	NG	NG	NG	NG	NG	NG
1,2,4-trimethylbenzene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	NG	NG	NG	NG	NG	NG	NG	NG
1,3,5-trimethylbenzene	µg/L	NG	<0.50	<0.50	<0.50	<0.50	<0.50	NG	NG	NG	NG	NG	NG	NG	NG
Vinyl chloride	µg/L	1.1	<0.50	<0.50	<0.50	<0.50	<0.50	1.1	2	NG	1.1	NG	NG	NG	2

Notes:

µg/L - micrograms per litre

< - Indicates sample concentration less than laboratory method detection limit (MDL)

- - sample not analyzed for indicated parameter

NG - No guideline

Laboratory reports detail detection limits, testing protocols, and quality assurance/quality control procedures.

**Bold/Underline**

Indicates the sample concentration exceeds the referenced guideline concentration.

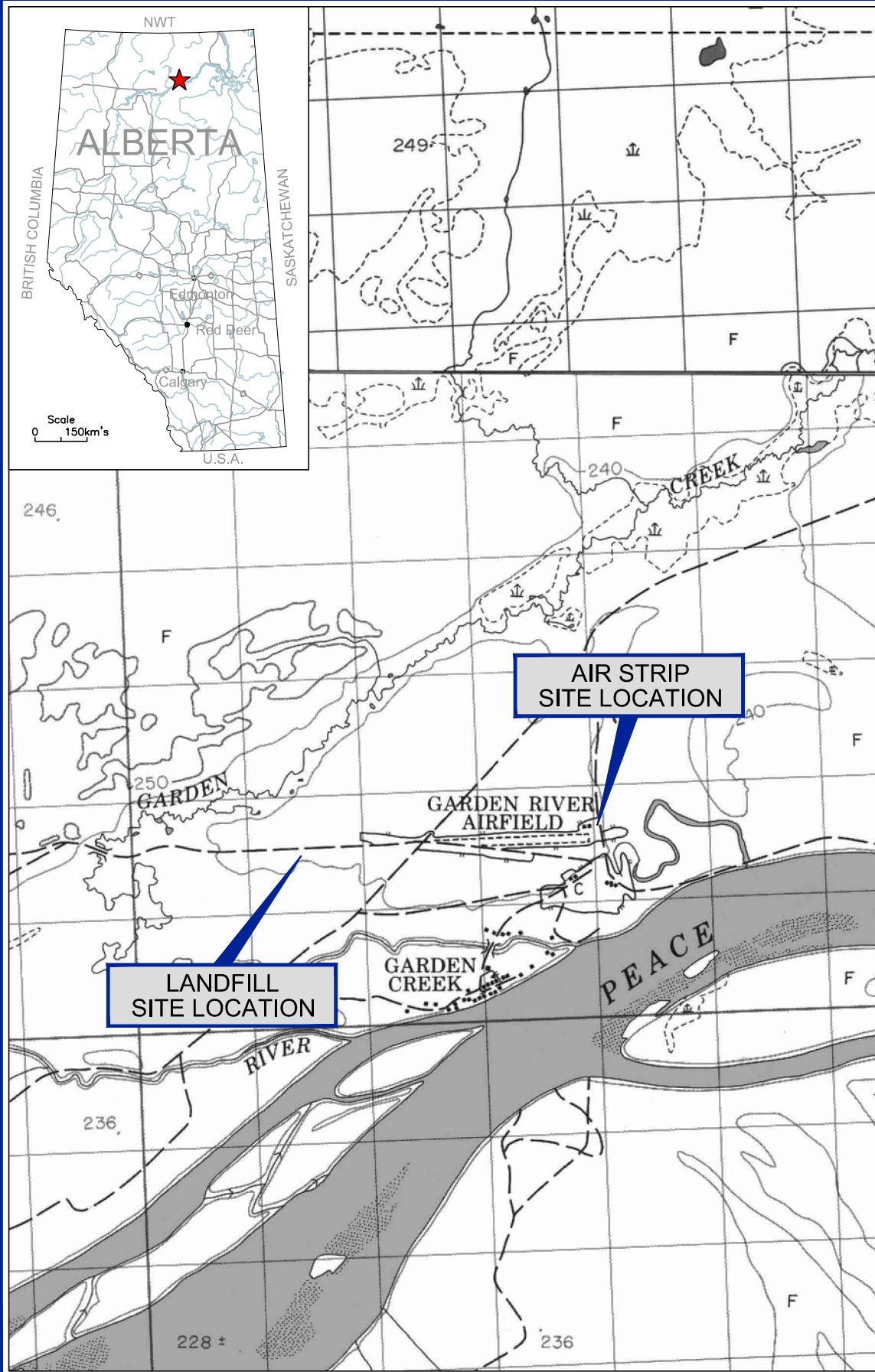
<sup>1</sup> - Health Canada, October 2014, Guidelines for Canadian Drinking Water Quality Summary Table

<sup>2</sup> - Federal Contaminated Sites Action Plan, November 2014, Guidance Document on Federal Interim Groundwater Quality Guidelines for Federal Contaminated Sites

<sup>3</sup> - Alberta Environment and Sustainable Resource Development, May 2014, Alberta Tier 1 Soil and Groundwater Remediation Guidelines

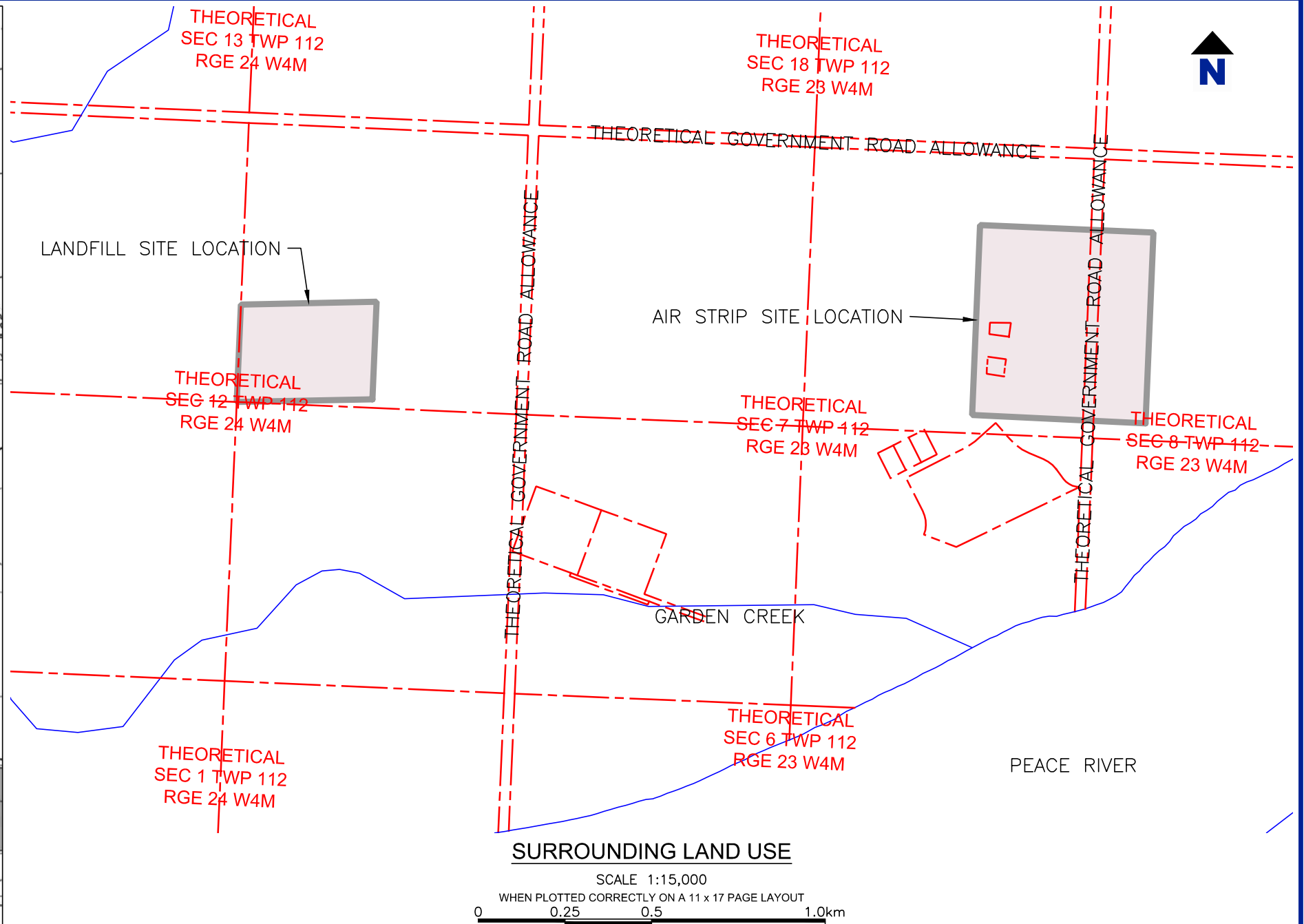
## **DRAWINGS**

Groundwater Characterization Report  
Landfill and Air Strip  
Garden River, Alberta  
SLR Project No. 200.20022.00000



SCALE 1:50,000  
WHEN PLOTTED CORRECTLY ON A 11 x 17 PAGE LAYOUT  
0 0.5 1.0 2.0 3.0km

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.



SCALE 1:15,000  
WHEN PLOTTED CORRECTLY ON A 11 x 17 PAGE LAYOUT  
0 0.25 0.5 1.0km

**NOTES**  
DRAWING COMPILED FROM ALTUS GEOMATICS AUTOCAD FILE NO. C010914S.DWG, SLR CONSULTING (CANADA) LTD. DRAWING NO. 200.02005.00000-01 REV. B, BING MAPS IMAGERY, ABACUS DATAGRAPHS SATELLITE IMAGERY, NTS MAPS 84 I/12 TITLED "BUCHANAN LAKE" AND 84 I/13 TITLED "TRIDENT CREEK" AND SITE RECONNAISSANCE INFORMATION.  
  
LEGAL DESCRIPTION:  
THEORETICAL NE 1/4 SEC 12 TWP 112 RGE 24 W4M AND THEORETICAL SEC 7 & 8 TWP 112 RGE 23 W4M AND THE THEORETICAL GOVERNMENT ROAD ALLOWANCE BETWEEN SEC 7 & 8 TWP 112 RGE 23 W4M  
GARDEN RIVER, ALBERTA

**LEGEND**  
--- PROPERTY BOUNDARY  
SITE LOCATION

**PARKS CANADA  
GARDEN RIVER LANDFILL & AIRSTRIP  
WOOD BUFFALO NATIONAL PARK  
GARDEN RIVER, ALBERTA**

Report  
**GROUNDWATER CHARACTERIZATION  
REPORT**

Drawing  
**SITE LOCATION &  
SURROUNDING LAND USE**

Date	December 16, 2014	Scale	AS SHOWN	Drawing No.	1
File Name	S_200-02005-00000-A1	Project No.	200.02005.00000		





NOTES

DRAWING COMPILED FROM ALTUS GEOMATICS AUTOCAD FILE NO. C010914S.DWG, SLR CONSULTING (CANADA) LTD. DRAWING NO. 200.02005.00000-01 REV. B, BING MAPS IMAGERY, ABACUS DATAGRAPHS SATELLITE IMAGERY, NTS MAPS 84 I/12 TITLED "BUCHANAN LAKE" AND 84 I/13 TITLED "TRIDENT CREEK" AND SITE RECONNAISSANCE INFORMATION.

LEGAL DESCRIPTION:  
THEORETICAL NE 1/4 SEC 12 TWP 112 RGE 24 W4M AND THEORETICAL SEC 7 & 8 TWP 112 RGE 23 W4M AND THE THEORETICAL GOVERNMENT ROAD ALLOWANCE BETWEEN SEC 7 & 8 TWP 112 RGE 23 W4M  
GARDEN RIVER, ALBERTA

LEGEND

- BOREHOLE LOCATION
- BOREHOLE LOCATION COMPLETED AS A MONITORING WELL
- EXISTING DITCHING
- EXISTING TREELINE
- THEORETICAL QUARTER SECTION LINE
- STRATIGRAPHIC CROSS SECTION A - A'

PARKS CANADA  
GARDEN RIVER LANDFILL & AIRSTRIP  
WOOD BUFFALO NATIONAL PARK  
GARDEN RIVER, ALBERTA

Report  
GROUNDWATER CHARACTERIZATION  
REPORT

Drawing  
BOREHOLE & MONITORING WELL LOCATION  
PLAN - LANDFILL

Date	December 16, 2014	Scale	AS SHOWN	Drawing No.	2
File Name	S_200-02005-00000-A1	Project No.	200.02005.00000		

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

SCALE 1:1,250  
WHEN PLOTTED CORRECTLY ON A 11 x 17 PAGE LAYOUT








NOTES

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LEGAL DESCRIPTION:  
THEORETICAL NE 1/4 SEC 12 TWP 112 RGE 24 W4M AND THEORETICAL SEC 7 & 8 TWP 112 RGE 23 W4M AND THE THEORETICAL GOVERNMENT ROAD ALLOWANCE BETWEEN SEC 7 & 8 TWP 112 RGE 23 W4M  
GARDEN RIVER, ALBERTA

LEGEND

-  BH BOREHOLE LOCATION COMPLETED AS A MONITORING WELL
-  - - - - - PROPERTY BOUNDARY
-  SITE LOCATION

PARKS CANADA  
GARDEN RIVER LANDFILL & AIRSTRIP  
WOOD BUFFALO NATIONAL PARK  
GARDEN RIVER, ALBERTA

Report  
GROUNDWATER CHARACTERIZATION  
REPORT

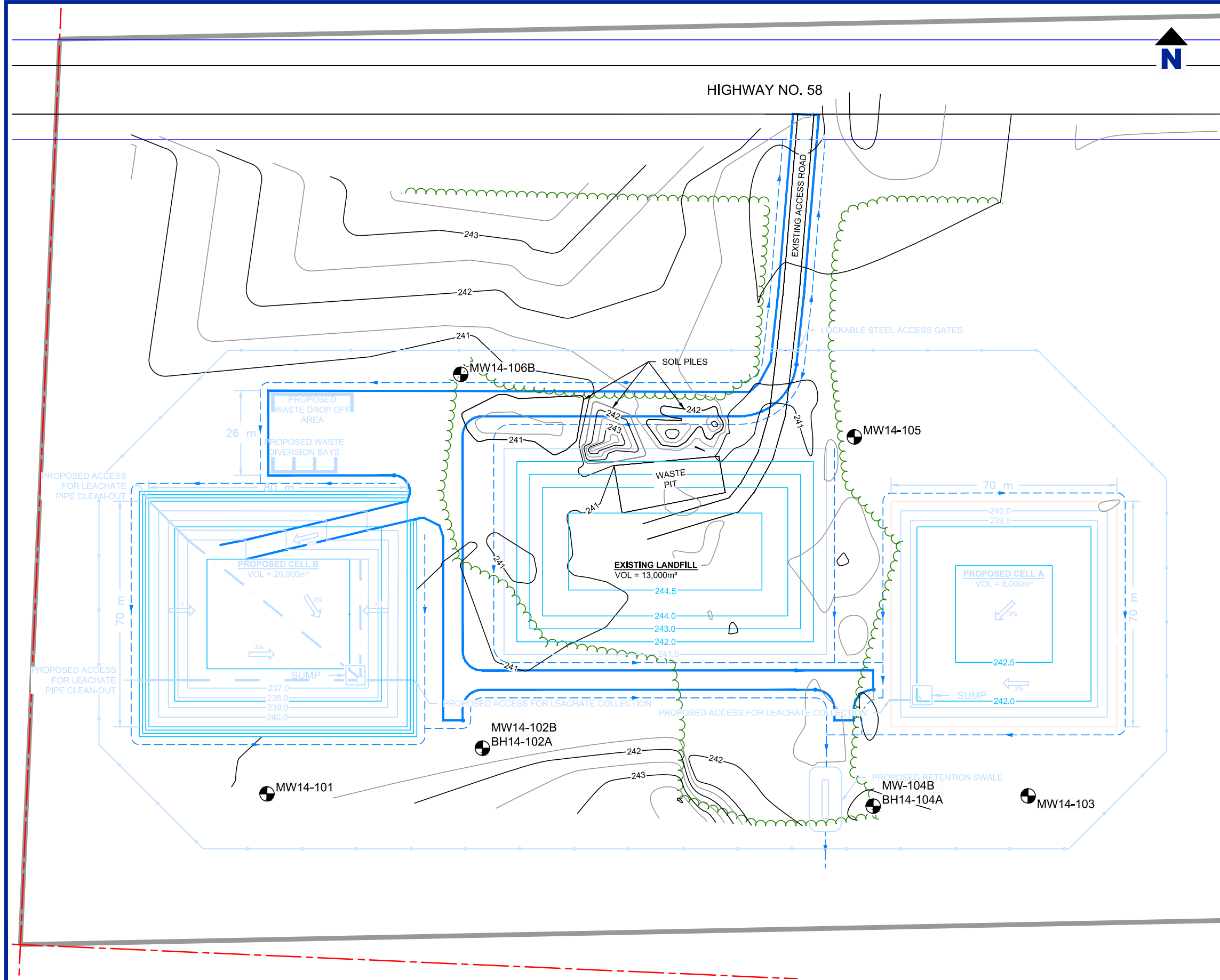
Drawing  
BOREHOLE & MONITORING WELL LOCATION  
PLAN - AIR STRIP

Date	December 16, 2014	Scale	AS SHOWN	Drawing No.	3
File Name	S_200-02005-00000-A1	Project No.	200.02005.00000		

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

SCALE 1:2,500  
WHEN PLOTTED CORRECTLY ON A 11 x 17 PAGE LAYOUT  
0 25 50 100 150m





NOTES  
DRAWING COMPILED FROM ALTUS GEOMATICS AUTOCAD FILE NO. C010914S.DWG, SLR CONSULTING (CANADA) LTD. DRAWING NO. 200.02005.00000-01 REV. B, BING MAPS IMAGERY, ABACUS DATAGRAPHS SATELLITE IMAGERY, NTS MAPS 84 I/12 TITLED "BUCHANAN LAKE" AND 84 I/13 TITLED "TRIDENT CREEK" AND SITE RECONNAISSANCE INFORMATION.

LEGAL DESCRIPTION:  
THEORETICAL NE 1/4 SEC 12 TWP 112 RGE 24 W4M AND THEORETICAL SEC 7 & 8 TWP 112 RGE 23 W4M AND THE THEORETICAL GOVERNMENT ROAD ALLOWANCE BETWEEN SEC 7 & 8 TWP 112 RGE 23 W4M GARDEN RIVER, ALBERTA

- LEGEND
- ⊕<sup>BH</sup> BOREHOLE LOCATION
  - ⊙<sup>BH</sup> BOREHOLE LOCATION COMPLETED AS A MONITORING WELL
  - EXISTING DITCHING
  - 242— EXISTING 1.0 m CONTOURS (JUNE 2014)
  - EXISTING 0.5 m CONTOURS (JUNE 2014)
  - ~ EXISTING TREELINE
  - - -> PROPOSED DITCHING AND DIRECTION OF FLOW
  - - -> PROPOSED CULVERT
  - 242.0— PROPOSED CONTOURS BELOW GRADE
  - 242.0— PROPOSED CONTOURS ABOVE GRADE
  - PROPOSED SOLID LEACHATE PIPE
  - · - · - PROPOSED PERFORATED LEACHATE PIPE
  - · - · - PROPOSED WILDLIFE FENCE
  - PROPOSED SITE ROAD
  - - - - - THEORETICAL QUARTER SECTION LINE

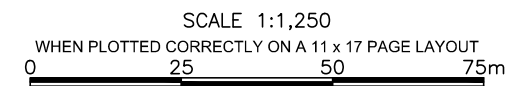
PARKS CANADA  
GARDEN RIVER LANDFILL & AIRSTRIP  
WOOD BUFFALO NATIONAL PARK  
GARDEN RIVER, ALBERTA

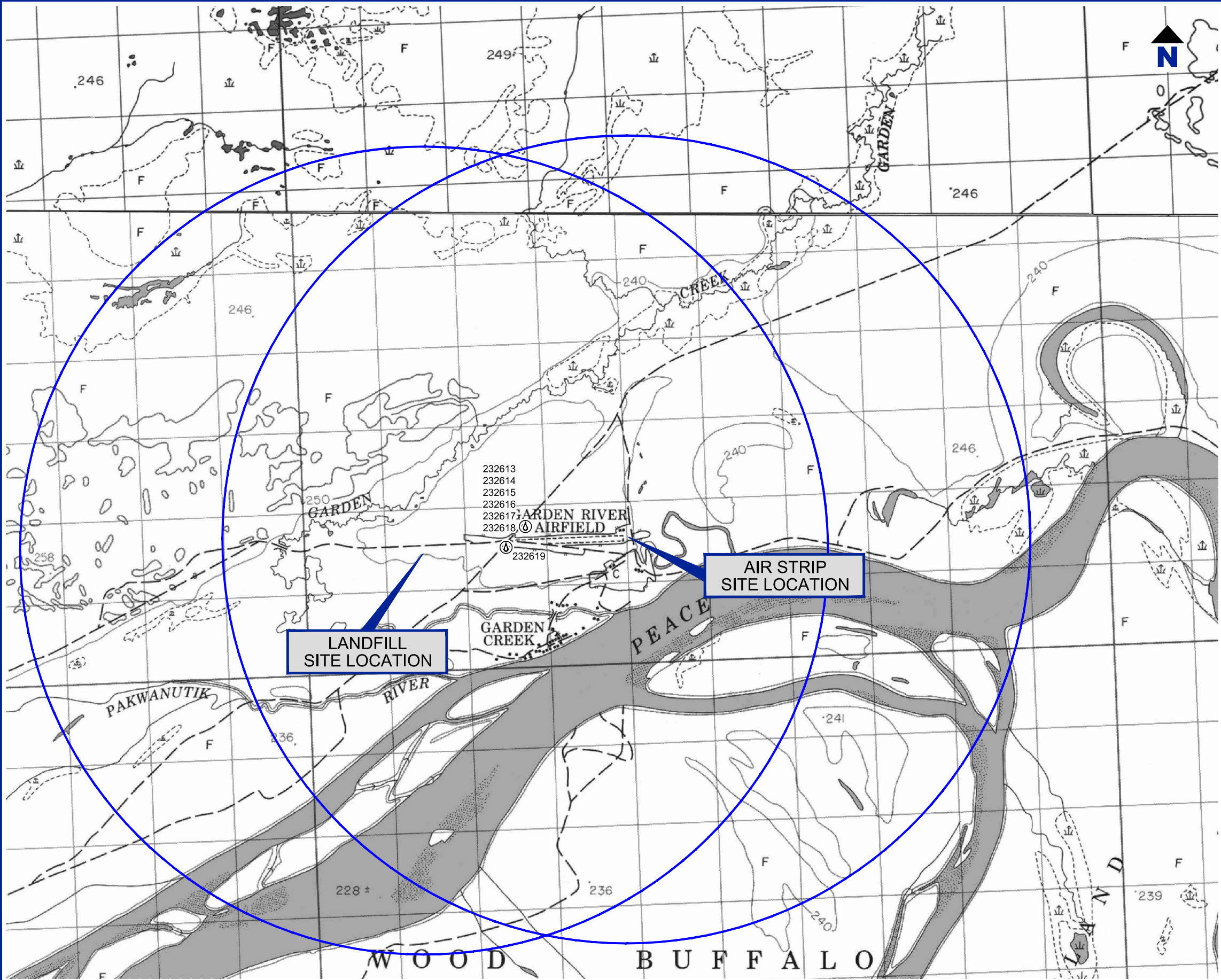
Report  
GROUNDWATER CHARACTERIZATION  
REPORT

Drawing  
SITE TOPOGRAPHY - LANDFILL

Date	December 16, 2014	Scale	AS SHOWN	Drawing No.	4
File Name	S_200-02005-00000-A1	Project No.	200.02005.00000		

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.








NOTES  
DRAWING COMPILED FROM ALTUS GEOMATICS AUTOCAD FILE NO. C010914S.DWG, SLR CONSULTING (CANADA) LTD. DRAWING NO. 200.02005.00000-01 REV. B, BING MAPS IMAGERY, ABACUS DATAGRAPHS SATELLITE IMAGERY, NTS MAPS 84 I/12 TITLED "BUCHANAN LAKE" AND 84 I/13 TITLED "TRIDENT CREEK" AND SITE RECONNAISSANCE INFORMATION.

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GARDEN RIVER, ALBERTA

LEGEND

-  AESRD ID
-  WATER WELL LOCATION
-  5 km RADIUS

PARKS CANADA  
GARDEN RIVER LANDFILL & AIRSTRIP  
WOOD BUFFALO NATIONAL PARK  
GARDEN RIVER, ALBERTA

Report  
GROUNDWATER CHARACTERIZATION  
REPORT

Drawing  
LOCATION OF WATER WELLS WITHIN 5 km  
OF THE SITE

Date	December 16, 2014	Scale	AS SHOWN	Drawing No.	5
File Name	S_200-02005-00000-A1	Project No.	200.02005.00000		

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

SCALE 1:50,000  
WHEN PLOTTED CORRECTLY ON A 11 x 17 PAGE LAYOUT  
0 0.5 1.0 2.0 3.0km



NOTES

DRAWING COMPILED FROM ALTUS GEOMATICS AUTOCAD FILE NO. C010914S.DWG, SLR CONSULTING (CANADA) LTD. DRAWING NO. 200.02005.00000-01 REV. B, BING MAPS IMAGERY, ABACUS DATAGRAPHS SATELLITE IMAGERY, NTS MAPS 84 I/12 TITLED "BUCHANAN LAKE" AND 84 I/13 TITLED "TRIDENT CREEK" AND SITE RECONNAISSANCE INFORMATION.

LEGAL DESCRIPTION:  
THEORETICAL NE 1/4 SEC 12 TWP 112 RGE 24 W4M AND THEORETICAL SEC 7 & 8 TWP 112 RGE 23 W4M AND THE THEORETICAL GOVERNMENT ROAD ALLOWANCE BETWEEN SEC 7 & 8 TWP 112 RGE 23 W4M  
GARDEN RIVER, ALBERTA

LEGEND

- BH

BOREHOLE LOCATION
- MW

BOREHOLE LOCATION COMPLETED AS A MONITORING WELL
- DATE

GROUNDWATER ELEVATION
- A

A'
- STRATIGRAPHIC CROSS SECTION A - A'

TS

TOPSOIL

ST

SILT

S

SAND

C

CLAY

WELL

SCREENED INTERVAL

BOREHOLE

END OF HOLE

DEEPER BOREHOLE

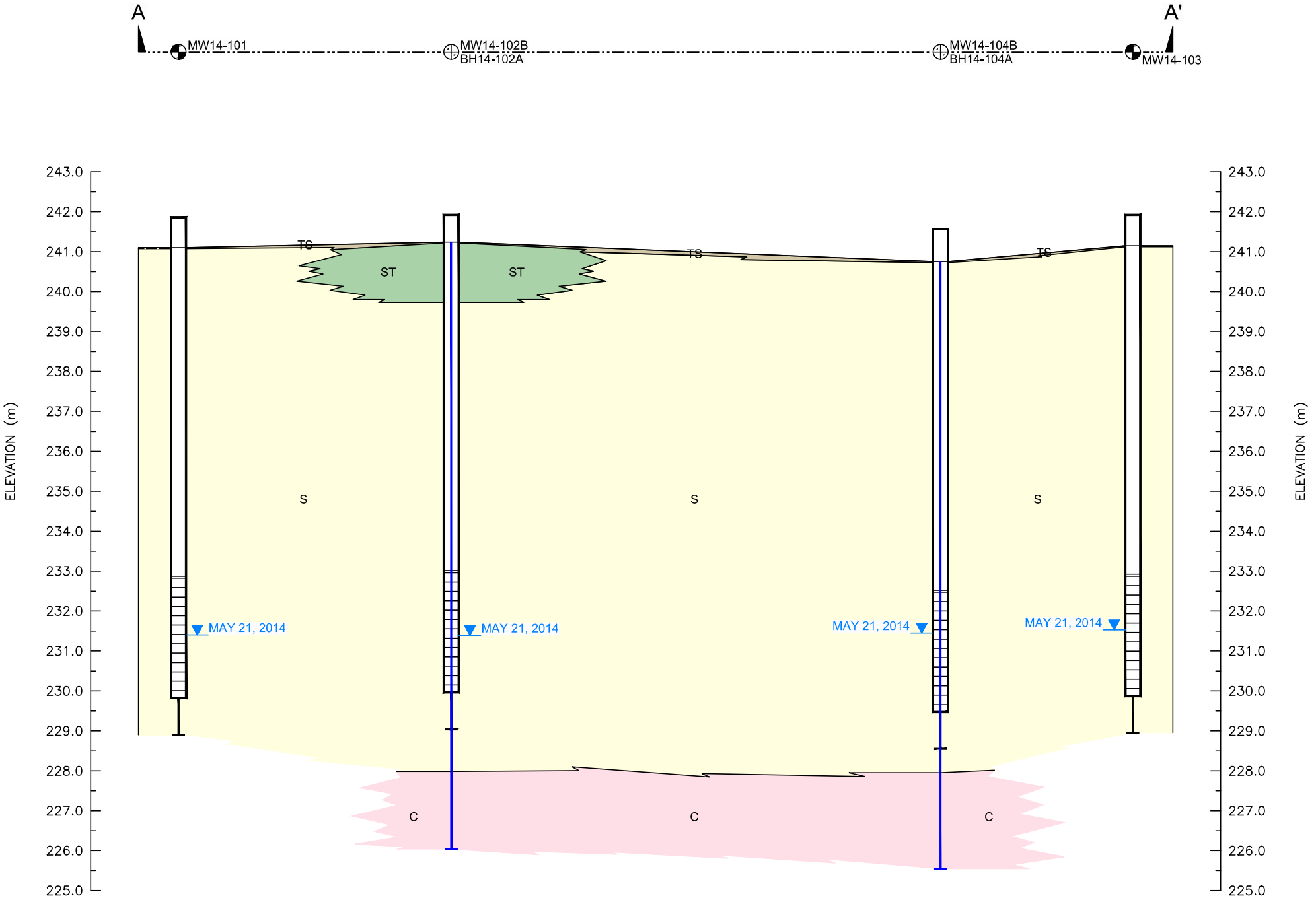
END OF HOLE

PARKS CANADA  
GARDEN RIVER LANDFILL & AIRSTRIP  
WOOD BUFFALO NATIONAL PARK  
GARDEN RIVER, ALBERTA

Report  
GROUNDWATER CHARACTERIZATION  
REPORT

Drawing  
LOCAL CROSS SECTION A - A'

Date	December 16, 2014	Scale	AS SHOWN	Drawing No.	6
File Name	S_200-02005-00000-A1	Project No.	200.02005.00000		



THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.

SCALE 1:1,250  
WHEN PLOTTED CORRECTLY ON A 11 x 17 PAGE LAYOUT  
0 25 50 75m

## **PHOTOLOG**

Groundwater Characterization Report  
Landfill and Air Strip  
Garden River, Alberta  
SLR Project No. 200.20022.00000



**Photo 1:** Aerial view of existing landfill area and surrounding woods from the south. Highway 58 in background (March 2014).



**Photo 2:** Aerial view of landfill (right side of photo) and surrounding woods. Highway 58 in foreground, Peace River visible in background (March 2014).



SITE PHOTOGRAPHS

Groundwater Characterization Report  
Landfill and Air Strip  
Garden River, AB

Project No: 200.02005.00000



**Photo 3:** Aerial view of landfill and surrounding features. Peace River in background (March 2014).



**Photo 4:** View of drill rig during borehole drilling and monitoring well installation program at landfill (March 2014).



SITE PHOTOGRAPHS

Groundwater Characterization Report  
Landfill and Air Strip  
Garden River, AB

Project No: 200.02005.00000



**Photo 5:** View of current landfill access road (May 2014).



**Photo 6:** View of MW14-105 located in northeast corner of landfill site (May 2014).



SITE PHOTOGRAPHS

Groundwater Characterization Report  
Landfill and Air Strip  
Garden River, AB

Project No: 200.02005.00000



**Photo 7:** View of white goods storage (left side), excavated soil from disposal pit (right) (May 2014).



**Photo 8:** View of landfill site, facing north from south side of existing cleared area (May 2014).



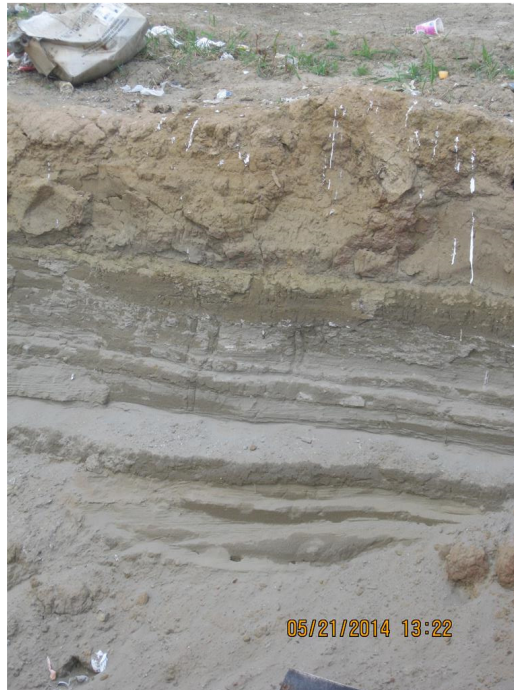
SITE PHOTOGRAPHS

Groundwater Characterization Report  
Landfill and Air Strip  
Garden River, AB

Project No: 200.02005.00000



**Photo 9:** View of disposal pit in use in May 2014. Vehicle storage in background on west side of existing landfill cleared area.



**Photo 10:** View of exposed side wall of disposal pit, showing soil stratigraphy observed at landfill site.



SITE PHOTOGRAPHS

Groundwater Characterization Report  
Landfill and Air Strip  
Garden River, AB

Project No: 200.02005.00000



**Photo 11:** View of MW14-104B in southeast corner of existing cleared area. Cut line that was used to access MW14-103 is shown in left centre portion of photograph (May 2014).



**Photo 12:** View of cutline used to access monitoring well location MW14-101 (May 2014).



SITE PHOTOGRAPHS

Groundwater Characterization Report  
Landfill and Air Strip  
Garden River, AB

Project No: 200.02005.00000

## **APPENDIX A**

### **Borehole Logs/Piezometer Construction Details**

Groundwater Characterization Report  
Landfill and Air Strip  
Garden River, Alberta  
SLR Project No. 200.20022.00000



CLIENT: Parks Canada Agency  
PROJECT: Landfill Remediation  
ADDRESS: Garden River Landfill & Airstrip,  
Garden River, AB  
SLR JOB NO: 200.02005.00000

## MONITOR WELL LOG

MONITOR WELL NO: MW14-101 UTM COORDINATES  
6511566.12 N  
SURFACE ELEVATION: 241.10 m 331722.03 E

SLR CONSULTING (CANADA) LTD. SLR JOB NO: 200.02005.00000					SURFACE ELEVATION: 241.10 m					331722.03 E						
DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)		
						ORGANIC VAPOUR LEVEL (ppmv)										
						1	10	100	1000	10000						
0		MW14-101-1			Ground Surface											
					ORGANICS/TOPSOIL											
					SAND											
					Medium-grained, well sorted, non-plastic, orangish to light brown											
					@ 0.5 m: Light brown/tan, moist											
1		MW14-101-2														
		MW14-101-3														240
2		MW14-101-4														239
		MW14-101-5														238
3		MW14-101-6														
					@ 3.4 m: Trace gravel, poorly sorted											
		MW14-101-7														
4		MW14-101-8														
					@ 4.6 m: No gravel											
		MW14-101-9														
5		MW14-101-10														
					@ 5.5 m: Increased moisture, still moist											
		MW14-101-11														
6		MW14-101-12														
					@ 6.4 m: Clay lens (<25 mm thick), moist to wet											
		MW14-101-13														
7																
8																
											</					

DRILLING METHOD: Solid Stem Auger Drilling  
BOREHOLE DIAMETER: 0.15 m (OD)

Notes: ■ GRAB SAMPLE

DATE: 18 March 2014  
LOGGED BY: DSK  
CONTRACTOR: Frontier Enviro-Drill

Sheet 1 of 2



CLIENT: Parks Canada Agency  
 PROJECT: Landfill Remediation  
 ADDRESS: Garden River Landfill & Airstrip,  
 Garden River, AB  
 SLR JOB NO: 200.02005.00000

# MONITOR WELL LOG

MONITOR WELL NO: MW14-101 UTM COORDINATES 6511566.12 N  
 SURFACE ELEVATION: 241.10 m 331722.03 E

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
						ORGANIC VAPOUR LEVEL (ppmv)								
						1	10	100	1000	10000				
9.0					@ 9.0 m: Trace gravel									
9.5					@ 9.5 m: Coarse sand, trace gravel, poorly sorted, wet, reddish brown									
10.1					@ 10.1 m: Grey									
10.14		MW14-101-14												
10.15		MW14-101-15												
11.3														
12.2					End of monitor well at 12.2 m									
					Well Completion Details: Screened interval from 8.2 m to 11.3 m below surface Elevation at top of casing (TOC) = 241.86 m									

DRILLING METHOD: Solid Stem Auger Drilling  
 BOREHOLE DIAMETER: 0.15 m (OD)

Notes: ■ GRAB SAMPLE

DATE: 18 March 2014  
 LOGGED BY: DSK  
 CONTRACTOR: Frontier Enviro-Drill



CLIENT: Parks Canada Agency  
 PROJECT: Landfill Remediation  
 ADDRESS: Garden River Landfill & Airstrip,  
 Garden River, AB  
 SLR JOB NO: 200.02005.00000

## BOREHOLE LOG

BOREHOLE NO: BH14-102A  
 SURFACE ELEVATION: 241.24 m

SLR CONSULTING (CANADA) LTD.

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
						ORGANIC VAPOUR LEVEL (ppmv)								
						1	10	100	1000	10000				
1		MW14-102A-1			<b>TOPSOIL/ORANICS</b> <b>SILT</b> Some sand, fine-grained, well sorted, compact, non-plastic, reddish brown, dry								bentonite chips	
		MW14-102A-2												
		MW14-102A-3												
2		MW14-102A-4			<b>SAND</b> Some silt, fine to medium grained, well sorted, non-plastic, light brown/tan, dry									
		MW14-102A-5												
		MW14-102A-6												
3		MW14-102A-7			@ 4.0 m: Trace gravel, poorly sorted									
		MW14-102A-8												
		MW14-102A-9												
4		MW14-102A-10			@ 6.1 m: No gravel, well sorted, medium grained, moist									
		MW14-102A-11												
		MW14-102A-12												
5		MW14-102A-13			@ 6.9 m: Clay lens (<25 mm thick)									
		MW14-102A-14												
		MW14-102A-15												
6		MW14-102A-16			@ 8.2 m: Trace gravel								sand and slough	
		MW14-102A-17												
		MW14-102A-18												
7		MW14-102A-19			@ 9.1 m: Coarse sand, some gravel, poorly sorted, very loose, reddish brown, wet									
		MW14-102A-20												
		MW14-102A-21												
8		MW14-102A-22												
		MW14-102A-23												
		MW14-102A-24												

DRILLING METHOD: Hollow Stem Auger Drilling

Notes: ■ GRAB SAMPLE

DATE: 18 March 2014

LOGGED BY: DSK  
 CONTRACTOR: Frontier Enviro-Drill

Sheet 1 of 2



CLIENT: Parks Canada Agency  
 PROJECT: Landfill Remediation  
 ADDRESS: Garden River Landfill & Airstrip,  
 Garden River, AB  
 SLR JOB NO: 200.02005.00000

## BOREHOLE LOG

BOREHOLE NO: BH14-102A  
 SURFACE ELEVATION: 241.24 m

SLR CONSULTING (CANADA) LTD.

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
						ORGANIC VAPOUR LEVEL (ppmv)								
						1	10	100	1000	10000				
11		102A-14			@ 10.1 m: Grey, wet									231
		MW14-102A-15				▲								
		MW14-102A-16				▲								230
12		MW14-102A-17				▲								229
13		MW14-102A-18				▲								228
		MW14-102A-19			CLAY Very soft, high plasticity, dark, grey, wet	▲								227
14		MW14-102A-20				▲								
15		MW14-102A-21			@ 14.9 m: Silty and clay, medium to low plasticity	▲								
					End of borehole at 15.2 m									
					Well Completion Details: Screened interval from 13.7 m to 15.2 m below surface Elevation at top of casing (TOC) = 0.00 m									
					Slough to 8.8 m at completion of drilling, unable to install well									

DRILLING METHOD: Hollow Stem Auger Drilling

Notes: ■ GRAB SAMPLE

DATE: 18 March 2014

LOGGED BY: DSK  
 CONTRACTOR: Frontier Enviro-Drill

Sheet 2 of 2



CLIENT: Parks Canada Agency  
 PROJECT: Landfill Remediation  
 ADDRESS: Garden River Landfill & Airstrip,  
 Garden River, AB  
 SLR JOB NO: 200.02005.00000

# MONITOR WELL LOG

MONITOR WELL NO: MW14-102B  
 SURFACE ELEVATION: 241.24 m  
 UTM COORDINATES  
 6511580.269 N  
 331788.7877 E

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
						ORGANIC VAPOUR LEVEL (ppmv)								
						1	10	100	1000	10000				
0					Ground Surface								steel casing, stickup, lockable	
					<b>TOPSOIL/ORANICS</b>									
					<b>SILT</b> Some sand, fine-grained, well sorted, non-plastic, reddish brown, dry								sand	241
1					@ 1.1 m: Light brown/tan									240
					<b>SAND</b> Some silt, fine to medium grained, well sorted, non-plastic, light brown/tan, dry									
2														239
3														238
4					@ 4.0 m: Trace gravel, poorly sorted								bentonite chips	237
5														236
6					@ 6.1 m: No gravel, well sorted, medium grained, moist									235
7					@ 6.9 m: Clay lens (<25 mm thick)									234
8					@ 8.2 m: Trace gravel								50 mm solid PVC pipe	233
9														

SLR CANADA V5.2 100 SERIES LOGS.GPJ SLR\_CAN V5.2.GDT 27/11/14

DRILLING METHOD: Solid Stem Auger Drilling  
 BOREHOLE DIAMETER: 0.15 m (OD)  
 DATE: 18 March 2014  
 LOGGED BY: DSK  
 CONTRACTOR: Frontier Enviro-Drill

Notes:

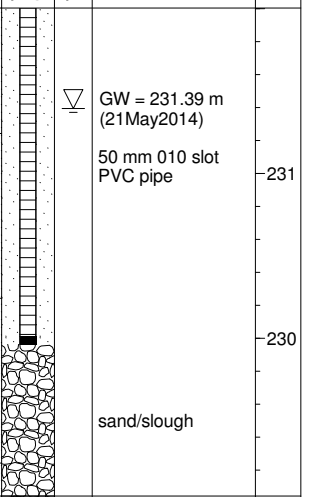


CLIENT: Parks Canada Agency  
 PROJECT: Landfill Remediation  
 ADDRESS: Garden River Landfill & Airstrip,  
 Garden River, AB  
 SLR JOB NO: 200.02005.00000

# MONITOR WELL LOG

MONITOR WELL NO: MW14-102B UTM COORDINATES  
 SURFACE ELEVATION: 241.24 m 6511580.269 N  
 331788.7877 E

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
						ORGANIC VAPOUR LEVEL (ppmv)								
						1	10	100	1000	10000				
10					@ 9.1 m: Coarse sand, some gravel, poorly sorted, reddish brown, wet									
11					@ 10.1 m: Grey, wet									
12														
					End of monitor well at 12.2 m									
					Well Completion Details: Screened interval from 8.2 m to 11.3 m below surface Elevation at top of casing (TOC) = 241.92 m									



DRILLING METHOD: Solid Stem Auger Drilling  
 BOREHOLE DIAMETER: 0.15 m (OD)  
 DATE: 18 March 2014  
 LOGGED BY: DSK  
 CONTRACTOR: Frontier Enviro-Drill

Notes:  
 Sheet 2 of 2



CLIENT: Parks Canada Agency  
PROJECT: Landfill Remediation  
ADDRESS: Garden River Landfill & Airstrip,  
Garden River, AB  
SLR JOB NO: 200.02005.00000

## MONITOR WELL LOG

MONITOR WELL NO: MW14-103 UTM COORDINATES  
SURFACE ELEVATION: 241.15 m 6511565.435 N  
331957.951 E

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
						ORGANIC VAPOUR LEVEL (ppmv)								
						1	10	100	1000	10000				
0		MW14-103-1			Ground Surface								steel casing, stickup, lockable	241
		MW14-103-2			TOPSOIL/ORGANICS								sand	
		MW14-103-3			SAND									
		MW14-103-4			Silty, fine-grained, well sorted, non-plastic, reddish brown, dry									
1					@ 0.9 m: Brown/tan									240
		MW14-103-5			@ 1.5 m: No silt									
2														239
		MW14-103-6												
		MW14-103-7			@ 3.1 m: Fine to medium grained									238
3														
		MW14-103-8											bentonite chips	237
4														
		MW14-103-9												236
5														
		MW14-103-10												235
6														
		MW14-103-11												234
7														
		MW14-103-12											50 mm solid PVC pipe	233
8														
		MW14-103-13			@ 8.8 m: Clay lens (<25 mm thick)									232

SLR CANADA V5.2 100 SERIES LOGS.GPJ SLR\_CAN V5.2.GDT 27/11/14

DRILLING METHOD: Solid Stem Auger Drilling  
BOREHOLE DIAMETER: 0.15 m (OD)

Notes: ■ GRAB SAMPLE

DATE: 18 March 2014  
LOGGED BY: DSK  
CONTRACTOR: Frontier Enviro-Drill

Sheet 1 of 2



CLIENT: Parks Canada Agency  
 PROJECT: Landfill Remediation  
 ADDRESS: Garden River Landfill & Airstrip,  
 Garden River, AB  
 SLR JOB NO: 200.02005.00000

# MONITOR WELL LOG

MONITOR WELL NO: MW14-103 UTM COORDINATES  
 SURFACE ELEVATION: 241.15 m 6511565.435 N  
 331957.951 E

SLR CONSULTING (CANADA) LTD.

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
						ORGANIC VAPOUR LEVEL (ppmv)								
						1	10	100	1000	10000				
10		MW14-103-14			@ 9.1 m: Coarse grained, poorly sorted, wet									
					@ 10.2 m: Grey, wet									
11		MW14-103-15			@ 10.7 m: Trace gravel									
		MW14-103-16												
12		MW14-103-17												
					End of monitor well at 12.2 m									
					Well Completion Details: Screened interval from 8.2 m to 11.3 m below surface Elevation at top of casing (TOC) = 241.92 m									

End of monitor well at 12.2 m  
 Well Completion Details:  
 Screened interval from 8.2 m to 11.3 m below surface  
 Elevation at top of casing (TOC) = 241.92 m

DRILLING METHOD: Solid Stem Auger Drilling  
 BOREHOLE DIAMETER: 0.15 m (OD)

Notes: ■ GRAB SAMPLE

DATE: 18 March 2014  
 LOGGED BY: DSK  
 CONTRACTOR: Frontier Enviro-Drill



CLIENT: Parks Canada Agency  
PROJECT: Landfill Remediation  
ADDRESS: Garden River Landfill & Airstrip,  
Garden River, AB  
SLR JOB NO: 200.02005.00000

## BOREHOLE LOG

BOREHOLE NO: BH14-104A  
SURFACE ELEVATION: 240.75 m

SLR CONSULTING (CANADA) LTD.

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
						ORGANIC VAPOUR LEVEL (ppmv)								
						1	10	100	1000	10000				
1					<b>TOPSOIL/ORGANICS</b> <b>SAND</b> Silty, fine grained, well sorted, non-plastic, reddish brown, dry  @ 0.6 m: Brown/tan									240
2					@ 1.5 m: No silt, fine to medium grained, well sorted, moist									239
3					@ 3.1 m: Trace gravel									238
4					@ 3.5 m: No gravel									237
5														236
6														235
7														234
8														233
9					@ 9.1 m: Coarse grained, trace gravel, poorly sorted, wet									232
														231

DRILLING METHOD: Hollow Stem Auger Drilling

Notes: ■ GRAB SAMPLE

DATE: 18 March 2014  
LOGGED BY: DSK  
CONTRACTOR: Frontier Enviro-Drill

Sheet 1 of 2



CLIENT: Parks Canada Agency  
 PROJECT: Landfill Remediation  
 ADDRESS: Garden River Landfill & Airstrip,  
 Garden River, AB  
 SLR JOB NO: 200.02005.00000

## BOREHOLE LOG

BOREHOLE NO: BH14-104A  
 SURFACE ELEVATION: 240.75 m

SLR CONSULTING (CANADA) LTD.

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)	
						ORGANIC VAPOUR LEVEL (ppmv)									
						1	10	100	1000	10000					
11					@ 10.1 m: Grey										-230
12					@ 12.2 m: Trace gravel, coarse grained, poorly sorted, grey, wet										-229
13		MW14-104A-1			<b>CLAY</b> Soft, high plasticity, dark grey, wet										-228
14		MW14-104A-2													-227
15		MW14-104A-3													-226
15		MW14-104A-4													
					End of borehole at 15.2 m										

DRILLING METHOD: Hollow Stem Auger Drilling

Notes: ■ GRAB SAMPLE

DATE: 18 March 2014

LOGGED BY: DSK  
 CONTRACTOR: Frontier Enviro-Drill

Sheet 2 of 2



CLIENT: Parks Canada Agency  
 PROJECT: Landfill Remediation  
 ADDRESS: Garden River Landfill & Airstrip,  
 Garden River, AB  
 SLR JOB NO: 200.02005.00000

# MONITOR WELL LOG

MONITOR WELL NO: MW14-104B UTM COORDINATES  
 SURFACE ELEVATION: 240.75 m 6511562.274 N  
 331909.9166 E

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)	
						ORGANIC VAPOUR LEVEL (ppmv)									
						1	10	100	1000	10000					
0		MW14-104B-1			Ground Surface									steel casing, stickup, lockable	241
					<b>TOPSOIL/ORGANICS</b>									sand	
		MW14-104B-2			<b>SAND</b>										
					Silty, fine grained, well sorted, non-plastic, reddish brown, dry										
					@ 0.6 m: Brown/tan										240
1		MW14-104B-3													
					@ 1.5 m: No silt, fine to medium grained, well sorted, moist										239
2		MW14-104B-4													
					@ 3.1 m: Trace gravel										238
3		MW14-104B-5													
					@ 3.5 m: No gravel										237
4		MW14-104B-6												bentonite chips	
		MW14-104B-7													236
5		MW14-104B-8													
															235
6		MW14-104B-9													
															234
7		MW14-104B-10													
		MW14-104B-11													233
8		MW14-104B-12												50 mm solid PVC pipe	
															232
9		MW14-104B-13			@ 9.1 m: Coarse grained, trace gravel, poorly sorted, wet										

SLR CANADA V5.2 100 SERIES LOGS.GPJ SLR\_CAN V5.2.GDT 27/11/14

DRILLING METHOD: Solid Stem Auger Drilling  
 BOREHOLE DIAMETER: 0.15 m (OD)

Notes: ■ GRAB SAMPLE

DATE: 18 March 2014  
 LOGGED BY: DSK  
 CONTRACTOR: Frontier Enviro-Drill



CLIENT: Parks Canada Agency  
PROJECT: Landfill Remediation  
ADDRESS: Garden River Landfill & Airstrip,  
Garden River, AB  
SLR JOB NO: 200.02005.00000

## MONITOR WELL LOG

MONITOR WELL NO: MW14-104B  
SURFACE ELEVATION: 240.75 m  
UTM COORDINATES  
6511562.274 N  
331909.9166 E

SLR CONSULTING (CANADA) LTD. SLR JOB NO: 200.02005.00000					SURFACE ELEVATION: 240.75 m					331909.9166 E					
DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)	
						ORGANIC VAPOUR LEVEL (ppmv)									
						1	10	100	1000	10000					
0		MW14-104B-14			@ 10.1 m: Grey									GW = 231.45 m (21May2014)	231
		MW14-104B-15												50 mm Ø10 slot PVC pipe	230
1		MW14-104B-16													
		MW14-104B-17												sand/slough	229
2															
End of monitor well at 12.2 m															
Well Completion Details: Screened interval from 8.2 m to 11.3 m below surface Elevation at top of casing (TOC) = 241.56 m															

DRILLING METHOD: Solid Stem Auger Drilling  
BOREHOLE DIAMETER: 0.15 m (OD)

Notes: ■ GRAB SAMPLE

DATE: 18 March 2014  
LOGGED BY: DSK  
CONTRACTOR: Frontier Enviro-Drill

Sheet 2 of 2



CLIENT: Parks Canada Agency  
PROJECT: Landfill Remediation  
ADDRESS: Garden River Landfill & Airstrip,  
Garden River, AB  
SLR JOB NO: 200.02005.00000

## MONITOR WELL LOG

MONITOR WELL NO: MW14-105 UTM COORDINATES  
6511676.812 N  
SURFACE ELEVATION: 241.22 m 331904.0838 E

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)	
						ORGANIC VAPOUR LEVEL (ppmv)									
						1	10	100	1000	10000					
0		MW14-105-1			Ground Surface									steel casing, stickup, lockable	
					TOPSOIL/ORGANICS										
					SAND									sand	241
		MW14-105-2			Silty, fine grained, well sorted, non-plastic, reddish brown, moist										
					@ 0.5 m: Light brown/tan										
1		MW14-105-3													240
					@ 1.5 m: No silt, medium to fine grained, well sorted										
2		MW14-105-4													239
					@ 2.7 m: Trace coarse grained sand/gravel										
		MW14-105-5			@ 3.1 m: No coarse grained sand/gravel										238
		MW14-105-6													
					@ 4.6 m: Increased moisture									bentonite chips	237
		MW14-105-7													
5		MW14-105-8													236
					@ 5.6 m: Clay lens (<25 mm thick)										
		MW14-105-9													235
		MW14-105-10													
															234
		MW14-105-11													
8		MW14-105-12												50 mm solid PVC pipe	233
9		MW14-105-13													

DRILLING METHOD: Solid Stem Auger Drilling  
BOREHOLE DIAMETER: 0.15 m (OD)

Notes: ■ GRAB SAMPLE

DATE: 19 March 2014  
LOGGED BY: DSK  
CONTRACTOR: Frontier Enviro-Drill

Sheet 1 of 2



CLIENT: Parks Canada Agency  
 PROJECT: Landfill Remediation  
 ADDRESS: Garden River Landfill & Airstrip,  
 Garden River, AB  
 SLR JOB NO: 200.02005.00000

# MONITOR WELL LOG

MONITOR WELL NO: MW14-105 UTM COORDINATES  
 SURFACE ELEVATION: 241.22 m 6511676.812 N  
 331904.0838 E

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
						ORGANIC VAPOUR LEVEL (ppmv)								
						1	10	100	1000	10000				
0		MW14-105-14			@ 9.3 m: Coarse sand, trace gravel, poorly sorted, wet								GW = 231.61 m (21May2014)	231
1		MW14-105-15			@ 10.4 m: Grey								50 mm 010 slot PVC pipe	230
2													sand/slough	
End of monitor well at 12.2 m														
Well Completion Details: Screened interval from 8.2 m to 11.3 m below surface Elevation at top of casing (TOC) = 241.97 m														

DRILLING METHOD: Solid Stem Auger Drilling  
 BOREHOLE DIAMETER: 0.15 m (OD)

Notes: GRAB SAMPLE

DATE: 19 March 2014  
 LOGGED BY: DSK  
 CONTRACTOR: Frontier Enviro-Drill



CLIENT: Parks Canada Agency  
 PROJECT: Landfill Remediation  
 ADDRESS: Garden River Landfill & Airstrip,  
 Garden River, AB  
 SLR JOB NO: 200.02005.00000

## BOREHOLE LOG

BOREHOLE NO: BH14-106A  
 SURFACE ELEVATION: 240.72 m

SLR CONSULTING (CANADA) LTD.

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
						ORGANIC VAPOUR LEVEL (ppmv)								
						1	10	100	1000	10000				
					<b>TOPSOIL/ORGANICS</b>									
					<b>SAND</b>									
					Silty, fine grained, well sorted, loose, non-plastic, reddish brown, moist									
1					@ 0.6 m: Light brown/tan								bentonite	240
					@ 1.5 m: No silt, medium to fine grained, well sorted									239
2														
														238
3														
					@ 3.8 m: Silty sand									237
4														
					@ 4.3 m: Wet									
					@ 4.6 m: No silt, moist									236
5														
													sand/cuttings	
					@ 5.5 m: Trace gravel									235
6														
														234
7														
					@ 8.1 m: Clay lens (<25 mm thick)									233
8														
					@ 9.0 m: Trace gravel, wet									232
9														
					@ 9.8 m: Coarse grained, poorly sorted, wet									231

DRILLING METHOD: Hollow Stem Auger Drilling

Notes: ■ GRAB SAMPLE

DATE: 19 March 2014  
 LOGGED BY: DSK  
 CONTRACTOR: Frontier Enviro-Drill

Sheet 1 of 2



CLIENT: Parks Canada Agency  
 PROJECT: Landfill Remediation  
 ADDRESS: Garden River Landfill & Airstrip,  
 Garden River, AB

SLR JOB NO: 200.02005.00000

## BOREHOLE LOG

BOREHOLE NO: BH14-106A

SURFACE ELEVATION: 240.72 m

SLR CONSULTING (CANADA) LTD.

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
						ORGANIC VAPOUR LEVEL (ppmv)								
						1	10	100	1000	10000				
11					@ 10.1 m: Grey									230
12					<b>CLAY</b> Silty, soft, medium to high plasticity, dark grey, wet @ 11.6 m: No silt, high plasticity									229
13		MW14-106A-1 (LAB)	24.1		@ 12.8 m: Silty									228
14		MW14-106A-2 (LAB)	27											227
15		MW14-106A-3 (LAB)	23.6											226
15		MW14-106A-4 (LAB)	26.3											
					End of borehole at 15.2 m									
					No monitor well installed									

DRILLING METHOD: Hollow Stem Auger Drilling

Notes: ■ GRAB SAMPLE

DATE: 19 March 2014

LOGGED BY: DSK  
 CONTRACTOR: Frontier Enviro-Drill

Sheet 2 of 2

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
						ORGANIC VAPOUR LEVEL (ppmv)								
						1	10	100	1000	10000				
0	MW14-106B-1 (LAB)				Ground Surface <b>TOPSOIL/ORGANICS</b> <b>SAND</b> Silty, fine grained, well sorted, loose, non-plastic, reddish brown, moist @ 0.6 m: Light brown/tan								steel casing, stickup, lockable	-241
1	MW14-106B-2 (LAB)	4.1				4.1							sand	-240
2	MW14-106B-3 (LAB)	4.7			@ 1.5 m: No silt, medium to fine grained, compact, well sorted	4.7								-239
3	MW14-106B-4 (LAB)	3.3				3.3								-238
4	MW14-106B-5 (LAB)	3.2				3.2								-237
5	MW14-106B-6 (LAB)	13			@ 3.8 m: Silty sand	13							bentonite chips	-236
6	MW14-106B-7 (LAB)	26.3			@ 4.3 m: Wet @ 4.6 m: No silt, moist	26.3								-235
7	MW14-106B-8 (LAB)	2.3			@ 5.5 m: Trace gravel	2.3								-234
8	MW14-106B-9 (LAB)	3.4				3.4								-233
9	MW14-106B-10 (LAB)	2.9				2.9								-232
10	MW14-106B-11 (LAB)	2.2				2.2								-231
11	MW14-106B-12 (LAB)	7.2			@ 8.1 m: Clay lens (<25 mm thick)	7.2							50 mm solid PVC pipe	-230
12	MW14-106B-13 (LAB)	15.5			@ 9.0 m: Trace gravel, wet	15.5								-229
13													GW = 231.51 m	-228

SLR CANADA V5.2 100 SERIES LOGS.GPJ SLR CAN V5.2.GDT 27/11/14

DRILLING METHOD:	Solid Stem Auger Drilling
BOREHOLE DIAMETER:	0.15 m (OD)

Notes: ██████████ GRAB SAMPLE

DATE: 19 March 2014 LOGGED BY: DSK  
CONTRACTOR: Frontier Enviro-Drill



CLIENT: Parks Canada Agency  
 PROJECT: Landfill Remediation  
 ADDRESS: Garden River Landfill & Airstrip,  
 Garden River, AB  
 SLR JOB NO: 200.02005.00000

# MONITOR WELL LOG

MONITOR WELL NO: MW14-106B  
 SURFACE ELEVATION: 240.72 m  
 UTM COORDINATES  
 6511696.191 N  
 331782.0952 E

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
						ORGANIC VAPOUR LEVEL (ppmv)								
						1	10	100	1000	10000				
10		MW14-106B-14 (LAB)	21.8		@ 9.8 m: Coarse grained, poorly sorted, wet		2.8						(21May2014)	231
		MW14-106B-15 (LAB)	8.9		@ 10.1 m: Grey		8.9						50 mm 010 slot PVC pipe	230
11		MW14-106B-16 (LAB)	24.2		<b>CLAY</b> Silty, soft, medium to high plasticity, dark grey, wet @ 11.6 m: No silt, high plasticity		24.2						sand/slough	229
12		MW14-106B-17 (LAB)	33.2				33.2							
End of monitor well at 12.2 m														
Well Completion Details: Screened interval from 8.1 m to 11.1 m below surface Elevation at top of casing (TOC) = 241.48 m														

SLR CANADA V5.2 100 SERIES LOGS.GPJ SLR\_CAN V5.2.GDT 27/11/14

DRILLING METHOD: Solid Stem Auger Drilling  
 BOREHOLE DIAMETER: 0.15 m (OD)

Notes: ■ GRAB SAMPLE

DATE: 19 March 2014  
 LOGGED BY: DSK  
 CONTRACTOR: Frontier Enviro-Drill



CLIENT: Parks Canada Agency  
 PROJECT: Landfill Remediation  
 ADDRESS: Garden River Landfill & Airstrip,  
 Garden River, AB  
 SLR JOB NO: 200.02005.00000

# MONITOR WELL LOG

MONITOR WELL NO: MW14-107 UTM COORDINATES 6511808.423 N  
 SURFACE ELEVATION: 234.48 m 334120.0793 E

DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)
						ORGANIC VAPOUR LEVEL (ppmv)								
						1	10	100	1000	10000				
														235
0		MW14-107-1			Ground Surface									235
					TOPSOIL/ORGANICS									
					CLAY									
					Trace sand, hard, dark brown, moist to dry									
		MW14-107-2												234
1		MW14-107-3			@ 1.2 m: Some sand, trace oxidation									233
2		MW14-107-4			@ 2.1 m: Silty, clay, dark grey									232
					@ 2.6 m: Clayey silt, dark brown, soft									
3		MW14-107-5			@ 3.1 m: Silt, clay, low plasticity									231
4		MW14-107-6			@ 4.1 m: Silt, some clay, very soft, increased oxidation									230
					@ 4.3 m: Wet, dark grey									
		MW14-107-7												
5		MW14-107-8												229
6		MW14-107-9												
					End of monitor well at 6.1 m									
					Well Completion Details: Screened interval from 3.1 m to 6.1 m below surface Elevation at top of casing (TOC) = 235.21 m									
DRILLING METHOD: Solid Stem Auger Drilling						Notes: GRAB SAMPLE								
BOREHOLE DIAMETER: 0.15 m (OD)														
DATE: 21 March 2014						LOGGED BY: DSK						Sheet 1 of 1		
						CONTRACTOR: Frontier Enviro-Drill								

SLR CANADA V5.2 100 SERIES LOGS.GPJ SLR\_CAN V5.2.GDT 27/11/14

DRILLING METHOD: Solid Stem Auger Drilling  
 BOREHOLE DIAMETER: 0.15 m (OD)

Notes: ■ GRAB SAMPLE

DATE: 21 March 2014  
 LOGGED BY: DSK  
 CONTRACTOR: Frontier Enviro-Drill



334204.8575 E

SLR CONSULTING (CANADA) LTD.

SLR JOB NO: 200.02005.00000

Notes: GRAB SAMPLE

Sheet 1 of 1



CLIENT: Parks Canada Agency  
PROJECT: Landfill Remediation  
ADDRESS: Garden River Landfill & Airstrip,  
Garden River, AB  
SLR JOB NO: 200.02005.00000

## MONITOR WELL LOG

MONITOR WELL NO: MW14-109 UTM COORDINATES  
6511998.818 N  
SURFACE ELEVATION: 241.58 m 333854.7445 E

SLR CONSULTING (CANADA) LTD.					SLR JOB NO: 200.02005.00000	SURFACE ELEVATION: 241.58 m					333854.7445 E					
DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)		
						ORGANIC VAPOUR LEVEL (ppmv)										
						1	10	100	1000	10000						
0					Ground Surface											
		MW14-109-1			TOPSOIL/ORGANICS											
					SAND											
					Silty, fine grained, well sorted, non-plastic, light reddish brown, dry											
					@ 0.6 m: Trace silt, light brown/tan											
1		MW14-109-2														
		MW14-109-3														
2		MW14-109-4			@ 1.8 m: No silt											
		MW14-109-5														
3		MW14-109-6			@ 3.1 m: Fine to medium grained, well sorted											
		MW14-109-7														
5		MW14-109-8														
6		MW14-109-9			@ 6.1 m: Poorly sorted											
		MW14-109-10			@ 6.6 m: Trace gravel											
7																
		MW14-109-11			@ 7.5 m: Moist											
8		MW14-109-12														
9		MW14-109-13														

DRILLING METHOD: Solid Stem Auger Drilling  
BOREHOLE DIAMETER: 0.15 m (OD)

Notes: ■ GRAB SAMPLE

DATE: 21 March 2014  
LOGGED BY: DSK  
CONTRACTOR: Frontier Enviro-Drill

Sheet 1 of 2



CLIENT: Parks Canada Agency  
PROJECT: Landfill Remediation  
ADDRESS: Garden River Landfill & Airstrip,  
Garden River, AB  
SLR JOB NO: 200.02005.00000

## MONITOR WELL LOG

MONITOR WELL NO: MW14-109 UTM COORDINATES  
SURFACE ELEVATION: 241.58 m 6511998.818 N  
333854.7445 E

SLR CONSULTING (CANADA) LTD.					SLR JOB NO: 200.02005.00000	SURFACE ELEVATION: 241.58 m					333854.7445 E					
DEPTH (m)	SAMPLE TYPE	SAMPLE ID	MOISTURE CONTENT (%)	SOIL TYPE	SOIL DESCRIPTION	FIELD TEST DATA					WELL COMPLETION	WATER LEVEL	WELL COMPLETION NOTES	ELEVATION (m)		
						ORGANIC VAPOUR LEVEL (ppmv)										
						1	10	100	1000	10000						
0		MW14-109-14			@ 10.2 m: Wet @ 10.4 m: Grey								GW = 231.93 m (21May2014)  50 mm 010 slot PVC pipe	232		
		MW14-109-15													231	
1		MW14-109-16														230
2		MW14-109-17														
End of monitor well at 12.2 m																
Well Completion Details: Screened interval from 8.8 m to 11.9 m below surface Elevation at top of casing (TOC) = 242.29 m																

DRILLING METHOD: Solid Stem Auger Drilling  
BOREHOLE DIAMETER: 0.15 m (OD)

Notes: ■ GRAB SAMPLE

DATE: 21 March 2014  
LOGGED BY: DSK  
CONTRACTOR: Frontier Enviro-Drill

Sheet 2 of 2

## **APPENDIX B**

### **Water Well Database Search Results**

Groundwater Characterization Report  
Landfill and Air Strip  
Garden River, Alberta  
SLR Project No. 200.20022.00000

Reconnaissance Report

[View in Imperial](#)  
[Export to Excel](#)

Groundwater Wells

Please click the water Well ID to generate the Water Well Drilling Report.

Well ID	LSD	SEC	TWP	RGE	M	DRILLING COMPANY	DATE COMPLETED	DEPTH (m)	TYPE OF WORK	USE	CHM	LT	PT	WELL OWNER	STATIC LEVEL (m)	TEST RATE (L/min)
<a href="#">232613</a>	NE	07	112	23	4	SMITTY'S WW SVC LTD	1981-09-03	10.67	New Well	Domestic		3		INDIAN AFFAIRS CAN#DH 2	8.84	4.32
<a href="#">232614</a>	NE	07	112	23	4	SMITTY'S WW SVC LTD	1981-09-03	13.11	New Well	Dewatering		5		INDIAN AFFAIRS CAN#DH 3	8.84	13.64
<a href="#">232615</a>	NE	07	112	23	4	SMITTY'S WW SVC LTD	1981-09-03	10.06	New Well	Domestic		7		INDIAN AFFAIRS		
<a href="#">232616</a>	NE	07	112	23	4	SMITTY'S WW SVC LTD	1982-02-06	8.53	Dry Hole- Abandoned	Domestic		4		INDIAN AFFAIRS		
<a href="#">232617</a>	NE	07	112	23	4	SMITTY'S WW SVC LTD	1982-02-06	14.94	New Well	Domestic		6		INDIAN AFFAIRS	9.91	7.46
<a href="#">232618</a>	NE	07	112	23	4	SMITTY'S WW SVC LTD	1982-02-08	13.72	New Well	Domestic		6		INDIAN AFFAIRS	7.62	10.18
<a href="#">232619</a>	00	07	112	23	4	SAVILLE WATER WELL DRILLING LTD.	1976-02-24	16.76	New Well	Unknown		3		NORTHLAND SCHOOL DIV	9.14	45.46

Well Identification and Location										Measurement in Metric	
<b>Owner Name</b> INDIAN AFFAIRS CAN#DH 2		Address		Town		Province		Country	Postal Code		
<b>Location</b>	1/4 or LSD NE	SEC 07	TWP 112	RGE 23	W of MER 4	Lot	Block	Plan	Additional Description		
<b>Measured from Boundary of</b>					<b>GPS Coordinates in Decimal Degrees (NAD 83)</b>						
_____ m from _____					Latitude <u>58.714586</u> Longitude <u>-113.871454</u>					Elevation _____ m	
_____ m from _____					How Location Obtained					How Elevation Obtained	
					Map					Not Obtained	

Drilling Information	
<b>Method of Drilling</b> Backhoe	<b>Type of Work</b> New Well
<b>Proposed Well Use</b> Domestic	

Formation Log			Measurement in Metric
Depth from ground level (m)	Water Bearing	Lithology Description	
0.61		Brown Sandy Clay	
8.23		Brown Fine Grained Sand	
10.67		Brown Coarse Grained Sand	

Yield Test Summary			Measurement in Metric
<b>Recommended Pump Rate</b> _____			0.00 L/min
<b>Test Date</b>	<b>Water Removal Rate (L/min)</b>	<b>Static Water Level (m)</b>	
1981/09/01	4.32	8.84	

Well Completion			Measurement in Metric
<b>Total Depth Drilled</b>	<b>Finished Well Depth</b>	<b>Start Date</b>	<b>End Date</b>
10.67 m		1981/08/26	1981/09/03
<b>Borehole</b>			
<b>Diameter (cm)</b>	<b>From (m)</b>	<b>To (m)</b>	
0.00	0.00	10.67	
<b>Surface Casing (if applicable)</b>		<b>Well Casing/Liner</b>	
Culvert			
<b>Size OD :</b>	<u>62.99 cm</u>	<b>Size OD :</b>	<u>0.00 cm</u>
<b>Wall Thickness :</b>	<u>0.160 cm</u>	<b>Wall Thickness :</b>	<u>0.000 cm</u>
<b>Bottom at :</b>	<u>10.67 m</u>	<b>Top at :</b>	<u>0.00 m</u>
		<b>Bottom at :</b>	<u>0.00 m</u>
<b>Perforations</b>			
<b>From (m)</b>	<b>To (m)</b>	<b>Diameter or Slot Width(cm)</b>	<b>Slot Length(cm)</b>
Perforated by _____			
<b>Annular Seal</b>			
Placed from <u>0.00 m</u> to <u>0.00 m</u>			
Amount _____			
Other Seals			
Type		At (m)	
<b>Screen Type</b> Stainless Steel			
Size OD : <u>59.99 cm</u>			
<b>From (m)</b>	<b>To (m)</b>	<b>Slot Size (cm)</b>	
9.75	10.36	0.030	
Attachment <u>Attached To Casing</u>			
Top Fittings <u>Welded</u>		Bottom Fittings <u>Other</u>	
<b>Pack</b>			
Type <u>Sand</u>		Grain Size _____	
Amount <u>3.00 Yards</u>			

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well UNKNOWN NA DRILLER	Certification No 1
Company Name SMITTY'S WW SVC LTD	Copy of Well report provided to owner Date approval holder signed

Well Identification and Location										Measurement in Metric
<b>Owner Name</b> INDIAN AFFAIRS CAN#DH 2		Address		Town		Province		Country	Postal Code	
<b>Location</b>	1/4 or LSD NE	SEC 07	TWP 112	RGE 23	W of MER 4	Lot	Block	Plan	Additional Description	
<b>Measured from Boundary of</b> _____ m from _____ _____ m from _____					<b>GPS Coordinates in Decimal Degrees (NAD 83)</b> Latitude <u>58.714586</u> Longitude <u>-113.871454</u> How Location Obtained Map				Elevation _____ m How Elevation Obtained Not Obtained	

Additional Information										Measurement in Metric
Distance From Top of Casing to Ground Level _____ cm					Is Flow Control Installed _____					
Is Artesian Flow _____ Rate _____ L/min					Describe _____					
Recommended Pump Rate _____ 0.00 L/min					Pump Installed <b>Yes</b>		Depth _____ m			
Recommended Pump Intake Depth (From TOC) _____ 0.00 m					Type <b>HAND</b>		Make _____ H.P. _____		Model (Output Rating) _____	
Did you Encounter Saline Water (>4000 ppm TDS) _____					Depth _____ m		Well Disinfected Upon Completion _____			
Gas _____					Depth _____ m		Geophysical Log Taken _____ Submitted to ESRD _____			
Additional Comments on Well _____					Sample Collected for Potability _____ Submitted to ESRD _____					

Yield Test			Taken From Ground Level Depth to water level	Measurement in Metric
Test Date 1981/09/01	Start Time 12:00 AM	Static Water Level 8.84 m		
			Drawdown (m)	Elapsed Time Minutes:Sec
				Recovery (m)
<b>Method of Water Removal</b>				
Type <b>Pump</b>				
Removal Rate <u>4.32</u> L/min				
Depth Withdrawn From <u>10.36</u> m				
If water removal period was < 2 hours, explain why _____				

Water Diverted for Drilling		
Water Source	Amount Taken L	Diversion Date & Time

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well <b>UNKNOWN NA DRILLER</b>	Certification No <b>1</b>
Company Name <b>SMITTY'S WW SVC LTD</b>	Copy of Well report provided to owner Date approval holder signed

GIC Well ID 232614  
GoA Well Tag No.  
Drilling Company Well ID  
Date Report Received 1981/09/28

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

Well Identification and Location										Measurement in Metric	
<b>Owner Name</b> INDIAN AFFAIRS CAN#DH 3		Address		Town		Province		Country	Postal Code		
<b>Location</b>	1/4 or LSD NE	SEC 07	TWP 112	RGE 23	W of MER 4	Lot	Block	Plan	Additional Description		
<b>Measured from Boundary of</b>					<b>GPS Coordinates in Decimal Degrees (NAD 83)</b>						
_____ m from _____					Latitude <u>58.714586</u> Longitude <u>-113.871454</u>					Elevation _____ m	
_____ m from _____					How Location Obtained					How Elevation Obtained	
					Map					Not Obtained	

Drilling Information	
<b>Method of Drilling</b> Bored	<b>Type of Work</b> New Well
<b>Proposed Well Use</b> Dewatering	

Formation Log			Measurement in Metric
Depth from ground level (m)	Water Bearing	Lithology Description	
0.30		Brown Clay	
8.23		Brown Sandy Clay	
8.84		Coarse Grained Sand	
10.06		Coarse Grained Sand & Gravel	
13.11		Gray Clay	

Yield Test Summary			Measurement in Metric
<b>Recommended Pump Rate</b> <u>0.00</u> L/min			
Test Date	Water Removal Rate (L/min)	Static Water Level (m)	
1981/09/01	13.64	8.84	

Well Completion			Measurement in Metric
Total Depth Drilled	Finished Well Depth	Start Date	End Date
13.11 m		1981/08/28	1981/09/03
<b>Borehole</b>			
Diameter (cm)	From (m)	To (m)	
0.00	0.00	13.11	
<b>Surface Casing (if applicable)</b>		<b>Well Casing/Liner</b>	
Culvert			
Size OD :	<u>62.99</u> cm	Size OD :	<u>0.00</u> cm
Wall Thickness :	<u>0.160</u> cm	Wall Thickness :	<u>0.000</u> cm
Bottom at :	<u>13.11</u> m	Top at :	<u>0.00</u> m
		Bottom at :	<u>0.00</u> m
<b>Perforations</b>			
From (m)	To (m)	Diameter or Slot Width(cm)	Slot Length(cm)
Perforated by			
<b>Annular Seal</b>			
Placed from <u>0.00</u> m to <u>0.00</u> m			
Amount _____			
Other Seals			
Type		At (m)	
<b>Screen Type</b> Stainless Steel			
Size OD : <u>59.99</u> cm			
From (m)	To (m)	Slot Size (cm)	
9.75	10.36	0.030	
Attachment <u>Attached To Casing</u>			
Top Fittings <u>Welded</u>		Bottom Fittings <u>Other</u>	
<b>Pack</b>			
Type <u>Sand</u>	Grain Size _____		
Amount <u>3.00</u> Yards			

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well UNKNOWN NA DRILLER	Certification No 1
Company Name SMITTY'S WW SVC LTD	Copy of Well report provided to owner Date approval holder signed

Well Identification and Location										Measurement in Metric	
<b>Owner Name</b> INDIAN AFFAIRS CAN#DH 3		Address		Town		Province		Country	Postal Code		
<b>Location</b>	1/4 or LSD NE	SEC 07	TWP 112	RGE 23	W of MER 4	Lot	Block	Plan	Additional Description		
<b>Measured from Boundary of</b>					<b>GPS Coordinates in Decimal Degrees (NAD 83)</b>						
_____ m from _____					Latitude <u>58.714586</u> Longitude <u>-113.871454</u>					Elevation _____ m	
_____ m from _____					How Location Obtained					How Elevation Obtained	
					Map					Not Obtained	

Additional Information										Measurement in Metric
Distance From Top of Casing to Ground Level _____ cm										
Is Artesian Flow _____										
Rate _____ L/min										
Is Flow Control Installed _____										
Describe _____										
Recommended Pump Rate _____ 0.00 L/min										
Pump Installed _____ Depth _____ m										
Recommended Pump Intake Depth (From TOC) _____ 0.00 m										
Type _____ Make _____ H.P. _____										
Model (Output Rating) _____										
Did you Encounter Saline Water (>4000 ppm TDS) _____										
Depth _____ m										
Well Disinfected Upon Completion _____										
Gas _____ Depth _____ m										
Geophysical Log Taken _____										
Submitted to ESRD _____										
Sample Collected for Potability _____										
Submitted to ESRD _____										
Additional Comments on Well										

Yield Test				Taken From Ground Level	Measurement in Metric
Test Date	Start Time	Static Water Level		Depth to water level	
1981/09/01	12:00 AM	8.84 m			
<b>Method of Water Removal</b>					
Type	Pump				
Removal Rate	13.64 L/min				
Depth Withdrawn From	12.19 m				
If water removal period was < 2 hours, explain why					

Water Diverted for Drilling		
Water Source	Amount Taken	Diversion Date & Time
	L	

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well	Certification No
UNKNOWN NA DRILLER	1
Company Name	Copy of Well report provided to owner
SMITTY'S WW SVC LTD	Date approval holder signed

GIC Well ID 232615  
GoA Well Tag No.  
Drilling Company Well ID  
Date Report Received 1981/09/28

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

Well Identification and Location										Measurement in Metric
<b>Owner Name</b> INDIAN AFFAIRS		Address		Town		Province		Country	Postal Code	
<b>Location</b>	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description	
	NE	07	112	23	4					
<b>Measured from Boundary of</b>					<b>GPS Coordinates in Decimal Degrees (NAD 83)</b>					
_____ m from _____					Latitude <u>58.714586</u> Longitude <u>-113.871454</u>			Elevation _____ m		
_____ m from _____					How Location Obtained			How Elevation Obtained		
					Map			Estimated		

Drilling Information	
<b>Method of Drilling</b> Backhoe	<b>Type of Work</b> New Well
<b>Proposed Well Use</b> Domestic	

Formation Log			Measurement in Metric
Depth from ground level (m)	Water Bearing	Lithology Description	
1.83		Brown Sandy Clay	
2.44		Brown Fine Grained Sand	
6.10		Brown Silty Sand	
6.40		Blue Clayey Till	
6.71		Brown Fine Grained Sand	
7.01		Blue Clayey Till	
10.06		Brown Coarse Grained Sand	

Yield Test Summary			Measurement in Metric
<b>Recommended Pump Rate</b> _____ L/min			
Test Date	Water Removal Rate (L/min)	Static Water Level (m)	

Well Completion			Measurement in Metric
<b>Total Depth Drilled</b>	<b>Finished Well Depth</b>	<b>Start Date</b>	<b>End Date</b>
10.06 m		1981/08/26	1981/09/03
<b>Borehole</b>			
Diameter (cm)	From (m)	To (m)	
0.00	0.00	10.06	
<b>Surface Casing (if applicable)</b>		<b>Well Casing/Liner</b>	
Culvert			
Size OD : <u>62.99 cm</u>		Size OD : <u>0.00 cm</u>	
Wall Thickness : <u>0.160 cm</u>		Wall Thickness : <u>0.000 cm</u>	
Bottom at : <u>10.06 m</u>		Top at : <u>0.00 m</u>	
		Bottom at : <u>0.00 m</u>	
<b>Perforations</b>			
From (m)	To (m)	Diameter or Slot Width (cm)	Slot Length (cm)
Perforated by _____			
<b>Annular Seal</b>			
Placed from <u>0.00 m</u> to <u>0.00 m</u>			
Amount _____			
Other Seals			
Type		At (m)	
<b>Screen Type</b> Stainless Steel			
Size OD : <u>59.99 cm</u>			
From (m)	To (m)	Slot Size (cm)	
9.14	9.75	0.030	
Attachment <u>Attached To Casing</u>			
Top Fittings <u>Welded</u>		Bottom Fittings <u>Other</u>	
<b>Pack</b>			
Type <u>Sand</u>		Grain Size _____	
Amount <u>3.00 Yards</u>			

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well UNKNOWN NA DRILLER	Certification No 1
Company Name SMITTY'S WW SVC LTD	Copy of Well report provided to owner Date approval holder signed

Well Identification and Location										Measurement in Metric
Owner Name INDIAN AFFAIRS		Address		Town		Province		Country	Postal Code	
Location	1/4 or LSD NE	SEC 07	TWP 112	RGE 23	W of MER 4	Lot	Block	Plan	Additional Description	
Measured from Boundary of					GPS Coordinates in Decimal Degrees (NAD 83)					
_____ m from					Latitude 58.714586			Longitude -113.871454		
_____ m from					How Location Obtained			Elevation _____ m		
					Map			How Elevation Obtained		
								Estimated		

Additional Information										Measurement in Metric
Distance From Top of Casing to Ground Level _____ cm										
Is Artesian Flow _____										
Rate _____ L/min										
Is Flow Control Installed _____										
Describe _____										
Recommended Pump Rate _____ L/min										
Pump Installed _____										
Depth _____ m										
Recommended Pump Intake Depth (From TOC) _____ m										
Type _____										
Make _____										
H.P. _____										
Model (Output Rating) _____										
Did you Encounter Saline Water (>4000 ppm TDS) _____										
Depth _____ m										
Well Disinfected Upon Completion _____										
Gas _____										
Depth _____ m										
Geophysical Log Taken _____										
Submitted to ESRD _____										
Sample Collected for Potability _____										
Submitted to ESRD _____										
Additional Comments on Well										

Yield Test			Taken From Ground Level	Measurement in Metric
Test Date	Start Time	Static Water Level		
		m		
<b>Method of Water Removal</b>				
Type _____				
Removal Rate _____ L/min				
Depth Withdrawn From _____ m				
If water removal period was < 2 hours, explain why				

Water Diverted for Drilling		
Water Source	Amount Taken	Diversion Date & Time
	L	

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well	Certification No
UNKNOWN NA DRILLER	1
Company Name	Copy of Well report provided to owner
SMITTY'S WW SVC LTD	Date approval holder signed

Well Identification and Location										Measurement in Metric
<b>Owner Name</b> INDIAN AFFAIRS		<b>Address</b> GARDEN RIVER		<b>Town</b>		<b>Province</b>		<b>Country</b>	<b>Postal Code</b>	
<b>Location</b>	1/4 or LSD NE	SEC 07	TWP 112	RGE 23	W of MER 4	Lot	Block	Plan	Additional Description	
<b>Measured from Boundary of</b> _____ m from _____ _____ m from _____					<b>GPS Coordinates in Decimal Degrees (NAD 83)</b> Latitude <u>58.714586</u> Longitude <u>-113.871454</u> How Location Obtained Map			Elevation _____ m How Elevation Obtained Not Obtained		

Drilling Information	
<b>Method of Drilling</b> Bored	<b>Type of Work</b> Dry Hole-Abandoned
<b>Proposed Well Use</b> Domestic	

Formation Log			Measurement in Metric
Depth from ground level (m)	Water Bearing	Lithology Description	
3.05		Brown Clayey Till	
4.27		Brown Silty Sand	
4.57		Brown Silty Clay	
8.53		Brown Sand	

Yield Test Summary			Measurement in Metric
<b>Recommended Pump Rate</b> _____ L/min			
Test Date	Water Removal Rate (L/min)	Static Water Level (m)	

Well Completion				Measurement in Metric
Total Depth Drilled	Finished Well Depth	Start Date	End Date	
8.53 m		1982/02/05	1982/02/06	
<b>Borehole</b>				
Diameter (cm)	From (m)	To (m)		
0.00	0.00	8.53		
<b>Surface Casing (if applicable)</b>		<b>Well Casing/Liner</b>		
Size OD : _____ 0.00 cm		Size OD : _____ 0.00 cm		
Wall Thickness : _____ 0.000 cm		Wall Thickness : _____ 0.000 cm		
Bottom at : _____ 0.00 m		Top at : _____ 0.00 m		
		Bottom at : _____ 0.00 m		
<b>Perforations</b>				
From (m)	To (m)	Diameter or Slot Width (cm)	Slot Length (cm)	Hole or Slot Interval (cm)
Perforated by _____				
<b>Annular Seal</b>				
Placed from _____ 0.00 m to _____ 0.00 m				
Amount _____				
Other Seals				
Type		At (m)		
<b>Screen Type</b>				
Size OD : _____ 0.00 cm				
From (m)	To (m)	Slot Size (cm)		
Attachment _____				
Top Fittings _____		Bottom Fittings _____		
<b>Pack</b>				
Type _____		Grain Size _____		
Amount _____				

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well UNKNOWN NA DRILLER	Certification No 1
Company Name SMITTY'S WW SVC LTD	Copy of Well report provided to owner Date approval holder signed

Well Identification and Location										Measurement in Metric
<b>Owner Name</b> INDIAN AFFAIRS		<b>Address</b> GARDEN RIVER			<b>Town</b>		<b>Province</b>		<b>Country</b>	<b>Postal Code</b>
<b>Location</b>	1/4 or LSD NE	SEC 07	TWP 112	RGE 23	W of MER 4	Lot	Block	Plan	Additional Description	
<b>Measured from Boundary of</b>					<b>GPS Coordinates in Decimal Degrees (NAD 83)</b>					
_____ m from _____					Latitude <u>58.714586</u> Longitude <u>-113.871454</u>			Elevation _____ m		
_____ m from _____					How Location Obtained			How Elevation Obtained		
					Map			Not Obtained		

Additional Information										Measurement in Metric
Distance From Top of Casing to Ground Level _____ cm										
Is Artesian Flow _____					Is Flow Control Installed _____					
Rate _____ L/min					Describe _____					
Recommended Pump Rate _____ L/min					Pump Installed _____		Depth _____ m			
Recommended Pump Intake Depth (From TOC) _____ m					Type _____	Make _____	H.P. _____		Model (Output Rating) _____	
Did you Encounter Saline Water (>4000 ppm TDS) _____					Depth _____ m		Well Disinfected Upon Completion _____			
Gas _____					Depth _____ m		Geophysical Log Taken _____			
					Submitted to ESRD _____					
Additional Comments on Well _____					Sample Collected for Potability _____			Submitted to ESRD _____		

Yield Test			Taken From Ground Level	Measurement in Metric
Test Date	Start Time	Static Water Level		
		m		
<b>Method of Water Removal</b>				
Type _____				
Removal Rate _____ L/min				
Depth Withdrawn From _____ m				
If water removal period was < 2 hours, explain why _____				

Water Diverted for Drilling		
Water Source	Amount Taken	Diversion Date & Time
	L	

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well UNKNOWN NA DRILLER	Certification No 1
Company Name SMITTY'S WW SVC LTD	Copy of Well report provided to owner Date approval holder signed

Well Identification and Location										Measurement in Metric
<b>Owner Name</b> INDIAN AFFAIRS		<b>Address</b> GARDEN RIVER		<b>Town</b>		<b>Province</b>		<b>Country</b>	<b>Postal Code</b>	
<b>Location</b>	<b>1/4 or LSD</b> NE	<b>SEC</b> 07	<b>TWP</b> 112	<b>RGE</b> 23	<b>W of MER</b> 4	<b>Lot</b>	<b>Block</b>	<b>Plan</b>	<b>Additional Description</b>	
<b>Measured from Boundary of</b> _____ m from _____ _____ m from _____					<b>GPS Coordinates in Decimal Degrees (NAD 83)</b> Latitude <u>58.714586</u> Longitude <u>-113.871454</u> How Location Obtained Map			Elevation _____ m How Elevation Obtained Not Obtained		

Drilling Information	
<b>Method of Drilling</b> Bored	<b>Type of Work</b> New Well
<b>Proposed Well Use</b> Domestic	

Formation Log			Measurement in Metric
Depth from ground level (m)	Water Bearing	Lithology Description	
3.05		Brown Clayey Till	
3.96		Brown Silty Sand	
10.67		Blue Clay	
11.89		Brown Sand	
13.72		Blue Clay	
14.94		Blue Clayey Sand & Rocks	

Yield Test Summary			Measurement in Metric
<b>Recommended Pump Rate</b> <u>0.00</u> L/min			
<b>Test Date</b>	<b>Water Removal Rate (L/min)</b>	<b>Static Water Level (m)</b>	
1982/02/05	7.46	9.91	

Well Completion			Measurement in Metric
<b>Total Depth Drilled</b>	<b>Finished Well Depth</b>	<b>Start Date</b>	<b>End Date</b>
14.94 m		1982/02/05	1982/02/06
<b>Borehole</b>			
<b>Diameter (cm)</b>	<b>From (m)</b>	<b>To (m)</b>	
0.00	0.00	14.94	
<b>Surface Casing (if applicable)</b>		<b>Well Casing/Liner</b>	
Culvert			
<b>Size OD :</b>	<u>62.99</u> cm	<b>Size OD :</b>	<u>0.00</u> cm
<b>Wall Thickness :</b>	<u>0.160</u> cm	<b>Wall Thickness :</b>	<u>0.000</u> cm
<b>Bottom at :</b>	<u>14.94</u> m	<b>Top at :</b>	<u>0.00</u> m
		<b>Bottom at :</b>	<u>0.00</u> m
<b>Perforations</b>			
<b>From (m)</b>	<b>To (m)</b>	<b>Diameter or Slot Width(cm)</b>	<b>Slot Length(cm)</b>
Perforated by			
<b>Annular Seal</b>			
Placed from <u>0.00</u> m to <u>0.00</u> m			
Amount _____			
Other Seals			
Type		At (m)	
<b>Screen Type</b> Stainless Steel			
Size OD : <u>59.99</u> cm			
<b>From (m)</b>	<b>To (m)</b>	<b>Slot Size (cm)</b>	
10.97	11.58	0.030	
Attachment <u>Attached To Casing</u>			
Top Fittings <u>Welded</u>		Bottom Fittings <u>Open</u>	
<b>Pack</b>			
Type <u>Frac Sand</u>		Grain Size <u>20-40</u>	
Amount <u>12.00</u> Bags			

Contractor Certification	
<b>Name of Journeyman responsible for drilling/construction of well</b> UNKNOWN NA DRILLER	<b>Certification No</b> 1
<b>Company Name</b> SMITTY'S WW SVC LTD	<b>Copy of Well report provided to owner</b> <b>Date approval holder signed</b>

GIC Well ID 232617  
GoA Well Tag No.  
Drilling Company Well ID  
Date Report Received 1982/05/04

The driller supplies the data contained in this report. The Province disclaims responsibility for its accuracy. The information on this report will be retained in a public database.

Well Identification and Location										Measurement in Metric		
Owner Name		Address			Town		Province		Country		Postal Code	
INDIAN AFFAIRS		GARDEN RIVER										
Location		1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description		
		NE	07	112	23	4						
Measured from Boundary of					GPS Coordinates in Decimal Degrees (NAD 83)							
_____ m from					Latitude 58.714586 Longitude -113.871454					Elevation _____ m		
_____ m from					How Location Obtained					How Elevation Obtained		
					Map					Not Obtained		

Additional Information										Measurement in Metric	
Distance From Top of Casing to Ground Level _____ cm											
Is Artesian Flow _____											
Rate _____ L/min											
Is Flow Control Installed _____											
Describe _____											
Recommended Pump Rate				0.00 L/min				Pump Installed _____		Depth _____ m	
Recommended Pump Intake Depth (From TOC)				0.00 m				Type _____		Make _____ H.P. _____	
Model (Output Rating) _____											
Did you Encounter Saline Water (>4000 ppm TDS)				Depth _____ m				Well Disinfected Upon Completion _____			
Gas _____				Depth _____ m				Geophysical Log Taken _____			
Submitted to ESRD _____											
Sample Collected for Potability _____ Submitted to ESRD _____											
Additional Comments on Well _____											

Yield Test			Taken From Ground Level		Measurement in Metric									
			Depth to water level											
Test Date		Start Time		Static Water Level										
1982/02/05		12:00 AM		9.91 m										
<table><tr><td>Drawdown (m)</td><td>Elapsed Time</td><td>Recovery (m)</td></tr><tr><td></td><td>Minutes:Sec</td><td></td></tr><tr><td></td><td></td><td></td></tr></table>						Drawdown (m)	Elapsed Time	Recovery (m)		Minutes:Sec				
Drawdown (m)	Elapsed Time	Recovery (m)												
	Minutes:Sec													
Method of Water Removal														
Type Bailer														
Removal Rate		7.46 L/min												
Depth Withdrawn From		13.72 m												
If water removal period was < 2 hours, explain why														

Water Diverted for Drilling		
Water Source	Amount Taken	Diversion Date & Time
	L	

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well	Certification No
UNKNOWN NA DRILLER	1
Company Name	Copy of Well report provided to owner
SMITTY'S WW SVC LTD	Date approval holder signed

Well Identification and Location										Measurement in Metric
<b>Owner Name</b> INDIAN AFFAIRS		<b>Address</b> GARDEN RIVER		<b>Town</b>		<b>Province</b>		<b>Country</b>	<b>Postal Code</b>	
<b>Location</b>	1/4 or LSD NE	SEC 07	TWP 112	RGE 23	W of MER 4	Lot	Block	Plan	Additional Description	
<b>Measured from Boundary of</b> _____ m from _____ _____ m from _____					<b>GPS Coordinates in Decimal Degrees (NAD 83)</b> Latitude <u>58.714586</u> Longitude <u>-113.871454</u> How Location Obtained Map			Elevation _____ m How Elevation Obtained Not Obtained		

Drilling Information	
<b>Method of Drilling</b> Bored	<b>Type of Work</b> New Well
<b>Proposed Well Use</b> Domestic	

Formation Log			Measurement in Metric
Depth from ground level (m)	Water Bearing	Lithology Description	
2.44		Brown Clayey Till	
4.27		Brown Sandy Clay	
5.49		Brown Fine Grained Sand	
12.80		Brown Medium Grained Sand	
13.11		Blue Sand & Rocks	
13.72		Blue Sandy Clay	

Yield Test Summary			Measurement in Metric
<b>Recommended Pump Rate</b> <u>9.09 L/min</u>			
<b>Test Date</b>	<b>Water Removal Rate (L/min)</b>	<b>Static Water Level (m)</b>	
1982/02/07	10.18	7.62	

Well Completion			Measurement in Metric
<b>Total Depth Drilled</b>	<b>Finished Well Depth</b>	<b>Start Date</b>	<b>End Date</b>
13.72 m		1982/02/06	1982/02/08
<b>Borehole</b>			
<b>Diameter (cm)</b>	<b>From (m)</b>	<b>To (m)</b>	
0.00	0.00	13.72	
<b>Surface Casing (if applicable)</b>		<b>Well Casing/Liner</b>	
Culvert			
<b>Size OD :</b>	<u>62.99 cm</u>	<b>Size OD :</b>	<u>0.00 cm</u>
<b>Wall Thickness :</b>	<u>0.160 cm</u>	<b>Wall Thickness :</b>	<u>0.000 cm</u>
<b>Bottom at :</b>	<u>13.72 m</u>	<b>Top at :</b>	<u>0.00 m</u>
		<b>Bottom at :</b>	<u>0.00 m</u>
<b>Perforations</b>			
<b>From (m)</b>	<b>To (m)</b>	<b>Diameter or Slot Width(cm)</b>	<b>Slot Length(cm)</b>
Perforated by			
<b>Annular Seal</b>			
Placed from <u>0.00 m</u> to <u>0.00 m</u>			
Amount _____			
Other Seals			
Type		At (m)	
<b>Screen Type</b> Stainless Steel			
Size OD : <u>59.99 cm</u>			
<b>From (m)</b>	<b>To (m)</b>	<b>Slot Size (cm)</b>	
13.11	13.72	0.030	
Attachment <u>Attached To Casing</u>			
Top Fittings <u>Welded</u>		Bottom Fittings <u>Other</u>	
<b>Pack</b>			
Type <u>Frac Sand</u>		Grain Size <u>20-40</u>	
Amount <u>13.00 Bags</u>			

Contractor Certification	
<b>Name of Journeyman responsible for drilling/construction of well</b> UNKNOWN NA DRILLER	<b>Certification No</b> 1
<b>Company Name</b> SMITTY'S WW SVC LTD	<b>Copy of Well report provided to owner</b> <b>Date approval holder signed</b>

Well Identification and Location										Measurement in Metric	
Owner Name		Address			Town		Province		Country	Postal Code	
INDIAN AFFAIRS		GARDEN RIVER									
Location	1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description		
	NE	07	112	23	4						
Measured from Boundary of					GPS Coordinates in Decimal Degrees (NAD 83)						
_____ m from					Latitude 58.714586		Longitude -113.871454		Elevation _____ m		
_____ m from					How Location Obtained		How Elevation Obtained				
					Map		Not Obtained				

Additional Information										Measurement in Metric
Distance From Top of Casing to Ground Level _____ cm										
Is Artesian Flow _____										
Rate _____ L/min										
Is Flow Control Installed _____										
Describe _____										
Recommended Pump Rate					9.09 L/min					
Recommended Pump Intake Depth (From TOC)					13.11 m					
Pump Installed _____					Depth _____ m					
Type _____					Make _____ H.P. _____					
					Model (Output Rating) _____					
Did you Encounter Saline Water (>4000 ppm TDS) _____					Depth _____ m					
Gas _____					Depth _____ m					
Well Disinfected Upon Completion _____										
Geophysical Log Taken _____										
Submitted to ESRD _____										
Sample Collected for Potability _____					Submitted to ESRD _____					
Additional Comments on Well										

Yield Test			Taken From Ground Level	Measurement in Metric
			Depth to water level	
Test Date	Start Time	Static Water Level		
1982/02/07	12:00 AM	7.62 m		
			Drawdown (m)	Recovery (m)
			Elapsed Time	
			Minutes:Sec	
Method of Water Removal				
Type Bailer				
Removal Rate 10.18 L/min				
Depth Withdrawn From 13.11 m				
If water removal period was < 2 hours, explain why				

Water Diverted for Drilling		
Water Source	Amount Taken	Diversion Date & Time
	L	

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well	Certification No
UNKNOWN NA DRILLER	1
Company Name	Copy of Well report provided to owner
SMITTY'S WW SVC LTD	Date approval holder signed

Well Identification and Location										Measurement in Metric
<b>Owner Name</b> NORTHLAND SCHOOL DIV		<b>Address</b> PEACE RIVER		<b>Town</b>		<b>Province</b>		<b>Country</b>	<b>Postal Code</b>	
<b>Location</b>	<b>1/4 or LSD</b> 00	<b>SEC</b> 07	<b>TWP</b> 112	<b>RGE</b> 23	<b>W of MER</b> 4	<b>Lot</b>	<b>Block</b>	<b>Plan</b>	<b>Additional Description</b>	
<b>Measured from Boundary of</b> _____ m from _____ _____ m from _____					<b>GPS Coordinates in Decimal Degrees (NAD 83)</b> Latitude <u>58.710971</u> Longitude <u>-113.878400</u> How Location Obtained Not Verified			Elevation _____ m How Elevation Obtained Not Obtained		

Drilling Information	
<b>Method of Drilling</b> Rotary	<b>Type of Work</b> New Well
<b>Proposed Well Use</b> Unknown	

Formation Log			Measurement in Metric
Depth from ground level (m)	Water Bearing	Lithology Description	
6.10		Clay	
15.24		Sand	
16.76		Gravel	

Yield Test Summary			Measurement in Metric
<b>Recommended Pump Rate</b> <u>31.82</u> L/min			
<b>Test Date</b>	<b>Water Removal Rate (L/min)</b>	<b>Static Water Level (m)</b>	
1976/02/24	45.46	9.14	

Well Completion			Measurement in Metric
<b>Total Depth Drilled</b>	<b>Finished Well Depth</b>	<b>Start Date</b>	<b>End Date</b>
16.76 m		1976/02/24	1976/02/24
<b>Borehole</b>			
<b>Diameter (cm)</b>	<b>From (m)</b>	<b>To (m)</b>	
0.00	0.00	16.76	
<b>Surface Casing (if applicable)</b>		<b>Well Casing/Liner</b>	
Steel			
<b>Size OD :</b>	<u>13.97</u> cm	<b>Size OD :</b>	<u>0.00</u> cm
<b>Wall Thickness :</b>	<u>0.000</u> cm	<b>Wall Thickness :</b>	<u>0.000</u> cm
<b>Bottom at :</b>	<u>15.54</u> m	<b>Top at :</b>	<u>0.00</u> m
		<b>Bottom at :</b>	<u>0.00</u> m
<b>Perforations</b>			
<b>From (m)</b>	<b>To (m)</b>	<b>Diameter or Slot Width(cm)</b>	<b>Slot Length(cm)</b>
Perforated by _____			
<b>Annular Seal</b>			
Placed from <u>0.00</u> m to <u>0.00</u> m			
Amount _____			
Other Seals			
Type		At (m)	
<b>Screen Type</b>			
Size OD : <u>0.00</u> cm			
<b>From (m)</b>	<b>To (m)</b>	<b>Slot Size (cm)</b>	
Attachment _____			
Top Fittings _____		Bottom Fittings _____	
<b>Pack</b>			
Type _____		Grain Size _____	
Amount _____			

Contractor Certification	
<b>Name of Journeyman responsible for drilling/construction of well</b> UNKNOWN NA DRILLER	<b>Certification No</b> 1
<b>Company Name</b> SAVILLE WATER WELL DRILLING LTD.	<b>Copy of Well report provided to owner</b> <b>Date approval holder signed</b>

Well Identification and Location										Measurement in Metric		
Owner Name		Address			Town		Province		Country		Postal Code	
NORTHLAND SCHOOL DIV		PEACE RIVER										
Location		1/4 or LSD	SEC	TWP	RGE	W of MER	Lot	Block	Plan	Additional Description		
		00	07	112	23	4						
Measured from Boundary of					GPS Coordinates in Decimal Degrees (NAD 83)							
					Latitude 58.710971 Longitude -113.878400					Elevation m		
					How Location Obtained					How Elevation Obtained		
					Not Verified					Not Obtained		

Additional Information										Measurement in Metric	
Distance From Top of Casing to Ground Level cm											
Is Artesian Flow											
Rate L/min											
Is Flow Control Installed											
Describe											
Recommended Pump Rate				31.82 L/min				Pump Installed Yes		Depth m	
Recommended Pump Intake Depth (From TOC)				0.00 m				Type SUB		Make H.P. .75	
Model (Output Rating)											
Did you Encounter Saline Water (>4000 ppm TDS)				Depth m		Well Disinfected Upon Completion					
Gas				Depth m		Geophysical Log Taken					
Submitted to ESRD											
Sample Collected for Potability											
Submitted to ESRD											
Additional Comments on Well											

Yield Test			Taken From Ground Level		Measurement in Metric	
			Depth to water level			
Test Date		Start Time		Static Water Level		
1976/02/24		12:00 AM		9.14 m		
Method of Water Removal						
Type Pump						
Removal Rate		45.46 L/min				
Depth Withdrawn From		11.28 m				
If water removal period was < 2 hours, explain why						

Water Diverted for Drilling		
Water Source	Amount Taken	Diversion Date & Time
	L	

Contractor Certification	
Name of Journeyman responsible for drilling/construction of well	Certification No
UNKNOWN NA DRILLER	1
Company Name	Copy of Well report provided to owner
SAVILLE WATER WELL DRILLING LTD.	Date approval holder signed

## **APPENDIX C**

### **Geotechnical Laboratory Reports**

Groundwater Characterization Report  
Landfill and Air Strip  
Garden River, Alberta  
SLR Project No. 200.20022.00000



# MOISTURE DENSITY RELATIONSHIP WORKSHEET

PROJECT Garden River Landfill  
CLIENT SLR Consulting

PROJECT # GP2562  
DATE 2-Apr-14

SAMPLE NUMBER	1	2	3	4	5	
Wt. Sample Wet + Mold	6200.0	6259.3	6296.8	6244.6	6192.5	
Wt. Small Mold	4358.6	4358.6	4358.6	4358.6	4358.6	
Wt. Sample Wet	1841.4	1900.7	1938.2	1886.0	1833.9	
Volume Mold, cm <sup>3</sup>	938	938	938	938	938	
Wet Density, kg/m <sup>3</sup>	1963	2026	2066	2011	1955	
Dry Density, kg/m <sup>3</sup>	1763	1793	1790	1714	1648	
Corr. Density, kg/m <sup>3</sup>						

DATE SAMPLED NA

CONTRACTOR SLR

SOURCE/LOCATION Garden River

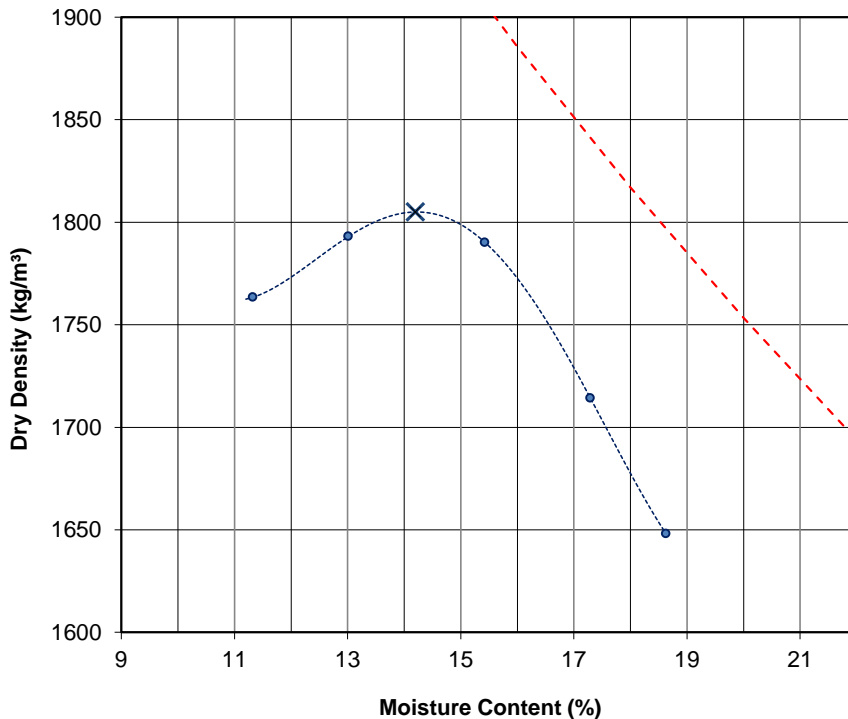
SAMPLED BY Client

PROCTOR # 1

CONTAINER NUMBER	A	B	C	D	E	
Wt. Sample Wet + Tare	253.0	258.7	263.1	548.4	466.4	
Wt. Sample Dry + Tare	228.9	230.8	230.3	470.4	396.0	
Wt. Water	24.1	27.9	32.8	78.0	70.4	
Tare Container	16.1	16.4	17.7	19.3	18.1	
Wt. Dry Soil	212.8	214.4	212.6	451.1	377.9	
Moisture Content	11.3	13.0	15.4	17.3	18.6	
Corr. Moisture Content						

PREPARATION: Moist  
RAMMER TYPE: Auto

COMPACTION STANDARD: ASTM D698



SOIL TYPE: Sand

COMMENTS:

## ROCK CORRECTION

% Rock Retained  
4.75 mm Sieve 0.0 %  
19.0 mm Sieve 0.0 %

% Moisture Content  
Tare wt. :                       
Wet wt. + Tare :                       
Dry wt. + Tare :                       
Wt. of Water :                       
Moisture Content:                     

MAXIMUM DRY DENSITY  
(Corrected) 1805 kg/m<sup>3</sup>

OPTIMUM MOISTURE CONTENT  
(Corrected) 14.2 %

MAXIMUM DRY DENSITY  
(Uncorrected) 1805 kg/m<sup>3</sup>

OPTIMUM MOISTURE CONTENT  
(Uncorrected) 14.2 %

TECHNICIAN IT

CHECKED IT



# SOIL MOISTURE CONTENT WORKSHEET

PROJECT Garden River Landfill

PROJECT # GP2562

DATE 31-Mar-14

MW	DEPTH (m)	106A-1	106A-2	106A-3	106A-4			
#	Wt. Sample Wet + Tare	322.3	353.8	339.1	311.1			
14	Wt. Sample Dry + Tare	263.4	282.5	277.6	249.8			
	Wt. Water	58.9	71.3	61.5	61.3	0	0	0
	Tare Container	19	18	17	17			
	Wt. Dry Soil	244.4	264.5	260.6	232.8	0	0	0
	Moisture Content	24.1	27.0	23.6	26.3	#DIV/0!	#DIV/0!	#DIV/0!

MW	DEPTH (m)	106B-1	106B-2	106B-3	106B-4	106B-5	106B-6	106B-7
#	Wt. Sample Wet + Tare		290.2	239.1	265.8	449.3	304.4	448.2
14	Wt. Sample Dry + Tare		279.4	229.3	257.9	435.9	271.6	358.8
	Wt. Water	0	10.8	9.8	7.9	13.4	32.8	89.4
	Tare Container		19	19	18	18	19	19
	Wt. Dry Soil	0	260.4	210.3	239.9	417.9	252.6	339.8
	Moisture Content	#DIV/0!	4.1	4.7	3.3	3.2	13.0	26.3

MW	DEPTH (m)	106B-8	106B-9	106B-10	106B-11	106B-12	106B-13	106B-14
#	Wt. Sample Wet + Tare	304	495.6	262.3	365.3	251.4	316.6	357.3
14	Wt. Sample Dry + Tare	297.5	480	255.4	357.8	235.7	276.6	296.6
	Wt. Water	6.5	15.6	6.9	7.5	15.7	40	60.7
	Tare Container	17	17	19	19	19	19	18
	Wt. Dry Soil	280.5	463	236.4	338.8	216.7	257.6	278.6
	Moisture Content	2.3	3.4	2.9	2.2	7.2	15.5	21.8

MW	DEPTH (m)	106B-15	106B-16	106B-17				
#	Wt. Sample Wet + Tare	312.9	301.3	309.2				
14	Wt. Sample Dry + Tare	288.8	246.3	236.8				
	Wt. Water	24.1	55	72.4	0	0	0	0
	Tare Container	19	19	19				
	Wt. Dry Soil	269.8	227.3	217.8	0	0	0	0
	Moisture Content	8.9	24.2	33.2	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

BH	DEPTH (m)							
#	Wt. Sample Wet + Tare							
	Wt. Sample Dry + Tare							
	Wt. Water	0	0	0	0	0	0	0
	Tare Container							
	Wt. Dry Soil	0	0	0	0	0	0	0
	Moisture Content	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

BH	DEPTH (m)							
#	Wt. Sample Wet + Tare							
	Wt. Sample Dry + Tare							
	Wt. Water	0	0	0	0	0	0	0
	Tare Container							
	Wt. Dry Soil	0	0	0	0	0	0	0
	Moisture Content	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!

TECHNICIAN PG



PROJECT Garden River Landfill SLR  
 PROJECT # GP2562 DATE 1-Apr-14  
 SAMPLE SOURCE MW14 106B-3  
 PIT NAME  
 TECHNICIAN PG SIEVE # 1

SIEVE NO.	OPENING SIZE (mm)	WEIGHT RETAINED (g)	TOTAL WT. FINER (gms)	PERCENT PASSING	SPECIFICATION	
					Min.	Max.
80000	80		417.4	100.0		
40000	40		417.4	100.0		
25000	25		417.4	100.0		
20000	20		417.4	100.0		
16000	16		417.4	100.0		
12500	12.5		417.4	100.0		
10000	10		417.4	100.0		
5000	5		417.4	100.0		
2500	2.5		417.4	100.0		
2000	2	0	417.4	100.0		
1250	1.25	0.1	417.3	100.0		
630	0.63	0.6	416.7	99.8		
315	0.315	2.9	413.8	99.1		
160	0.16	48.8	365	87.4		
80	0.08	83.5	281.5	67.4		
SIEVE PAN		35.2				
MOISTURE CONTENT SAMPLE			SIEVE ANALYSIS SAMPLE		D.W.W.CALCULATIONS	
A-WT. WET SAMPLE + PAN		741.7	G-WT. OF DRY SAMPLE		417.4	
B-WT. DRY SAMPLE + PAN		741.7	H- WASHED DRY +PAN		495.7	
C-WT. OF WATER		0	I- WT OF WASHED DRY SA		171.4	
D-WT. OF PAN		324.3	J- WT WASHED FINES		246	
E-WT. OF DRY SAMPLE		417.4				
F-MOISTURE CONTENT		0.0				
DESCRIPTION OF SAMPLE/COMMENTS			METHOD OF PREPARATION		WASHED	
			TOTAL WEIGHT		417.1	
			DRY WT.		417.4	
			DIFFERENCE		-0.3	
			% DIFFERENCE		-0.00072	

### SIEVE ANALYSIS

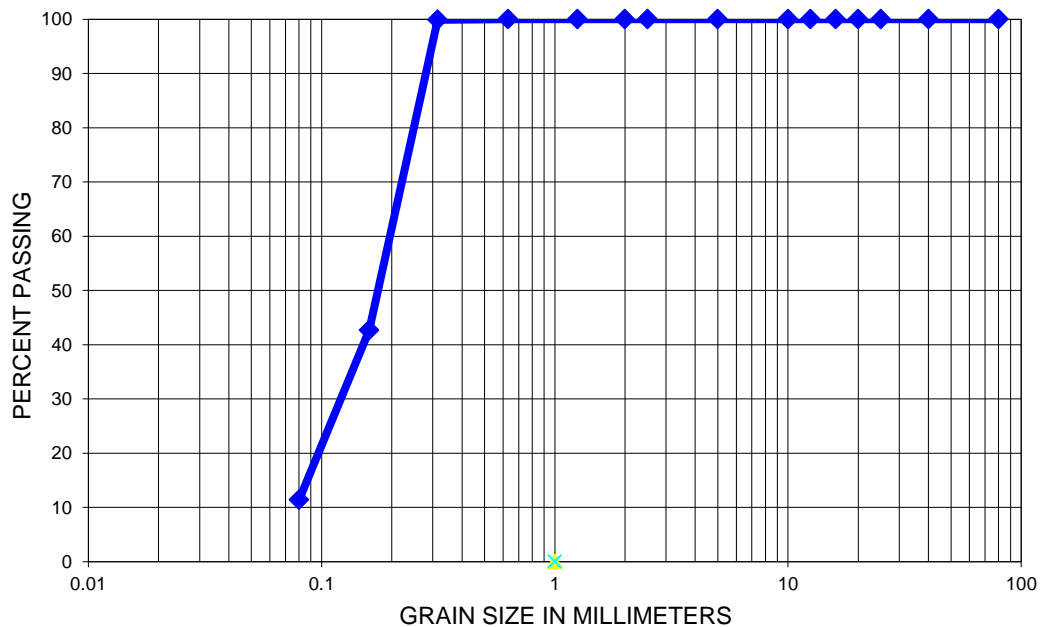




PROJECT Garden River Landfill SLR  
 PROJECT # GP2562 DATE 1-Apr-14  
 SAMPLE SOURCE MW14 106B-5  
 PIT NAME  
 TECHNICIAN PG SIEVE # 2

SIEVE NO.	OPENING SIZE (mm)	WEIGHT RETAINED (g)	TOTAL WT. FINER (gms)	PERCENT PASSING	SPECIFICATION	
					Min.	Max.
80000	80		417.3	100.0		
40000	40		417.3	100.0		
25000	25		417.3	100.0		
20000	20		417.3	100.0		
16000	16		417.3	100.0		
12500	12.5		417.3	100.0		
10000	10		417.3	100.0		
5000	5		417.3	100.0		
2500	2.5		417.3	100.0		
2000	2		417.3	100.0		
1250	1.25		417.3	100.0		
630	0.63		417.3	100.0		
315	0.315	0.5	416.8	99.9		
160	0.16	238.7	178.1	42.7		
80	0.08	130.5	47.6	11.4		
SIEVE PAN		8.7				
MOISTURE CONTENT SAMPLE			SIEVE ANALYSIS SAMPLE		D.W.W.CALCULATIONS	
A-WT. WET SAMPLE + PAN		741.6	G-WT. OF DRY SAMPLE		417.3	
B-WT. DRY SAMPLE + PAN		741.6	H- WASHED DRY +PAN		703	
C-WT. OF WATER		0	I- WT OF WASHED DRY SA		378.7	
D-WT. OF PAN		324.3	J- WT WASHED FINES		38.6	
E-WT. OF DRY SAMPLE		417.3				
F-MOISTURE CONTENT		0.0				
DESCRIPTION OF SAMPLE/COMMENTS			METHOD OF PREPARATION		WASHED	
			TOTAL WEIGHT		417	
			DRY WT.		417.3	
			DIFFERENCE		-0.3	
			% DIFFERENCE		-0.00072	

### SIEVE ANALYSIS

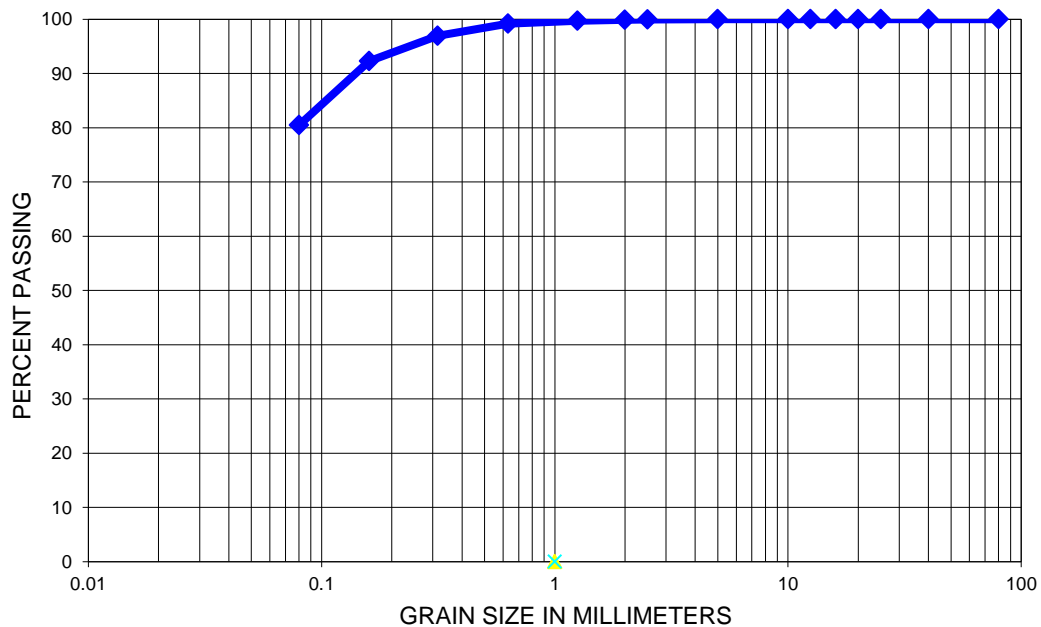




PROJECT Garden River Landfill SLR  
 PROJECT # GP2562 DATE 1-Apr-14  
 SAMPLE SOURCE MW14 106B-7  
 PIT NAME  
 TECHNICIAN PG SIEVE # 3

SIEVE NO.	OPENING SIZE (mm)	WEIGHT RETAINED (g)	TOTAL WT. FINER (gms)	PERCENT PASSING	SPECIFICATION	
					Min.	Max.
80000	80		340.3	100.0		
40000	40		340.3	100.0		
25000	25		340.3	100.0		
20000	20		340.3	100.0		
16000	16		340.3	100.0		
12500	12.5		340.3	100.0		
10000	10		340.3	100.0		
5000	5	0	340.3	100.0		
2500	2.5	0.2	340.1	99.9		
2000	2	0.2	339.9	99.9		
1250	1.25	0.6	339.3	99.7		
630	0.63	1.8	337.5	99.2		
315	0.315	7.7	329.8	96.9		
160	0.16	15.8	314	92.3		
80	0.08	40.1	273.9	80.5		
SIEVE PAN		17.6				
MOISTURE CONTENT SAMPLE			SIEVE ANALYSIS SAMPLE		D.W.W.CALCULATIONS	
A-WT. WET SAMPLE + PAN		664.3	G-WT. OF DRY SAMPLE		340.3	
B-WT. DRY SAMPLE + PAN		664.3	H- WASHED DRY +PAN		408.2	
C-WT. OF WATER		0	I- WT OF WASHED DRY SA		84.2	
D-WT. OF PAN		324	J- WT WASHED FINES		256.1	
E-WT. OF DRY SAMPLE		340.3				
F-MOISTURE CONTENT		0.0				
DESCRIPTION OF SAMPLE/COMMENTS			METHOD OF PREPARATION		WASHED	
			TOTAL WEIGHT		340.1	
			DRY WT.		340.3	
			DIFFERENCE		-0.2	
			% DIFFERENCE		-0.00059	

### SIEVE ANALYSIS

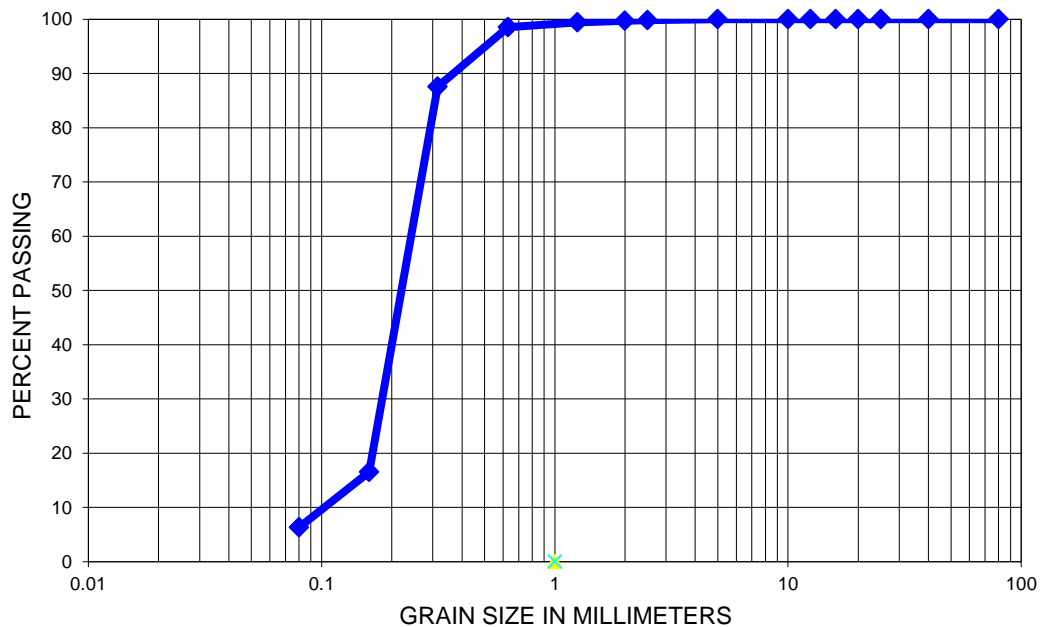




PROJECT Garden River Landfill SLR  
 PROJECT # GP2562 DATE 1-Apr-14  
 SAMPLE SOURCE MW14 106B-9  
 PIT NAME  
 TECHNICIAN PG SIEVE # 4

SIEVE NO.	OPENING SIZE (mm)	WEIGHT RETAINED (g)	TOTAL WT. FINER (gms)	PERCENT PASSING	SPECIFICATION	
					Min.	Max.
80000	80		463.5	100.0		
40000	40		463.5	100.0		
25000	25		463.5	100.0		
20000	20		463.5	100.0		
16000	16		463.5	100.0		
12500	12.5		463.5	100.0		
10000	10		463.5	100.0		
5000	5	0	463.5	100.0		
2500	2.5	0.9	462.6	99.8		
2000	2	0.5	462.1	99.7		
1250	1.25	1.4	460.7	99.4		
630	0.63	4.1	456.6	98.5		
315	0.315	50.7	405.9	87.6		
160	0.16	329.3	76.6	16.5		
80	0.08	47.2	29.4	6.3		
SIEVE PAN		2.9				
MOISTURE CONTENT SAMPLE			SIEVE ANALYSIS SAMPLE		D.W.W.CALCULATIONS	
A-WT. WET SAMPLE + PAN		786.9	G-WT. OF DRY SAMPLE		463.5	
B-WT. DRY SAMPLE + PAN		786.9	H- WASHED DRY +PAN		760.7	
C-WT. OF WATER		0	I- WT OF WASHED DRY SA		437.3	
D-WT. OF PAN		323.4	J- WT WASHED FINES		26.2	
E-WT. OF DRY SAMPLE		463.5				
F-MOISTURE CONTENT		0.0				
DESCRIPTION OF SAMPLE/COMMENTS			METHOD OF PREPARATION		WASHED	
			TOTAL WEIGHT		463.2	
			DRY WT.		463.5	
			DIFFERENCE		-0.3	
			% DIFFERENCE		-0.00065	

### SIEVE ANALYSIS

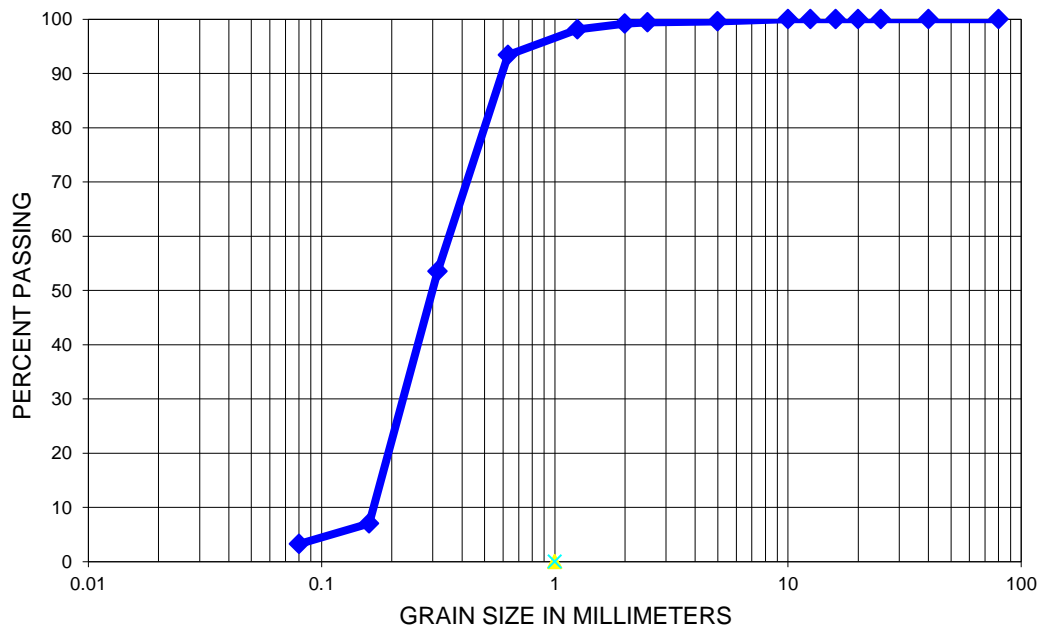




PROJECT Garden River Landfill SLR  
 PROJECT # GP2562 DATE 1-Apr-14  
 SAMPLE SOURCE MW14 106B-11  
 PIT NAME  
 TECHNICIAN PG SIEVE # 5

SIEVE NO.	OPENING SIZE (mm)	WEIGHT RETAINED (g)	TOTAL WT. FINER (gms)	PERCENT PASSING	SPECIFICATION	
					Min.	Max.
80000	80		339.2	100.0		
40000	40		339.2	100.0		
25000	25		339.2	100.0		
20000	20		339.2	100.0		
16000	16		339.2	100.0		
12500	12.5		339.2	100.0		
10000	10	0	339.2	100.0		
5000	5	1.3	337.9	99.6		
2500	2.5	0.7	337.2	99.4		
2000	2	0.8	336.4	99.2		
1250	1.25	3.6	332.8	98.1		
630	0.63	16	316.8	93.4		
315	0.315	135.2	181.6	53.5		
160	0.16	157.7	23.9	7.0		
80	0.08	12.8	11.1	3.3		
SIEVE PAN		2.3				
MOISTURE CONTENT SAMPLE			SIEVE ANALYSIS SAMPLE		D.W.W.CALCULATIONS	
A-WT. WET SAMPLE + PAN		662	G-WT. OF DRY SAMPLE		339.2	
B-WT. DRY SAMPLE + PAN		662	H- WASHED DRY +PAN		653.2	
C-WT. OF WATER		0	I- WT OF WASHED DRY SA		330.4	
D-WT. OF PAN		322.8	J- WT WASHED FINES		8.8	
E-WT. OF DRY SAMPLE		339.2				
F-MOISTURE CONTENT		0.0				
DESCRIPTION OF SAMPLE/COMMENTS			METHOD OF PREPARATION		WASHED	
			TOTAL WEIGHT		339.2	
			DRY WT.		339.2	
			DIFFERENCE		0	
			% DIFFERENCE		0.00000	

### SIEVE ANALYSIS



**APPENDIX D**  
**Laboratory Analysis Reports - Groundwater**

Groundwater Characterization Report  
Landfill and Air Strip  
Garden River, Alberta  
SLR Project No. 200.20022.00000

Your Project #: 200.02005.00000  
 Site Location: GARDEN RIVER, AB  
 Your C.O.C. #: A165042

### Attention: JASON PENTLAND

SLR CONSULTING (CANADA) LTD  
 6940 ROPER ROAD  
 EDMONTON, AB  
 CANADA T6B 3H9

Report Date: 2014/04/01  
 Report #: R1544616  
 Version: 1

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: B423358**

**Received: 2014/03/24, 14:00**

Sample Matrix: Water

# Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO <sub>3</sub> ,HCO <sub>3</sub> ,OH	6	N/A	2014/03/26	AB SOP-00005	SM 2320-B
Alkalinity @25C (pp, total), CO <sub>3</sub> ,HCO <sub>3</sub> ,OH	3	N/A	2014/04/01	AB SOP-00005	SM 2320-B
BTEX/F1 in Water by HS GC/MS	10	N/A	2014/03/27	AB SOP-00039	CCME, EPA 8260C
Cadmium - low level CCME - Dissolved	9	N/A	2014/03/27	AB SOP-00043	EPA 200.8
Chloride by Automated Colourimetry	9	N/A	2014/03/31	AB SOP-00020	SM 4500 Cl-G
Carbon (DOC) (2)	9	N/A	2014/03/31	CAL SOP-00077	MMCW 119
Conductivity @25C	9	N/A	2014/03/26	AB SOP-00005	SM 2510-B
CCME Hydrocarbons in Water (F2; C10-C16)	9	2014/03/26	2014/03/26	AB SOP-00040	EPA3510C/CCME PHCCWS
				AB SOP-00037	
CCME Hydrocarbons in Water (F2; C10-C16)	1	2014/03/26	2014/03/27	AB SOP-00040	EPA3510C/CCME PHCCWS
				AB SOP-00037	
Hardness	9	N/A	2014/03/28	AB WI-00065	SM 2340B
Mercury (Dissolved) (1)	9	2014/03/31	2014/03/31	EENV SOP-00031	EPA 245.1
Elements by ICP - Dissolved	9	N/A	2014/03/27	AB SOP-00042	EPA 200.7
Elements by ICPMS - Dissolved	9	N/A	2014/03/25	AB SOP-00043	EPA 200.8
Ion Balance	9	N/A	2014/03/26	AB WI-00065	SM 1030E
Sum of cations, anions	9	N/A	2014/03/28	AB WI-00065	SM 1030E
Ammonia-N (Total)	9	N/A	2014/03/26	AB SOP-00007	EPA 350.1
Nitrate and Nitrite	9	N/A	2014/03/27	AB SOP-00023	SM4110B
Nitrate + Nitrite-N (calculated)	9	N/A	2014/03/27	AB SOP-00023	SM 4110-B
Nitrogen, (Nitrite, Nitrate) by IC	9	N/A	2014/03/26	AB SOP-00023	SM 4110-B
pH @25°C (Alkalinity titrator)	9	N/A	2014/03/26	AB SOP-00005	SM 4500-H+B
Phenols (4-AAP)	9	N/A	2014/03/27	CAL SOP-00067	EPA 420.2
Sulphate by Automated Colourimetry	9	N/A	2014/03/31	AB SOP-00018	SM 4500 SO4-E
Total Dissolved Solids (Calculated)	9	N/A	2014/03/31	AB WI-00065	SM 1030E
Total Trihalomethanes Calculation	10	N/A	2014/03/31	CAL SOP-00104	EPA 8260 C
Total Kjeldahl Nitrogen	9	2014/03/26	2014/03/27	AB SOP-00008	EPA 351.1, 351.2
VOCs in Water by HS GC/MS (Std List)	6	N/A	2014/03/28	CAL SOP-00227	EPA 8260 C
VOCs in Water by HS GC/MS (Std List)	4	N/A	2014/03/29	CAL SOP-00227	EPA 8260 C

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Edmonton Environmental

(2) DOC present in the sample should be considered as non-purgeable DOC.

Your Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Your C.O.C. #: A165042

**Attention: JASON PENTLAND**

SLR CONSULTING (CANADA) LTD  
6940 ROPER ROAD  
EDMONTON, AB  
CANADA T6B 3H9

**Report Date: 2014/04/01**  
**Report #: R1544616**  
**Version: 1**

**CERTIFICATE OF ANALYSIS**

-2-

**Encryption Key**

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

Wendy Sears, Project manager  
Email: [WSears@maxxam.ca](mailto:WSears@maxxam.ca)  
Phone# (403) 291-3077

=====

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: 2

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### AT1 BTEX AND F1-F2 (WATER)

Maxxam ID		JD0430	JD0431	JD0432	JD0433		
Sampling Date		2014/03/20 11:00	2014/03/20 12:00	2014/03/20 12:30	2014/03/20 13:00		
COC Number		A165042	A165042	A165042	A165042		
	<b>UNITS</b>	<b>MW14-101</b>	<b>MW14-102B</b>	<b>MW14-103</b>	<b>MW14-104B</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Hydrocarbons</b>							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	7428427
<b>Volatiles</b>							
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7429413
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7429413
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7429413
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7429413
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7429413
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7429413
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	7429413
(C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	7429413
<b>Surrogate Recovery (%)</b>							
1,4-Difluorobenzene (sur.)	%	108	108	107	108	N/A	7429413
4-Bromofluorobenzene (sur.)	%	108	108	107	108	N/A	7429413
D4-1,2-Dichloroethane (sur.)	%	111	110	112	110	N/A	7429413
O-TERPHENYL (sur.)	%	100	98	99	98	N/A	7428427

N/A = Not Applicable  
RDL = Reportable Detection Limit

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### AT1 BTEX AND F1-F2 (WATER)

Maxxam ID		JD0434	JD0435	JD0436	JD0437		
Sampling Date		2014/03/22 12:30	2014/03/22 13:00	2014/03/20 11:30	2014/03/22 14:00		
COC Number		A165042	A165042	A165042	A165042		
	<b>UNITS</b>	<b>MW14-105</b>	<b>MW14-106B</b>	<b>DUP 1</b>	<b>MW14-109</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Hydrocarbons</b>							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	7428427
<b>Volatiles</b>							
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7429413
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7429413
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7429413
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7429413
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7429413
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7429413
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	7429413
(C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	7429413
<b>Surrogate Recovery (%)</b>							
1,4-Difluorobenzene (sur.)	%	108	108	107	107	N/A	7429413
4-Bromofluorobenzene (sur.)	%	108	108	108	109	N/A	7429413
D4-1,2-Dichloroethane (sur.)	%	111	111	110	113	N/A	7429413
O-TERPHENYL (sur.)	%	99	96	95	93	N/A	7428427

N/A = Not Applicable  
RDL = Reportable Detection Limit

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### AT1 BTEX AND F1-F2 (WATER)

Maxxam ID		JD0438	JD0439		
Sampling Date		2014/03/22 09:00			
COC Number		A165042	A165042		
	<b>UNITS</b>	<b>DUP 2</b>	<b>TRIP BLANK</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Hydrocarbons</b>					
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	0.10	7428427
<b>Volatiles</b>					
Benzene	mg/L	<0.00040	<0.00040	0.00040	7429413
Toluene	mg/L	<0.00040	<0.00040	0.00040	7429413
Ethylbenzene	mg/L	<0.00040	<0.00040	0.00040	7429413
m & p-Xylene	mg/L	<0.00080	<0.00080	0.00080	7429413
o-Xylene	mg/L	<0.00040	<0.00040	0.00040	7429413
Xylenes (Total)	mg/L	<0.00080	<0.00080	0.00080	7429413
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	0.10	7429413
(C6-C10)	mg/L	<0.10	<0.10	0.10	7429413
<b>Surrogate Recovery (%)</b>					
1,4-Difluorobenzene (sur.)	%	108	109	N/A	7429413
4-Bromofluorobenzene (sur.)	%	108	108	N/A	7429413
D4-1,2-Dichloroethane (sur.)	%	108	108	N/A	7429413
O-TERPHENYL (sur.)	%	95	95	N/A	7428427
N/A = Not Applicable RDL = Reportable Detection Limit					

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		JD0430	JD0431		JD0432		
Sampling Date		2014/03/20 11:00	2014/03/20 12:00		2014/03/20 12:30		
COC Number		A165042	A165042		A165042		
	<b>UNITS</b>	<b>MW14-101</b>	<b>MW14-102B</b>	<b>QC Batch</b>	<b>MW14-103</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Calculated Parameters</b>							
Anion Sum	meq/L	7.7	7.1	7427424	7.2	N/A	7427424
Cation Sum	meq/L	9.0	7.8	7427424	8.1	N/A	7427424
Hardness (CaCO <sub>3</sub> )	mg/L	400	350	7427422	370	0.50	7427422
Ion Balance	N/A	1.2	1.1	7427423	1.1	0.010	7427423
Dissolved Nitrate (NO <sub>3</sub> )	mg/L	0.12	0.085	7427425	0.20	0.044	7427425
Nitrate plus Nitrite (N)	mg/L	0.028	0.019	7427426	0.045	0.010	7427426
Dissolved Nitrite (NO <sub>2</sub> )	mg/L	<0.033	<0.033	7427425	<0.033	0.033	7427425
Total Dissolved Solids	mg/L	410	360	7427427	380	10	7427427
<b>Misc. Inorganics</b>							
Conductivity	uS/cm	710	660	7429188	680	1.0	7429188
pH	pH	7.63	7.69	7429189	7.73	N/A	7429189
<b>Low Level Elements</b>							
Dissolved Cadmium (Cd)	ug/L	0.025	0.022	7427628	0.033	0.0050	7427628
<b>Anions</b>							
Alkalinity (PP as CaCO <sub>3</sub> )	mg/L	<0.50	<0.50	7436255	<0.50	0.50	7429187
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	340	330	7436255	290	0.50	7429187
Bicarbonate (HCO <sub>3</sub> )	mg/L	420	400	7436255	360	0.50	7429187
Carbonate (CO <sub>3</sub> )	mg/L	<0.50	<0.50	7436255	<0.50	0.50	7429187
Hydroxide (OH)	mg/L	<0.50	<0.50	7436255	<0.50	0.50	7429187
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	37	15	7434974	55	1.0	7434974
Dissolved Chloride (Cl)	mg/L	5.5	6.4	7434973	4.5	1.0	7434973
<b>Nutrients</b>							
Dissolved Nitrite (N)	mg/L	<0.010	<0.010	7429973	<0.010	0.010	7429973
Dissolved Nitrate (N)	mg/L	0.028	0.019	7429973	0.045	0.010	7429973
<b>Elements</b>							
Dissolved Aluminum (Al)	mg/L	0.026	<0.0030	7427874	<0.0030	0.0030	7427874
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060	7427874	<0.00060	0.00060	7427874
Dissolved Arsenic (As)	mg/L	0.0078	0.0053	7427874	0.0021	0.00020	7427874
Dissolved Barium (Ba)	mg/L	0.55	0.46	7430704	0.25	0.010	7430704
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010	7427874	<0.0010	0.0010	7427874
Dissolved Boron (B)	mg/L	0.065	0.060	7430704	0.051	0.020	7430704
Dissolved Calcium (Ca)	mg/L	120	100	7433727	110	0.30	7430704

RDL = Reportable Detection Limit

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		JD0430	JD0431		JD0432		
Sampling Date		2014/03/20 11:00	2014/03/20 12:00		2014/03/20 12:30		
COC Number		A165042	A165042		A165042		
	<b>UNITS</b>	<b>MW14-101</b>	<b>MW14-102B</b>	<b>QC Batch</b>	<b>MW14-103</b>	<b>RDL</b>	<b>QC Batch</b>

Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	7427874	<0.0010	0.0010	7427874
Dissolved Cobalt (Co)	mg/L	0.0020	0.0011	7427874	0.0016	0.00030	7427874
Dissolved Copper (Cu)	mg/L	0.00099	0.00037	7427874	0.00043	0.00020	7427874
Dissolved Iron (Fe)	mg/L	8.9	2.8	7433727	0.99	0.060	7430704
Dissolved Lead (Pb)	mg/L	0.00035	<0.00020	7427874	<0.00020	0.00020	7427874
Dissolved Lithium (Li)	mg/L	0.024	<0.020	7430704	0.021	0.020	7430704
Dissolved Magnesium (Mg)	mg/L	26	24	7433727	25	0.20	7430704
Dissolved Manganese (Mn)	mg/L	0.52	0.29	7433727	0.29	0.0040	7430704
Dissolved Molybdenum (Mo)	mg/L	0.0019	0.0027	7427874	0.0023	0.00020	7427874
Dissolved Nickel (Ni)	mg/L	0.0028	0.0017	7427874	0.0024	0.00050	7427874
Dissolved Phosphorus (P)	mg/L	<0.10	<0.10	7430704	<0.10	0.10	7430704
Dissolved Potassium (K)	mg/L	2.7	2.8	7433727	2.6	0.30	7430704
Dissolved Selenium (Se)	mg/L	0.00051	0.00042	7427874	0.0016	0.00020	7427874
Dissolved Silicon (Si)	mg/L	9.5	8.2	7430704	7.1	0.10	7430704
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010	7427874	<0.00010	0.00010	7427874
Dissolved Sodium (Na)	mg/L	14	13	7433727	10	0.50	7430704
Dissolved Strontium (Sr)	mg/L	0.42	0.35	7430704	0.37	0.020	7430704
Dissolved Sulphur (S)	mg/L	12	4.0	7430704	18	0.20	7430704
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020	7427874	<0.00020	0.00020	7427874
Dissolved Tin (Sn)	mg/L	<0.0010	<0.0010	7427874	<0.0010	0.0010	7427874
Dissolved Titanium (Ti)	mg/L	<0.0010	<0.0010	7427874	<0.0010	0.0010	7427874
Dissolved Uranium (U)	mg/L	0.0022	0.0027	7427874	0.0032	0.00010	7427874
Dissolved Vanadium (V)	mg/L	<0.0010	<0.0010	7427874	<0.0010	0.0010	7427874
Dissolved Zinc (Zn)	mg/L	<0.0030	<0.0030	7427874	<0.0030	0.0030	7427874

RDL = Reportable Detection Limit

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		JD0433		JD0434		JD0435		
Sampling Date		2014/03/20 13:00		2014/03/22 12:30		2014/03/22 13:00		
COC Number		A165042		A165042		A165042		
	<b>UNITS</b>	<b>MW14-104B</b>	<b>QC Batch</b>	<b>MW14-105</b>	<b>QC Batch</b>	<b>MW14-106B</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>								
Anion Sum	meq/L	6.6	7427424	6.9	7427808	6.7	N/A	7427808
Cation Sum	meq/L	7.6	7427424	7.8	7427808	7.5	N/A	7427808
Hardness (CaCO <sub>3</sub> )	mg/L	360	7427422	360	7427806	350	0.50	7427806
Ion Balance	N/A	1.1	7427423	1.1	7427807	1.1	0.010	7427807
Dissolved Nitrate (NO <sub>3</sub> )	mg/L	0.19	7427813	0.20	7427813	0.29	0.044	7427813
Nitrate plus Nitrite (N)	mg/L	0.044	7427814	0.044	7427814	0.066	0.010	7427814
Dissolved Nitrite (NO <sub>2</sub> )	mg/L	<0.033	7427813	<0.033	7427813	<0.033	0.033	7427813
Total Dissolved Solids	mg/L	350	7427427	360	7427817	360	10	7427817
<b>Misc. Inorganics</b>								
Conductivity	uS/cm	660	7429188	660	7429188	640	1.0	7429188
pH	pH	7.67	7429189	7.57	7429189	7.55	N/A	7429189
<b>Low Level Elements</b>								
Dissolved Cadmium (Cd)	ug/L	0.026	7427628	0.026	7427628	0.025	0.0050	7427628
<b>Anions</b>								
Alkalinity (PP as CaCO <sub>3</sub> )	mg/L	<0.50	7429187	<0.50	7429187	<0.50	0.50	7429187
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	280	7429187	300	7429187	290	0.50	7429187
Bicarbonate (HCO <sub>3</sub> )	mg/L	350	7429187	370	7429187	350	0.50	7429187
Carbonate (CO <sub>3</sub> )	mg/L	<0.50	7429187	<0.50	7429187	<0.50	0.50	7429187
Hydroxide (OH)	mg/L	<0.50	7429187	<0.50	7429187	<0.50	0.50	7429187
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	41	7434974	30	7434974	43	1.0	7434974
Dissolved Chloride (Cl)	mg/L	4.2	7434973	4.9	7434973	4.8	1.0	7434973
<b>Nutrients</b>								
Dissolved Nitrite (N)	mg/L	<0.010	7429973	<0.010	7429490	<0.010	0.010	7429973
Dissolved Nitrate (N)	mg/L	0.044	7429973	0.044	7429490	0.066	0.010	7429973
<b>Elements</b>								
Dissolved Aluminum (Al)	mg/L	0.0088	7427874	<0.0030	7427874	<0.0030	0.0030	7427874
Dissolved Antimony (Sb)	mg/L	<0.00060	7427874	<0.00060	7427874	<0.00060	0.00060	7427874
Dissolved Arsenic (As)	mg/L	0.0012	7427874	0.0025	7427874	0.00088	0.00020	7427874
Dissolved Barium (Ba)	mg/L	0.33	7430704	0.37	7430704	0.44	0.010	7430704
Dissolved Beryllium (Be)	mg/L	<0.0010	7427874	<0.0010	7427874	<0.0010	0.0010	7427874
Dissolved Boron (B)	mg/L	0.046	7430704	0.051	7430704	0.037	0.020	7430704
Dissolved Calcium (Ca)	mg/L	100	7430704	100	7430704	100	0.30	7430704
RDL = Reportable Detection Limit								

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		JD0433		JD0434		JD0435		
Sampling Date		2014/03/20 13:00		2014/03/22 12:30		2014/03/22 13:00		
COC Number		A165042		A165042		A165042		
	<b>UNITS</b>	<b>MW14-104B</b>	<b>QC Batch</b>	<b>MW14-105</b>	<b>QC Batch</b>	<b>MW14-106B</b>	<b>RDL</b>	<b>QC Batch</b>
Dissolved Chromium (Cr)	mg/L	<0.0010	7427874	<0.0010	7427874	<0.0010	0.0010	7427874
Dissolved Cobalt (Co)	mg/L	0.00093	7427874	0.0017	7427874	0.00077	0.00030	7427874
Dissolved Copper (Cu)	mg/L	0.0018	7427874	0.00055	7427874	0.00087	0.00020	7427874
Dissolved Iron (Fe)	mg/L	0.66	7430704	0.90	7430704	0.086	0.060	7430704
Dissolved Lead (Pb)	mg/L	<0.00020	7427874	<0.00020	7427874	<0.00020	0.00020	7427874
Dissolved Lithium (Li)	mg/L	0.020	7430704	0.021	7430704	0.021	0.020	7430704
Dissolved Magnesium (Mg)	mg/L	24	7430704	24	7430704	24	0.20	7430704
Dissolved Manganese (Mn)	mg/L	0.16	7430704	0.75	7430704	0.16	0.0040	7430704
Dissolved Molybdenum (Mo)	mg/L	0.0020	7427874	0.0038	7427874	0.0019	0.00020	7427874
Dissolved Nickel (Ni)	mg/L	0.0038	7427874	0.0037	7427874	0.0017	0.00050	7427874
Dissolved Phosphorus (P)	mg/L	<0.10	7430704	<0.10	7430704	<0.10	0.10	7430704
Dissolved Potassium (K)	mg/L	2.2	7430704	2.6	7430704	2.7	0.30	7430704
Dissolved Selenium (Se)	mg/L	0.0015	7427874	0.0013	7427874	0.0026	0.00020	7427874
Dissolved Silicon (Si)	mg/L	7.2	7430704	7.5	7430704	6.9	0.10	7430704
Dissolved Silver (Ag)	mg/L	<0.00010	7427874	<0.00010	7427874	<0.00010	0.00010	7427874
Dissolved Sodium (Na)	mg/L	8.9	7430704	10	7430704	9.8	0.50	7430704
Dissolved Strontium (Sr)	mg/L	0.34	7430704	0.35	7430704	0.30	0.020	7430704
Dissolved Sulphur (S)	mg/L	14	7430704	10	7430704	14	0.20	7430704
Dissolved Thallium (Tl)	mg/L	<0.00020	7427874	<0.00020	7427874	<0.00020	0.00020	7427874
Dissolved Tin (Sn)	mg/L	<0.0010	7427874	<0.0010	7427874	<0.0010	0.0010	7427874
Dissolved Titanium (Ti)	mg/L	<0.0010	7427874	<0.0010	7427874	<0.0010	0.0010	7427874
Dissolved Uranium (U)	mg/L	0.0030	7427874	0.0053	7427874	0.0062	0.00010	7427874
Dissolved Vanadium (V)	mg/L	<0.0010	7427874	<0.0010	7427874	<0.0010	0.0010	7427874
Dissolved Zinc (Zn)	mg/L	0.0045	7427874	<0.0030	7427874	<0.0030	0.0030	7427874
RDL = Reportable Detection Limit								

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		JD0436		JD0437		JD0438		
Sampling Date		2014/03/20 11:30		2014/03/22 14:00		2014/03/22 09:00		
COC Number		A165042		A165042		A165042		
	<b>UNITS</b>	<b>DUP 1</b>	<b>QC Batch</b>	<b>MW14-109</b>	<b>QC Batch</b>	<b>DUP 2</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>								
Anion Sum	meq/L	6.9	7427808	6.8	7427808	0.016	N/A	7427808
Cation Sum	meq/L	7.9	7427808	7.7	7427808	0.0030	N/A	7427808
Hardness (CaCO <sub>3</sub> )	mg/L	360	7427806	360	7427806	<0.50	0.50	7427806
Ion Balance	N/A	1.1	7427807	1.1	7427807	NC	0.010	7427807
Dissolved Nitrate (NO <sub>3</sub> )	mg/L	0.096	7427813	0.15	7427813	<0.044	0.044	7427813
Nitrate plus Nitrite (N)	mg/L	0.022	7427814	0.033	7427814	<0.010	0.010	7427814
Dissolved Nitrite (NO <sub>2</sub> )	mg/L	<0.033	7427813	<0.033	7427813	<0.033	0.033	7427813
Total Dissolved Solids	mg/L	360	7427817	370	7427817	<10	10	7427817
<b>Misc. Inorganics</b>								
Conductivity	uS/cm	660	7429188	650	7429188	<1.0	1.0	7429188
pH	pH	7.69	7429189	7.70	7429189	5.60	N/A	7429189
<b>Low Level Elements</b>								
Dissolved Cadmium (Cd)	ug/L	0.020	7427628	0.033	7427628	<0.0050	0.0050	7427628
<b>Anions</b>								
Alkalinity (PP as CaCO <sub>3</sub> )	mg/L	<0.50	7436255	<0.50	7429187	<0.50	0.50	7429187
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	320	7436255	260	7429187	0.79	0.50	7429187
Bicarbonate (HCO <sub>3</sub> )	mg/L	400	7436255	320	7429187	0.97	0.50	7429187
Carbonate (CO <sub>3</sub> )	mg/L	<0.50	7436255	<0.50	7429187	<0.50	0.50	7429187
Hydroxide (OH)	mg/L	<0.50	7436255	<0.50	7429187	<0.50	0.50	7429187
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	13	7434974	71	7434974	<1.0	1.0	7434974
Dissolved Chloride (Cl)	mg/L	6.3	7434973	4.2	7434973	<1.0	1.0	7434973
<b>Nutrients</b>								
Dissolved Nitrite (N)	mg/L	<0.010	7429973	<0.010	7429490	<0.010	0.010	7429973
Dissolved Nitrate (N)	mg/L	0.022	7429973	0.033	7429490	<0.010	0.010	7429973
<b>Elements</b>								
Dissolved Aluminum (Al)	mg/L	<0.0030	7427874	<0.0030	7427874	<0.0030	0.0030	7427874
Dissolved Antimony (Sb)	mg/L	<0.00060	7427874	<0.00060	7427874	<0.00060	0.00060	7427874
Dissolved Arsenic (As)	mg/L	0.0056	7427874	0.0022	7427874	<0.00020	0.00020	7427874
Dissolved Barium (Ba)	mg/L	0.46	7430704	0.35	7430704	<0.010	0.010	7430704
Dissolved Beryllium (Be)	mg/L	<0.0010	7427874	<0.0010	7427874	<0.0010	0.0010	7427874
Dissolved Boron (B)	mg/L	0.059	7430704	0.031	7430704	<0.020	0.020	7430704
Dissolved Calcium (Ca)	mg/L	100	7433727	100	7430704	<0.30	0.30	7430704
RDL = Reportable Detection Limit								

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		JD0436		JD0437		JD0438		
Sampling Date		2014/03/20 11:30		2014/03/22 14:00		2014/03/22 09:00		
COC Number		A165042		A165042		A165042		
	<b>UNITS</b>	<b>DUP 1</b>	<b>QC Batch</b>	<b>MW14-109</b>	<b>QC Batch</b>	<b>DUP 2</b>	<b>RDL</b>	<b>QC Batch</b>
Dissolved Chromium (Cr)	mg/L	<0.0010	7427874	<0.0010	7427874	<0.0010	0.0010	7427874
Dissolved Cobalt (Co)	mg/L	0.0011	7427874	0.0025	7427874	<0.00030	0.00030	7427874
Dissolved Copper (Cu)	mg/L	0.00040	7427874	0.00050	7427874	<0.00020	0.00020	7427874
Dissolved Iron (Fe)	mg/L	2.9	7433727	0.88	7430704	<0.060	0.060	7430704
Dissolved Lead (Pb)	mg/L	<0.00020	7427874	<0.00020	7427874	<0.00020	0.00020	7427874
Dissolved Lithium (Li)	mg/L	0.021	7430704	<0.020	7430704	<0.020	0.020	7430704
Dissolved Magnesium (Mg)	mg/L	24	7433727	25	7430704	<0.20	0.20	7430704
Dissolved Manganese (Mn)	mg/L	0.30	7433727	0.60	7430704	<0.0040	0.0040	7430704
Dissolved Molybdenum (Mo)	mg/L	0.0028	7427874	0.0022	7427874	<0.00020	0.00020	7427874
Dissolved Nickel (Ni)	mg/L	0.0018	7427874	0.0034	7427874	<0.00050	0.00050	7427874
Dissolved Phosphorus (P)	mg/L	<0.10	7430704	<0.10	7430704	<0.10	0.10	7430704
Dissolved Potassium (K)	mg/L	2.8	7433727	2.4	7430704	<0.30	0.30	7430704
Dissolved Selenium (Se)	mg/L	0.00048	7427874	0.00077	7427874	<0.00020	0.00020	7427874
Dissolved Silicon (Si)	mg/L	8.1	7430704	6.9	7430704	<0.10	0.10	7430704
Dissolved Silver (Ag)	mg/L	<0.00010	7427874	<0.00010	7427874	<0.00010	0.00010	7427874
Dissolved Sodium (Na)	mg/L	13	7433727	7.5	7430704	<0.50	0.50	7430704
Dissolved Strontium (Sr)	mg/L	0.34	7430704	0.30	7430704	<0.020	0.020	7430704
Dissolved Sulphur (S)	mg/L	4.1	7430704	24	7430704	<0.20	0.20	7430704
Dissolved Thallium (Tl)	mg/L	<0.00020	7427874	<0.00020	7427874	<0.00020	0.00020	7427874
Dissolved Tin (Sn)	mg/L	<0.0010	7427874	<0.0010	7427874	<0.0010	0.0010	7427874
Dissolved Titanium (Ti)	mg/L	<0.0010	7427874	<0.0010	7427874	<0.0010	0.0010	7427874
Dissolved Uranium (U)	mg/L	0.0030	7427874	0.0027	7427874	<0.00010	0.00010	7427874
Dissolved Vanadium (V)	mg/L	<0.0010	7427874	<0.0010	7427874	<0.0010	0.0010	7427874
Dissolved Zinc (Zn)	mg/L	<0.0030	7427874	<0.0030	7427874	<0.0030	0.0030	7427874
RDL = Reportable Detection Limit								

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		JD0430		JD0431	JD0432		
Sampling Date		2014/03/20 11:00		2014/03/20 12:00	2014/03/20 12:30		
COC Number		A165042		A165042	A165042		
	<b>UNITS</b>	<b>MW14-101</b>	<b>RDL</b>	<b>MW14-102B</b>	<b>MW14-103</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Misc. Inorganics</b>							
Dissolved Organic Carbon (C)	mg/L	16	0.50	11	6.3	0.50	7434986
<b>Nutrients</b>							
Total Ammonia (N)	mg/L	0.59	0.050	0.38	0.18	0.050	7429500
Total Total Kjeldahl Nitrogen	mg/L	1.1 (1)	0.10	1.1 (2)	1.1 (2)	0.50	7430017
<b>Misc. Organics</b>							
Phenols	mg/L	0.0066	0.0020	<0.0020	0.0075	0.0020	7431476

RDL = Reportable Detection Limit

( 1 ) Detection limits raised due to matrix interference.

( 2 ) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly

Maxxam ID		JD0433		JD0434		JD0435		
Sampling Date		2014/03/20 13:00		2014/03/22 12:30		2014/03/22 13:00		
COC Number		A165042		A165042		A165042		
	<b>UNITS</b>	<b>MW14-104B</b>	<b>RDL</b>	<b>MW14-105</b>	<b>RDL</b>	<b>MW14-106B</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Misc. Inorganics</b>								
Dissolved Organic Carbon (C)	mg/L	5.7	0.50	5.3	0.50	3.2	0.50	7434986
<b>Nutrients</b>								
Total Ammonia (N)	mg/L	0.18	0.050	0.40	0.050	0.14	0.050	7429500
Total Total Kjeldahl Nitrogen	mg/L	0.50	0.050	1.6 (1)	0.50	0.91	0.050	7430017
<b>Misc. Organics</b>								
Phenols	mg/L	0.0050	0.0020	0.0034	0.0020	0.0055	0.0020	7431476

RDL = Reportable Detection Limit

( 1 ) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		JD0436		JD0437		JD0438		
Sampling Date		2014/03/20 11:30		2014/03/22 14:00		2014/03/22 09:00		
COC Number		A165042		A165042		A165042		
	<b>UNITS</b>	<b>DUP 1</b>	<b>RDL</b>	<b>MW14-109</b>	<b>RDL</b>	<b>DUP 2</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Misc. Inorganics</b>								
Dissolved Organic Carbon (C)	mg/L	10	0.50	4.6	0.50	0.95	0.50	7434986
<b>Nutrients</b>								
Total Ammonia (N)	mg/L	0.34	0.050	0.16	0.050	<0.050	0.050	7429500
Total Total Kjeldahl Nitrogen	mg/L	0.96	0.050	1.1 (1)	0.50	<0.050	0.050	7430017
<b>Misc. Organics</b>								
Phenols	mg/L	0.0053	0.0020	0.011	0.0020	<0.0020	0.0020	7431476

RDL = Reportable Detection Limit

( 1 ) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		JD0430	JD0431	JD0432	JD0433		
Sampling Date		2014/03/20 11:00	2014/03/20 12:00	2014/03/20 12:30	2014/03/20 13:00		
COC Number		A165042	A165042	A165042	A165042		
	<b>UNITS</b>	<b>MW14-101</b>	<b>MW14-102B</b>	<b>MW14-103</b>	<b>MW14-104B</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Low Level Elements</b>							
Dissolved Mercury (Hg)	ug/L	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7434589
RDL = Reportable Detection Limit							

Maxxam ID		JD0434	JD0435	JD0436	JD0437		
Sampling Date		2014/03/22 12:30	2014/03/22 13:00	2014/03/20 11:30	2014/03/22 14:00		
COC Number		A165042	A165042	A165042	A165042		
	<b>UNITS</b>	<b>MW14-105</b>	<b>MW14-106B</b>	<b>DUP 1</b>	<b>MW14-109</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Low Level Elements</b>							
Dissolved Mercury (Hg)	ug/L	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7434589
RDL = Reportable Detection Limit							

Maxxam ID		JD0438		
Sampling Date		2014/03/22 09:00		
COC Number		A165042		
	<b>UNITS</b>	<b>DUP 2</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Low Level Elements</b>				
Dissolved Mercury (Hg)	ug/L	<0.0050	0.0050	7434589
RDL = Reportable Detection Limit				

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		JD0430	JD0431	JD0432	JD0433		
Sampling Date		2014/03/20 11:00	2014/03/20 12:00	2014/03/20 12:30	2014/03/20 13:00		
COC Number		A165042	A165042	A165042	A165042		
	<b>UNITS</b>	<b>MW14-101</b>	<b>MW14-102B</b>	<b>MW14-103</b>	<b>MW14-104B</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Volatiles</b>							
Total Trihalomethanes	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	7427428
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Bromoform	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Bromomethane	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	7431339
Carbon tetrachloride	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Chlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Chlorodibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7431339
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7431339
Chloroform	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Chloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	7431339
1,2-dibromoethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,2-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,3-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,4-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,1-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,2-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,1-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
cis-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
trans-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Dichloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	7431339
1,2-dichloropropane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
cis-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
trans-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Methyl methacrylate	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Methyl-tert-butylether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,1,1,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	7431339
1,1,2,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	7431339
Tetrachloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,2,3-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7431339
1,2,4-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7431339
1,3,5-trichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339

RDL = Reportable Detection Limit

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		JD0430	JD0431	JD0432	JD0433		
Sampling Date		2014/03/20 11:00	2014/03/20 12:00	2014/03/20 12:30	2014/03/20 13:00		
COC Number		A165042	A165042	A165042	A165042		
	<b>UNITS</b>	<b>MW14-101</b>	<b>MW14-102B</b>	<b>MW14-103</b>	<b>MW14-104B</b>	<b>RDL</b>	<b>QC Batch</b>
1,1,1-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,1,2-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Trichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Trichlorofluoromethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,2,4-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,3,5-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Vinyl chloride	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
<b>Surrogate Recovery (%)</b>							
1,4-Difluorobenzene (sur.)	%	98	98	97	97	N/A	7431339
4-Bromofluorobenzene (sur.)	%	106	100	101	98	N/A	7431339
D4-1,2-Dichloroethane (sur.)	%	103	91	105	85	N/A	7431339
N/A = Not Applicable RDL = Reportable Detection Limit							

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		JD0434	JD0435	JD0436	JD0437		
Sampling Date		2014/03/22 12:30	2014/03/22 13:00	2014/03/20 11:30	2014/03/22 14:00		
COC Number		A165042	A165042	A165042	A165042		
	<b>UNITS</b>	<b>MW14-105</b>	<b>MW14-106B</b>	<b>DUP 1</b>	<b>MW14-109</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Volatiles</b>							
Total Trihalomethanes	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	7427428
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Bromoform	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Bromomethane	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	7431339
Carbon tetrachloride	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Chlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Chlorodibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7431339
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7431339
Chloroform	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Chloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	7431339
1,2-dibromoethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,2-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,3-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,4-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,1-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,2-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,1-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
cis-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
trans-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Dichloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	7431339
1,2-dichloropropane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
cis-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
trans-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Methyl methacrylate	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Methyl-tert-butylether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,1,1,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	7431339
1,1,2,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	2.0	7431339
Tetrachloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,2,3-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7431339
1,2,4-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7431339
1,3,5-trichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339

RDL = Reportable Detection Limit

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		JD0434	JD0435	JD0436	JD0437		
Sampling Date		2014/03/22 12:30	2014/03/22 13:00	2014/03/20 11:30	2014/03/22 14:00		
COC Number		A165042	A165042	A165042	A165042		
	<b>UNITS</b>	<b>MW14-105</b>	<b>MW14-106B</b>	<b>DUP 1</b>	<b>MW14-109</b>	<b>RDL</b>	<b>QC Batch</b>
1,1,1-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,1,2-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Trichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Trichlorofluoromethane	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,2,4-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
1,3,5-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
Vinyl chloride	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7431339
<b>Surrogate Recovery (%)</b>							
1,4-Difluorobenzene (sur.)	%	98	97	99	97	N/A	7431339
4-Bromofluorobenzene (sur.)	%	99	96	100	100	N/A	7431339
D4-1,2-Dichloroethane (sur.)	%	101	98	102	101	N/A	7431339
N/A = Not Applicable RDL = Reportable Detection Limit							

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		JD0438	JD0439		
Sampling Date		2014/03/22 09:00			
COC Number		A165042	A165042		
	<b>UNITS</b>	<b>DUP 2</b>	<b>TRIP BLANK</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Volatiles</b>					
Total Trihalomethanes	ug/L	<2.0	<2.0	2.0	7427428
Bromodichloromethane	ug/L	<0.50	<0.50	0.50	7431339
Bromoform	ug/L	<0.50	<0.50	0.50	7431339
Bromomethane	ug/L	<2.0	<2.0	2.0	7431339
Carbon tetrachloride	ug/L	<0.50	<0.50	0.50	7431339
Chlorobenzene	ug/L	<0.50	<0.50	0.50	7431339
Chlorodibromomethane	ug/L	<1.0	<1.0	1.0	7431339
Chloroethane	ug/L	<1.0	<1.0	1.0	7431339
Chloroform	ug/L	<0.50	<0.50	0.50	7431339
Chloromethane	ug/L	<2.0	<2.0	2.0	7431339
1,2-dibromoethane	ug/L	<0.50	<0.50	0.50	7431339
1,2-dichlorobenzene	ug/L	<0.50	<0.50	0.50	7431339
1,3-dichlorobenzene	ug/L	<0.50	<0.50	0.50	7431339
1,4-dichlorobenzene	ug/L	<0.50	<0.50	0.50	7431339
1,1-dichloroethane	ug/L	<0.50	<0.50	0.50	7431339
1,2-dichloroethane	ug/L	<0.50	<0.50	0.50	7431339
1,1-dichloroethene	ug/L	<0.50	<0.50	0.50	7431339
cis-1,2-dichloroethene	ug/L	<0.50	<0.50	0.50	7431339
trans-1,2-dichloroethene	ug/L	<0.50	<0.50	0.50	7431339
Dichloromethane	ug/L	<2.0	<2.0	2.0	7431339
1,2-dichloropropane	ug/L	<0.50	<0.50	0.50	7431339
cis-1,3-dichloropropene	ug/L	<0.50	<0.50	0.50	7431339
trans-1,3-dichloropropene	ug/L	<0.50	<0.50	0.50	7431339
Methyl methacrylate	ug/L	<0.50	<0.50	0.50	7431339
Methyl-tert-butylether (MTBE)	ug/L	<0.50	<0.50	0.50	7431339
Styrene	ug/L	<0.50	<0.50	0.50	7431339
1,1,1,2-tetrachloroethane	ug/L	<2.0	<2.0	2.0	7431339
1,1,2,2-tetrachloroethane	ug/L	<2.0	<2.0	2.0	7431339
Tetrachloroethene	ug/L	<0.50	<0.50	0.50	7431339
1,2,3-trichlorobenzene	ug/L	<1.0	<1.0	1.0	7431339
1,2,4-trichlorobenzene	ug/L	<1.0	<1.0	1.0	7431339
1,3,5-trichlorobenzene	ug/L	<0.50	<0.50	0.50	7431339

RDL = Reportable Detection Limit

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: DSK

### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		JD0438	JD0439		
Sampling Date		2014/03/22 09:00			
COC Number		A165042	A165042		
	<b>UNITS</b>	<b>DUP 2</b>	<b>TRIP BLANK</b>	<b>RDL</b>	<b>QC Batch</b>
1,1,1-trichloroethane	ug/L	<0.50	<0.50	0.50	7431339
1,1,2-trichloroethane	ug/L	<0.50	<0.50	0.50	7431339
Trichloroethene	ug/L	<0.50	<0.50	0.50	7431339
Trichlorofluoromethane	ug/L	<0.50	<0.50	0.50	7431339
1,2,4-trimethylbenzene	ug/L	<0.50	<0.50	0.50	7431339
1,3,5-trimethylbenzene	ug/L	<0.50	<0.50	0.50	7431339
Vinyl chloride	ug/L	<0.50	<0.50	0.50	7431339
<b>Surrogate Recovery (%)</b>					
1,4-Difluorobenzene (sur.)	%	99	99	N/A	7431339
4-Bromofluorobenzene (sur.)	%	99	101	N/A	7431339
D4-1,2-Dichloroethane (sur.)	%	101	95	N/A	7431339
N/A = Not Applicable RDL = Reportable Detection Limit					

Maxxam Job #: B423358  
Report Date: 2014/04/01

SLR CONSULTING (CANADA) LTD  
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Sampler Initials: DSK

Package 1	-0.3°C
Package 2	1.3°C

Each temperature is the average of up to three cooler temperatures taken at receipt

#### General Comments

Sample JD0430-01: Anion - Cation balance exceeds normal acceptance limits and major ions reanalyzed due to possible matrix interference.

Sample JD0430, Elements by ICP - Dissolved: Test repeated.

Sample JD0431, Elements by ICP - Dissolved: Test repeated.

Sample JD0436, Elements by ICP - Dissolved: Test repeated.

**Results relate only to the items tested.**

SLR CONSULTING (CANADA) LTD  
Attention: JASON PENTLAND  
Client Project #: 200.02005.00000  
P.O. #:  
Site Location: GARDEN RIVER, AB

Quality Assurance Report  
Maxxam Job Number: EGPB423358

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7427874 KA3	Matrix Spike [JD0430-04]	Dissolved Aluminum (Al)	2014/03/26		NC	%	80 - 120
		Dissolved Antimony (Sb)	2014/03/26		74 (1)	%	80 - 120
		Dissolved Arsenic (As)	2014/03/26		91	%	80 - 120
		Dissolved Beryllium (Be)	2014/03/26		95	%	80 - 120
		Dissolved Chromium (Cr)	2014/03/26		90	%	80 - 120
		Dissolved Cobalt (Co)	2014/03/26		88	%	80 - 120
		Dissolved Copper (Cu)	2014/03/26		89	%	80 - 120
		Dissolved Lead (Pb)	2014/03/26		88	%	80 - 120
		Dissolved Molybdenum (Mo)	2014/03/26		96	%	80 - 120
		Dissolved Nickel (Ni)	2014/03/26		89	%	80 - 120
		Dissolved Selenium (Se)	2014/03/26		92	%	80 - 120
		Dissolved Silver (Ag)	2014/03/26		83	%	80 - 120
		Dissolved Thallium (Tl)	2014/03/26		90	%	80 - 120
		Dissolved Tin (Sn)	2014/03/26		86	%	80 - 120
		Dissolved Titanium (Ti)	2014/03/26		103	%	80 - 120
		Dissolved Uranium (U)	2014/03/26		93	%	80 - 120
		Dissolved Vanadium (V)	2014/03/26		93	%	80 - 120
		Dissolved Zinc (Zn)	2014/03/26		86	%	80 - 120
	Spiked Blank	Dissolved Aluminum (Al)	2014/03/26		87	%	80 - 120
		Dissolved Antimony (Sb)	2014/03/26		87	%	80 - 120
		Dissolved Arsenic (As)	2014/03/26		84	%	80 - 120
		Dissolved Beryllium (Be)	2014/03/26		87	%	80 - 120
		Dissolved Chromium (Cr)	2014/03/26		84	%	80 - 120
		Dissolved Cobalt (Co)	2014/03/26		85	%	80 - 120
		Dissolved Copper (Cu)	2014/03/26		85	%	80 - 120
		Dissolved Lead (Pb)	2014/03/26		84	%	80 - 120
		Dissolved Molybdenum (Mo)	2014/03/26		87	%	80 - 120
		Dissolved Nickel (Ni)	2014/03/26		85	%	80 - 120
		Dissolved Selenium (Se)	2014/03/26		88	%	80 - 120
		Dissolved Silver (Ag)	2014/03/26		90	%	80 - 120
		Dissolved Thallium (Tl)	2014/03/26		85	%	80 - 120
		Dissolved Tin (Sn)	2014/03/26		82	%	80 - 120
		Dissolved Titanium (Ti)	2014/03/26		86	%	80 - 120
		Dissolved Uranium (U)	2014/03/26		86	%	80 - 120
		Dissolved Vanadium (V)	2014/03/26		86	%	80 - 120
		Dissolved Zinc (Zn)	2014/03/26		82	%	80 - 120
	Method Blank	Dissolved Aluminum (Al)	2014/03/25	<0.0030		mg/L	
		Dissolved Antimony (Sb)	2014/03/25	<0.00060		mg/L	
		Dissolved Arsenic (As)	2014/03/25	<0.00020		mg/L	
		Dissolved Beryllium (Be)	2014/03/25	<0.0010		mg/L	
		Dissolved Chromium (Cr)	2014/03/25	<0.0010		mg/L	
		Dissolved Cobalt (Co)	2014/03/25	<0.00030		mg/L	
		Dissolved Copper (Cu)	2014/03/25	<0.00020		mg/L	
		Dissolved Lead (Pb)	2014/03/25	<0.00020		mg/L	
		Dissolved Molybdenum (Mo)	2014/03/25	<0.00020		mg/L	
		Dissolved Nickel (Ni)	2014/03/25	<0.00050		mg/L	
		Dissolved Selenium (Se)	2014/03/25	<0.00020		mg/L	
		Dissolved Silver (Ag)	2014/03/25	<0.00010		mg/L	
		Dissolved Thallium (Tl)	2014/03/25	<0.00020		mg/L	
		Dissolved Tin (Sn)	2014/03/25	<0.0010		mg/L	
		Dissolved Titanium (Ti)	2014/03/25	<0.0010		mg/L	
		Dissolved Uranium (U)	2014/03/25	<0.00010		mg/L	
		Dissolved Vanadium (V)	2014/03/25	<0.0010		mg/L	
		Dissolved Zinc (Zn)	2014/03/25	<0.0030		mg/L	

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### Quality Assurance Report (Continued)

Maxxam Job Number: EGPB423358

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7427874 KA3	RPD [JD0430-04]	Dissolved Aluminum (Al)	2014/03/25	1.7		%	20
		Dissolved Antimony (Sb)	2014/03/25	NC		%	20
		Dissolved Arsenic (As)	2014/03/25	1.2		%	20
		Dissolved Beryllium (Be)	2014/03/25	NC		%	20
		Dissolved Chromium (Cr)	2014/03/25	NC		%	20
		Dissolved Cobalt (Co)	2014/03/25	2.7		%	20
		Dissolved Copper (Cu)	2014/03/25	NC		%	20
		Dissolved Lead (Pb)	2014/03/25	NC		%	20
		Dissolved Molybdenum (Mo)	2014/03/25	1.2		%	20
		Dissolved Nickel (Ni)	2014/03/25	2.9		%	20
		Dissolved Selenium (Se)	2014/03/25	NC		%	20
		Dissolved Silver (Ag)	2014/03/25	NC		%	20
		Dissolved Thallium (Tl)	2014/03/25	NC		%	20
		Dissolved Tin (Sn)	2014/03/25	NC		%	20
		Dissolved Titanium (Ti)	2014/03/25	NC		%	20
		Dissolved Uranium (U)	2014/03/25	3.9		%	20
		Dissolved Vanadium (V)	2014/03/25	NC		%	20
		Dissolved Zinc (Zn)	2014/03/25	NC		%	20
7428427 PN0	Matrix Spike [JD0430-07]	O-TERPHENYL (sur.)	2014/03/26		99	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2014/03/26		103	%	50 - 130
	Spiked Blank	O-TERPHENYL (sur.)	2014/03/26		97	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2014/03/26		91	%	70 - 130
	Method Blank	O-TERPHENYL (sur.)	2014/03/26		100	%	50 - 130
		F2 (C10-C16 Hydrocarbons)	2014/03/26	<0.10		mg/L	
		F2 (C10-C16 Hydrocarbons)	2014/03/26	NC		%	40
7429187 JLD	RPD [JD0439-01]	Alkalinity (Total as CaCO3)	2014/03/26		92	%	80 - 120
		Alkalinity (PP as CaCO3)	2014/03/26	<0.50		mg/L	
	Spiked Blank	Alkalinity (Total as CaCO3)	2014/03/26	<0.50		mg/L	
		Bicarbonate (HCO3)	2014/03/26	<0.50		mg/L	
		Carbonate (CO3)	2014/03/26	<0.50		mg/L	
		Hydroxide (OH)	2014/03/26	<0.50		mg/L	
		Conductivity	2014/03/26		101	%	90 - 110
7429188 JLD	Method Blank	Conductivity	2014/03/26	<1.0		uS/cm	
		Conductivity	2014/03/26	2.4		%	20
7429189 JLD	Spiked Blank	pH	2014/03/26		100	%	97 - 102
		pH	2014/03/26	0.3		%	5
7429413 ARA	Matrix Spike [JD0431-08]	1,4-Difluorobenzene (sur.)	2014/03/28		107	%	70 - 130
		4-Bromofluorobenzene (sur.)	2014/03/28		108	%	70 - 130
		D4-1,2-Dichloroethane (sur.)	2014/03/28		114	%	70 - 130
		Benzene	2014/03/28		93	%	70 - 130
		Toluene	2014/03/28		86	%	70 - 130
		Ethylbenzene	2014/03/28		86	%	70 - 130
		m & p-Xylene	2014/03/28		84	%	70 - 130
		o-Xylene	2014/03/28		84	%	70 - 130
		(C6-C10)	2014/03/28		72	%	70 - 130
		1,4-Difluorobenzene (sur.)	2014/03/27		108	%	70 - 130
	Spiked Blank	4-Bromofluorobenzene (sur.)	2014/03/27		109	%	70 - 130
		D4-1,2-Dichloroethane (sur.)	2014/03/27		111	%	70 - 130
		Benzene	2014/03/27		89	%	70 - 130
		Toluene	2014/03/27		83	%	70 - 130
		Ethylbenzene	2014/03/27		85	%	70 - 130
		m & p-Xylene	2014/03/27		83	%	70 - 130
		o-Xylene	2014/03/27		82	%	70 - 130

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### Quality Assurance Report (Continued)

Maxxam Job Number: EGPB423358

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7429413 ARA	Spiked Blank	(C6-C10)	2014/03/27		77	%	70 - 130
	Method Blank	1,4-Difluorobenzene (sur.)	2014/03/27		109	%	70 - 130
		4-Bromofluorobenzene (sur.)	2014/03/27		108	%	70 - 130
		D4-1,2-Dichloroethane (sur.)	2014/03/27		110	%	70 - 130
		Benzene	2014/03/27	<0.00040		mg/L	
		Toluene	2014/03/27	<0.00040		mg/L	
		Ethylbenzene	2014/03/27	<0.00040		mg/L	
		m & p-Xylene	2014/03/27	<0.00080		mg/L	
		o-Xylene	2014/03/27	<0.00040		mg/L	
		Xylenes (Total)	2014/03/27	<0.00080		mg/L	
		F1 (C6-C10) - BTEX	2014/03/27	<0.10		mg/L	
		(C6-C10)	2014/03/27	<0.10		mg/L	
	RPD [JD0430-08]	Benzene	2014/03/27	NC		%	40
		Toluene	2014/03/27	NC		%	40
		Ethylbenzene	2014/03/27	NC		%	40
		m & p-Xylene	2014/03/27	NC		%	40
		o-Xylene	2014/03/27	NC		%	40
		Xylenes (Total)	2014/03/27	NC		%	40
		F1 (C6-C10) - BTEX	2014/03/27	NC		%	40
		(C6-C10)	2014/03/27	NC		%	40
7429490 CT6	Matrix Spike	Dissolved Nitrite (N)	2014/03/26		101	%	80 - 120
		Dissolved Nitrate (N)	2014/03/26		102	%	80 - 120
	Spiked Blank	Dissolved Nitrite (N)	2014/03/26		103	%	90 - 110
		Dissolved Nitrate (N)	2014/03/26		104	%	90 - 110
	Method Blank	Dissolved Nitrite (N)	2014/03/26	<0.010		mg/L	
		Dissolved Nitrate (N)	2014/03/26	<0.010		mg/L	
	RPD	Dissolved Nitrite (N)	2014/03/26	NC		%	20
		Dissolved Nitrate (N)	2014/03/26	7.7		%	20
7429500 BL5	Matrix Spike	Total Ammonia (N)	2014/03/26		NC	%	80 - 120
	Spiked Blank	Total Ammonia (N)	2014/03/26		101	%	80 - 120
	Method Blank	Total Ammonia (N)	2014/03/26	<0.050		mg/L	
	RPD	Total Ammonia (N)	2014/03/26	0.7		%	20
7429973 CT6	Matrix Spike	Dissolved Nitrite (N)	2014/03/26		102	%	80 - 120
		Dissolved Nitrate (N)	2014/03/26		103	%	80 - 120
	Spiked Blank	Dissolved Nitrite (N)	2014/03/26		101	%	90 - 110
		Dissolved Nitrate (N)	2014/03/26		103	%	90 - 110
	Method Blank	Dissolved Nitrite (N)	2014/03/26	<0.010		mg/L	
		Dissolved Nitrate (N)	2014/03/26	<0.010		mg/L	
	RPD	Dissolved Nitrite (N)	2014/03/26	NC		%	20
		Dissolved Nitrate (N)	2014/03/26	0.9		%	20
7430017 RM9	Matrix Spike	Total Total Kjeldahl Nitrogen	2014/03/27		NC	%	80 - 120
	QC Standard	Total Total Kjeldahl Nitrogen	2014/03/27		102	%	75 - 125
	Spiked Blank	Total Total Kjeldahl Nitrogen	2014/03/27		95	%	80 - 120
	Method Blank	Total Total Kjeldahl Nitrogen	2014/03/27	<0.050		mg/L	
	RPD	Total Total Kjeldahl Nitrogen	2014/03/27	6.7		%	20
7430704 SRT	Matrix Spike [JD0430-04]	Dissolved Barium (Ba)	2014/03/27		101	%	80 - 120
		Dissolved Boron (B)	2014/03/27		105	%	80 - 120
		Dissolved Calcium (Ca)	2014/03/27		NC	%	80 - 120
		Dissolved Iron (Fe)	2014/03/27		NC	%	80 - 120
		Dissolved Lithium (Li)	2014/03/27		103	%	80 - 120
		Dissolved Magnesium (Mg)	2014/03/27		103	%	80 - 120
		Dissolved Manganese (Mn)	2014/03/27		102	%	80 - 120
		Dissolved Phosphorus (P)	2014/03/27		108	%	80 - 120
		Dissolved Potassium (K)	2014/03/27		104	%	80 - 120

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Maxxam Job Number: EGPB423358

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7430704 SRT	Matrix Spike [JD0430-04]	Dissolved Silicon (Si)	2014/03/27		NC	%	80 - 120
		Dissolved Sodium (Na)	2014/03/27		105	%	80 - 120
	Spiked Blank	Dissolved Strontium (Sr)	2014/03/27		103	%	80 - 120
		Dissolved Barium (Ba)	2014/03/27		97	%	80 - 120
		Dissolved Boron (B)	2014/03/27		99	%	80 - 120
		Dissolved Calcium (Ca)	2014/03/27		104	%	80 - 120
		Dissolved Iron (Fe)	2014/03/27		99	%	80 - 120
		Dissolved Lithium (Li)	2014/03/27		95	%	80 - 120
		Dissolved Magnesium (Mg)	2014/03/27		99	%	80 - 120
		Dissolved Manganese (Mn)	2014/03/27		98	%	80 - 120
		Dissolved Phosphorus (P)	2014/03/27		99	%	80 - 120
		Dissolved Potassium (K)	2014/03/27		99	%	80 - 120
		Dissolved Silicon (Si)	2014/03/27		103	%	80 - 120
		Dissolved Sodium (Na)	2014/03/27		100	%	80 - 120
	Method Blank	Dissolved Strontium (Sr)	2014/03/27		98	%	80 - 120
		Dissolved Barium (Ba)	2014/03/27	<0.010		mg/L	
		Dissolved Boron (B)	2014/03/27	<0.020		mg/L	
		Dissolved Calcium (Ca)	2014/03/27	<0.30		mg/L	
		Dissolved Iron (Fe)	2014/03/27	<0.060		mg/L	
		Dissolved Lithium (Li)	2014/03/27	<0.020		mg/L	
		Dissolved Magnesium (Mg)	2014/03/27	<0.20		mg/L	
		Dissolved Manganese (Mn)	2014/03/27	<0.0040		mg/L	
		Dissolved Phosphorus (P)	2014/03/27	<0.10		mg/L	
		Dissolved Potassium (K)	2014/03/27	<0.30		mg/L	
		Dissolved Silicon (Si)	2014/03/27	<0.10		mg/L	
		Dissolved Sodium (Na)	2014/03/27	<0.50		mg/L	
		Dissolved Strontium (Sr)	2014/03/27	<0.020		mg/L	
		RPD [JD0430-04]	Dissolved Sulphur (S)	2014/03/27	<0.20		mg/L
	Dissolved Barium (Ba)		2014/03/27	0.9		%	20
	Dissolved Boron (B)		2014/03/27	NC		%	20
	Dissolved Lithium (Li)		2014/03/27	NC		%	20
	Dissolved Phosphorus (P)		2014/03/27	NC		%	20
	Dissolved Silicon (Si)		2014/03/27	0.8		%	20
	Dissolved Strontium (Sr)		2014/03/27	1.0		%	20
	Dissolved Sulphur (S)		2014/03/27	1.2		%	20
	7431339 GP4	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/03/28		99	%
4-Bromofluorobenzene (sur.)			2014/03/28		104	%	70 - 130
D4-1,2-Dichloroethane (sur.)			2014/03/28		110	%	70 - 130
Bromodichloromethane			2014/03/28		107	%	70 - 130
Bromoform			2014/03/28		116	%	70 - 130
Bromomethane			2014/03/28		94	%	70 - 130
Carbon tetrachloride			2014/03/28		95	%	70 - 130
Chlorobenzene			2014/03/28		98	%	70 - 130
Chlorodibromomethane			2014/03/28		110	%	70 - 130
Chloroethane			2014/03/28		92	%	70 - 130
Chloroform			2014/03/28		98	%	70 - 130
Chloromethane			2014/03/28		76	%	70 - 130
1,2-dibromoethane			2014/03/28		110	%	70 - 130
1,2-dichlorobenzene			2014/03/28		104	%	70 - 130
1,3-dichlorobenzene			2014/03/28		95	%	70 - 130
1,4-dichlorobenzene			2014/03/28		96	%	70 - 130
1,1-dichloroethane			2014/03/28		94	%	70 - 130
1,2-dichloroethane			2014/03/28		101	%	70 - 130
1,1-dichloroethene			2014/03/28		92	%	70 - 130

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### Quality Assurance Report (Continued)

Maxxam Job Number: EGPB423358

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7431339 GP4	Matrix Spike	cis-1,2-dichloroethene	2014/03/28		94	%	70 - 130
		trans-1,2-dichloroethene	2014/03/28		94	%	70 - 130
		Dichloromethane	2014/03/28		102	%	70 - 130
		1,2-dichloropropane	2014/03/28		100	%	70 - 130
		cis-1,3-dichloropropene	2014/03/28		105	%	70 - 130
		trans-1,3-dichloropropene	2014/03/28		108	%	70 - 130
		Methyl methacrylate	2014/03/28		115	%	70 - 130
		Methyl-tert-butylether (MTBE)	2014/03/28		96	%	70 - 130
		Styrene	2014/03/28		93	%	70 - 130
		1,1,1,2-tetrachloroethane	2014/03/28		101	%	70 - 130
		1,1,2,2-tetrachloroethane	2014/03/28		108	%	70 - 130
		Tetrachloroethene	2014/03/28		91	%	70 - 130
		1,2,3-trichlorobenzene	2014/03/28		105	%	70 - 130
		1,2,4-trichlorobenzene	2014/03/28		99	%	70 - 130
		1,3,5-trichlorobenzene	2014/03/28		97	%	70 - 130
		1,1,1-trichloroethane	2014/03/28		89	%	70 - 130
		1,1,2-trichloroethane	2014/03/28		107	%	70 - 130
		Trichloroethene	2014/03/28		88	%	70 - 130
		Trichlorofluoromethane	2014/03/28		86	%	70 - 130
		1,2,4-trimethylbenzene	2014/03/28		93	%	70 - 130
		1,3,5-trimethylbenzene	2014/03/28		97	%	70 - 130
		Vinyl chloride	2014/03/28		83	%	70 - 130
	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/03/29		99	%	70 - 130
		4-Bromofluorobenzene (sur.)	2014/03/29		104	%	70 - 130
		D4-1,2-Dichloroethane (sur.)	2014/03/29		124	%	70 - 130
		Bromodichloromethane	2014/03/29		109	%	70 - 130
		Bromoform	2014/03/29		124	%	70 - 130
		Bromomethane	2014/03/29		93	%	70 - 130
		Carbon tetrachloride	2014/03/29		100	%	70 - 130
		Chlorobenzene	2014/03/29		103	%	70 - 130
		Chlorodibromomethane	2014/03/29		113	%	70 - 130
		Chloroethane	2014/03/29		97	%	70 - 130
		Chloroform	2014/03/29		107	%	70 - 130
		Chloromethane	2014/03/29		74	%	70 - 130
		1,2-dibromoethane	2014/03/29		119	%	70 - 130
		1,2-dichlorobenzene	2014/03/29		106	%	70 - 130
		1,3-dichlorobenzene	2014/03/29		95	%	70 - 130
		1,4-dichlorobenzene	2014/03/29		98	%	70 - 130
		1,1-dichloroethane	2014/03/29		104	%	70 - 130
		1,2-dichloroethane	2014/03/29		113	%	70 - 130
		1,1-dichloroethene	2014/03/29		96	%	70 - 130
		cis-1,2-dichloroethene	2014/03/29		102	%	70 - 130
		trans-1,2-dichloroethene	2014/03/29		98	%	70 - 130
		Dichloromethane	2014/03/29		110	%	70 - 130
		1,2-dichloropropane	2014/03/29		108	%	70 - 130
		cis-1,3-dichloropropene	2014/03/29		96	%	70 - 130
		trans-1,3-dichloropropene	2014/03/29		101	%	70 - 130
		Methyl methacrylate	2014/03/29		119	%	70 - 130
		Methyl-tert-butylether (MTBE)	2014/03/29		105	%	70 - 130
		Styrene	2014/03/29		102	%	70 - 130
		1,1,1,2-tetrachloroethane	2014/03/29		109	%	70 - 130
		1,1,2,2-tetrachloroethane	2014/03/29		118	%	70 - 130
		Tetrachloroethene	2014/03/29		95	%	70 - 130
		1,2,3-trichlorobenzene	2014/03/29		105	%	70 - 130
		1,2,4-trichlorobenzene	2014/03/29		99	%	70 - 130

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Maxxam Job Number: EGPB423358

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7431339 GP4	Spiked Blank	1,3,5-trichlorobenzene	2014/03/29		97	%	70 - 130
		1,1,1-trichloroethane	2014/03/29		98	%	70 - 130
		1,1,2-trichloroethane	2014/03/29		118	%	70 - 130
		Trichloroethene	2014/03/29		91	%	70 - 130
		Trichlorofluoromethane	2014/03/29		88	%	70 - 130
		1,2,4-trimethylbenzene	2014/03/29		94	%	70 - 130
	Method Blank	1,3,5-trimethylbenzene	2014/03/29		97	%	70 - 130
		Vinyl chloride	2014/03/29		86	%	70 - 130
		1,4-Difluorobenzene (sur.)	2014/03/28		98	%	70 - 130
		4-Bromofluorobenzene (sur.)	2014/03/28		96	%	70 - 130
		D4-1,2-Dichloroethane (sur.)	2014/03/28		102	%	70 - 130
		Bromodichloromethane	2014/03/28	<0.50		ug/L	
		Bromoform	2014/03/28	<0.50		ug/L	
		Bromomethane	2014/03/28	<2.0		ug/L	
		Carbon tetrachloride	2014/03/28	<0.50		ug/L	
		Chlorobenzene	2014/03/28	<0.50		ug/L	
		Chlorodibromomethane	2014/03/28	<1.0		ug/L	
		Chloroethane	2014/03/28	<1.0		ug/L	
		Chloroform	2014/03/28	<0.50		ug/L	
		Chloromethane	2014/03/28	<2.0		ug/L	
		1,2-dibromoethane	2014/03/28	<0.50		ug/L	
		1,2-dichlorobenzene	2014/03/28	<0.50		ug/L	
		1,3-dichlorobenzene	2014/03/28	<0.50		ug/L	
		1,4-dichlorobenzene	2014/03/28	<0.50		ug/L	
		1,1-dichloroethane	2014/03/28	<0.50		ug/L	
		1,2-dichloroethane	2014/03/28	<0.50		ug/L	
		1,1-dichloroethene	2014/03/28	<0.50		ug/L	
		cis-1,2-dichloroethene	2014/03/28	<0.50		ug/L	
		trans-1,2-dichloroethene	2014/03/28	<0.50		ug/L	
		Dichloromethane	2014/03/28	<2.0		ug/L	
		1,2-dichloropropane	2014/03/28	<0.50		ug/L	
		cis-1,3-dichloropropene	2014/03/28	<0.50		ug/L	
		trans-1,3-dichloropropene	2014/03/28	<0.50		ug/L	
		Methyl methacrylate	2014/03/28	<0.50		ug/L	
		Methyl-tert-butylether (MTBE)	2014/03/28	<0.50		ug/L	
		Styrene	2014/03/28	<0.50		ug/L	
		1,1,1,2-tetrachloroethane	2014/03/28	<2.0		ug/L	
		1,1,2,2-tetrachloroethane	2014/03/28	<2.0		ug/L	
		Tetrachloroethene	2014/03/28	<0.50		ug/L	
		1,2,3-trichlorobenzene	2014/03/28	<1.0		ug/L	
		1,2,4-trichlorobenzene	2014/03/28	<1.0		ug/L	
		1,3,5-trichlorobenzene	2014/03/28	<0.50		ug/L	
		1,1,1-trichloroethane	2014/03/28	<0.50		ug/L	
		1,1,2-trichloroethane	2014/03/28	<0.50		ug/L	
		Trichloroethene	2014/03/28	<0.50		ug/L	
		Trichlorofluoromethane	2014/03/28	<0.50		ug/L	
		1,2,4-trimethylbenzene	2014/03/28	<0.50		ug/L	
		1,3,5-trimethylbenzene	2014/03/28	<0.50		ug/L	
		Vinyl chloride	2014/03/28	<0.50		ug/L	
	RPD	1,2-dibromoethane	2014/03/29	NC		%	40
		1,2-dichloroethane	2014/03/29	NC		%	40
7431476 LY	Matrix Spike						
	[JD0430-06]	Phenols	2014/03/27		91	%	80 - 120
	Spiked Blank	Phenols	2014/03/27		93	%	80 - 120
	Method Blank	Phenols	2014/03/27	<0.0020		mg/L	

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QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7431476 LY	RPD [JD0430-06]	Phenols	2014/03/27	NC		%	20
7433727 STI	Matrix Spike	Dissolved Calcium (Ca)	2014/03/29		95	%	80 - 120
		Dissolved Iron (Fe)	2014/03/29		96	%	80 - 120
		Dissolved Magnesium (Mg)	2014/03/29		91	%	80 - 120
		Dissolved Manganese (Mn)	2014/03/29		93	%	80 - 120
		Dissolved Potassium (K)	2014/03/29		97	%	80 - 120
		Dissolved Sodium (Na)	2014/03/29		NC	%	80 - 120
	Spiked Blank	Dissolved Calcium (Ca)	2014/03/29		100	%	80 - 120
		Dissolved Iron (Fe)	2014/03/29		99	%	80 - 120
		Dissolved Magnesium (Mg)	2014/03/29		100	%	80 - 120
		Dissolved Manganese (Mn)	2014/03/29		96	%	80 - 120
		Dissolved Potassium (K)	2014/03/29		102	%	80 - 120
		Dissolved Sodium (Na)	2014/03/29		99	%	80 - 120
	Method Blank	Dissolved Calcium (Ca)	2014/03/29	<0.30		mg/L	
		Dissolved Iron (Fe)	2014/03/29	<0.060		mg/L	
		Dissolved Magnesium (Mg)	2014/03/29	<0.20		mg/L	
		Dissolved Manganese (Mn)	2014/03/29	<0.0040		mg/L	
		Dissolved Potassium (K)	2014/03/29	<0.30		mg/L	
		Dissolved Sodium (Na)	2014/03/29	<0.50		mg/L	
	RPD	Dissolved Calcium (Ca)	2014/03/29	0.7		%	20
		Dissolved Iron (Fe)	2014/03/29	NC		%	20
		Dissolved Magnesium (Mg)	2014/03/29	0.05		%	20
		Dissolved Manganese (Mn)	2014/03/29	0.5		%	20
		Dissolved Potassium (K)	2014/03/29	0.2		%	20
		Dissolved Sodium (Na)	2014/03/29	1.2		%	20
7434589 PM5	Matrix Spike						
	[JD0430-05]	Dissolved Mercury (Hg)	2014/03/31		98	%	85 - 115
	QC Standard	Dissolved Mercury (Hg)	2014/03/31		112	%	85 - 115
	Spiked Blank	Dissolved Mercury (Hg)	2014/03/31		102	%	85 - 115
	Method Blank	Dissolved Mercury (Hg)	2014/03/31	<0.0050		ug/L	
	RPD [JD0430-05]	Dissolved Mercury (Hg)	2014/03/31	NC		%	20
7434973 ZI	Matrix Spike						
	[JD0430-01]	Dissolved Chloride (Cl)	2014/03/31		104	%	80 - 120
	Spiked Blank	Dissolved Chloride (Cl)	2014/03/31		100	%	80 - 120
	Method Blank	Dissolved Chloride (Cl)	2014/03/31	<1.0		mg/L	
	RPD [JD0430-01]	Dissolved Chloride (Cl)	2014/03/31	6.2		%	20
7434974 ZI	Matrix Spike						
	[JD0430-01]	Dissolved Sulphate (SO4)	2014/03/31		NC	%	80 - 120
	Spiked Blank	Dissolved Sulphate (SO4)	2014/03/31		99	%	80 - 120
	Method Blank	Dissolved Sulphate (SO4)	2014/03/31	<1.0		mg/L	
	RPD [JD0430-01]	Dissolved Sulphate (SO4)	2014/03/31	0.6		%	20
7434986 AP1	Matrix Spike						
	[JD0430-01]	Dissolved Organic Carbon (C)	2014/03/31		NC	%	80 - 120
	Spiked Blank	Dissolved Organic Carbon (C)	2014/03/31		107	%	80 - 120
	Method Blank	Dissolved Organic Carbon (C)	2014/03/31	<0.50		mg/L	
	RPD	Dissolved Organic Carbon (C)	2014/03/31	1.7		%	20
7436255 CT6	Spiked Blank	Alkalinity (Total as CaCO3)	2014/04/01		91	%	80 - 120
	Method Blank	Alkalinity (PP as CaCO3)	2014/04/01	<0.50		mg/L	
		Alkalinity (Total as CaCO3)	2014/04/01	<0.50		mg/L	
		Bicarbonate (HCO3)	2014/04/01	<0.50		mg/L	
		Carbonate (CO3)	2014/04/01	<0.50		mg/L	
		Hydroxide (OH)	2014/04/01	<0.50		mg/L	
	RPD	Alkalinity (PP as CaCO3)	2014/04/01	NC		%	20
		Alkalinity (Total as CaCO3)	2014/04/01	NC		%	20
		Bicarbonate (HCO3)	2014/04/01	NC		%	20
		Carbonate (CO3)	2014/04/01	NC		%	20

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QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7436255 CT6	RPD	Hydroxide (OH)	2014/04/01	NC		%	20
<p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.</p> <p>Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</p> <p>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.</p> <p>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.</p> <p>( 1 ) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.</p>							

Maxxam Analytics International Corporation o/a Maxxam Analytics Grand Prairie: Bay 101, 7002 - 98 Street Clairmont T0H 0W0 Telephone (780)532-0227 Fax (780)532-0288

## Validation Signature Page

**Maxxam Job #: B423358**


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The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



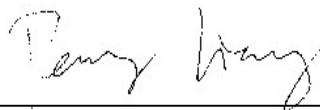

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Peng Liang, Analyst II




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Luba Shymushovska, Senior Analyst, Organic Department

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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.

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 Address: **8940 Roper Road**  
 Prov: **Alberta** PC: **T6B 3H9**  
 Contact #s: **Ph: 780-490-7893** Cell: **780-721-1804**

Report To: **Same as Invoice**  
 Prov: PC:  
 Ph: Cell:

Report Distribution (E-Mail):  
**jpentland@slrconsulting.com**  
**tpaulmiller@slrconsulting.com**

REGULATORY GUIDELINES:

- ☐ AT1  
☒ CCME  
☐ Regulated Drinking Water  
☐ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #: **721**  
 Project # / Name: **200.07005.00000**  
 Site Location: **Garden River, AB**  
 Quote #: **B40105**  
 Sampled By: **DSK**

SERVICE REQUESTED: ☐ RUSH (Contact lab to reserve)  
 Date Required: **REGULAR (5 to 7 Days)**

Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	SOIL					WATER					Other Analysis					HOLD - Do not Analyze # of Containers Submitted
				BTEX F1-F4	Sieve (75 micron)	Regulated Metals (CCME / AT1)	Salinity 4	Assessment ICP Metals	Basic Class II Landfill	OBTEX F1	OBTEX F1-F2	OBTEX F1-F4	Routine Water Turbidity	DOC	Regulated Metals (CCME / AT1)	Total Dissolved	Mercury	Total	
1 MW14-101	—	GW	14/03/20 11:00							X	X	X	X	X	X	X	X	X	14
2 MW14-102B	—		12:00							X	X	X	X	X	X	X	X	X	14
3 MW14-103	—		12:30							X	X	X	X	X	X	X	X	X	14
4 MW14-104B	—		13:00							X	X	X	X	X	X	X	X	X	14
5 MW14-105	—		14/03/22 12:30							X	X	X	X	X	X	X	X	X	14
6 MW14-106B	—		13:00							X	X	X	X	X	X	X	X	X	14
7 DUP 1	—		14/03/20 11:30							X	X	X	X	X	X	X	X	X	14
8 MW14-109	—		14/03/22 14:00							X	X	X	X	X	X	X	X	X	14
9 DUP 2	—		9:00							X	X	X	X	X	X	X	X	X	14
10 TRIP BLANK	—									X	X	X	X	X	X	X	X	X	8
11																			
12																			

Please indicate Filtered, Preserved or Both (F, P, F/P)

P P F/P F/P F/P P P P

Relinquished By (Signature/Print): **Wendy Sears**  
 Date (YY/MM/DD): **14/03/24** Time (24:00): **14:00**  
 Relinquished By: **Wendy Sears**  
 Date (YY/MM/DD): **24-Mar-14 14:00** Time (24:00):  
 Special Instructions: **B423358**  
 AB FCC: **AT8** INS-0010

LAB USE ONLY  
 Received By: **Green** Date: **14/03/24** Time: **1400**  
 Maxxam Job #: **2014/03/25**  
 Custody Seal: **21-11-2**  
 Temperature: **-21/15**  
 Lab Comments: **2014/03/25**  
 Maxxam Job #: **0730 SEE ACTR**

Your Project #: 200.02005.00000  
 Site Location: GARDEN RIVER, AB  
 Your C.O.C. #: A093633

**Attention: JASON PENTLAND**

SLR CONSULTING (CANADA) LTD  
 6940 ROPER ROAD  
 EDMONTON, AB  
 CANADA T6B 3H9

**Report Date: 2014/06/02**

Report #: R1577622

Version: 1

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: B442080**

**Received: 2014/05/23, 16:10**

Sample Matrix: Water  
 # Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO <sub>3</sub> ,HCO <sub>3</sub> ,OH (1)	6	N/A	2014/05/29	AB SOP-00005	SM 2320-B
Alkalinity @25C (pp, total), CO <sub>3</sub> ,HCO <sub>3</sub> ,OH (1)	4	N/A	2014/05/30	AB SOP-00005	SM 2320-B
BTEX/F1 in Water by HS GC/MS	12	N/A	2014/05/30	AB SOP-00039	CCME, EPA 8260C
Cadmium - low level CCME - Dissolved	10	N/A	2014/05/30	AB SOP-00043	EPA 200.8
Chloride by Automated Colourimetry	10	N/A	2014/05/30	AB SOP-00020	SM 4500 Cl-G
Carbon (DOC) (3)	10	N/A	2014/05/29	CAL SOP-00077	MMCW 119
Conductivity @25C (1)	6	N/A	2014/05/29	AB SOP-00005	SM 2510-B
Conductivity @25C (1)	4	N/A	2014/05/30	AB SOP-00005	SM 2510-B
CCME Hydrocarbons in Water (F2; C10-C16)	8	2014/05/28	2014/05/31	AB SOP-00040 AB SOP-00037	EPA3510C/CCME PHCCWS
CCME Hydrocarbons in Water (F2; C10-C16)	3	2014/05/28	2014/06/02	AB SOP-00040 AB SOP-00037	EPA3510C/CCME PHCCWS
Hardness	10	N/A	2014/05/30	AB WI-00065	SM 2340B
Mercury (Dissolved-LowLevel) by CVAf (2)	10	N/A	2014/06/02	BBY7SOP-00015	BC MOE Lab Manual
Elements by ICP - Dissolved	10	N/A	2014/05/29	AB SOP-00042	EPA 200.7
Elements by ICP (Dissolved) Lab Filtered	1	N/A	2014/05/29	AB SOP-00042	EPA 200.7
Elements by ICPMS - Dissolved	10	N/A	2014/05/28	AB SOP-00043	EPA 200.8
Ion Balance	5	N/A	2014/05/29	AB WI-00065	SM 1030E
Ion Balance	5	N/A	2014/05/30	AB WI-00065	SM 1030E
Sum of cations, anions	10	N/A	2014/05/30	AB WI-00065	SM 1030E
Ammonia-N (Total)	6	N/A	2014/05/29	AB SOP-00007	EPA 350.1
Ammonia-N (Total)	5	N/A	2014/05/30	AB SOP-00007	EPA 350.1
Nitrate and Nitrite	10	N/A	2014/05/30	AB SOP-00023	SM4110B
Nitrate + Nitrite-N (calculated)	10	N/A	2014/05/30	AB SOP-00023	SM 4110-B
Nitrogen, (Nitrite, Nitrate) by IC	10	N/A	2014/05/30	AB SOP-00023	SM 4110-B
pH @25°C (Alkalinity titrator) (1)	6	N/A	2014/05/29	AB SOP-00005	SM 4500-H+B
pH @25°C (Alkalinity titrator) (1)	4	N/A	2014/05/30	AB SOP-00005	SM 4500-H+B
Phenols (4-AAP)	11	N/A	2014/05/29	CAL SOP-00067	EPA 420.2
Sulphate by Automated Colourimetry	10	N/A	2014/05/30	AB SOP-00018	SM 4500 SO4-E
Total Dissolved Solids (Calculated)	10	N/A	2014/05/30	AB WI-00065	SM 1030E
Total Trihalomethanes Calculation	12	N/A	2014/06/02	CAL SOP-00104	EPA 8260 C

Your Project #: 200.02005.00000  
 Site Location: GARDEN RIVER, AB  
 Your C.O.C. #: A093633

**Attention: JASON PENTLAND**

SLR CONSULTING (CANADA) LTD  
 6940 ROPER ROAD  
 EDMONTON, AB  
 CANADA T6B 3H9

**Report Date: 2014/06/02**

Report #: R1577622

Version: 1

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B442080**

**Received: 2014/05/23, 16:10**

Sample Matrix: Water  
 # Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Kjeldahl Nitrogen	3	2014/05/30	2014/05/30	AB SOP-00008	EPA 351.1, 351.2
Total Kjeldahl Nitrogen	8	2014/05/30	2014/05/31	AB SOP-00008	EPA 351.1, 351.2
VOCs in Water by HS GC/MS (Std List)	12	N/A	2014/05/27	CAL SOP-00227	EPA 8260 C

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) This test was performed by Maxxam Edmonton Environmental

(2) This test was performed by Maxxam Vancouver

(3) DOC present in the sample should be considered as non-purgeable DOC.

**Encryption Key**

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

Wendy Sears, Project manager

Email: WSears@maxxam.ca

Phone# (403) 291-3077

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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.

Maxxam Job #: B442080  
Report Date: 2014/06/02

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

## RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		JR5533			JR5534	JR5535			JR5536		
Sampling Date		2014/05/22 12:15			2014/05/22 11:15	2014/05/22 13:20			2014/05/22 13:00		
COC Number		A093633			A093633	A093633			A093633		
	Units	MW14-101	RDL	QC Batch	MW14-102B	MW14-103	RDL	QC Batch	MW14-104B	RDL	QC Batch

### Calculated Parameters

Anion Sum	meq/L	8.2	N/A	7499147	7.5	7.5	N/A	7499147	7.3	N/A	7499147
Cation Sum	meq/L	9.0	N/A	7499147	8.0	8.0	N/A	7499147	7.2	N/A	7499147
Hardness (CaCO <sub>3</sub> )	mg/L	390	0.50	7499145	360	370	0.50	7499145	340	0.50	7499145
Ion Balance	N/A	1.1	0.010	7499146	1.1	1.1	0.010	7499146	0.99	0.010	7499146
Dissolved Nitrate (NO <sub>3</sub> )	mg/L	0.081	0.044	7499148	0.092	0.24	0.044	7499148	0.20	0.044	7499148
Nitrate plus Nitrite (N)	mg/L	0.018	0.010	7499149	0.021	0.055	0.010	7499149	0.045	0.010	7499149
Dissolved Nitrite (NO <sub>2</sub> )	mg/L	<0.033	0.033	7499148	<0.033	<0.033	0.033	7499148	<0.033	0.033	7499148
Total Dissolved Solids	mg/L	430	10	7499150	380	390	10	7499150	370	10	7499150

### Misc. Inorganics

Conductivity	uS/cm	720	1.0	7503370	660	660	1.0	7503370	640	1.0	7503432
Dissolved Organic Carbon (C)	mg/L	18	0.50	7503996	12	8.2	0.50	7503996	3.3	0.50	7503996
pH	pH	7.54	N/A	7503348	7.72	7.81	N/A	7503348	7.77	N/A	7503411

### Low Level Elements

Dissolved Cadmium (Cd)	ug/L	0.021	0.0050	7498194	0.023	0.035	0.0050	7498194	0.024	0.0050	7498194
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### Anions

Alkalinity (PP as CaCO <sub>3</sub> )	mg/L	<0.50	0.50	7503368	<0.50	<0.50	0.50	7503368	<0.50	0.50	7503426
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	370	0.50	7503368	350	320	0.50	7503368	310	0.50	7503426
Bicarbonate (HCO <sub>3</sub> )	mg/L	450	0.50	7503368	430	390	0.50	7503368	380	0.50	7503426
Carbonate (CO <sub>3</sub> )	mg/L	<0.50	0.50	7503368	<0.50	<0.50	0.50	7503368	<0.50	0.50	7503426
Hydroxide (OH)	mg/L	<0.50	0.50	7503368	<0.50	<0.50	0.50	7503368	<0.50	0.50	7503426
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	35	1.0	7505840	11	47	1.0	7505840	43 (1)	2.0	7505840
Dissolved Chloride (Cl)	mg/L	6.3	1.0	7505839	6.8	4.7	1.0	7505839	4.7	1.0	7505839

### Nutrients

Total Ammonia (N)	mg/L	0.91	0.050	7503670	0.38	0.21	0.050	7505853	0.061	0.050	7505853
Total Total Kjeldahl Nitrogen	mg/L	1.5	0.050	7504847	0.97 (2)	<0.50 (2)	0.50	7505263	<0.50 (2)	0.50	7505263
Dissolved Nitrite (N)	mg/L	<0.010	0.010	7504715	<0.010	<0.010	0.010	7504715	<0.010	0.010	7504715
Dissolved Nitrate (N)	mg/L	0.018	0.010	7504715	0.021	0.055	0.010	7504715	0.045	0.010	7504715

### Misc. Organics

Phenols	mg/L	<0.0020	0.0020	7503223	<0.0020	<0.0020	0.0020	7503223	<0.0020	0.0020	7503223
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RDL = Reportable Detection Limit

N/A = Not Applicable

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

(2) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly

Maxxam Job #: B442080  
Report Date: 2014/06/02

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

## RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		JR5537			JR5538			JR5539		
Sampling Date		2014/05/22 14:10			2014/05/22 14:30			2014/05/22 16:00		
COC Number		A093633			A093633			A093633		
	Units	MW14-105	RDL	QC Batch	MW14-106B	RDL	QC Batch	MW14-107	RDL	QC Batch
<b>Calculated Parameters</b>										
Anion Sum	meq/L	7.3	N/A	7499147	7.2	N/A	7499147	12	N/A	7499147
Cation Sum	meq/L	7.5	N/A	7499147	7.2	N/A	7499147	12	N/A	7499147
Hardness (CaCO <sub>3</sub> )	mg/L	350	0.50	7499145	340	0.50	7499145	560	0.50	7499145
Ion Balance	N/A	1.0	0.010	7499146	1.0	0.010	7499146	1.0	0.010	7499146
Dissolved Nitrate (NO <sub>3</sub> )	mg/L	0.28	0.044	7499148	0.29	0.044	7499148	<0.044	0.044	7499148
Nitrate plus Nitrite (N)	mg/L	0.062	0.010	7499149	0.065	0.010	7499149	<0.010	0.010	7499149
Dissolved Nitrite (NO <sub>2</sub> )	mg/L	<0.033	0.033	7499148	<0.033	0.033	7499148	<0.033	0.033	7499148
Total Dissolved Solids	mg/L	370	10	7499150	360	10	7499150	630	10	7499150
<b>Misc. Inorganics</b>										
Conductivity	uS/cm	640	1.0	7503370	630	1.0	7503370	990	1.0	7503370
Dissolved Organic Carbon (C)	mg/L	6.7	0.50	7503996	3.1	0.50	7503996	N/A	0.50	7503996
pH	pH	7.96	N/A	7503348	7.79	N/A	7503348	7.38	N/A	7503348
<b>Low Level Elements</b>										
Dissolved Cadmium (Cd)	ug/L	0.029	0.0050	7498194	0.026	0.0050	7498194	N/A	0.0050	7498194
<b>Anions</b>										
Alkalinity (PP as CaCO <sub>3</sub> )	mg/L	<0.50	0.50	7503368	<0.50	0.50	7503368	<0.50	0.50	7503368
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	330	0.50	7503368	310	0.50	7503368	390	0.50	7503368
Bicarbonate (HCO <sub>3</sub> )	mg/L	400	0.50	7503368	370	0.50	7503368	480	0.50	7503368
Carbonate (CO <sub>3</sub> )	mg/L	<0.50	0.50	7503368	<0.50	0.50	7503368	<0.50	0.50	7503368
Hydroxide (OH)	mg/L	<0.50	0.50	7503368	<0.50	0.50	7503368	<0.50	0.50	7503368
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	30	1.0	7505840	45 (1)	2.0	7505840	170	1.0	7505840
Dissolved Chloride (Cl)	mg/L	5.2	1.0	7505839	5.0	1.0	7505839	6.6	1.0	7505839
<b>Nutrients</b>										
Total Ammonia (N)	mg/L	0.32	0.050	7505853	0.23	0.050	7503670	1.1	0.050	7503670
Total Total Kjeldahl Nitrogen	mg/L	0.58 (2)	0.50	7505263	1.7 (2)	0.50	7504847	6.3 (2)	0.50	7505263
Dissolved Nitrite (N)	mg/L	<0.010	0.010	7504715	<0.010	0.010	7504715	<0.010	0.010	7504715
Dissolved Nitrate (N)	mg/L	0.062	0.010	7504715	0.065	0.010	7504715	<0.010	0.010	7504715
<b>Misc. Organics</b>										
Phenols	mg/L	<0.0020	0.0020	7503223	<0.0020	0.0020	7503223	<0.0020	0.0020	7503223
RDL = Reportable Detection Limit N/A = Not Applicable (1) Detection limits raised due to dilution to bring analyte within the calibrated range. (2) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly										

Maxxam Job #: B442080  
Report Date: 2014/06/02

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

## RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		JR5540		JR5541			JR5542		
Sampling Date		2014/05/22 16:30		2014/05/22 15:00			2014/05/22 11:45		
COC Number		A093633		A093633			A093633		
	Units	MW14-108	QC Batch	MW14-109	RDL	QC Batch	DUP1	RDL	QC Batch
<b>Calculated Parameters</b>									
Anion Sum	meq/L	20	7499147	N/A	N/A	7499147	7.5	N/A	7499147
Cation Sum	meq/L	21	7499147	N/A	N/A	7499147	8.0	N/A	7499147
Hardness (CaCO <sub>3</sub> )	mg/L	950	7499145	N/A	0.50	7499145	360	0.50	7499145
Ion Balance	N/A	1.0	7499146	N/A	0.010	7499146	1.1	0.010	7499146
Dissolved Nitrate (NO <sub>3</sub> )	mg/L	<0.044	7499148	N/A	0.044	7499148	0.096	0.044	7499148
Nitrate plus Nitrite (N)	mg/L	<0.010	7499149	N/A	0.010	7499149	0.022	0.010	7499149
Dissolved Nitrite (NO <sub>2</sub> )	mg/L	<0.033	7499148	N/A	0.033	7499148	<0.033	0.033	7499148
Total Dissolved Solids	mg/L	1200	7499150	N/A	10	7499150	380	10	7499150
<b>Misc. Inorganics</b>									
Conductivity	uS/cm	1700	7503432	N/A	1.0	7503432	660	1.0	7503432
Dissolved Organic Carbon (C)	mg/L	7.3	7503996	4.8	0.50	7503996	11	0.50	7503996
pH	pH	7.61	7503411	N/A	N/A	7503411	7.86	N/A	7503411
<b>Low Level Elements</b>									
Dissolved Cadmium (Cd)	ug/L	0.028	7498194	0.027	0.0050	7499188	0.023	0.0050	7498194
<b>Anions</b>									
Alkalinity (PP as CaCO <sub>3</sub> )	mg/L	<0.50	7503426	N/A	0.50	N/A	<0.50	0.50	7503426
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	600	7503426	N/A	0.50	N/A	360	0.50	7503426
Bicarbonate (HCO <sub>3</sub> )	mg/L	730	7503426	N/A	0.50	N/A	430	0.50	7503426
Carbonate (CO <sub>3</sub> )	mg/L	<0.50	7503426	N/A	0.50	N/A	<0.50	0.50	7503426
Hydroxide (OH)	mg/L	<0.50	7503426	N/A	0.50	N/A	<0.50	0.50	7503426
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	390 (1)	7505840	N/A	5.0	N/A	12	1.0	7505840
Dissolved Chloride (Cl)	mg/L	5.2	7505839	N/A	1.0	N/A	6.7	1.0	7505839
<b>Nutrients</b>									
Total Ammonia (N)	mg/L	0.94	7503670	0.15	0.050	7503670	0.38	0.050	7503670
Total Total Kjeldahl Nitrogen	mg/L	1.6 (2)	7505263	0.66 (2)	0.50	7505263	1.3 (2)	0.50	7505263
Dissolved Nitrite (N)	mg/L	<0.010	7504715	N/A	0.010	N/A	<0.010	0.010	7504715
Dissolved Nitrate (N)	mg/L	<0.010	7504715	N/A	0.010	N/A	0.022	0.010	7504715
<b>Misc. Organics</b>									
Phenols	mg/L	0.0022	7503223	<0.0020	0.0020	7503223	<0.0020	0.0020	7503223
RDL = Reportable Detection Limit N/A = Not Applicable (1) Detection limits raised due to dilution to bring analyte within the calibrated range. (2) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly									

Maxxam Job #: B442080  
Report Date: 2014/06/02

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

## RESULTS OF CHEMICAL ANALYSES OF WATER

<b>Maxxam ID</b>		JR5543		
<b>Sampling Date</b>		2014/05/22 17:00		
<b>COC Number</b>		A093633		
	<b>Units</b>	<b>DUP2</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>				
Anion Sum	meq/L	0.0000	N/A	7499147
Cation Sum	meq/L	0.0030	N/A	7499147
Hardness (CaCO <sub>3</sub> )	mg/L	<0.50	0.50	7499145
Ion Balance	N/A	NC	0.010	7499146
Dissolved Nitrate (NO <sub>3</sub> )	mg/L	<0.044	0.044	7499148
Nitrate plus Nitrite (N)	mg/L	<0.010	0.010	7499149
Dissolved Nitrite (NO <sub>2</sub> )	mg/L	<0.033	0.033	7499148
Total Dissolved Solids	mg/L	<10	10	7499150
<b>Misc. Inorganics</b>				
Conductivity	uS/cm	1.5	1.0	7503432
Dissolved Organic Carbon (C)	mg/L	<0.50	0.50	7503996
pH	pH	5.55	N/A	7503411
<b>Low Level Elements</b>				
Dissolved Cadmium (Cd)	ug/L	<0.0050	0.0050	7498194
<b>Anions</b>				
Alkalinity (PP as CaCO <sub>3</sub> )	mg/L	<0.50	0.50	7503426
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	<0.50	0.50	7503426
Bicarbonate (HCO <sub>3</sub> )	mg/L	<0.50	0.50	7503426
Carbonate (CO <sub>3</sub> )	mg/L	<0.50	0.50	7503426
Hydroxide (OH)	mg/L	<0.50	0.50	7503426
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	<1.0	1.0	7505840
Dissolved Chloride (Cl)	mg/L	<1.0	1.0	7505839
<b>Nutrients</b>				
Total Ammonia (N)	mg/L	<0.050	0.050	7505853
Total Total Kjeldahl Nitrogen	mg/L	<0.050 (1)	0.050	7504847
Dissolved Nitrite (N)	mg/L	<0.010	0.010	7504715
Dissolved Nitrate (N)	mg/L	<0.010	0.010	7504715
<b>Misc. Organics</b>				
Phenols	mg/L	<0.0020	0.0020	7503223
RDL = Reportable Detection Limit N/A = Not Applicable (1) Matrix Spike exceeds acceptance limits due to matrix interference. Reanalysis yields similar results.				

Maxxam Job #: B442080  
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Sampler Initials: KRD

### PETROLEUM HYDROCARBONS (CCME)

<b>Maxxam ID</b>		JR5533	JR5534	JR5535	JR5536	JR5537	JR5538	JR5539		
<b>Sampling Date</b>		2014/05/22 12:15	2014/05/22 11:15	2014/05/22 13:20	2014/05/22 13:00	2014/05/22 14:10	2014/05/22 14:30	2014/05/22 16:00		
<b>COC Number</b>		A093633	A093633	A093633	A093633	A093633	A093633	A093633		
	<b>Units</b>	<b>MW14-101</b>	<b>MW14-102B</b>	<b>MW14-103</b>	<b>MW14-104B</b>	<b>MW14-105</b>	<b>MW14-106B</b>	<b>MW14-107</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Hydrocarbons</b>										
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7500191
<b>Surrogate Recovery (%)</b>										
O-TERPHENYL (sur.)	%	87	109	96	97	98	99	97	N/A	7500191
RDL = Reportable Detection Limit										
N/A = Not Applicable										

<b>Maxxam ID</b>		JR5540	JR5541	JR5542	JR5543		
<b>Sampling Date</b>		2014/05/22 16:30	2014/05/22 15:00	2014/05/22 11:45	2014/05/22 17:00		
<b>COC Number</b>		A093633	A093633	A093633	A093633		
	<b>Units</b>	<b>MW14-108</b>	<b>MW14-109</b>	<b>DUP1</b>	<b>DUP2</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Hydrocarbons</b>							
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	7500191
<b>Surrogate Recovery (%)</b>							
O-TERPHENYL (sur.)	%	95	94	101	95	N/A	7500191
RDL = Reportable Detection Limit							
N/A = Not Applicable							

Maxxam Job #: B442080  
Report Date: 2014/06/02

SLR CONSULTING (CANADA) LTD  
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Sampler Initials: KRD

### MERCURY BY COLD VAPOR (WATER)

<b>Maxxam ID</b>		JR5533		JR5534	JR5535	JR5536	JR5537	JR5538		
<b>Sampling Date</b>		2014/05/22 12:15		2014/05/22 11:15	2014/05/22 13:20	2014/05/22 13:00	2014/05/22 14:10	2014/05/22 14:30		
<b>COC Number</b>		A093633		A093633	A093633	A093633	A093633	A093633		
	<b>Units</b>	<b>MW14-101</b>	<b>QC Batch</b>	<b>MW14-102B</b>	<b>MW14-103</b>	<b>MW14-104B</b>	<b>MW14-105</b>	<b>MW14-106B</b>	<b>RDL</b>	<b>QC Batch</b>

<b>Elements</b>										
Dissolved Mercury (Hg)	ug/L	0.0032	7507949	<0.0020	<0.0020	0.0026	0.0022	0.0022	0.0020	7508022
RDL = Reportable Detection Limit										

<b>Maxxam ID</b>		JR5540	JR5541	JR5542	JR5543		
<b>Sampling Date</b>		2014/05/22 16:30	2014/05/22 15:00	2014/05/22 11:45	2014/05/22 17:00		
<b>COC Number</b>		A093633	A093633	A093633	A093633		
	<b>Units</b>	<b>MW14-108</b>	<b>MW14-109</b>	<b>DUP1</b>	<b>DUP2</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Elements</b>							
Dissolved Mercury (Hg)	ug/L	<0.0020	0.0031	<0.0020	<0.0020	0.0020	7508022
RDL = Reportable Detection Limit							

Maxxam Job #: B442080  
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### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		JR5533	JR5534	JR5535	JR5536	JR5537	JR5538		
Sampling Date		2014/05/22 12:15	2014/05/22 11:15	2014/05/22 13:20	2014/05/22 13:00	2014/05/22 14:10	2014/05/22 14:30		
COC Number		A093633	A093633	A093633	A093633	A093633	A093633		
	Units	MW14-101	MW14-102B	MW14-103	MW14-104B	MW14-105	MW14-106B	RDL	QC Batch
<b>Elements</b>									
Dissolved Aluminum (Al)	mg/L	0.013	0.0054	<0.0030	0.0033	0.0032	0.0034	0.0030	7501787
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00060	7501787
Dissolved Arsenic (As)	mg/L	0.012	0.0055	0.0016	<0.00020	0.0023	0.00040	0.00020	7501787
Dissolved Barium (Ba)	mg/L	0.53	0.43	0.21	0.33	0.34	0.39	0.010	7502444
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7501787
Dissolved Boron (B)	mg/L	0.069	0.053	0.051	0.031	0.040	0.030	0.020	7502444
Dissolved Calcium (Ca)	mg/L	110	100	110	98	99	96	0.30	7502444
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7501787
Dissolved Cobalt (Co)	mg/L	0.0011	0.00070	0.0010	<0.00030	0.00072	0.00043	0.00030	7501787
Dissolved Copper (Cu)	mg/L	0.0014	0.00074	0.00067	0.0016	0.00070	0.0015	0.00020	7501787
Dissolved Iron (Fe)	mg/L	11	1.2	0.57	<0.060	1.6	<0.060	0.060	7502444
Dissolved Lead (Pb)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	7501787
Dissolved Lithium (Li)	mg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7502444
Dissolved Magnesium (Mg)	mg/L	27	25	26	24	24	24	0.20	7502444
Dissolved Manganese (Mn)	mg/L	0.43	0.22	0.22	0.020	0.31	0.061	0.0040	7502444
Dissolved Molybdenum (Mo)	mg/L	0.0025	0.0029	0.0025	0.0017	0.0023	0.0015	0.00020	7501787
Dissolved Nickel (Ni)	mg/L	0.0023	0.0016	0.0024	0.0011	0.0021	0.0014	0.00050	7501787
Dissolved Phosphorus (P)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7502444
Dissolved Potassium (K)	mg/L	3.0	3.2	2.8	2.3	2.5	2.8	0.30	7502444
Dissolved Selenium (Se)	mg/L	0.00070	0.00081	0.0013	0.0034	0.0022	0.0030	0.00020	7501787
Dissolved Silicon (Si)	mg/L	8.0	6.9	6.3	6.1	6.6	5.8	0.10	7502444
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	7501787
Dissolved Sodium (Na)	mg/L	14	12	10	7.2	9.1	8.3	0.50	7502444
Dissolved Strontium (Sr)	mg/L	0.40	0.33	0.38	0.32	0.33	0.28	0.020	7502444
Dissolved Sulphur (S)	mg/L	11	3.8	18	13	10	12	0.20	7502444
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	7501787
Dissolved Tin (Sn)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7501787
Dissolved Titanium (Ti)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7501787
Dissolved Uranium (U)	mg/L	0.0017	0.0038	0.0032	0.0034	0.0037	0.0059	0.00010	7501787
Dissolved Vanadium (V)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7501787
Dissolved Zinc (Zn)	mg/L	0.011	<0.0030	<0.0030	<0.0030	<0.0030	0.0079	0.0030	7501787
RDL = Reportable Detection Limit									

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Sampler Initials: KRD

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		JR5539		JR5540		JR5541	JR5542		
Sampling Date		2014/05/22 16:00		2014/05/22 16:30		2014/05/22 15:00	2014/05/22 11:45		
COC Number		A093633		A093633		A093633	A093633		
	Units	MW14-107	QC Batch	MW14-108	QC Batch	MW14-109	DUP1	RDL	QC Batch
<b>Elements</b>									
Dissolved Aluminum (Al)	mg/L	N/A	7501787	0.0053	7501787	0.0032	0.0030	0.0030	7501787
Dissolved Antimony (Sb)	mg/L	N/A	7501787	<0.00060	7501787	<0.00060	<0.00060	0.00060	7501787
Dissolved Arsenic (As)	mg/L	N/A	7501787	0.011	7501787	0.0010	0.0060	0.00020	7501787
Dissolved Barium (Ba)	mg/L	N/A	7502444	0.048	7502444	0.31	0.44	0.010	7502444
Dissolved Beryllium (Be)	mg/L	N/A	7501787	<0.0010	7501787	<0.0010	<0.0010	0.0010	7501787
Dissolved Boron (B)	mg/L	N/A	7502444	0.12	7502444	0.024	0.050	0.020	7502444
Dissolved Calcium (Ca)	mg/L	170	7503578	280	7506857	99	100	0.30	7502444
Dissolved Chromium (Cr)	mg/L	N/A	N/A	<0.0010	7501787	<0.0010	<0.0010	0.0010	7501787
Dissolved Cobalt (Co)	mg/L	N/A	N/A	0.0029	7501787	0.00068	0.00074	0.00030	7501787
Dissolved Copper (Cu)	mg/L	N/A	N/A	0.0010	7501787	0.00061	0.00066	0.00020	7501787
Dissolved Iron (Fe)	mg/L	0.066	7503578	40	7506857	0.74	1.3	0.060	7502444
Dissolved Lead (Pb)	mg/L	N/A	N/A	<0.00020	7501787	<0.00020	<0.00020	0.00020	7501787
Dissolved Lithium (Li)	mg/L	N/A	N/A	0.050	7502444	<0.020	<0.020	0.020	7502444
Dissolved Magnesium (Mg)	mg/L	36	7503578	59	7506857	26	25	0.20	7502444
Dissolved Manganese (Mn)	mg/L	1.1	7503578	1.4	7506857	0.30	0.23	0.0040	7502444
Dissolved Molybdenum (Mo)	mg/L	N/A	N/A	0.00074	7501787	0.0015	0.0030	0.00020	7501787
Dissolved Nickel (Ni)	mg/L	N/A	N/A	0.0059	7501787	0.0016	0.0016	0.00050	7501787
Dissolved Phosphorus (P)	mg/L	N/A	N/A	0.24	7502444	<0.10	<0.10	0.10	7502444
Dissolved Potassium (K)	mg/L	3.4	7503578	1.7	7506857	2.2	3.2	0.30	7502444
Dissolved Selenium (Se)	mg/L	N/A	N/A	<0.00020	7501787	0.00093	0.00071	0.00020	7501787
Dissolved Silicon (Si)	mg/L	N/A	N/A	7.2	7502444	6.1	6.9	0.10	7502444
Dissolved Silver (Ag)	mg/L	N/A	N/A	<0.00010	7501787	<0.00010	<0.00010	0.00010	7501787
Dissolved Sodium (Na)	mg/L	9.8	7503578	14	7506857	6.1	13	0.50	7502444
Dissolved Strontium (Sr)	mg/L	N/A	N/A	0.66	7502444	0.28	0.34	0.020	7502444
Dissolved Sulphur (S)	mg/L	N/A	N/A	140	7502444	23	3.7	0.20	7502444
Dissolved Thallium (Tl)	mg/L	N/A	N/A	<0.00020	7501787	<0.00020	<0.00020	0.00020	7501787
Dissolved Tin (Sn)	mg/L	N/A	N/A	<0.0010	7501787	<0.0010	0.0023	0.0010	7501787
Dissolved Titanium (Ti)	mg/L	N/A	N/A	<0.0010	7501787	<0.0010	<0.0010	0.0010	7501787
Dissolved Uranium (U)	mg/L	N/A	N/A	0.00080	7501787	0.0029	0.0037	0.00010	7501787
Dissolved Vanadium (V)	mg/L	N/A	N/A	<0.0010	7501787	<0.0010	<0.0010	0.0010	7501787
Dissolved Zinc (Zn)	mg/L	N/A	N/A	0.012	7501787	<0.0030	<0.0030	0.0030	7501787
RDL = Reportable Detection Limit									
N/A = Not Applicable									

Maxxam Job #: B442080  
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### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

<b>Maxxam ID</b>		JR5543		
<b>Sampling Date</b>		2014/05/22 17:00		
<b>COC Number</b>		A093633		
	<b>Units</b>	<b>DUP2</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Elements</b>				
Dissolved Aluminum (Al)	mg/L	<0.0030	0.0030	7501787
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	7501787
Dissolved Arsenic (As)	mg/L	<0.00020	0.00020	7501787
Dissolved Barium (Ba)	mg/L	<0.010	0.010	7502444
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	7501787
Dissolved Boron (B)	mg/L	<0.020	0.020	7502444
Dissolved Calcium (Ca)	mg/L	<0.30	0.30	7502444
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	7501787
Dissolved Cobalt (Co)	mg/L	<0.00030	0.00030	7501787
Dissolved Copper (Cu)	mg/L	<0.00020	0.00020	7501787
Dissolved Iron (Fe)	mg/L	<0.060	0.060	7502444
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	7501787
Dissolved Lithium (Li)	mg/L	<0.020	0.020	7502444
Dissolved Magnesium (Mg)	mg/L	<0.20	0.20	7502444
Dissolved Manganese (Mn)	mg/L	<0.0040	0.0040	7502444
Dissolved Molybdenum (Mo)	mg/L	<0.00020	0.00020	7501787
Dissolved Nickel (Ni)	mg/L	<0.00050	0.00050	7501787
Dissolved Phosphorus (P)	mg/L	<0.10	0.10	7502444
Dissolved Potassium (K)	mg/L	<0.30	0.30	7502444
Dissolved Selenium (Se)	mg/L	<0.00020	0.00020	7501787
Dissolved Silicon (Si)	mg/L	<0.10	0.10	7502444
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	7501787
Dissolved Sodium (Na)	mg/L	<0.50	0.50	7502444
Dissolved Strontium (Sr)	mg/L	<0.020	0.020	7502444
Dissolved Sulphur (S)	mg/L	<0.20	0.20	7502444
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	7501787
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	7501787
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	7501787
Dissolved Uranium (U)	mg/L	<0.00010	0.00010	7501787
Dissolved Vanadium (V)	mg/L	<0.0010	0.0010	7501787
Dissolved Zinc (Zn)	mg/L	<0.0030	0.0030	7501787
RDL = Reportable Detection Limit				

Maxxam Job #: B442080  
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### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		JR5533	JR5534	JR5535	JR5536	JR5537	JR5538	JR5539		
Sampling Date		2014/05/22 12:15	2014/05/22 11:15	2014/05/22 13:20	2014/05/22 13:00	2014/05/22 14:10	2014/05/22 14:30	2014/05/22 16:00		
COC Number		A093633	A093633	A093633	A093633	A093633	A093633	A093633		
	Units	MW14-101	MW14-102B	MW14-103	MW14-104B	MW14-105	MW14-106B	MW14-107	RDL	QC Batch
<b>Volatiles</b>										
Total Trihalomethanes	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7499198
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Bromoform	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Bromomethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7499506
Carbon tetrachloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Chlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Chlorodibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7499506
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7499506
Chloroform	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Chloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7499506
1,2-dibromoethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,2-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,3-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,4-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,1-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,2-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,1-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
cis-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
trans-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Dichloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7499506
1,2-dichloropropane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
cis-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
trans-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Methyl methacrylate	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Methyl-tert-butylether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,1,1,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7499506
1,1,2,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7499506
Tetrachloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,2,3-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7499506
1,2,4-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7499506
1,3,5-trichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,1,1-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,1,2-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
RDL = Reportable Detection Limit										

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Sampler Initials: KRD

### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		JR5533	JR5534	JR5535	JR5536	JR5537	JR5538	JR5539		
Sampling Date		2014/05/22 12:15	2014/05/22 11:15	2014/05/22 13:20	2014/05/22 13:00	2014/05/22 14:10	2014/05/22 14:30	2014/05/22 16:00		
COC Number		A093633	A093633	A093633	A093633	A093633	A093633	A093633		
	Units	MW14-101	MW14-102B	MW14-103	MW14-104B	MW14-105	MW14-106B	MW14-107	RDL	QC Batch
Trichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Trichlorofluoromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,2,4-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,3,5-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Vinyl chloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
<b>Surrogate Recovery (%)</b>										
1,4-Difluorobenzene (sur.)	%	99	100	99	99	99	100	99	N/A	7499506
4-Bromofluorobenzene (sur.)	%	98	98	98	98	98	98	98	N/A	7499506
D4-1,2-Dichloroethane (sur.)	%	97	105	106	99	100	102	105	N/A	7499506
RDL = Reportable Detection Limit										
N/A = Not Applicable										

Maxxam Job #: B442080  
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Site Location: GARDEN RIVER, AB  
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### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		JR5540	JR5541	JR5542	JR5543	JR5544		
Sampling Date		2014/05/22 16:30	2014/05/22 15:00	2014/05/22 11:45	2014/05/22 17:00	2014/05/22 12:00		
COC Number		A093633	A093633	A093633	A093633	A093633		
	Units	MW14-108	MW14-109	DUP1	DUP2	TRIP BLANK	RDL	QC Batch
<b>Volatiles</b>								
Total Trihalomethanes	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7499198
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Bromoform	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Bromomethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7499506
Carbon tetrachloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Chlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Chlorodibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7499506
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7499506
Chloroform	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Chloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7499506
1,2-dibromoethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,2-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,3-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,4-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,1-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,2-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,1-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
cis-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
trans-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Dichloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7499506
1,2-dichloropropane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
cis-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
trans-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Methyl methacrylate	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Methyl-tert-butylether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,1,1,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7499506
1,1,2,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7499506
Tetrachloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,2,3-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7499506
1,2,4-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7499506
1,3,5-trichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,1,1-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,1,2-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
RDL = Reportable Detection Limit								

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### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		JR5540	JR5541	JR5542	JR5543	JR5544		
Sampling Date		2014/05/22 16:30	2014/05/22 15:00	2014/05/22 11:45	2014/05/22 17:00	2014/05/22 12:00		
COC Number		A093633	A093633	A093633	A093633	A093633		
	Units	MW14-108	MW14-109	DUP1	DUP2	TRIP BLANK	RDL	QC Batch
Trichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Trichlorofluoromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,2,4-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
1,3,5-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
Vinyl chloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7499506
<b>Surrogate Recovery (%)</b>								
1,4-Difluorobenzene (sur.)	%	100	100	99	100	99	N/A	7499506
4-Bromofluorobenzene (sur.)	%	97	97	97	96	98	N/A	7499506
D4-1,2-Dichloroethane (sur.)	%	101	98	104	102	99	N/A	7499506
RDL = Reportable Detection Limit								
N/A = Not Applicable								

Maxxam Job #: B442080  
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Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		JR5533	JR5534	JR5535	JR5536	JR5537	JR5538		
Sampling Date		2014/05/22 12:15	2014/05/22 11:15	2014/05/22 13:20	2014/05/22 13:00	2014/05/22 14:10	2014/05/22 14:30		
COC Number		A093633	A093633	A093633	A093633	A093633	A093633		
	Units	MW14-101	MW14-102B	MW14-103	MW14-104B	MW14-105	MW14-106B	RDL	QC Batch

#### Volatiles

Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7503000
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7503000
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7503000
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7503000
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7503000
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7503000
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7503000
(C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7503000

#### Surrogate Recovery (%)

1,4-Difluorobenzene (sur.)	%	108	106	106	107	108	107	N/A	7503000
4-Bromofluorobenzene (sur.)	%	91	90	91	91	90	92	N/A	7503000
D4-1,2-Dichloroethane (sur.)	%	94	91	95	95	95	92	N/A	7503000

RDL = Reportable Detection Limit

N/A = Not Applicable

Maxxam ID		JR5539	JR5540	JR5541	JR5542	JR5543	JR5544		
Sampling Date		2014/05/22 16:00	2014/05/22 16:30	2014/05/22 15:00	2014/05/22 11:45	2014/05/22 17:00	2014/05/22 12:00		
COC Number		A093633	A093633	A093633	A093633	A093633	A093633		
	Units	MW14-107	MW14-108	MW14-109	DUP1	DUP2	TRIP BLANK	RDL	QC Batch

#### Volatiles

Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7503000
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7503000
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7503000
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7503000
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7503000
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7503000
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7503000
(C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7503000

#### Surrogate Recovery (%)

1,4-Difluorobenzene (sur.)	%	107	107	107	106	107	106	N/A	7503000
4-Bromofluorobenzene (sur.)	%	90	90	90	91	91	90	N/A	7503000
D4-1,2-Dichloroethane (sur.)	%	94	94	93	94	92	94	N/A	7503000

RDL = Reportable Detection Limit

N/A = Not Applicable

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### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	0.7°C
Package 2	5.0°C
Package 3	4.0°C

Sample JR5540, Elements by ICP - Dissolved: Test repeated.

**Results relate only to the items tested.**

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### QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7499506	ARA	Matrix Spike [JR5534-07]		1,4-Difluorobenzene (sur.)	2014/05/27		100	%	70 - 130
				4-Bromofluorobenzene (sur.)	2014/05/27		102	%	70 - 130
				D4-1,2-Dichloroethane (sur.)	2014/05/27		111	%	70 - 130
				Bromodichloromethane	2014/05/27		107	%	70 - 130
				Bromoform	2014/05/27		110	%	70 - 130
				Bromomethane	2014/05/27		91	%	70 - 130
				Carbon tetrachloride	2014/05/27		95	%	70 - 130
				Chlorobenzene	2014/05/27		94	%	70 - 130
				Chlorodibromomethane	2014/05/27		110	%	70 - 130
				Chloroethane	2014/05/27		86	%	70 - 130
				Chloroform	2014/05/27		103	%	70 - 130
				Chloromethane	2014/05/27		82	%	70 - 130
				1,2-dibromoethane	2014/05/27		103	%	70 - 130
				1,2-dichlorobenzene	2014/05/27		98	%	70 - 130
				1,3-dichlorobenzene	2014/05/27		94	%	70 - 130
				1,4-dichlorobenzene	2014/05/27		95	%	70 - 130
				1,1-dichloroethane	2014/05/27		94	%	70 - 130
				1,2-dichloroethane	2014/05/27		103	%	70 - 130
				1,1-dichloroethene	2014/05/27		93	%	70 - 130
				cis-1,2-dichloroethene	2014/05/27		95	%	70 - 130
				trans-1,2-dichloroethene	2014/05/27		93	%	70 - 130
				Dichloromethane	2014/05/27		97	%	70 - 130
				1,2-dichloropropane	2014/05/27		99	%	70 - 130
				cis-1,3-dichloropropene	2014/05/27		107	%	70 - 130
				trans-1,3-dichloropropene	2014/05/27		113	%	70 - 130
				Methyl methacrylate	2014/05/27		107	%	70 - 130
				Methyl-tert-butylether (MTBE)	2014/05/27		97	%	70 - 130
				Styrene	2014/05/27		92	%	70 - 130
				1,1,1,2-tetrachloroethane	2014/05/27		101	%	70 - 130
				1,1,2,2-tetrachloroethane	2014/05/27		101	%	70 - 130
				Tetrachloroethene	2014/05/27		89	%	70 - 130
				1,2,3-trichlorobenzene	2014/05/27		99	%	70 - 130
				1,2,4-trichlorobenzene	2014/05/27		95	%	70 - 130
				1,3,5-trichlorobenzene	2014/05/27		92	%	70 - 130
				1,1,1-trichloroethane	2014/05/27		96	%	70 - 130
				1,1,2-trichloroethane	2014/05/27		103	%	70 - 130
				Trichloroethene	2014/05/27		89	%	70 - 130
				Trichlorofluoromethane	2014/05/27		85	%	70 - 130
				1,2,4-trimethylbenzene	2014/05/27		92	%	70 - 130
				1,3,5-trimethylbenzene	2014/05/27		94	%	70 - 130
				Vinyl chloride	2014/05/27		82	%	70 - 130
7499506	ARA	Spiked Blank		1,4-Difluorobenzene (sur.)	2014/05/27		100	%	70 - 130
				4-Bromofluorobenzene (sur.)	2014/05/27		103	%	70 - 130
				D4-1,2-Dichloroethane (sur.)	2014/05/27		106	%	70 - 130
				Bromodichloromethane	2014/05/27		107	%	70 - 130
				Bromoform	2014/05/27		106	%	70 - 130
				Bromomethane	2014/05/27		93	%	70 - 130
				Carbon tetrachloride	2014/05/27		99	%	70 - 130
				Chlorobenzene	2014/05/27		97	%	70 - 130
				Chlorodibromomethane	2014/05/27		108	%	70 - 130
				Chloroethane	2014/05/27		89	%	70 - 130
				Chloroform	2014/05/27		104	%	70 - 130

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### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7499506	ARA	Method Blank	Chloromethane	2014/05/27		84	%	70 - 130
			1,2-dibromoethane	2014/05/27		102	%	70 - 130
			1,2-dichlorobenzene	2014/05/27		99	%	70 - 130
			1,3-dichlorobenzene	2014/05/27		97	%	70 - 130
			1,4-dichlorobenzene	2014/05/27		97	%	70 - 130
			1,1-dichloroethane	2014/05/27		96	%	70 - 130
			1,2-dichloroethane	2014/05/27		100	%	70 - 130
			1,1-dichloroethene	2014/05/27		96	%	70 - 130
			cis-1,2-dichloroethene	2014/05/27		96	%	70 - 130
			trans-1,2-dichloroethene	2014/05/27		96	%	70 - 130
			Dichloromethane	2014/05/27		97	%	70 - 130
			1,2-dichloropropane	2014/05/27		100	%	70 - 130
			cis-1,3-dichloropropene	2014/05/27		108	%	70 - 130
			trans-1,3-dichloropropene	2014/05/27		111	%	70 - 130
			Methyl methacrylate	2014/05/27		102	%	70 - 130
			Methyl-tert-butylether (MTBE)	2014/05/27		98	%	70 - 130
			Styrene	2014/05/27		95	%	70 - 130
			1,1,1,2-tetrachloroethane	2014/05/27		104	%	70 - 130
			1,1,2,2-tetrachloroethane	2014/05/27		97	%	70 - 130
			Tetrachloroethene	2014/05/27		94	%	70 - 130
			1,2,3-trichlorobenzene	2014/05/27		105	%	70 - 130
			1,2,4-trichlorobenzene	2014/05/27		98	%	70 - 130
			1,3,5-trichlorobenzene	2014/05/27		96	%	70 - 130
			1,1,1-trichloroethane	2014/05/27		100	%	70 - 130
			1,1,2-trichloroethane	2014/05/27		100	%	70 - 130
			Trichloroethene	2014/05/27		93	%	70 - 130
			Trichlorofluoromethane	2014/05/27		89	%	70 - 130
			1,2,4-trimethylbenzene	2014/05/27		96	%	70 - 130
			1,3,5-trimethylbenzene	2014/05/27		99	%	70 - 130
			Vinyl chloride	2014/05/27		80	%	70 - 130
			1,4-Difluorobenzene (sur.)	2014/05/31		98	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/05/31		98	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/05/31		95	%	70 - 130
			Bromodichloromethane	2014/05/31	<0.50		ug/L	
			Bromoform	2014/05/31	<0.50		ug/L	
			Bromomethane	2014/05/31	<2.0		ug/L	
			Carbon tetrachloride	2014/05/31	<0.50		ug/L	
			Chlorobenzene	2014/05/31	<0.50		ug/L	
			Chlorodibromomethane	2014/05/31	<1.0		ug/L	
			Chloroethane	2014/05/31	<1.0		ug/L	
			Chloroform	2014/05/31	<0.50		ug/L	
			Chloromethane	2014/05/31	<2.0		ug/L	
			1,2-dibromoethane	2014/05/31	<0.50		ug/L	
			1,2-dichlorobenzene	2014/05/31	<0.50		ug/L	
			1,3-dichlorobenzene	2014/05/31	<0.50		ug/L	
			1,4-dichlorobenzene	2014/05/31	<0.50		ug/L	
			1,1-dichloroethane	2014/05/31	<0.50		ug/L	
			1,2-dichloroethane	2014/05/31	<0.50		ug/L	
			1,1-dichloroethene	2014/05/31	<0.50		ug/L	
			cis-1,2-dichloroethene	2014/05/31	<0.50		ug/L	
			trans-1,2-dichloroethene	2014/05/31	<0.50		ug/L	
			Dichloromethane	2014/05/31	<2.0		ug/L	

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7499506	ARA	RPD [JR5533-07]	1,2-dichloropropane	2014/05/31	<0.50		ug/L	
			cis-1,3-dichloropropene	2014/05/31	<0.50		ug/L	
			trans-1,3-dichloropropene	2014/05/31	<0.50		ug/L	
			Methyl methacrylate	2014/05/31	<0.50		ug/L	
			Methyl-tert-butylether (MTBE)	2014/05/31	<0.50		ug/L	
			Styrene	2014/05/31	<0.50		ug/L	
			1,1,1,2-tetrachloroethane	2014/05/31	<2.0		ug/L	
			1,1,2,2-tetrachloroethane	2014/05/31	<2.0		ug/L	
			Tetrachloroethene	2014/05/31	<0.50		ug/L	
			1,2,3-trichlorobenzene	2014/05/31	<1.0		ug/L	
			1,2,4-trichlorobenzene	2014/05/31	<1.0		ug/L	
			1,3,5-trichlorobenzene	2014/05/31	<0.50		ug/L	
			1,1,1-trichloroethane	2014/05/31	<0.50		ug/L	
			1,1,2-trichloroethane	2014/05/31	<0.50		ug/L	
			Trichloroethene	2014/05/31	<0.50		ug/L	
			Trichlorofluoromethane	2014/05/31	<0.50		ug/L	
			1,2,4-trimethylbenzene	2014/05/31	<0.50		ug/L	
			1,3,5-trimethylbenzene	2014/05/31	<0.50		ug/L	
			Vinyl chloride	2014/05/31	<0.50		ug/L	
			Bromodichloromethane	2014/05/27	NC		%	40
			Bromoform	2014/05/27	NC		%	40
			Bromomethane	2014/05/27	NC		%	40
			Carbon tetrachloride	2014/05/27	NC		%	40
			Chlorobenzene	2014/05/27	NC		%	40
			Chlorodibromomethane	2014/05/27	NC		%	40
			Chloroethane	2014/05/27	NC		%	40
			Chloroform	2014/05/27	NC		%	40
			Chloromethane	2014/05/27	NC		%	40
			1,2-dibromoethane	2014/05/27	NC		%	40
			1,2-dichlorobenzene	2014/05/27	NC		%	40
			1,3-dichlorobenzene	2014/05/27	NC		%	40
			1,4-dichlorobenzene	2014/05/27	NC		%	40
			1,1-dichloroethane	2014/05/27	NC		%	40
			1,2-dichloroethane	2014/05/27	NC		%	40
			1,1-dichloroethene	2014/05/27	NC		%	40
			cis-1,2-dichloroethene	2014/05/27	NC		%	40
			trans-1,2-dichloroethene	2014/05/27	NC		%	40
			Dichloromethane	2014/05/27	NC		%	40
			1,2-dichloropropane	2014/05/27	NC		%	40
			cis-1,3-dichloropropene	2014/05/27	NC		%	40
			trans-1,3-dichloropropene	2014/05/27	NC		%	40
			Methyl methacrylate	2014/05/27	NC		%	40
			Methyl-tert-butylether (MTBE)	2014/05/27	NC		%	40
			Styrene	2014/05/27	NC		%	40
			1,1,1,2-tetrachloroethane	2014/05/27	NC		%	40
			1,1,2,2-tetrachloroethane	2014/05/27	NC		%	40
			Tetrachloroethene	2014/05/27	NC		%	40
			1,2,3-trichlorobenzene	2014/05/27	NC		%	40
			1,2,4-trichlorobenzene	2014/05/27	NC		%	40
			1,3,5-trichlorobenzene	2014/05/27	NC		%	40
			1,1,1-trichloroethane	2014/05/27	NC		%	40
			1,1,2-trichloroethane	2014/05/27	NC		%	40

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7500191	JA7	Matrix Spike	Trichloroethene	2014/05/27	NC		%	40
			Trichlorofluoromethane	2014/05/27	NC		%	40
			1,2,4-trimethylbenzene	2014/05/27	NC		%	40
			1,3,5-trimethylbenzene	2014/05/27	NC		%	40
			Vinyl chloride	2014/05/27	NC		%	40
7500191	JA7	Spiked Blank	O-TERPHENYL (sur.)	2014/05/30		86	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/05/30		82	%	50 - 130
7500191	JA7	Method Blank	O-TERPHENYL (sur.)	2014/05/30		104	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/05/30		94	%	70 - 130
7500191	JA7	RPD [JR5543-06]	O-TERPHENYL (sur.)	2014/05/30		103	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/05/30	<0.10		mg/L	40
7501787	HC7	Matrix Spike	Dissolved Aluminum (Al)	2014/05/29		102	%	80 - 120
			Dissolved Antimony (Sb)	2014/05/29		86	%	80 - 120
			Dissolved Arsenic (As)	2014/05/29		106	%	80 - 120
			Dissolved Beryllium (Be)	2014/05/29		107	%	80 - 120
			Dissolved Chromium (Cr)	2014/05/29		100	%	80 - 120
			Dissolved Cobalt (Co)	2014/05/29		91	%	80 - 120
			Dissolved Copper (Cu)	2014/05/29		93	%	80 - 120
			Dissolved Lead (Pb)	2014/05/29		92	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/05/29		112	%	80 - 120
			Dissolved Nickel (Ni)	2014/05/29		95	%	80 - 120
			Dissolved Selenium (Se)	2014/05/29		103	%	80 - 120
			Dissolved Silver (Ag)	2014/05/29		85	%	80 - 120
			Dissolved Thallium (Tl)	2014/05/29		93	%	80 - 120
			Dissolved Tin (Sn)	2014/05/29		100	%	80 - 120
			Dissolved Titanium (Ti)	2014/05/29		108	%	80 - 120
			Dissolved Uranium (U)	2014/05/29		104	%	80 - 120
			Dissolved Vanadium (V)	2014/05/29		108	%	80 - 120
			Dissolved Zinc (Zn)	2014/05/29		97	%	80 - 120
		Spiked Blank	Dissolved Aluminum (Al)	2014/05/28		108	%	80 - 120
			Dissolved Antimony (Sb)	2014/05/28		88	%	80 - 120
			Dissolved Arsenic (As)	2014/05/28		103	%	80 - 120
			Dissolved Beryllium (Be)	2014/05/28		105	%	80 - 120
			Dissolved Chromium (Cr)	2014/05/28		99	%	80 - 120
			Dissolved Cobalt (Co)	2014/05/28		95	%	80 - 120
			Dissolved Copper (Cu)	2014/05/28		103	%	80 - 120
			Dissolved Lead (Pb)	2014/05/28		98	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/05/28		103	%	80 - 120
			Dissolved Nickel (Ni)	2014/05/28		102	%	80 - 120
			Dissolved Selenium (Se)	2014/05/28		106	%	80 - 120
			Dissolved Silver (Ag)	2014/05/28		98	%	80 - 120
			Dissolved Thallium (Tl)	2014/05/28		98	%	80 - 120
			Dissolved Tin (Sn)	2014/05/28		101	%	80 - 120
			Dissolved Titanium (Ti)	2014/05/28		104	%	80 - 120
			Dissolved Uranium (U)	2014/05/28		103	%	80 - 120
			Dissolved Vanadium (V)	2014/05/28		104	%	80 - 120
			Dissolved Zinc (Zn)	2014/05/28		108	%	80 - 120
7501787	HC7	Method Blank	Dissolved Aluminum (Al)	2014/05/28	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2014/05/28	<0.00060		mg/L	
			Dissolved Arsenic (As)	2014/05/28	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2014/05/28	<0.0010		mg/L	

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			Dissolved Chromium (Cr)	2014/05/28	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2014/05/28	<0.00030		mg/L	
			Dissolved Copper (Cu)	2014/05/28	<0.00020		mg/L	
			Dissolved Lead (Pb)	2014/05/28	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2014/05/28	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2014/05/28	<0.00050		mg/L	
			Dissolved Selenium (Se)	2014/05/28	<0.00020		mg/L	
			Dissolved Silver (Ag)	2014/05/28	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2014/05/28	<0.00020		mg/L	
			Dissolved Tin (Sn)	2014/05/28	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2014/05/28	<0.0010		mg/L	
			Dissolved Uranium (U)	2014/05/28	<0.00010		mg/L	
			Dissolved Vanadium (V)	2014/05/28	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2014/05/28	0.0040 , RDL=0.0030		mg/L	
7502444	STI	Matrix Spike [JR5533-04]	Dissolved Barium (Ba)	2014/05/29		96	%	80 - 120
			Dissolved Boron (B)	2014/05/29		101	%	80 - 120
			Dissolved Calcium (Ca)	2014/05/29		NC	%	80 - 120
			Dissolved Iron (Fe)	2014/05/29		NC	%	80 - 120
			Dissolved Lithium (Li)	2014/05/29		94	%	80 - 120
			Dissolved Magnesium (Mg)	2014/05/29		101	%	80 - 120
			Dissolved Manganese (Mn)	2014/05/29		100	%	80 - 120
			Dissolved Phosphorus (P)	2014/05/29		104	%	80 - 120
			Dissolved Potassium (K)	2014/05/29		103	%	80 - 120
			Dissolved Silicon (Si)	2014/05/29		NC	%	80 - 120
			Dissolved Sodium (Na)	2014/05/29		92	%	80 - 120
			Dissolved Strontium (Sr)	2014/05/29		95	%	80 - 120
7502444	STI	Spiked Blank	Dissolved Barium (Ba)	2014/05/29		89	%	80 - 120
			Dissolved Boron (B)	2014/05/29		94	%	80 - 120
			Dissolved Calcium (Ca)	2014/05/29		98	%	80 - 120
			Dissolved Iron (Fe)	2014/05/29		98	%	80 - 120
			Dissolved Lithium (Li)	2014/05/29		87	%	80 - 120
			Dissolved Magnesium (Mg)	2014/05/29		95	%	80 - 120
			Dissolved Manganese (Mn)	2014/05/29		95	%	80 - 120
			Dissolved Phosphorus (P)	2014/05/29		91	%	80 - 120
			Dissolved Potassium (K)	2014/05/29		95	%	80 - 120
			Dissolved Silicon (Si)	2014/05/29		91	%	80 - 120
			Dissolved Sodium (Na)	2014/05/29		89	%	80 - 120
			Dissolved Strontium (Sr)	2014/05/29		91	%	80 - 120
7502444	STI	Method Blank	Dissolved Barium (Ba)	2014/05/29	<0.010		mg/L	
			Dissolved Boron (B)	2014/05/29	<0.020		mg/L	
			Dissolved Calcium (Ca)	2014/05/29	<0.30		mg/L	
			Dissolved Iron (Fe)	2014/05/29	<0.060		mg/L	
			Dissolved Lithium (Li)	2014/05/29	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2014/05/29	<0.20		mg/L	
			Dissolved Manganese (Mn)	2014/05/29	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2014/05/29	<0.10		mg/L	
			Dissolved Potassium (K)	2014/05/29	<0.30		mg/L	
			Dissolved Silicon (Si)	2014/05/29	<0.10		mg/L	
			Dissolved Sodium (Na)	2014/05/29	<0.50		mg/L	
			Dissolved Strontium (Sr)	2014/05/29	<0.020		mg/L	
			Dissolved Sulphur (S)	2014/05/29	<0.20		mg/L	

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7502444	STI	RPD [JR5533-04]	Dissolved Barium (Ba)	2014/05/29	0.4		%	20
			Dissolved Boron (B)	2014/05/29	NC		%	20
			Dissolved Calcium (Ca)	2014/05/29	0.4		%	20
			Dissolved Iron (Fe)	2014/05/29	0.05		%	20
			Dissolved Lithium (Li)	2014/05/29	NC		%	20
			Dissolved Magnesium (Mg)	2014/05/29	0.4		%	20
			Dissolved Manganese (Mn)	2014/05/29	0.2		%	20
			Dissolved Phosphorus (P)	2014/05/29	NC		%	20
			Dissolved Potassium (K)	2014/05/29	0.9		%	20
			Dissolved Silicon (Si)	2014/05/29	0.6		%	20
			Dissolved Sodium (Na)	2014/05/29	1.6		%	20
			Dissolved Strontium (Sr)	2014/05/29	0.4		%	20
			Dissolved Sulphur (S)	2014/05/29	0.6		%	20
7503000	ABG	Matrix Spike [JR5534-07]	1,4-Difluorobenzene (sur.)	2014/05/30		106	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/05/30		94	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/05/30		92	%	70 - 130
			Benzene	2014/05/30		102	%	70 - 130
			Toluene	2014/05/30		93	%	70 - 130
			Ethylbenzene	2014/05/30		99	%	70 - 130
			m & p-Xylene	2014/05/30		99	%	70 - 130
			o-Xylene	2014/05/30		97	%	70 - 130
			(C6-C10)	2014/05/30		72	%	70 - 130
7503000	ABG	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/05/30		106	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/05/30		95	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/05/30		94	%	70 - 130
			Benzene	2014/05/30		98	%	70 - 130
			Toluene	2014/05/30		89	%	70 - 130
			Ethylbenzene	2014/05/30		93	%	70 - 130
			m & p-Xylene	2014/05/30		94	%	70 - 130
			o-Xylene	2014/05/30		92	%	70 - 130
			(C6-C10)	2014/05/30		90	%	70 - 130
7503000	ABG	Method Blank	1,4-Difluorobenzene (sur.)	2014/05/30		107	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/05/30		90	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/05/30		93	%	70 - 130
			Benzene	2014/05/30	<0.00040		mg/L	
			Toluene	2014/05/30	<0.00040		mg/L	
			Ethylbenzene	2014/05/30	<0.00040		mg/L	
			m & p-Xylene	2014/05/30	<0.00080		mg/L	
			o-Xylene	2014/05/30	<0.00040		mg/L	
			Xylenes (Total)	2014/05/30	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2014/05/30	<0.10		mg/L	
			(C6-C10)	2014/05/30	<0.10		mg/L	
7503000	ABG	RPD [JR5533-07]	Benzene	2014/05/30	NC		%	40
			Toluene	2014/05/30	NC		%	40
			Ethylbenzene	2014/05/30	NC		%	40
			m & p-Xylene	2014/05/30	NC		%	40
			o-Xylene	2014/05/30	NC		%	40
			Xylenes (Total)	2014/05/30	NC		%	40
			F1 (C6-C10) - BTEX	2014/05/30	NC		%	40
			(C6-C10)	2014/05/30	NC		%	40
7503223	AP1	Matrix Spike [JR5533-05]	Phenols	2014/05/29		108	%	80 - 120
7503223	AP1	Spiked Blank	Phenols	2014/05/29		91	%	80 - 120

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7503223	AP1	Method Blank	Phenols	2014/05/29	<0.0020		mg/L	
7503223	AP1	RPD [JR5533-05]	Phenols	2014/05/29	NC		%	20
7503348	CH7	Spiked Blank	pH	2014/05/29		100	%	97 - 103
7503368	CH7	Spiked Blank	Alkalinity (Total as CaCO3)	2014/05/29		102	%	80 - 120
7503368	CH7	Method Blank	Alkalinity (PP as CaCO3)	2014/05/29	<0.50		mg/L	
			Alkalinity (Total as CaCO3)	2014/05/29	<0.50		mg/L	
			Bicarbonate (HCO3)	2014/05/29	<0.50		mg/L	
			Carbonate (CO3)	2014/05/29	<0.50		mg/L	
			Hydroxide (OH)	2014/05/29	<0.50		mg/L	
7503370	CH7	Spiked Blank	Conductivity	2014/05/29		102	%	90 - 110
7503370	CH7	Method Blank	Conductivity	2014/05/29	1.2 , RDL=1.0		uS/cm	
7503411	CH7	Spiked Blank	pH	2014/05/29		100	%	97 - 103
7503426	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2014/05/29		102	%	80 - 120
7503426	MA4	Method Blank	Alkalinity (PP as CaCO3)	2014/05/29	<0.50		mg/L	
			Alkalinity (Total as CaCO3)	2014/05/29	<0.50		mg/L	
			Bicarbonate (HCO3)	2014/05/29	<0.50		mg/L	
			Carbonate (CO3)	2014/05/29	<0.50		mg/L	
			Hydroxide (OH)	2014/05/29	<0.50		mg/L	
7503432	MA4	Spiked Blank	Conductivity	2014/05/29		103	%	90 - 110
7503432	MA4	Method Blank	Conductivity	2014/05/30	<1.0		uS/cm	
7503578	SRT	Matrix Spike	Dissolved Calcium (Ca)	2014/05/29		97	%	80 - 120
			Dissolved Iron (Fe)	2014/05/29		97	%	80 - 120
			Dissolved Magnesium (Mg)	2014/05/29		97	%	80 - 120
			Dissolved Manganese (Mn)	2014/05/29		100	%	80 - 120
			Dissolved Potassium (K)	2014/05/29		105	%	80 - 120
			Dissolved Sodium (Na)	2014/05/29		98	%	80 - 120
7503578	SRT	Spiked Blank	Dissolved Calcium (Ca)	2014/05/29		97	%	80 - 120
			Dissolved Iron (Fe)	2014/05/29		91	%	80 - 120
			Dissolved Magnesium (Mg)	2014/05/29		92	%	80 - 120
			Dissolved Manganese (Mn)	2014/05/29		94	%	80 - 120
			Dissolved Potassium (K)	2014/05/29		98	%	80 - 120
			Dissolved Sodium (Na)	2014/05/29		94	%	80 - 120
7503578	SRT	Method Blank	Dissolved Calcium (Ca)	2014/05/29	<0.30		mg/L	
			Dissolved Iron (Fe)	2014/05/29	<0.060		mg/L	
			Dissolved Magnesium (Mg)	2014/05/29	<0.20		mg/L	
			Dissolved Manganese (Mn)	2014/05/29	<0.0040		mg/L	
			Dissolved Potassium (K)	2014/05/29	<0.30		mg/L	
			Dissolved Sodium (Na)	2014/05/29	<0.50		mg/L	
7503670	BL5	Matrix Spike	Total Ammonia (N)	2014/05/29		98	%	80 - 120
7503670	BL5	Spiked Blank	Total Ammonia (N)	2014/05/29		103	%	80 - 120
7503670	BL5	Method Blank	Total Ammonia (N)	2014/05/29	<0.050		mg/L	
7503996	LY	Matrix Spike	Dissolved Organic Carbon (C)	2014/05/29		NC	%	80 - 120
7503996	LY	Spiked Blank	Dissolved Organic Carbon (C)	2014/05/29		108	%	80 - 120
7503996	LY	Method Blank	Dissolved Organic Carbon (C)	2014/05/29	<0.50		mg/L	
7504715	CT6	Matrix Spike [JR5533-01]	Dissolved Nitrite (N)	2014/05/30		102	%	80 - 120
			Dissolved Nitrate (N)	2014/05/30		104	%	80 - 120
7504715	CT6	Spiked Blank	Dissolved Nitrite (N)	2014/05/30		100	%	90 - 110
			Dissolved Nitrate (N)	2014/05/30		102	%	90 - 110
7504715	CT6	Method Blank	Dissolved Nitrite (N)	2014/05/30	<0.010		mg/L	
			Dissolved Nitrate (N)	2014/05/30	<0.010		mg/L	
7504715	CT6	RPD [JR5533-01]	Dissolved Nitrite (N)	2014/05/30	NC		%	20

Maxxam Job #: B442080  
Report Date: 2014/06/02

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Dissolved Nitrate (N)	2014/05/30	NC		%	20
7504847	BL5	Matrix Spike [JR5543-02]	Total Total Kjeldahl Nitrogen	2014/05/30		78 (1)	%	80 - 120
7504847	BL5	QC Standard	Total Total Kjeldahl Nitrogen	2014/05/30		88	%	80 - 120
7504847	BL5	Spiked Blank	Total Total Kjeldahl Nitrogen	2014/05/30		85	%	80 - 120
7504847	BL5	Method Blank	Total Total Kjeldahl Nitrogen	2014/05/30	<0.050		mg/L	
7504847	BL5	RPD [JR5543-02]	Total Total Kjeldahl Nitrogen	2014/05/30	NC		%	20
7505263	BL5	Matrix Spike	Total Total Kjeldahl Nitrogen	2014/05/31		NC	%	80 - 120
7505263	BL5	QC Standard	Total Total Kjeldahl Nitrogen	2014/05/31		112	%	80 - 120
7505263	BL5	Spiked Blank	Total Total Kjeldahl Nitrogen	2014/05/31		103	%	80 - 120
7505263	BL5	Method Blank	Total Total Kjeldahl Nitrogen	2014/05/31	<0.050		mg/L	
7505839	KP9	Matrix Spike [JR5533-01]	Dissolved Chloride (Cl)	2014/05/30		107	%	80 - 120
7505839	KP9	Spiked Blank	Dissolved Chloride (Cl)	2014/05/30		102	%	80 - 120
7505839	KP9	Method Blank	Dissolved Chloride (Cl)	2014/05/30	<1.0		mg/L	
7505839	KP9	RPD [JR5533-01]	Dissolved Chloride (Cl)	2014/05/30	2.2		%	20
7505840	KP9	Matrix Spike [JR5533-01]	Dissolved Sulphate (SO4)	2014/05/30		NC	%	80 - 120
7505840	KP9	Spiked Blank	Dissolved Sulphate (SO4)	2014/05/30		101	%	80 - 120
7505840	KP9	Method Blank	Dissolved Sulphate (SO4)	2014/05/30	<1.0		mg/L	
7505840	KP9	RPD [JR5533-01]	Dissolved Sulphate (SO4)	2014/05/30	0.3		%	20
7505853	BL5	Matrix Spike	Total Ammonia (N)	2014/05/30		91	%	80 - 120
7505853	BL5	Spiked Blank	Total Ammonia (N)	2014/05/30		104	%	80 - 120
7505853	BL5	Method Blank	Total Ammonia (N)	2014/05/30	<0.050		mg/L	
7506857	KSF	Matrix Spike	Dissolved Calcium (Ca)	2014/06/01		NC	%	80 - 120
			Dissolved Iron (Fe)	2014/06/01		86	%	80 - 120
			Dissolved Magnesium (Mg)	2014/06/01		NC	%	80 - 120
			Dissolved Manganese (Mn)	2014/06/01		NC	%	80 - 120
			Dissolved Potassium (K)	2014/06/01		99	%	80 - 120
			Dissolved Sodium (Na)	2014/06/01		NC	%	80 - 120
7506857	KSF	Spiked Blank	Dissolved Calcium (Ca)	2014/06/01		96	%	80 - 120
			Dissolved Iron (Fe)	2014/06/01		95	%	80 - 120
			Dissolved Magnesium (Mg)	2014/06/01		102	%	80 - 120
			Dissolved Manganese (Mn)	2014/06/01		97	%	80 - 120
			Dissolved Potassium (K)	2014/06/01		103	%	80 - 120
			Dissolved Sodium (Na)	2014/06/01		100	%	80 - 120
7506857	KSF	Method Blank	Dissolved Calcium (Ca)	2014/06/01	<0.30		mg/L	
			Dissolved Iron (Fe)	2014/06/01	<0.060		mg/L	
			Dissolved Magnesium (Mg)	2014/06/01	<0.20		mg/L	
			Dissolved Manganese (Mn)	2014/06/01	<0.0040		mg/L	
			Dissolved Potassium (K)	2014/06/01	<0.30		mg/L	
			Dissolved Sodium (Na)	2014/06/01	<0.50		mg/L	
7507949	CJY	Matrix Spike [JR5533-08]	Dissolved Mercury (Hg)	2014/06/02		87	%	80 - 120
7507949	CJY	Spiked Blank	Dissolved Mercury (Hg)	2014/06/02		109	%	80 - 120
7507949	CJY	Method Blank	Dissolved Mercury (Hg)	2014/06/02	<0.0020		ug/L	
7507949	CJY	RPD [JR5533-08]	Dissolved Mercury (Hg)	2014/06/02	NC		%	20
7508022	CJY	Matrix Spike [JR5534-08]	Dissolved Mercury (Hg)	2014/06/02		88	%	80 - 120
7508022	CJY	Spiked Blank	Dissolved Mercury (Hg)	2014/06/02		98	%	80 - 120
7508022	CJY	Method Blank	Dissolved Mercury (Hg)	2014/06/02	<0.0020		ug/L	

Maxxam Job #: B442080  
Report Date: 2014/06/02

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### QUALITY ASSURANCE REPORT(CONT'D)

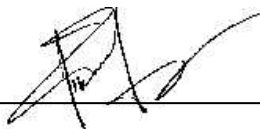
QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7508022	CJY	RPD [JR5534-08]	Dissolved Mercury (Hg)	2014/06/02	NC		%	20
<p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.</p> <p>Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.</p> <p>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.</p> <p>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.</p> <p>(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.</p>								

Maxxam Job #: B442080  
Report Date: 2014/06/02

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

## VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



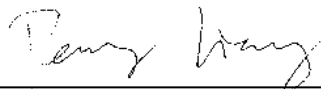
Dina Tleugabulova, Ph. D., Ph.D., Scientific Specialist, Inorganics Department



Janet Gao, Senior Analyst, Organics Department



Luba Shymushovska, Senior Analyst, Organic Department



Peng Liang, Analyst II



Rob Reinert, Data Validation Coordinator

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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.

Company:	Invoice To:	C/O Report Address	<input type="checkbox"/>
Contact:	SLR Consulting (Canada) Ltd		
Address:	Jason Pentland		
	6940 Repor Road		
	Prov: Alberta	PC:	T6B 3H9
Contact #s:	Ph: 780-490-7893	Cell:	780-721-15

Report To:	Same as Invoice	<input checked="" type="checkbox"/>
Prov:	PC:	
Ph:	Cell:	

Report Distribution (E-Mail):
j.pentland@slrconsulting.com
+pailamilla@slrconsulting.com

**REGULATORY GUIDELINES:**

☐ AT1

☒ CCME

☐ Regulated Drinking Water

☐ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:  
Project # / Name: 200.02005.00000  
Site Location: Garden River, AB  
Quote #: B40105  
Sampled By: KR D

SERVICE REQUESTED:	<input type="checkbox"/> RUSH (Contact lab to reserve)
	Date Required: _____
	<input checked="" type="checkbox"/> REGULAR (5 to 7 Days)

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00
1	MW14 - 101	—	GW	12:15
2	MW14 - 102 B	—		11:15
3	MW14 - 103	—		13:20
4	MW14 - 104 B	—		13:00
5	MW14 - 105	—		14:10
6	MW14 - 106 B	—		14:30
7	MW14 - 107	—		16:00
8	MW14 - 108	—		16:30
9	MW14 - 109	—		15:00
10	Dup 1	—		11:45
11	Dup 2	—		17:00
12	Tripl Blank K	—		

Please indicate Filtered, Preserved or Both (F, P, F/P)

Relinquished By (Signature/Print): <i>Kyle DAVIES</i>	Date (YY/MM/DD): <i>14/05/23</i>	Time (24:00): <i>16:10</i>
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
Special Instructions: <i>Insufficient water in MW14-107 and MW14-108</i>	# of Jars Used & Not Submitted <i>0</i>	

LAB USE ONLY			
Received By:	Date:	Time:	Maxxim Job #:
<i>Chapman</i>	<i>May 23/14</i>	<i>10:10</i>	
Lab Comments:		Custody Seal	Temperature
<i>DAVID THEODORAKIS 2014/05/24</i>			
<i>D. Theod</i>	<i>07:20</i>	<input checked="" type="checkbox"/>	<i>Temp Sheet</i>

AB FCD-00331 Rev3 2010/05

Maxxam Analytics International Corporation o/a Maxxam Analytics

Your Project #: 200.02005.00000  
 Site Location: GARDEN RIVER, AB  
 Your C.O.C. #: a093830

**Attention: JASON PENTLAND**

SLR CONSULTING (CANADA) LTD  
 6940 ROPER ROAD  
 EDMONTON, AB  
 CANADA T6B 3H9

**Report Date: 2014/08/08**

Report #: R1618282

Version: 1

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: B465771**

**Received: 2014/07/30, 14:18**

Sample Matrix: GROUND WATER  
 # Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO <sub>3</sub> ,HCO <sub>3</sub> ,OH	9	N/A	2014/08/05	AB SOP-00005	SM 2320-B
BTEX/F1 in Water by HS GC/MS	10	N/A	2014/08/07	AB SOP-00039	CCME, EPA 8260C
Cadmium - low level CCME - Dissolved	9	N/A	2014/08/06	AB SOP-00043	EPA 200.8 R5.4 m
Chloride by Automated Colourimetry	9	N/A	2014/08/08	AB SOP-00020	SM 22 4500-Cl G m
Carbon (DOC) (1)	9	N/A	2014/08/06	CAL SOP-00077	MMCW 119 1996 m
Conductivity @25C	9	N/A	2014/08/05	AB SOP-00005	SM 2510-B
CCME Hydrocarbons in Water (F2; C10-C16)	10	2014/08/01	2014/08/03	AB SOP-00040 AB SOP-00037	EPA3510C/CCME PHCCWS
Hardness	9	N/A	2014/08/05	AB WI-00065	SM 2340B
Mercury - Low Level (Dissolved)	5	2014/08/06	2014/08/06	CAL SOP-00007	EPA 1631
Mercury - Low Level (Dissolved)	1	2014/08/06	2014/08/07	CAL SOP-00007	EPA 1631
Mercury - Low Level (Dissolved)	3	2014/08/07	2014/08/08	CAL SOP-00007	EPA 1631
Elements by ICP - Dissolved	9	N/A	2014/08/01	AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICPMS - Dissolved	9	N/A	2014/08/06	AB SOP-00043	EPA 200.8 R5.4 m
Ion Balance	9	N/A	2014/08/05	AB WI-00065	SM 1030E
Sum of cations, anions	9	N/A	2014/08/05	AB WI-00065	SM 1030E
Ammonia-N (Total)	9	N/A	2014/08/06	AB SOP-00007	EPA 350.1 R2.0 m
Nitrate and Nitrite	9	N/A	2014/08/06	AB SOP-00023	SM4110B
Nitrate + Nitrite-N (calculated)	9	N/A	2014/08/06	AB SOP-00023	SM 4110-B
Nitrogen, (Nitrite, Nitrate) by IC	9	N/A	2014/08/06	AB SOP-00023	SM 22 4110 B m
pH @25°C (Alkalinity titrator)	9	N/A	2014/08/05	AB SOP-00005	SM 4500-H+B
Phenols (4-AAP)	5	N/A	2014/08/06	CAL SOP-00067	EPA 420.2
Phenols (4-AAP)	4	N/A	2014/08/08	CAL SOP-00067	EPA 420.2
Sulphate by Automated Colourimetry	9	N/A	2014/08/08	AB SOP-00018	SM 4500 SO4-E
Total Dissolved Solids (Calculated)	9	N/A	2014/08/08	AB WI-00065	SM 1030E
Total Trihalomethanes Calculation	8	N/A	2014/08/06	CAL SOP-00104	EPA 8260 C
Total Trihalomethanes Calculation	2	N/A	2014/08/08	CAL SOP-00104	EPA 8260 C
Total Kjeldahl Nitrogen	9	2014/08/07	2014/08/07	AB SOP-00008	EPA 351.1, 351.2
VOCs in Water by HS GC/MS (Std List)	8	N/A	2014/08/06	CAL SOP-00227	EPA 8260 C
VOCs in Water by HS GC/MS (Std List)	2	N/A	2014/08/07	CAL SOP-00227	EPA 8260 C

Your Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Your C.O.C. #: a093830

**Attention: JASON PENTLAND**

SLR CONSULTING (CANADA) LTD  
6940 ROPER ROAD  
EDMONTON, AB  
CANADA T6B 3H9

**Report Date: 2014/08/08**  
Report #: R1618282  
Version: 1

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B465771**

**Received: 2014/07/30, 14:18**

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) DOC present in the sample should be considered as non-purgeable DOC.

**Encryption Key**

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

Wendy Sears, Project manager

Email: WSears@maxxam.ca

Phone# (403) 291-3077

=====

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.

Maxxam Job #: B465771  
Report Date: 2014/08/08

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

# RESULTS OF CHEMICAL ANALYSES OF GROUND WATER

Maxxam ID		KF8774		KF8775	KF8776		KF8777		KF8778		
Sampling Date		2014/07/29 14:17		2014/07/29 13:59	2014/07/29 14:52		2014/07/29 14:39		2014/07/29 15:46		
COC Number		a093830		a093830	a093830		a093830		a093830		
	Units	MW14-101	QC Batch	MW14-102B	MW14-103	RDL	MW14-104B	RDL	MW14-105	RDL	QC Batch

Calculated Parameters											
Anion Sum	meq/L	8.2	7584918	7.6	7.5	N/A	7.1	N/A	7.4	N/A	7584918
Cation Sum	meq/L	8.0	7584918	8.2	7.1	N/A	7.9	N/A	8.3	N/A	7584918
Hardness (CaCO <sub>3</sub> )	mg/L	340	7584916	370	320	0.50	370	0.50	370	0.50	7584916
Ion Balance	N/A	0.98	7584917	1.1	0.95	0.010	1.1	0.010	1.1	0.010	7584917
Dissolved Nitrate (NO <sub>3</sub> )	mg/L	0.16	7584919	0.099	0.080	0.044	0.17	0.044	0.079	0.044	7585540
Nitrate plus Nitrite (N)	mg/L	0.036	7584920	0.022	0.018	0.010	0.039	0.010	0.018	0.010	7585541
Dissolved Nitrite (NO <sub>2</sub> )	mg/L	<0.033	7584919	<0.033	<0.033	0.033	<0.033	0.033	<0.033	0.033	7585540
Total Dissolved Solids	mg/L	410	7584921	380	370	10	370	10	390	10	7584921

Misc. Inorganics											
Conductivity	uS/cm	730	7588844	670	690	1.0	650	1.0	670	1.0	7588844
Dissolved Organic Carbon (C)	mg/L	17	7590151	13	9.7	0.50	7.9	0.50	11	0.50	7590151
pH	pH	7.49	7588845	7.69	7.72	N/A	7.72	N/A	7.70	N/A	7588845

Low Level Elements											
Dissolved Cadmium (Cd)	ug/L	0.0097	7585538	0.010	0.055	0.0050	0.022	0.0050	0.059	0.0050	7585538

Anions											
Alkalinity (PP as CaCO <sub>3</sub> )	mg/L	<0.50	7588840	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	7588840
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	360	7588840	360	320	0.50	310	0.50	340	0.50	7588840
Bicarbonate (HCO <sub>3</sub> )	mg/L	440	7588840	440	390	0.50	370	0.50	410	0.50	7588840
Carbonate (CO <sub>3</sub> )	mg/L	<0.50	7588840	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	7588840
Hydroxide (OH)	mg/L	<0.50	7588840	<0.50	<0.50	0.50	<0.50	0.50	<0.50	0.50	7588840
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	36	7593215	9.9	44	1.0	41 (1)	2.0	29	1.0	7593215
Dissolved Chloride (Cl)	mg/L	5.6	7593200	6.0	4.4	1.0	3.7	1.0	4.5	1.0	7593200

Nutrients											
Total Ammonia (N)	mg/L	0.71	7590059	0.32	0.072	0.050	0.069	0.050	0.24	0.050	7590059
Total Total Kjeldahl Nitrogen	mg/L	0.76 (2)	7591444	1.5 (2)	0.72 (2)	0.50	0.80 (2)	0.50	0.62	0.050	7591444
Dissolved Nitrite (N)	mg/L	<0.010	7589504	<0.010	<0.010	0.010	<0.010	0.010	<0.010	0.010	7589504
Dissolved Nitrate (N)	mg/L	0.036	7589504	0.022	0.018	0.010	0.039	0.010	0.018	0.010	7589504

Misc. Organics											
Phenols	mg/L	0.0045	7589971	0.0044	0.0040	0.0020	0.0045	0.0020	0.0041	0.0020	7589971

RDL = Reportable Detection Limit

N/A = Not Applicable

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

(2) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly

Maxxam Job #: B465771  
Report Date: 2014/08/08

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

## RESULTS OF CHEMICAL ANALYSES OF GROUND WATER

Maxxam ID		KF8779		KF8780	KF8781		KF8782		
Sampling Date		2014/07/29 15:24		2014/07/29 16:17	2014/07/29 13:50		2014/07/29 16:40		
COC Number		a093830		a093830	a093830		a093830		
	Units	MW14-106B	RDL	MW14-109	DUP 1	RDL	DUP 2	RDL	QC Batch
<b>Calculated Parameters</b>									
Anion Sum	meq/L	7.4	N/A	6.9	7.5	N/A	0.0000	N/A	7584918
Cation Sum	meq/L	8.0	N/A	7.9	8.3	N/A	0.018	N/A	7584918
Hardness (CaCO <sub>3</sub> )	mg/L	370	0.50	370	380	0.50	<0.50	0.50	7584916
Ion Balance	N/A	1.1	0.010	1.1	1.1	0.010	NC	0.010	7584917
Dissolved Nitrate (NO <sub>3</sub> )	mg/L	0.093	0.044	0.098	0.089	0.044	<0.044	0.044	7585540
Nitrate plus Nitrite (N)	mg/L	0.021	0.010	0.022	0.020	0.010	<0.010	0.010	7585541
Dissolved Nitrite (NO <sub>2</sub> )	mg/L	<0.033	0.033	<0.033	<0.033	0.033	<0.033	0.033	7585540
Total Dissolved Solids	mg/L	380	10	370	390	10	<10	10	7584921
<b>Misc. Inorganics</b>									
Conductivity	uS/cm	670	1.0	640	670	1.0	<1.0	1.0	7588844
Dissolved Organic Carbon (C)	mg/L	8.7	0.50	3.9	11	0.50	<0.50	0.50	7590151
pH	pH	7.63	N/A	7.80	7.75	N/A	4.91	N/A	7588845
<b>Low Level Elements</b>									
Dissolved Cadmium (Cd)	ug/L	0.047	0.0050	0.028	0.018	0.0050	<0.0050	0.0050	7585538
<b>Anions</b>									
Alkalinity (PP as CaCO <sub>3</sub> )	mg/L	<0.50	0.50	<0.50	<0.50	0.50	<0.50	0.50	7588840
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	320	0.50	270	360	0.50	<0.50	0.50	7588840
Bicarbonate (HCO <sub>3</sub> )	mg/L	400	0.50	340	440	0.50	<0.50	0.50	7588840
Carbonate (CO <sub>3</sub> )	mg/L	<0.50	0.50	<0.50	<0.50	0.50	<0.50	0.50	7588840
Hydroxide (OH)	mg/L	<0.50	0.50	<0.50	<0.50	0.50	<0.50	0.50	7588840
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	37 (1)	2.0	61	10	1.0	<1.0	1.0	7593215
Dissolved Chloride (Cl)	mg/L	4.9	1.0	3.5	6.0	1.0	<1.0	1.0	7593200
<b>Nutrients</b>									
Total Ammonia (N)	mg/L	0.080	0.050	0.11	0.34	0.050	0.086 (2)	0.050	7590059
Total Total Kjeldahl Nitrogen	mg/L	0.28	0.050	0.80 (3)	1.2 (3)	0.50	<0.050	0.050	7591444
Dissolved Nitrite (N)	mg/L	<0.010	0.010	<0.010	<0.010	0.010	<0.010	0.010	7589504
Dissolved Nitrate (N)	mg/L	0.021	0.010	0.022	0.020	0.010	<0.010	0.010	7589504
<b>Misc. Organics</b>									
Phenols	mg/L	0.0038	0.0020	0.0037	0.0033	0.0020	0.0031	0.0020	7593089
RDL = Reportable Detection Limit N/A = Not Applicable (1) Detection limits raised due to dilution to bring analyte within the calibrated range. (2) Ammonia greater than TKN. Results are within limits of uncertainty(MU). (3) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly									

Maxxam Job #: B465771  
Report Date: 2014/08/08

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		KF8774	KF8775	KF8776	KF8777	KF8778	KF8779	KF8780		
Sampling Date		2014/07/29 14:17	2014/07/29 13:59	2014/07/29 14:52	2014/07/29 14:39	2014/07/29 15:46	2014/07/29 15:24	2014/07/29 16:17		
COC Number		a093830	a093830	a093830	a093830	a093830	a093830	a093830		
	Units	MW14-101	MW14-102B	MW14-103	MW14-104B	MW14-105	MW14-106B	MW14-109	RDL	QC Batch
<b>Hydrocarbons</b>										
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7584005
<b>Surrogate Recovery (%)</b>										
O-TERPHENYL (sur.)	%	96	104	99	98	99	99	99	N/A	7584005
RDL = Reportable Detection Limit										
N/A = Not Applicable										

Maxxam ID		KF8781	KF8782	KF8783		
Sampling Date		2014/07/29 13:50	2014/07/29 16:40	2014/07/25		
COC Number		a093830	a093830	a093830		
	Units	DUP 1	DUP 2	TRIP BLANK	RDL	QC Batch
<b>Hydrocarbons</b>						
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	0.10	7584005
<b>Surrogate Recovery (%)</b>						
O-TERPHENYL (sur.)	%	97	96	99	N/A	7584005
RDL = Reportable Detection Limit						
N/A = Not Applicable						

Maxxam Job #: B465771  
Report Date: 2014/08/08

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

Maxxam ID		KF8774		KF8775		KF8776		KF8777		
Sampling Date		2014/07/29 14:17		2014/07/29 13:59		2014/07/29 14:52		2014/07/29 14:39		
COC Number		a093830		a093830		a093830		a093830		
	Units	MW14-101	QC Batch	MW14-102B	QC Batch	MW14-103	QC Batch	MW14-104B	RDL	QC Batch
<b>Elements</b>										
Dissolved Aluminum (Al)	mg/L	0.0053	7588804	0.0030	7588804	0.015	7588804	<0.0030	0.0030	7588804
Dissolved Antimony (Sb)	mg/L	<0.00060	7588804	<0.00060	7588804	<0.00060	7588804	<0.00060	0.00060	7588804
Dissolved Arsenic (As)	mg/L	0.017	7588804	0.0076	7588804	0.0058	7588804	0.0022	0.00020	7588804
Dissolved Barium (Ba)	mg/L	0.58	7586208	0.44	7586208	0.21	7586208	0.31	0.010	7586208
Dissolved Beryllium (Be)	mg/L	<0.0010	7588804	<0.0010	7588804	<0.0010	7588804	<0.0010	0.0010	7588804
Dissolved Boron (B)	mg/L	0.076	7586208	0.063	7586208	0.059	7586208	0.047	0.020	7586208
Dissolved Calcium (Ca)	mg/L	97	7592539	110	7586208	91	7592539	100	0.30	7586208
Dissolved Chromium (Cr)	mg/L	<0.0010	7588804	<0.0010	7588804	<0.0010	7588804	<0.0010	0.0010	7588804
Dissolved Cobalt (Co)	mg/L	0.0020	7588804	0.00078	7588804	0.0015	7588804	0.0013	0.00030	7588804
Dissolved Copper (Cu)	mg/L	0.0012	7588804	0.00056	7588804	0.0015	7588804	0.0017	0.00020	7588804
Dissolved Iron (Fe)	mg/L	12	7586208	2.2	7586208	3.4	7586208	1.0	0.060	7586208
Dissolved Lead (Pb)	mg/L	<0.00020	7588804	<0.00020	7588804	<0.00020	7588804	<0.00020	0.00020	7588804
Dissolved Lithium (Li)	mg/L	0.020	7586208	<0.020	7586208	<0.020	7586208	<0.020	0.020	7586208
Dissolved Magnesium (Mg)	mg/L	24	7592539	26	7586208	23	7592539	26	0.20	7586208
Dissolved Manganese (Mn)	mg/L	0.53	7586208	0.25	7586208	0.35	7586208	0.22	0.0040	7586208
Dissolved Molybdenum (Mo)	mg/L	0.0028	7588804	0.0033	7588804	0.0030	7588804	0.0024	0.00020	7588804
Dissolved Nickel (Ni)	mg/L	0.0034	7588804	0.0017	7588804	0.0028	7588804	0.0023	0.00050	7588804
Dissolved Phosphorus (P)	mg/L	<0.10	7586208	<0.10	7586208	<0.10	7586208	<0.10	0.10	7586208
Dissolved Potassium (K)	mg/L	2.6	7592539	3.4	7586208	2.4	7592539	2.5	0.30	7586208
Dissolved Selenium (Se)	mg/L	0.00034	7588804	0.00054	7588804	0.00065	7588804	0.0017	0.00020	7588804
Dissolved Silicon (Si)	mg/L	8.5	7586208	7.2	7586208	7.1	7586208	6.7	0.10	7586208
Dissolved Silver (Ag)	mg/L	<0.00010	7588804	<0.00010	7588804	<0.00010	7588804	<0.00010	0.00010	7588804
Dissolved Sodium (Na)	mg/L	14	7592539	14	7586208	11	7592539	9.4	0.50	7586208
Dissolved Strontium (Sr)	mg/L	0.44	7586208	0.35	7586208	0.41	7586208	0.36	0.020	7586208
Dissolved Sulphur (S)	mg/L	11	7586208	3.7	7586208	19	7586208	15	0.20	7586208
Dissolved Thallium (Tl)	mg/L	<0.00020	7588804	<0.00020	7588804	<0.00020	7588804	<0.00020	0.00020	7588804
Dissolved Tin (Sn)	mg/L	<0.0010	7588804	<0.0010	7588804	<0.0010	7588804	<0.0010	0.0010	7588804
Dissolved Titanium (Ti)	mg/L	<0.0010	7588804	<0.0010	7588804	<0.0010	7588804	<0.0010	0.0010	7588804
Dissolved Uranium (U)	mg/L	0.0014	7588804	0.0033	7588804	0.0024	7588804	0.0028	0.00010	7588804
Dissolved Vanadium (V)	mg/L	<0.0010	7588804	<0.0010	7588804	<0.0010	7588804	<0.0010	0.0010	7588804
Dissolved Zinc (Zn)	mg/L	0.0042	7588804	<0.0030	7588804	0.0045	7588804	0.0044	0.0030	7588804
<b>Low Level Elements</b>										
Dissolved Mercury (Hg)	ug/L	0.0064	7590118	<0.0020	7590118	<0.0020	7590118	<0.0020	0.0020	7590118
RDL = Reportable Detection Limit										

Maxxam Job #: B465771  
Report Date: 2014/08/08

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### ELEMENTS BY ATOMIC SPECTROSCOPY (GROUND WATER)

Maxxam ID		KF8778	KF8779		KF8780	KF8781	KF8782		
Sampling Date		2014/07/29 15:46	2014/07/29 15:24		2014/07/29 16:17	2014/07/29 13:50	2014/07/29 16:40		
COC Number		a093830	a093830		a093830	a093830	a093830		
	Units	MW14-105	MW14-106B	QC Batch	MW14-109	DUP 1	DUP 2	RDL	QC Batch
<b>Elements</b>									
Dissolved Aluminum (Al)	mg/L	0.0049	<0.0030	7588804	0.0050	0.0094	<0.0030	0.0030	7588804
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060	7588804	<0.00060	<0.00060	<0.00060	0.00060	7588804
Dissolved Arsenic (As)	mg/L	0.0058	0.0038	7588804	0.0023	0.0075	<0.00020	0.00020	7588804
Dissolved Barium (Ba)	mg/L	0.33	0.47	7586208	0.32	0.44	<0.010	0.010	7586208
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010	7588804	<0.0010	<0.0010	<0.0010	0.0010	7588804
Dissolved Boron (B)	mg/L	0.057	0.047	7586208	0.031	0.059	<0.020	0.020	7586208
Dissolved Calcium (Ca)	mg/L	110	100	7586208	100	110	<0.30	0.30	7586208
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	7588804	<0.0010	<0.0010	<0.0010	0.0010	7588804
Dissolved Cobalt (Co)	mg/L	0.0010	0.0012	7588804	0.0017	0.00083	<0.00030	0.00030	7588804
Dissolved Copper (Cu)	mg/L	0.00094	0.00078	7588804	0.0011	0.00051	<0.00020	0.00020	7588804
Dissolved Iron (Fe)	mg/L	5.4	1.6	7586208	2.1	2.2	<0.060	0.060	7586208
Dissolved Lead (Pb)	mg/L	<0.00020	<0.00020	7588804	<0.00020	<0.00020	<0.00020	0.00020	7588804
Dissolved Lithium (Li)	mg/L	<0.020	<0.020	7586208	<0.020	<0.020	<0.020	0.020	7586208
Dissolved Magnesium (Mg)	mg/L	26	26	7586208	27	26	<0.20	0.20	7586208
Dissolved Manganese (Mn)	mg/L	0.44	0.30	7586208	0.37	0.25	<0.0040	0.0040	7586208
Dissolved Molybdenum (Mo)	mg/L	0.0028	0.0023	7588804	0.0017	0.0034	<0.00020	0.00020	7588804
Dissolved Nickel (Ni)	mg/L	0.0021	0.0022	7588804	0.0023	0.0016	<0.00050	0.00050	7588804
Dissolved Phosphorus (P)	mg/L	0.11	<0.10	7586208	0.11	<0.10	<0.10	0.10	7586208
Dissolved Potassium (K)	mg/L	3.0	3.1	7586208	2.3	3.3	<0.30	0.30	7586208
Dissolved Selenium (Se)	mg/L	0.00075	0.00090	7588804	0.00052	0.00059	<0.00020	0.00020	7588804
Dissolved Silicon (Si)	mg/L	7.5	7.0	7586208	6.6	7.3	<0.10	0.10	7586208
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010	7588804	<0.00010	<0.00010	<0.00010	0.00010	7588804
Dissolved Sodium (Na)	mg/L	12	12	7586208	7.0	14	<0.50	0.50	7586208
Dissolved Strontium (Sr)	mg/L	0.37	0.34	7586208	0.29	0.35	<0.020	0.020	7586208
Dissolved Sulphur (S)	mg/L	9.6	14	7586208	24	3.7	<0.20	0.20	7586208
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020	7588804	<0.00020	<0.00020	<0.00020	0.00020	7588804
Dissolved Tin (Sn)	mg/L	<0.0010	<0.0010	7588804	<0.0010	<0.0010	<0.0010	0.0010	7588804
Dissolved Titanium (Ti)	mg/L	<0.0010	<0.0010	7588804	<0.0010	<0.0010	<0.0010	0.0010	7588804
Dissolved Uranium (U)	mg/L	0.0023	0.0039	7588804	0.0026	0.0033	<0.00010	0.00010	7588804
Dissolved Vanadium (V)	mg/L	<0.0010	<0.0010	7588804	<0.0010	<0.0010	<0.0010	0.0010	7588804
Dissolved Zinc (Zn)	mg/L	0.0082	<0.0030	7588804	0.0097	0.0036	<0.0030	0.0030	7588804
<b>Low Level Elements</b>									
Dissolved Mercury (Hg)	ug/L	<0.0020	0.0027	7590118	0.0023	0.0025	<0.0020	0.0020	7592041
RDL = Reportable Detection Limit									

Maxxam Job #: B465771  
Report Date: 2014/08/08

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KR D

### VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		KF8774	KF8775	KF8776	KF8777	KF8778	KF8779	KF8780		
Sampling Date		2014/07/29 14:17	2014/07/29 13:59	2014/07/29 14:52	2014/07/29 14:39	2014/07/29 15:46	2014/07/29 15:24	2014/07/29 16:17		
COC Number		a093830	a093830	a093830	a093830	a093830	a093830	a093830		
	Units	MW14-101	MW14-102B	MW14-103	MW14-104B	MW14-105	MW14-106B	MW14-109	RDL	QC Batch

Volatiles										
Total Trihalomethanes	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7584830
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
Bromoform	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
Bromomethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7588350
Carbon tetrachloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
Chlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
Chlorodibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7588350
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7588350
Chloroform	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
Chloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7588350
1,2-dibromoethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
1,2-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
1,3-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
1,4-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
1,1-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
1,2-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
1,1-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
cis-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
trans-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
Dichloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7588350
1,2-dichloropropane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
cis-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
trans-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
Methyl methacrylate	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
Methyl-tert-butylether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
1,1,1,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7588350
1,1,2,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7588350
Tetrachloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
1,2,3-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7588350
1,2,4-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7588350
1,3,5-trichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
1,1,1-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
1,1,2-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350

RDL = Reportable Detection Limit

Maxxam Job #: B465771  
Report Date: 2014/08/08

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		KF8774	KF8775	KF8776	KF8777	KF8778	KF8779	KF8780		
Sampling Date		2014/07/29 14:17	2014/07/29 13:59	2014/07/29 14:52	2014/07/29 14:39	2014/07/29 15:46	2014/07/29 15:24	2014/07/29 16:17		
COC Number		a093830	a093830	a093830	a093830	a093830	a093830	a093830		
	Units	MW14-101	MW14-102B	MW14-103	MW14-104B	MW14-105	MW14-106B	MW14-109	RDL	QC Batch
Trichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
Trichlorofluoromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
1,2,4-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
1,3,5-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
Vinyl chloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7588350
<b>Surrogate Recovery (%)</b>										
1,4-Difluorobenzene (sur.)	%	99	99	99	98	98	98	99	N/A	7588350
4-Bromofluorobenzene (sur.)	%	101	100	101	101	100	103	102	N/A	7588350
D4-1,2-Dichloroethane (sur.)	%	97	96	97	98	95	102	100	N/A	7588350
RDL = Reportable Detection Limit										
N/A = Not Applicable										

Maxxam Job #: B465771  
Report Date: 2014/08/08

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		KF8781		KF8782	KF8783		
Sampling Date		2014/07/29 13:50		2014/07/29 16:40	2014/07/25		
COC Number		a093830		a093830	a093830		
	Units	DUP 1	QC Batch	DUP 2	TRIP BLANK	RDL	QC Batch
<b>Volatiles</b>							
Total Trihalomethanes	ug/L	<2.0	7584830	<2.0	<2.0	2.0	7584830
Bromodichloromethane	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
Bromoform	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
Bromomethane	ug/L	<2.0	7588350	<2.0	<2.0	2.0	7591211
Carbon tetrachloride	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
Chlorobenzene	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
Chlorodibromomethane	ug/L	<1.0	7588350	<1.0	<1.0	1.0	7591211
Chloroethane	ug/L	<1.0	7588350	<1.0	<1.0	1.0	7591211
Chloroform	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
Chloromethane	ug/L	<2.0	7588350	<2.0	<2.0	2.0	7591211
1,2-dibromoethane	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
1,2-dichlorobenzene	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
1,3-dichlorobenzene	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
1,4-dichlorobenzene	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
1,1-dichloroethane	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
1,2-dichloroethane	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
1,1-dichloroethene	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
cis-1,2-dichloroethene	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
trans-1,2-dichloroethene	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
Dichloromethane	ug/L	<2.0	7588350	<2.0	<2.0	2.0	7591211
1,2-dichloropropane	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
cis-1,3-dichloropropene	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
trans-1,3-dichloropropene	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
Methyl methacrylate	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
Methyl-tert-butylether (MTBE)	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
Styrene	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
1,1,1,2-tetrachloroethane	ug/L	<2.0	7588350	<2.0	<2.0	2.0	7591211
1,1,2,2-tetrachloroethane	ug/L	<2.0	7588350	<2.0	<2.0	2.0	7591211
Tetrachloroethene	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
1,2,3-trichlorobenzene	ug/L	<1.0	7588350	<1.0	<1.0	1.0	7591211
1,2,4-trichlorobenzene	ug/L	<1.0	7588350	<1.0	<1.0	1.0	7591211
1,3,5-trichlorobenzene	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
1,1,1-trichloroethane	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
1,1,2-trichloroethane	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
RDL = Reportable Detection Limit							

Maxxam Job #: B465771  
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SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		KF8781		KF8782	KF8783		
Sampling Date		2014/07/29 13:50		2014/07/29 16:40	2014/07/25		
COC Number		a093830		a093830	a093830		
	Units	DUP 1	QC Batch	DUP 2	TRIP BLANK	RDL	QC Batch
Trichloroethene	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
Trichlorofluoromethane	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
1,2,4-trimethylbenzene	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
1,3,5-trimethylbenzene	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
Vinyl chloride	ug/L	<0.50	7588350	<0.50	<0.50	0.50	7591211
<b>Surrogate Recovery (%)</b>							
1,4-Difluorobenzene (sur.)	%	99	7588350	101	100	N/A	7591211
4-Bromofluorobenzene (sur.)	%	101	7588350	100	98	N/A	7591211
D4-1,2-Dichloroethane (sur.)	%	99	7588350	91	91	N/A	7591211
RDL = Reportable Detection Limit N/A = Not Applicable							

Maxxam Job #: B465771  
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SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
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Sampler Initials: KRD

### VOLATILE ORGANICS BY GC-MS (GROUND WATER)

Maxxam ID		KF8774	KF8775	KF8776	KF8777	KF8778	KF8779		
Sampling Date		2014/07/29 14:17	2014/07/29 13:59	2014/07/29 14:52	2014/07/29 14:39	2014/07/29 15:46	2014/07/29 15:24		
COC Number		a093830	a093830	a093830	a093830	a093830	a093830		
	Units	MW14-101	MW14-102B	MW14-103	MW14-104B	MW14-105	MW14-106B	RDL	QC Batch

Volatiles									
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7589853
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7589853
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7589853
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7589853
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7589853
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7589853
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7589853
(C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7589853

#### Surrogate Recovery (%)

1,4-Difluorobenzene (sur.)	%	109	108	111	111	110	109	N/A	7589853
4-Bromofluorobenzene (sur.)	%	103	103	103	103	102	103	N/A	7589853
D4-1,2-Dichloroethane (sur.)	%	112	112	112	111	112	112	N/A	7589853

RDL = Reportable Detection Limit

N/A = Not Applicable

Maxxam ID		KF8780	KF8781	KF8782	KF8783		
Sampling Date		2014/07/29 16:17	2014/07/29 13:50	2014/07/29 16:40	2014/07/25		
COC Number		a093830	a093830	a093830	a093830		
	Units	MW14-109	DUP 1	DUP 2	TRIP BLANK	RDL	QC Batch

Volatiles							
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7589853
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7589853
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7589853
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7589853
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7589853
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7589853
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	7589853
(C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	7589853

#### Surrogate Recovery (%)

1,4-Difluorobenzene (sur.)	%	110	111	109	111	N/A	7589853
4-Bromofluorobenzene (sur.)	%	103	103	104	103	N/A	7589853
D4-1,2-Dichloroethane (sur.)	%	111	114	113	112	N/A	7589853

RDL = Reportable Detection Limit

N/A = Not Applicable

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SLR CONSULTING (CANADA) LTD  
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Sampler Initials: KRD

### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.3°C
Package 2	5.3°C

Sample KF8774, Elements by ICP - Dissolved: Test repeated.  
Sample KF8776, Elements by ICP - Dissolved: Test repeated.

**Results relate only to the items tested.**

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SLR CONSULTING (CANADA) LTD  
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Sampler Initials: KRD

### QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7584005	MWB	Matrix Spike	O-TERPHENYL (sur.)	2014/08/02		101	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/02		84	%	50 - 130
7584005	MWB	Spiked Blank	O-TERPHENYL (sur.)	2014/08/03		98	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/03		84	%	70 - 130
7584005	MWB	Method Blank	O-TERPHENYL (sur.)	2014/08/02		96	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/08/02	<0.10		mg/L	
7586208	MB5	Matrix Spike [KF8774-04]	Dissolved Barium (Ba)	2014/08/01		101	%	80 - 120
			Dissolved Boron (B)	2014/08/01		105	%	80 - 120
			Dissolved Calcium (Ca)	2014/08/01		NC	%	80 - 120
			Dissolved Iron (Fe)	2014/08/01		NC	%	80 - 120
			Dissolved Lithium (Li)	2014/08/01		100	%	80 - 120
			Dissolved Magnesium (Mg)	2014/08/01		109	%	80 - 120
			Dissolved Manganese (Mn)	2014/08/01		104	%	80 - 120
			Dissolved Phosphorus (P)	2014/08/01		107	%	80 - 120
			Dissolved Potassium (K)	2014/08/01		109	%	80 - 120
			Dissolved Silicon (Si)	2014/08/01		NC	%	80 - 120
			Dissolved Sodium (Na)	2014/08/01		102	%	80 - 120
			Dissolved Strontium (Sr)	2014/08/01		103	%	80 - 120
7586208	MB5	Spiked Blank	Dissolved Barium (Ba)	2014/08/01		98	%	80 - 120
			Dissolved Boron (B)	2014/08/01		103	%	80 - 120
			Dissolved Calcium (Ca)	2014/08/01		110	%	80 - 120
			Dissolved Iron (Fe)	2014/08/01		104	%	80 - 120
			Dissolved Lithium (Li)	2014/08/01		95	%	80 - 120
			Dissolved Magnesium (Mg)	2014/08/01		108	%	80 - 120
			Dissolved Manganese (Mn)	2014/08/01		106	%	80 - 120
			Dissolved Phosphorus (P)	2014/08/01		101	%	80 - 120
			Dissolved Potassium (K)	2014/08/01		106	%	80 - 120
			Dissolved Silicon (Si)	2014/08/01		106	%	80 - 120
			Dissolved Sodium (Na)	2014/08/01		99	%	80 - 120
			Dissolved Strontium (Sr)	2014/08/01		101	%	80 - 120
7586208	MB5	Method Blank	Dissolved Barium (Ba)	2014/08/01	<0.010		mg/L	
			Dissolved Boron (B)	2014/08/01	<0.020		mg/L	
			Dissolved Calcium (Ca)	2014/08/01	<0.30		mg/L	
			Dissolved Iron (Fe)	2014/08/01	<0.060		mg/L	
			Dissolved Lithium (Li)	2014/08/01	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2014/08/01	<0.20		mg/L	
			Dissolved Manganese (Mn)	2014/08/01	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2014/08/01	<0.10		mg/L	
			Dissolved Potassium (K)	2014/08/01	<0.30		mg/L	
			Dissolved Silicon (Si)	2014/08/01	<0.10		mg/L	
			Dissolved Sodium (Na)	2014/08/01	<0.50		mg/L	
			Dissolved Strontium (Sr)	2014/08/01	<0.020		mg/L	
			Dissolved Sulphur (S)	2014/08/01	<0.20		mg/L	
7586208	MB5	RPD [KF8774-04]	Dissolved Barium (Ba)	2014/08/01	0.3		%	20
			Dissolved Boron (B)	2014/08/01	NC		%	20
			Dissolved Iron (Fe)	2014/08/01	0.2		%	20
			Dissolved Lithium (Li)	2014/08/01	NC		%	20
			Dissolved Manganese (Mn)	2014/08/01	0.6		%	20
			Dissolved Phosphorus (P)	2014/08/01	NC		%	20
			Dissolved Silicon (Si)	2014/08/01	0.4		%	20
			Dissolved Strontium (Sr)	2014/08/01	0.5		%	20
			Dissolved Sulphur (S)	2014/08/01	1.4		%	20

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Sampler Initials: KRD

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7588350	SLZ	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/08/06		99	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/08/06		106	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/06		104	%	70 - 130
			Bromodichloromethane	2014/08/06		108	%	70 - 130
			Bromoform	2014/08/06		112	%	70 - 130
			Bromomethane	2014/08/06		86	%	70 - 130
			Carbon tetrachloride	2014/08/06		93	%	70 - 130
			Chlorobenzene	2014/08/06		99	%	70 - 130
			Chlorodibromomethane	2014/08/06		112	%	70 - 130
			Chloroethane	2014/08/06		84	%	70 - 130
			Chloroform	2014/08/06		102	%	70 - 130
			Chloromethane	2014/08/06		76	%	70 - 130
			1,2-dibromoethane	2014/08/06		111	%	70 - 130
			1,2-dichlorobenzene	2014/08/06		107	%	70 - 130
			1,3-dichlorobenzene	2014/08/06		101	%	70 - 130
			1,4-dichlorobenzene	2014/08/06		103	%	70 - 130
			1,1-dichloroethane	2014/08/06		94	%	70 - 130
			1,2-dichloroethane	2014/08/06		NC	%	70 - 130
			1,1-dichloroethene	2014/08/06		91	%	70 - 130
			cis-1,2-dichloroethene	2014/08/06		94	%	70 - 130
			trans-1,2-dichloroethene	2014/08/06		92	%	70 - 130
			Dichloromethane	2014/08/06		90	%	70 - 130
			1,2-dichloropropane	2014/08/06		100	%	70 - 130
			cis-1,3-dichloropropene	2014/08/06		92	%	70 - 130
			trans-1,3-dichloropropene	2014/08/06		97	%	70 - 130
			Methyl methacrylate	2014/08/06		115	%	70 - 130
			Methyl-tert-butylether (MTBE)	2014/08/06		96	%	70 - 130
			Styrene	2014/08/06		106	%	70 - 130
			1,1,1,2-tetrachloroethane	2014/08/06		107	%	70 - 130
			1,1,2,2-tetrachloroethane	2014/08/06		106	%	70 - 130
			Tetrachloroethene	2014/08/06		93	%	70 - 130
			1,2,3-trichlorobenzene	2014/08/06		100	%	70 - 130
			1,2,4-trichlorobenzene	2014/08/06		98	%	70 - 130
			1,3,5-trichlorobenzene	2014/08/06		97	%	70 - 130
			1,1,1-trichloroethane	2014/08/06		97	%	70 - 130
			1,1,2-trichloroethane	2014/08/06		104	%	70 - 130
			Trichloroethene	2014/08/06		90	%	70 - 130
			Trichlorofluoromethane	2014/08/06		82	%	70 - 130
			1,2,4-trimethylbenzene	2014/08/06		102	%	70 - 130
			1,3,5-trimethylbenzene	2014/08/06		107	%	70 - 130
			Vinyl chloride	2014/08/06		74	%	70 - 130
7588350	SLZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/08/06		99	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/08/06		106	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/06		103	%	70 - 130
			Bromodichloromethane	2014/08/06		108	%	70 - 130
			Bromoform	2014/08/06		109	%	70 - 130
			Bromomethane	2014/08/06		82	%	70 - 130
			Carbon tetrachloride	2014/08/06		94	%	70 - 130
			Chlorobenzene	2014/08/06		98	%	70 - 130
			Chlorodibromomethane	2014/08/06		109	%	70 - 130
			Chloroethane	2014/08/06		84	%	70 - 130
			Chloroform	2014/08/06		102	%	70 - 130

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### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7588350	SLZ	Method Blank	Chloromethane	2014/08/06		78	%	70 - 130
			1,2-dibromoethane	2014/08/06		108	%	70 - 130
			1,2-dichlorobenzene	2014/08/06		105	%	70 - 130
			1,3-dichlorobenzene	2014/08/06		103	%	70 - 130
			1,4-dichlorobenzene	2014/08/06		101	%	70 - 130
			1,1-dichloroethane	2014/08/06		94	%	70 - 130
			1,2-dichloroethane	2014/08/06		103	%	70 - 130
			1,1-dichloroethene	2014/08/06		93	%	70 - 130
			cis-1,2-dichloroethene	2014/08/06		94	%	70 - 130
			trans-1,2-dichloroethene	2014/08/06		94	%	70 - 130
			Dichloromethane	2014/08/06		91	%	70 - 130
			1,2-dichloropropane	2014/08/06		100	%	70 - 130
			cis-1,3-dichloropropene	2014/08/06		88	%	70 - 130
			trans-1,3-dichloropropene	2014/08/06		90	%	70 - 130
			Methyl methacrylate	2014/08/06		113	%	70 - 130
			Methyl-tert-butylether (MTBE)	2014/08/06		95	%	70 - 130
			Styrene	2014/08/06		105	%	70 - 130
			1,1,1,2-tetrachloroethane	2014/08/06		106	%	70 - 130
			1,1,2,2-tetrachloroethane	2014/08/06		102	%	70 - 130
			Tetrachloroethene	2014/08/06		94	%	70 - 130
			1,2,3-trichlorobenzene	2014/08/06		95	%	70 - 130
			1,2,4-trichlorobenzene	2014/08/06		95	%	70 - 130
			1,3,5-trichlorobenzene	2014/08/06		97	%	70 - 130
			1,1,1-trichloroethane	2014/08/06		97	%	70 - 130
			1,1,2-trichloroethane	2014/08/06		103	%	70 - 130
			Trichloroethene	2014/08/06		92	%	70 - 130
			Trichlorofluoromethane	2014/08/06		82	%	70 - 130
			1,2,4-trimethylbenzene	2014/08/06		103	%	70 - 130
			1,3,5-trimethylbenzene	2014/08/06		108	%	70 - 130
			Vinyl chloride	2014/08/06		83	%	70 - 130
			1,4-Difluorobenzene (sur.)	2014/08/06		98	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/08/06		101	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/06		96	%	70 - 130
			Bromodichloromethane	2014/08/06	<0.50		ug/L	
			Bromoform	2014/08/06	<0.50		ug/L	
			Bromomethane	2014/08/06	<2.0		ug/L	
			Carbon tetrachloride	2014/08/06	<0.50		ug/L	
			Chlorobenzene	2014/08/06	<0.50		ug/L	
			Chlorodibromomethane	2014/08/06	<1.0		ug/L	
			Chloroethane	2014/08/06	<1.0		ug/L	
			Chloroform	2014/08/06	<0.50		ug/L	
			Chloromethane	2014/08/06	<2.0		ug/L	
			1,2-dibromoethane	2014/08/06	<0.50		ug/L	
			1,2-dichlorobenzene	2014/08/06	<0.50		ug/L	
			1,3-dichlorobenzene	2014/08/06	<0.50		ug/L	
			1,4-dichlorobenzene	2014/08/06	<0.50		ug/L	
			1,1-dichloroethane	2014/08/06	<0.50		ug/L	
			1,2-dichloroethane	2014/08/06	<0.50		ug/L	
			1,1-dichloroethene	2014/08/06	<0.50		ug/L	
			cis-1,2-dichloroethene	2014/08/06	<0.50		ug/L	
			trans-1,2-dichloroethene	2014/08/06	<0.50		ug/L	
			Dichloromethane	2014/08/06	<2.0		ug/L	

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			1,2-dichloropropane	2014/08/06	<0.50		ug/L	
			cis-1,3-dichloropropene	2014/08/06	<0.50		ug/L	
			trans-1,3-dichloropropene	2014/08/06	<0.50		ug/L	
			Methyl methacrylate	2014/08/06	<0.50		ug/L	
			Methyl-tert-butylether (MTBE)	2014/08/06	<0.50		ug/L	
			Styrene	2014/08/06	<0.50		ug/L	
			1,1,1,2-tetrachloroethane	2014/08/06	<2.0		ug/L	
			1,1,2,2-tetrachloroethane	2014/08/06	<2.0		ug/L	
			Tetrachloroethene	2014/08/06	<0.50		ug/L	
			1,2,3-trichlorobenzene	2014/08/06	<1.0		ug/L	
			1,2,4-trichlorobenzene	2014/08/06	<1.0		ug/L	
			1,3,5-trichlorobenzene	2014/08/06	<0.50		ug/L	
			1,1,1-trichloroethane	2014/08/06	<0.50		ug/L	
			1,1,2-trichloroethane	2014/08/06	<0.50		ug/L	
			Trichloroethene	2014/08/06	<0.50		ug/L	
			Trichlorofluoromethane	2014/08/06	<0.50		ug/L	
			1,2,4-trimethylbenzene	2014/08/06	<0.50		ug/L	
			1,3,5-trimethylbenzene	2014/08/06	<0.50		ug/L	
			Vinyl chloride	2014/08/06	<0.50		ug/L	
7588804	PC5	Matrix Spike [KF8774-04]	Dissolved Aluminum (Al)	2014/08/06		112	%	80 - 120
			Dissolved Antimony (Sb)	2014/08/06		92	%	80 - 120
			Dissolved Arsenic (As)	2014/08/06		109	%	80 - 120
			Dissolved Beryllium (Be)	2014/08/06		114	%	80 - 120
			Dissolved Chromium (Cr)	2014/08/06		102	%	80 - 120
			Dissolved Cobalt (Co)	2014/08/06		99	%	80 - 120
			Dissolved Copper (Cu)	2014/08/06		96	%	80 - 120
			Dissolved Lead (Pb)	2014/08/06		97	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/08/06		112	%	80 - 120
			Dissolved Nickel (Ni)	2014/08/06		98	%	80 - 120
			Dissolved Selenium (Se)	2014/08/06		104	%	80 - 120
			Dissolved Silver (Ag)	2014/08/06		86	%	80 - 120
			Dissolved Thallium (Tl)	2014/08/06		96	%	80 - 120
			Dissolved Tin (Sn)	2014/08/06		109	%	80 - 120
			Dissolved Titanium (Ti)	2014/08/06		111	%	80 - 120
			Dissolved Uranium (U)	2014/08/06		105	%	80 - 120
			Dissolved Vanadium (V)	2014/08/06		109	%	80 - 120
			Dissolved Zinc (Zn)	2014/08/06		101	%	80 - 120
7588804	PC5	Spiked Blank	Dissolved Aluminum (Al)	2014/08/05		108	%	80 - 120
			Dissolved Antimony (Sb)	2014/08/05		86	%	80 - 120
			Dissolved Arsenic (As)	2014/08/05		103	%	80 - 120
			Dissolved Beryllium (Be)	2014/08/05		103	%	80 - 120
			Dissolved Chromium (Cr)	2014/08/05		100	%	80 - 120
			Dissolved Cobalt (Co)	2014/08/05		100	%	80 - 120
			Dissolved Copper (Cu)	2014/08/05		102	%	80 - 120
			Dissolved Lead (Pb)	2014/08/05		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/08/05		103	%	80 - 120
			Dissolved Nickel (Ni)	2014/08/05		101	%	80 - 120
			Dissolved Selenium (Se)	2014/08/05		102	%	80 - 120
			Dissolved Silver (Ag)	2014/08/05		104	%	80 - 120
			Dissolved Thallium (Tl)	2014/08/05		97	%	80 - 120
			Dissolved Tin (Sn)	2014/08/05		102	%	80 - 120
			Dissolved Titanium (Ti)	2014/08/05		102	%	80 - 120

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7588804	PC5	Method Blank	Dissolved Uranium (U)	2014/08/05		104	%	80 - 120
			Dissolved Vanadium (V)	2014/08/05		103	%	80 - 120
			Dissolved Zinc (Zn)	2014/08/05		104	%	80 - 120
			Dissolved Aluminum (Al)	2014/08/06	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2014/08/06	0.00091 , RDL=0.00060		mg/L	
			Dissolved Arsenic (As)	2014/08/06	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2014/08/06	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2014/08/06	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2014/08/06	<0.00030		mg/L	
			Dissolved Copper (Cu)	2014/08/06	<0.00020		mg/L	
			Dissolved Lead (Pb)	2014/08/06	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2014/08/06	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2014/08/06	<0.00050		mg/L	
			Dissolved Selenium (Se)	2014/08/06	<0.00020		mg/L	
			Dissolved Silver (Ag)	2014/08/06	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2014/08/06	<0.00020		mg/L	
			Dissolved Tin (Sn)	2014/08/06	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2014/08/06	<0.0010		mg/L	
			Dissolved Uranium (U)	2014/08/06	<0.00010		mg/L	
			Dissolved Vanadium (V)	2014/08/06	<0.0010		mg/L	
7588804	PC5	RPD [KF8774-04]	Dissolved Zinc (Zn)	2014/08/06	<0.0030		mg/L	
			Dissolved Aluminum (Al)	2014/08/06	NC		%	20
			Dissolved Antimony (Sb)	2014/08/06	NC		%	20
			Dissolved Arsenic (As)	2014/08/06	0.06		%	20
			Dissolved Beryllium (Be)	2014/08/06	NC		%	20
			Dissolved Chromium (Cr)	2014/08/06	NC		%	20
			Dissolved Cobalt (Co)	2014/08/06	0.04		%	20
			Dissolved Copper (Cu)	2014/08/06	4.4		%	20
			Dissolved Lead (Pb)	2014/08/06	NC		%	20
			Dissolved Molybdenum (Mo)	2014/08/06	3.1		%	20
			Dissolved Nickel (Ni)	2014/08/06	1.2		%	20
			Dissolved Selenium (Se)	2014/08/06	NC		%	20
			Dissolved Silver (Ag)	2014/08/06	NC		%	20
			Dissolved Thallium (Tl)	2014/08/06	NC		%	20
			Dissolved Tin (Sn)	2014/08/06	NC		%	20
			Dissolved Titanium (Ti)	2014/08/06	NC		%	20
			Dissolved Uranium (U)	2014/08/06	0.7		%	20
			Dissolved Vanadium (V)	2014/08/06	NC		%	20
			Dissolved Zinc (Zn)	2014/08/06	NC		%	20
7588840	JLD	Spiked Blank	Alkalinity (Total as CaCO3)	2014/08/05		99	%	80 - 120
7588840	JLD	Method Blank	Alkalinity (PP as CaCO3)	2014/08/05	<0.50		mg/L	
			Alkalinity (Total as CaCO3)	2014/08/05	<0.50		mg/L	
			Bicarbonate (HCO3)	2014/08/05	<0.50		mg/L	
			Carbonate (CO3)	2014/08/05	<0.50		mg/L	
			Hydroxide (OH)	2014/08/05	<0.50		mg/L	
7588844	JLD	Spiked Blank	Conductivity	2014/08/05		100	%	90 - 110
7588844	JLD	Method Blank	Conductivity	2014/08/05	<1.0		uS/cm	
7588845	JLD	Spiked Blank	pH	2014/08/05		100	%	97 - 102
7589504	LQ1	Matrix Spike [KF8774-01]	Dissolved Nitrite (N)	2014/08/06		99	%	80 - 120
			Dissolved Nitrate (N)	2014/08/06		101	%	80 - 120
			Dissolved Nitrite (N)	2014/08/06		101	%	80 - 120

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7589504	LQ1	Method Blank	Dissolved Nitrate (N)	2014/08/06		102	%	80 - 120
			Dissolved Nitrite (N)	2014/08/06	<0.010		mg/L	
			Dissolved Nitrate (N)	2014/08/06	<0.010		mg/L	
7589504	LQ1	RPD [KF8774-01]	Dissolved Nitrite (N)	2014/08/06	NC		%	20
			Dissolved Nitrate (N)	2014/08/06	NC		%	20
7589853	RSA	Matrix Spike [KF8775-08]	1,4-Difluorobenzene (sur.)	2014/08/07		110	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/08/07		105	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/07		109	%	70 - 130
			Benzene	2014/08/07		113	%	70 - 130
			Toluene	2014/08/07		105	%	70 - 130
			Ethylbenzene	2014/08/07		111	%	70 - 130
			m & p-Xylene	2014/08/07		112	%	70 - 130
			o-Xylene	2014/08/07		110	%	70 - 130
			(C6-C10)	2014/08/07		93	%	70 - 130
			1,4-Difluorobenzene (sur.)	2014/08/07		111	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/08/07		104	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/07		109	%	70 - 130
7589853	RSA	Spiked Blank	Benzene	2014/08/07		117	%	70 - 130
			Toluene	2014/08/07		109	%	70 - 130
			Ethylbenzene	2014/08/07		117	%	70 - 130
			m & p-Xylene	2014/08/07		116	%	70 - 130
			o-Xylene	2014/08/07		114	%	70 - 130
			(C6-C10)	2014/08/07		102	%	70 - 130
			1,4-Difluorobenzene (sur.)	2014/08/07		109	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/08/07		103	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/07		110	%	70 - 130
			Benzene	2014/08/07	<0.00040		mg/L	
			Toluene	2014/08/07	<0.00040		mg/L	
			Ethylbenzene	2014/08/07	<0.00040		mg/L	
7589853	RSA	Method Blank	m & p-Xylene	2014/08/07	<0.00080		mg/L	
			o-Xylene	2014/08/07	<0.00040		mg/L	
			Xylenes (Total)	2014/08/07	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2014/08/07	<0.10		mg/L	
			(C6-C10)	2014/08/07	<0.10		mg/L	
			Benzene	2014/08/07	NC		%	40
			Toluene	2014/08/07	NC		%	40
			Ethylbenzene	2014/08/07	NC		%	40
			m & p-Xylene	2014/08/07	NC		%	40
			o-Xylene	2014/08/07	NC		%	40
			Xylenes (Total)	2014/08/07	NC		%	40
			F1 (C6-C10) - BTEX	2014/08/07	NC		%	40
7589853	RSA	RPD [KF8774-08]	(C6-C10)	2014/08/07	NC		%	40
7589971	LY	Matrix Spike	Phenols	2014/08/06		NC	%	80 - 120
7589971	LY	Spiked Blank	Phenols	2014/08/06		100	%	80 - 120
7589971	LY	Method Blank	Phenols	2014/08/06	<0.0020		mg/L	
7590059	HC	Matrix Spike [KF8774-02]	Total Ammonia (N)	2014/08/06		NC	%	80 - 120
7590059	HC	Spiked Blank	Total Ammonia (N)	2014/08/06		103	%	80 - 120
7590059	HC	Method Blank	Total Ammonia (N)	2014/08/06	<0.050		mg/L	
7590059	HC	RPD [KF8774-02]	Total Ammonia (N)	2014/08/06	0.1		%	20
7590118	RK3	Matrix Spike	Dissolved Mercury (Hg)	2014/08/06		113	%	80 - 120
7590118	RK3	Spiked Blank	Dissolved Mercury (Hg)	2014/08/06		111	%	80 - 120
7590118	RK3	Method Blank	Dissolved Mercury (Hg)	2014/08/06	<0.0020		ug/L	

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7590151	AP1	Matrix Spike [KF8774-03]	Dissolved Organic Carbon (C)	2014/08/06		NC	%	80 - 120
7590151	AP1	Spiked Blank	Dissolved Organic Carbon (C)	2014/08/06		92	%	80 - 120
7590151	AP1	Method Blank	Dissolved Organic Carbon (C)	2014/08/06	<0.50		mg/L	
7590151	AP1	RPD [KF8774-03]	Dissolved Organic Carbon (C)	2014/08/06	1.7		%	20
7591211	SLZ	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/08/07		101	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/08/07		90	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/07		100	%	70 - 130
			Bromodichloromethane	2014/08/07		104	%	70 - 130
			Bromoform	2014/08/07		125	%	70 - 130
			Bromomethane	2014/08/07		101	%	70 - 130
			Carbon tetrachloride	2014/08/07		92	%	70 - 130
			Chlorobenzene	2014/08/07		107	%	70 - 130
			Chlorodibromomethane	2014/08/07		120	%	70 - 130
			Chloroethane	2014/08/07		90	%	70 - 130
			Chloroform	2014/08/07		98	%	70 - 130
			Chloromethane	2014/08/07		77	%	70 - 130
			1,2-dibromoethane	2014/08/07		117	%	70 - 130
			1,2-dichlorobenzene	2014/08/07		97	%	70 - 130
			1,3-dichlorobenzene	2014/08/07		92	%	70 - 130
			1,4-dichlorobenzene	2014/08/07		92	%	70 - 130
			1,1-dichloroethane	2014/08/07		88	%	70 - 130
			1,2-dichloroethane	2014/08/07		100	%	70 - 130
			1,1-dichloroethene	2014/08/07		91	%	70 - 130
			cis-1,2-dichloroethene	2014/08/07		93	%	70 - 130
			trans-1,2-dichloroethene	2014/08/07		92	%	70 - 130
			Dichloromethane	2014/08/07		89	%	70 - 130
			1,2-dichloropropane	2014/08/07		94	%	70 - 130
			cis-1,3-dichloropropene	2014/08/07		103	%	70 - 130
			trans-1,3-dichloropropene	2014/08/07		115	%	70 - 130
			Methyl methacrylate	2014/08/07		111	%	70 - 130
			Methyl-tert-butylether (MTBE)	2014/08/07		93	%	70 - 130
			Styrene	2014/08/07		115	%	70 - 130
			1,1,1,2-tetrachloroethane	2014/08/07		116	%	70 - 130
			1,1,2,2-tetrachloroethane	2014/08/07		109	%	70 - 130
			Tetrachloroethene	2014/08/07		105	%	70 - 130
			1,2,3-trichlorobenzene	2014/08/07		117	%	70 - 130
			1,2,4-trichlorobenzene	2014/08/07		109	%	70 - 130
			1,3,5-trichlorobenzene	2014/08/07		101	%	70 - 130
			1,1,1-trichloroethane	2014/08/07		95	%	70 - 130
			1,1,2-trichloroethane	2014/08/07		105	%	70 - 130
			Trichloroethene	2014/08/07		95	%	70 - 130
			Trichlorofluoromethane	2014/08/07		80	%	70 - 130
			1,2,4-trimethylbenzene	2014/08/07		NC	%	70 - 130
			1,3,5-trimethylbenzene	2014/08/07		88	%	70 - 130
			Vinyl chloride	2014/08/07		87	%	70 - 130
7591211	SLZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/08/07		100	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/08/07		120	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/07		93	%	70 - 130
			Bromodichloromethane	2014/08/07		102	%	70 - 130
			Bromoform	2014/08/07		108	%	70 - 130
			Bromomethane	2014/08/07		77	%	70 - 130
			Carbon tetrachloride	2014/08/07		89	%	70 - 130

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			Chlorobenzene	2014/08/07		98	%	70 - 130
			Chlorodibromomethane	2014/08/07		106	%	70 - 130
			Chloroethane	2014/08/07		74	%	70 - 130
			Chloroform	2014/08/07		82	%	70 - 130
			Chloromethane	2014/08/07		65 (1)	%	70 - 130
			1,2-dibromoethane	2014/08/07		105	%	70 - 130
			1,2-dichlorobenzene	2014/08/07		111	%	70 - 130
			1,3-dichlorobenzene	2014/08/07		101	%	70 - 130
			1,4-dichlorobenzene	2014/08/07		103	%	70 - 130
			1,1-dichloroethane	2014/08/07		84	%	70 - 130
			1,2-dichloroethane	2014/08/07		92	%	70 - 130
			1,1-dichloroethene	2014/08/07		82	%	70 - 130
			cis-1,2-dichloroethene	2014/08/07		77	%	70 - 130
			trans-1,2-dichloroethene	2014/08/07		84	%	70 - 130
			Dichloromethane	2014/08/07		76	%	70 - 130
			1,2-dichloropropane	2014/08/07		95	%	70 - 130
			cis-1,3-dichloropropene	2014/08/07		90	%	70 - 130
			trans-1,3-dichloropropene	2014/08/07		94	%	70 - 130
			Methyl methacrylate	2014/08/07		107	%	70 - 130
			Methyl-tert-butylether (MTBE)	2014/08/07		85	%	70 - 130
			Styrene	2014/08/07		105	%	70 - 130
			1,1,1,2-tetrachloroethane	2014/08/07		106	%	70 - 130
			1,1,2,2-tetrachloroethane	2014/08/07		99	%	70 - 130
			Tetrachloroethene	2014/08/07		96	%	70 - 130
			1,2,3-trichlorobenzene	2014/08/07		97	%	70 - 130
			1,2,4-trichlorobenzene	2014/08/07		99	%	70 - 130
			1,3,5-trichlorobenzene	2014/08/07		105	%	70 - 130
			1,1,1-trichloroethane	2014/08/07		90	%	70 - 130
			1,1,2-trichloroethane	2014/08/07		94	%	70 - 130
			Trichloroethene	2014/08/07		90	%	70 - 130
			Trichlorofluoromethane	2014/08/07		69 (1)	%	70 - 130
			1,2,4-trimethylbenzene	2014/08/07		107	%	70 - 130
			1,3,5-trimethylbenzene	2014/08/07		117	%	70 - 130
			Vinyl chloride	2014/08/07		73	%	70 - 130
7591211	SLZ	Method Blank	1,4-Difluorobenzene (sur.)	2014/08/07		98	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/08/07		112	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/08/07		92	%	70 - 130
			Bromodichloromethane	2014/08/07	<0.50		ug/L	
			Bromoform	2014/08/07	<0.50		ug/L	
			Bromomethane	2014/08/07	<2.0		ug/L	
			Carbon tetrachloride	2014/08/07	<0.50		ug/L	
			Chlorobenzene	2014/08/07	<0.50		ug/L	
			Chlorodibromomethane	2014/08/07	<1.0		ug/L	
			Chloroethane	2014/08/07	<1.0		ug/L	
			Chloroform	2014/08/07	<0.50		ug/L	
			Chloromethane	2014/08/07	<2.0		ug/L	
			1,2-dibromoethane	2014/08/07	<0.50		ug/L	
			1,2-dichlorobenzene	2014/08/07	<0.50		ug/L	
			1,3-dichlorobenzene	2014/08/07	<0.50		ug/L	
			1,4-dichlorobenzene	2014/08/07	<0.50		ug/L	
			1,1-dichloroethane	2014/08/07	<0.50		ug/L	
			1,2-dichloroethane	2014/08/07	<0.50		ug/L	

Maxxam Job #: B465771  
Report Date: 2014/08/08

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			1,1-dichloroethene	2014/08/07	<0.50		ug/L	
			cis-1,2-dichloroethene	2014/08/07	<0.50		ug/L	
			trans-1,2-dichloroethene	2014/08/07	<0.50		ug/L	
			Dichloromethane	2014/08/07	<2.0		ug/L	
			1,2-dichloropropane	2014/08/07	<0.50		ug/L	
			cis-1,3-dichloropropene	2014/08/07	<0.50		ug/L	
			trans-1,3-dichloropropene	2014/08/07	<0.50		ug/L	
			Methyl methacrylate	2014/08/07	<0.50		ug/L	
			Methyl-tert-butylether (MTBE)	2014/08/07	<0.50		ug/L	
			Styrene	2014/08/07	<0.50		ug/L	
			1,1,1,2-tetrachloroethane	2014/08/07	<2.0		ug/L	
			1,1,2,2-tetrachloroethane	2014/08/07	<2.0		ug/L	
			Tetrachloroethene	2014/08/07	<0.50		ug/L	
			1,2,3-trichlorobenzene	2014/08/07	<1.0		ug/L	
			1,2,4-trichlorobenzene	2014/08/07	<1.0		ug/L	
			1,3,5-trichlorobenzene	2014/08/07	0.87 ,		ug/L	
					RDL=0.50			
			1,1,1-trichloroethane	2014/08/07	<0.50		ug/L	
			1,1,2-trichloroethane	2014/08/07	<0.50		ug/L	
			Trichloroethene	2014/08/07	<0.50		ug/L	
			Trichlorofluoromethane	2014/08/07	<0.50		ug/L	
			1,2,4-trimethylbenzene	2014/08/07	<0.50		ug/L	
			1,3,5-trimethylbenzene	2014/08/07	<0.50		ug/L	
			Vinyl chloride	2014/08/07	<0.50		ug/L	
7591444	BL5	Matrix Spike [KF8782-02]	Total Total Kjeldahl Nitrogen	2014/08/07		100	%	80 - 120
7591444	BL5	QC Standard	Total Total Kjeldahl Nitrogen	2014/08/07		108	%	80 - 120
7591444	BL5	Spiked Blank	Total Total Kjeldahl Nitrogen	2014/08/07		105	%	80 - 120
7591444	BL5	Method Blank	Total Total Kjeldahl Nitrogen	2014/08/07	<0.050		mg/L	
7591444	BL5	RPD [KF8782-02]	Total Total Kjeldahl Nitrogen	2014/08/07	NC		%	20
7592041	RK3	Matrix Spike	Dissolved Mercury (Hg)	2014/08/08		98	%	80 - 120
7592041	RK3	Spiked Blank	Dissolved Mercury (Hg)	2014/08/08		87	%	80 - 120
7592041	RK3	Method Blank	Dissolved Mercury (Hg)	2014/08/08	<0.0020		ug/L	
7592539	SRT	Matrix Spike	Dissolved Calcium (Ca)	2014/08/07		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2014/08/07		100	%	80 - 120
			Dissolved Potassium (K)	2014/08/07		103	%	80 - 120
			Dissolved Sodium (Na)	2014/08/07		NC	%	80 - 120
7592539	SRT	Spiked Blank	Dissolved Calcium (Ca)	2014/08/07		102	%	80 - 120
			Dissolved Magnesium (Mg)	2014/08/07		101	%	80 - 120
			Dissolved Potassium (K)	2014/08/07		100	%	80 - 120
			Dissolved Sodium (Na)	2014/08/07		100	%	80 - 120
7592539	SRT	Method Blank	Dissolved Calcium (Ca)	2014/08/07	<0.30		mg/L	
			Dissolved Magnesium (Mg)	2014/08/07	<0.20		mg/L	
			Dissolved Potassium (K)	2014/08/07	<0.30		mg/L	
			Dissolved Sodium (Na)	2014/08/07	<0.50		mg/L	
7592539	SRT	RPD	Dissolved Barium (Ba)	2014/08/07	1.0		%	20
			Dissolved Boron (B)	2014/08/07	2.9		%	20
			Dissolved Iron (Fe)	2014/08/07	0.7		%	20
			Dissolved Lithium (Li)	2014/08/07	NC		%	20
			Dissolved Manganese (Mn)	2014/08/07	0.3		%	20
			Dissolved Phosphorus (P)	2014/08/07	NC		%	20
			Dissolved Silicon (Si)	2014/08/07	0.5		%	20
			Dissolved Strontium (Sr)	2014/08/07	0.8		%	20

Maxxam Job #: B465771  
Report Date: 2014/08/08

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Dissolved Sulphur (S)	2014/08/07	NC		%	20
7593089	LY	Matrix Spike	Phenols	2014/08/08		106	%	80 - 120
7593089	LY	Spiked Blank	Phenols	2014/08/08		105	%	80 - 120
7593089	LY	Method Blank	Phenols	2014/08/08	<0.0020		mg/L	
7593200	ZI	Matrix Spike	Dissolved Chloride (Cl)	2014/08/08		NC	%	80 - 120
7593200	ZI	Spiked Blank	Dissolved Chloride (Cl)	2014/08/08		99	%	80 - 120
7593200	ZI	Method Blank	Dissolved Chloride (Cl)	2014/08/08	<1.0		mg/L	
7593215	ZI	Matrix Spike	Dissolved Sulphate (SO4)	2014/08/08		NC	%	80 - 120
7593215	ZI	Spiked Blank	Dissolved Sulphate (SO4)	2014/08/08		97	%	80 - 120
7593215	ZI	Method Blank	Dissolved Sulphate (SO4)	2014/08/08	<1.0		mg/L	

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 sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

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

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

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 too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

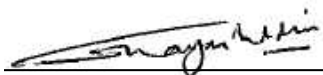
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B465771  
Report Date: 2014/08/08

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Ghayasuddin Khan, M.Sc., B.Ed., P.Chem, Scientific Specialist



Luba Shymushovska, Senior Analyst, Organic Department

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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.



Calgary: 4000 19st St. NE, T2E 6P8. Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247  
Edmonton: 9331 - 48 Street, T6B 2R4. Ph: (780) 577-7100, Fax: (780) 450-4187, Toll free: (877) 465-8889  
www.maxxamanalytics.com

Chain of Custody

A093830

Page: 1 of 1

Company: SLR Consulting (Canada) Ltd  
Contact: Jason Pentland  
Address: 6940 Roper Road  
Prov: Alberta PC: T6B 3H9  
Contact #s: Ph: 780-440-7893 Cell: 780-721-1804

Report To: Same as Invoice  
Prov: PC: Cell:

Report Distribution (E-Mail):  
j.pentland@slrconsulting.com  
tpailamilla@slrconsulting.com

REGULATORY GUIDELINES:  
☐ AT1  
☒ CCME  
☐ Regulated Drinking Water  
☐ Other:

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #: 200, 02005, 00000  
Project # / Name: Garden River, AB  
Site Location: B4 0105  
Quote #: KR D / DAP  
Sampled By:

SERVICE REQUESTED:  
☐ RUSH (Contact lab to reserve)  
Date Required:  
☒ REGULAR (5 to 7 Days)

Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	SOIL					WATER					Other Analysis					HOLD - Do not Analyze # of Containers Submitted
				BTEX F1-F4	Sieve (75 micron)	Regulated Metals (CCME / AT1)	Salinity 4	Assessment ICP Metals	Basic Class II Landfill	BTEX F1	BTEX F1-F2	BTEX F1-F4	Routine Water	Turbidity	DOC	Regulated Metals (CCME / AT1)	Total Dissolved	Mercury	
1 MW 14-101	—	GW	14/07/39 14:12																14
2 MW 14-102B	—		13:59																14
3 MW 14-103	—		14:52																14
4 MW 14-104B	—		14:39																14
5 MW 14-105	—		15:46																14
6 MW 14-106B	—		15:24																14
7 MW 14-109	—		16:12																14
8 Dup 1	—		13:50																14
9 Dup 2	—		16:40																14
10 TRIP BLANK	—																		8
11																			
12																			

Please indicate Filtered, Preserved or Both (F, P, F/P)

Relinquished By (Signature/Print): Kyle Davies  
Date (YY/MM/DD): 14/07/30  
Time (24:00): 14:15  
Relinquished By (Signature/Print): Dallen Peterson  
Date (YY/MM/DD): 14/07/30  
Time (24:00): 14:15  
Special Instructions:  
# of Jars Used & Not Submitted: 0

LAB USE ONLY  
Received By: J. Lapson  
Date: 14/07/31  
Time: 08:00  
Maxxam Job #: 81818  
Custody Seal: Y  
Temperature: 9/10/9  
Ice: Y  
Temp Sheet: 1/2/4

AB FCD-00331 Rev3 2010/05

Maxxam Analytics International Corporation o/a Maxxam Analytics

Your Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Your C.O.C. #: A093854

**Attention: JASON PENTLAND**

SLR CONSULTING (CANADA) LTD  
6940 ROPER ROAD  
EDMONTON, AB  
CANADA T6B 3H9

**Report Date: 2014/09/22**

Report #: R1647295

Version: 1

## **CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B481277**

**Received: 2014/09/12, 14:30**

Sample Matrix: Water  
# Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO <sub>3</sub> ,HCO <sub>3</sub> ,OH	9	N/A	2014/09/14	AB SOP-00005	SM 22 2320 B m
BTEX/F1 in Water by HS GC/MS	9	N/A	2014/09/18	AB SOP-00039	CCME CWS/EPA 8260C m
BTEX/F1 in Water by HS GC/MS	1	N/A	2014/09/22	AB SOP-00039	CCME CWS/EPA 8260C m
Cadmium - low level CCME - Dissolved	9	N/A	2014/09/17	AB SOP-00043	EPA 200.8 R5.4 m
Chloride by Automated Colourimetry	9	N/A	2014/09/19	AB SOP-00020	SM 22-4500-Cl G m
Carbon (DOC) (1)	9	N/A	2014/09/14	CAL SOP-00077	MMCW 119 1996 m
Conductivity @25C	9	N/A	2014/09/14	AB SOP-00005	SM 22 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16)	9	2014/09/16	2014/09/17	AB SOP-00040 AB SOP-00037	CCME PHC-CWS
Hardness	2	N/A	2014/09/17	AB WI-00065	SM 2340B
Hardness	7	N/A	2014/09/18	AB WI-00065	SM 2340B
Mercury - Low Level (Dissolved)	9	2014/09/18	2014/09/18	CAL SOP-00007	EPA 1631 RE 20460 m
Elements by ICP - Dissolved	9	N/A	2014/09/16	AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICPMS - Dissolved	9	N/A	2014/09/15	AB SOP-00043	EPA 200.8 R5.4 m
Ion Balance	9	N/A	2014/09/14	AB WI-00065	SM 1030E
Sum of cations, anions	2	N/A	2014/09/17	AB WI-00065	SM 1030E
Sum of cations, anions	7	N/A	2014/09/18	AB WI-00065	SM 1030E
Ammonia-N (Total)	9	N/A	2014/09/14	AB SOP-00007	EPA 350.1 R2.0 m
Nitrate and Nitrite	9	N/A	2014/09/15	AB SOP-00023	Auto Calc
Nitrate + Nitrite-N (calculated)	9	N/A	2014/09/15	AB SOP-00023	SM 4110-B
Nitrogen, (Nitrite, Nitrate) by IC	9	N/A	2014/09/14	AB SOP-00023	SM 22 4110 B m
pH @25°C (Alkalinity titrator)	9	N/A	2014/09/14	AB SOP-00005	SM 22 4500-H+B m
Phenols (4-AAP)	6	N/A	2014/09/15	CAL SOP-00067	EPA 9066 R0 m
Phenols (4-AAP)	3	N/A	2014/09/16	CAL SOP-00067	EPA 9066 R0 m
Sulphate by Automated Colourimetry	9	N/A	2014/09/19	AB SOP-00018	SM 22 4500-SO4 E m
Total Dissolved Solids (Calculated)	9	N/A	2014/09/19	AB WI-00065	SM 1030E
Total Trihalomethanes Calculation	10	N/A	2014/09/22	CAL SOP-00104	Auto Calc
Total Kjeldahl Nitrogen	8	2014/09/17	2014/09/18	AB SOP-00008	EPA 351.1 R1978 m
Total Kjeldahl Nitrogen	1	2014/09/22	2014/09/22	AB SOP-00008	EPA 351.1 R1978 m
VOCs in Water by HS GC/MS (Std List)	10	N/A	2014/09/19	AB SOP-00056	EPA 8260C / 5021A m

Your Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Your C.O.C. #: A093854

**Attention: JASON PENTLAND**

SLR CONSULTING (CANADA) LTD  
6940 ROPER ROAD  
EDMONTON, AB  
CANADA T6B 3H9

**Report Date: 2014/09/22**

Report #: R1647295

Version: 1

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B481277**

**Received: 2014/09/12, 14:30**

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) DOC present in the sample should be considered as non-purgeable DOC.

**Encryption Key**

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

Carmen McKay, Project Manager

Email: CMcKay@maxxam.ca

Phone# (403) 291-3077

=====

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.

Maxxam Job #: B481277  
Report Date: 2014/09/22

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		KP0239		KP0240	KP0241		KP0242		
Sampling Date		2014/09/09 14:58		2014/09/09 15:16	2014/09/09 14:26		2014/09/09 14:42		
COC Number		A093854		A093854	A093854		A093854		
	Units	MW14-101	QC Batch	MW14-102B	MW14-103	QC Batch	MW14-104B	RDL	QC Batch
<b>Calculated Parameters</b>									
Anion Sum	meq/L	7.9	7636840	7.2	7.6	7636840	7.0	N/A	7636840
Cation Sum	meq/L	8.1	7636840	7.5	8.1	7636840	7.7	N/A	7636840
Hardness (CaCO <sub>3</sub> )	mg/L	360	7636838	340	370	7636838	350	0.50	7636838
Ion Balance	N/A	1.0	7636839	1.1	1.1	7636839	1.1	0.010	7636839
Dissolved Nitrate (NO <sub>3</sub> )	mg/L	0.054	7636841	0.058	<0.044	7636841	0.12	0.044	7636841
Nitrate plus Nitrite (N)	mg/L	0.012	7636842	0.013	<0.010	7636842	0.026	0.010	7636842
Dissolved Nitrite (NO <sub>2</sub> )	mg/L	<0.033	7636841	<0.033	<0.033	7636841	<0.033	0.033	7636841
Total Dissolved Solids	mg/L	400	7636843	360	400	7636843	370	10	7636843
<b>Misc. Inorganics</b>									
Conductivity	uS/cm	720	7637080	660	700	7637080	650	1.0	7637080
Dissolved Organic Carbon (C)	mg/L	14	7637235	10	8.7	7637235	7.5	0.50	7637235
pH	pH	8.26	7637078	8.12	8.25	7637078	8.26	N/A	7637078
<b>Low Level Elements</b>									
Dissolved Cadmium (Cd)	ug/L	<0.020	7636698	<0.020	0.038	7636698	0.032	0.020	7636698
<b>Anions</b>									
Alkalinity (PP as CaCO <sub>3</sub> )	mg/L	<0.50	7637073	<0.50	<0.50	7637073	<0.50	0.50	7637073
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	350	7637073	340	320	7637073	300	0.50	7637073
Bicarbonate (HCO <sub>3</sub> )	mg/L	420	7637073	410	390	7637073	370	0.50	7637073
Carbonate (CO <sub>3</sub> )	mg/L	<0.50	7637073	<0.50	<0.50	7637073	<0.50	0.50	7637073
Hydroxide (OH)	mg/L	<0.50	7637073	<0.50	<0.50	7637073	<0.50	0.50	7637073
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	37	7645191	11	54	7645191	44	1.0	7645191
Dissolved Chloride (Cl)	mg/L	5.6	7645177	6.2	4.8	7645177	4.4	1.0	7645177
<b>Nutrients</b>									
Total Ammonia (N)	mg/L	0.66	7637594	0.41	0.25	7637594	0.18	0.050	7637594
Total Total Kjeldahl Nitrogen	mg/L	6.1 (1)	7641427	0.91 (1)	0.93 (1)	7641427	<0.50 (1)	0.50	7641427
Dissolved Nitrite (N)	mg/L	<0.010	7637338	<0.010	<0.010	7637342	<0.010	0.010	7637338
Dissolved Nitrate (N)	mg/L	0.012	7637338	0.013	<0.010	7637342	0.026	0.010	7637338
<b>Misc. Organics</b>									
Phenols	mg/L	0.0045	7640010	0.0034	0.0045	7638584	0.0033	0.0020	7638584
RDL = Reportable Detection Limit									
N/A = Not Applicable									
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly									

Maxxam Job #: B481277  
Report Date: 2014/09/22

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

## RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		KP0243			KP0244			KP0245		
Sampling Date		2014/09/09 15:47			2014/09/09 16:05			2014/09/09 16:43		
COC Number		A093854			A093854			A093854		
	Units	MW14-105	RDL	QC Batch	MW14-106B	RDL	QC Batch	MW14-109	RDL	QC Batch
<b>Calculated Parameters</b>										
Anion Sum	meq/L	7.1	N/A	7636840	7.4	N/A	7636840	6.9	N/A	7636840
Cation Sum	meq/L	7.6	N/A	7636840	7.6	N/A	7636840	7.3	N/A	7636840
Hardness (CaCO <sub>3</sub> )	mg/L	350	0.50	7636838	350	0.50	7636838	350	0.50	7636838
Ion Balance	N/A	1.1	0.010	7636839	1.0	0.010	7636839	1.1	0.010	7636839
Dissolved Nitrate (NO <sub>3</sub> )	mg/L	0.077	0.044	7636841	0.10	0.044	7636841	0.065	0.044	7636841
Nitrate plus Nitrite (N)	mg/L	0.017	0.010	7636842	0.023	0.010	7636842	0.015	0.010	7636842
Dissolved Nitrite (NO <sub>2</sub> )	mg/L	<0.033	0.033	7636841	<0.033	0.033	7636841	<0.033	0.033	7636841
Total Dissolved Solids	mg/L	370	10	7636843	380	10	7636843	370	10	7636843
<b>Misc. Inorganics</b>										
Conductivity	uS/cm	660	1.0	7637080	670	1.0	7637080	640	1.0	7637080
Dissolved Organic Carbon (C)	mg/L	9.1	0.50	7637235	7.2	0.50	7637235	3.8	0.50	7637235
pH	pH	8.26	N/A	7637078	8.25	N/A	7637078	8.30	N/A	7637078
<b>Low Level Elements</b>										
Dissolved Cadmium (Cd)	ug/L	0.027	0.020	7636698	0.034	0.020	7636698	0.032	0.020	7636698
<b>Anions</b>										
Alkalinity (PP as CaCO <sub>3</sub> )	mg/L	<0.50	0.50	7637073	<0.50	0.50	7637073	<0.50	0.50	7637073
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	320	0.50	7637073	320	0.50	7637073	260	0.50	7637073
Bicarbonate (HCO <sub>3</sub> )	mg/L	390	0.50	7637073	390	0.50	7637073	320	0.50	7637073
Carbonate (CO <sub>3</sub> )	mg/L	<0.50	0.50	7637073	<0.50	0.50	7637073	<0.50	0.50	7637073
Hydroxide (OH)	mg/L	<0.50	0.50	7637073	<0.50	0.50	7637073	<0.50	0.50	7637073
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	30	1.0	7645191	41 (1)	2.0	7645191	72	1.0	7645191
Dissolved Chloride (Cl)	mg/L	5.1	1.0	7645177	5.3	1.0	7645177	4.1	1.0	7645177
<b>Nutrients</b>										
Total Ammonia (N)	mg/L	0.57	0.050	7637594	0.089	0.050	7637594	0.13	0.050	7637594
Total Total Kjeldahl Nitrogen	mg/L	0.66 (2)	0.50	7641427	<0.50 (2)	0.50	7641427	<0.50 (2)	0.50	7641427
Dissolved Nitrite (N)	mg/L	<0.010	0.010	7637342	<0.010	0.010	7637338	<0.010	0.010	7637342
Dissolved Nitrate (N)	mg/L	0.017	0.010	7637342	0.023	0.010	7637338	0.015	0.010	7637342
<b>Misc. Organics</b>										
Phenols	mg/L	0.0040	0.0020	7638584	0.0022	0.0020	7638584	0.0031	0.0020	7638584
RDL = Reportable Detection Limit										
N/A = Not Applicable										
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.										
(2) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly										

Maxxam Job #: B481277  
Report Date: 2014/09/22

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

## RESULTS OF CHEMICAL ANALYSES OF WATER

<b>Maxxam ID</b>		KP0246			KP0247		
<b>Sampling Date</b>		2014/09/09 15:29			2014/09/09 16:55		
<b>COC Number</b>		A093854			A093854		
	<b>Units</b>	<b>MW13-101</b>	<b>RDL</b>	<b>QC Batch</b>	<b>MW13-102</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>							
Anion Sum	meq/L	7.3	N/A	7636840	0.0000	N/A	7636840
Cation Sum	meq/L	7.9	N/A	7636840	0.011	N/A	7636840
Hardness (CaCO <sub>3</sub> )	mg/L	350	0.50	7636838	<0.50	0.50	7636838
Ion Balance	N/A	1.1	0.010	7636839	NC	0.010	7636839
Dissolved Nitrate (NO <sub>3</sub> )	mg/L	0.063	0.044	7636841	<0.044	0.044	7636841
Nitrate plus Nitrite (N)	mg/L	0.014	0.010	7636842	<0.010	0.010	7636842
Dissolved Nitrite (NO <sub>2</sub> )	mg/L	<0.033	0.033	7636841	<0.033	0.033	7636841
Total Dissolved Solids	mg/L	370	10	7636843	<10	10	7636843
<b>Misc. Inorganics</b>							
Conductivity	uS/cm	660	1.0	7637080	<1.0	1.0	7637080
Dissolved Organic Carbon (C)	mg/L	10	0.50	7637235	<0.50	0.50	7637235
pH	pH	8.30	N/A	7637078	5.28	N/A	7637078
<b>Low Level Elements</b>							
Dissolved Cadmium (Cd)	ug/L	<0.020	0.020	7636698	<0.020	0.020	7636698
<b>Anions</b>							
Alkalinity (PP as CaCO <sub>3</sub> )	mg/L	<0.50	0.50	7637073	<0.50	0.50	7637073
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	340	0.50	7637073	<0.50	0.50	7637073
Bicarbonate (HCO <sub>3</sub> )	mg/L	420	0.50	7637073	<0.50	0.50	7637073
Carbonate (CO <sub>3</sub> )	mg/L	<0.50	0.50	7637073	<0.50	0.50	7637073
Hydroxide (OH)	mg/L	<0.50	0.50	7637073	<0.50	0.50	7637073
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	11	1.0	7645191	<1.0	1.0	7645191
Dissolved Chloride (Cl)	mg/L	6.0	1.0	7645177	<1.0	1.0	7645177
<b>Nutrients</b>							
Total Ammonia (N)	mg/L	0.41	0.050	7637594	0.085	0.050	7637594
Total Total Kjeldahl Nitrogen	mg/L	1.2 (1)	0.50	7641427	0.083	0.050	7647495
Dissolved Nitrite (N)	mg/L	<0.010	0.010	7637342	<0.010	0.010	7637342
Dissolved Nitrate (N)	mg/L	0.014	0.010	7637342	<0.010	0.010	7637342
<b>Misc. Organics</b>							
Phenols	mg/L	0.0055	0.0020	7640010	0.0043	0.0020	7640010
RDL = Reportable Detection Limit N/A = Not Applicable (1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly							

Maxxam Job #: B481277  
Report Date: 2014/09/22

SLR CONSULTING (CANADA) LTD  
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Sampler Initials: KRD

### PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		KP0239	KP0240	KP0241	KP0242	KP0243	KP0244	KP0245		
Sampling Date		2014/09/09 14:58	2014/09/09 15:16	2014/09/09 14:26	2014/09/09 14:42	2014/09/09 15:47	2014/09/09 16:05	2014/09/09 16:43		
COC Number		A093854	A093854	A093854	A093854	A093854	A093854	A093854		
	Units	MW14-101	MW14-102B	MW14-103	MW14-104B	MW14-105	MW14-106B	MW14-109	RDL	QC Batch

Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7638733
Surrogate Recovery (%)										
O-TERPHENYL (sur.)	%	88	85	91	86	91	89	90	N/A	7638733
RDL = Reportable Detection Limit										
N/A = Not Applicable										

Maxxam ID		KP0246	KP0247		
Sampling Date		2014/09/09 15:29	2014/09/09 16:55		
COC Number		A093854	A093854		
	Units	MW13-101	MW13-102	RDL	QC Batch

Hydrocarbons					
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	0.10	7638733
Surrogate Recovery (%)					
O-TERPHENYL (sur.)	%	87	89	N/A	7638733
RDL = Reportable Detection Limit					
N/A = Not Applicable					

Maxxam Job #: B481277  
Report Date: 2014/09/22

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		KP0239	KP0240		KP0241	KP0242	KP0243		
Sampling Date		2014/09/09 14:58	2014/09/09 15:16		2014/09/09 14:26	2014/09/09 14:42	2014/09/09 15:47		
COC Number		A093854	A093854		A093854	A093854	A093854		
	Units	MW14-101	MW14-102B	QC Batch	MW14-103	MW14-104B	MW14-105	RDL	QC Batch
<b>Elements</b>									
Dissolved Aluminum (Al)	mg/L	0.010	<0.0030	7638739	0.0062	0.0031	<0.0030	0.0030	7638739
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060	7638739	<0.00060	<0.00060	<0.00060	0.00060	7638739
Dissolved Arsenic (As)	mg/L	0.011	0.010	7638739	0.0054	0.0041	0.0040	0.00020	7638739
Dissolved Barium (Ba)	mg/L	0.49	0.43	7639835	0.20	0.28	0.32	0.010	7639857
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010	7638739	<0.0010	<0.0010	<0.0010	0.0010	7638739
Dissolved Boron (B)	mg/L	0.051	0.054	7639835	0.052	0.045	0.046	0.020	7639857
Dissolved Calcium (Ca)	mg/L	100	96	7639835	110	100	100	0.30	7639857
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	7638739	<0.0010	<0.0010	<0.0010	0.0010	7638739
Dissolved Cobalt (Co)	mg/L	0.0013	0.00078	7638739	0.0011	0.0015	0.0010	0.00030	7638739
Dissolved Copper (Cu)	mg/L	0.00086	0.00065	7638739	0.00047	0.0012	0.00084	0.00020	7638739
Dissolved Iron (Fe)	mg/L	8.6	4.0	7639835	3.1	2.6	3.3	0.060	7639857
Dissolved Lead (Pb)	mg/L	<0.00020	<0.00020	7638739	<0.00020	<0.00020	<0.00020	0.00020	7638739
Dissolved Lithium (Li)	mg/L	<0.020	<0.020	7639835	<0.020	<0.020	<0.020	0.020	7639857
Dissolved Magnesium (Mg)	mg/L	25	23	7639835	26	24	24	0.20	7639857
Dissolved Manganese (Mn)	mg/L	0.38	0.26	7639835	0.27	0.30	0.32	0.0040	7639857
Dissolved Molybdenum (Mo)	mg/L	0.0024	0.0034	7638739	0.0027	0.0026	0.0026	0.00020	7638739
Dissolved Nickel (Ni)	mg/L	0.0021	0.0015	7638739	0.0020	0.0024	0.0020	0.00050	7638739
Dissolved Phosphorus (P)	mg/L	<0.10	<0.10	7639835	<0.10	<0.10	<0.10	0.10	7639857
Dissolved Potassium (K)	mg/L	2.6	2.8	7639835	2.8	2.1	2.2	0.30	7639857
Dissolved Selenium (Se)	mg/L	0.00072	0.00043	7638739	0.0010	0.0012	0.0012	0.00020	7638739
Dissolved Silicon (Si)	mg/L	7.3	6.8	7639835	6.8	7.0	7.2	0.10	7639857
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010	7638739	<0.00010	<0.00010	<0.00010	0.00010	7638739
Dissolved Sodium (Na)	mg/L	13	14	7639835	11	9.7	10	0.50	7639857
Dissolved Strontium (Sr)	mg/L	0.37	0.33	7639835	0.39	0.36	0.34	0.020	7639857
Dissolved Sulphur (S)	mg/L	11	3.4	7639835	17	14	9.3	0.20	7639857
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020	7638739	<0.00020	<0.00020	<0.00020	0.00020	7638739
Dissolved Tin (Sn)	mg/L	<0.0010	<0.0010	7638739	<0.0010	<0.0010	<0.0010	0.0010	7638739
Dissolved Titanium (Ti)	mg/L	<0.0010	<0.0010	7638739	<0.0010	<0.0010	<0.0010	0.0010	7638739
Dissolved Uranium (U)	mg/L	0.0018	0.0027	7638739	0.0025	0.0023	0.0029	0.00010	7638739
Dissolved Vanadium (V)	mg/L	<0.0010	<0.0010	7638739	<0.0010	<0.0010	<0.0010	0.0010	7638739
Dissolved Zinc (Zn)	mg/L	<0.0030	<0.0030	7638739	<0.0030	<0.0030	0.0041	0.0030	7638739
<b>Low Level Elements</b>									
Dissolved Mercury (Hg)	ug/L	<0.0020	<0.0020	7643274	<0.0020	<0.0020	<0.0020	0.0020	7643274
RDL = Reportable Detection Limit									

Maxxam Job #: B481277  
Report Date: 2014/09/22

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Sampler Initials: KRD

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		KP0244	KP0245	KP0246	KP0247		
Sampling Date		2014/09/09 16:05	2014/09/09 16:43	2014/09/09 15:29	2014/09/09 16:55		
COC Number		A093854	A093854	A093854	A093854		
	Units	MW14-106B	MW14-109	MW13-101	MW13-102	RDL	QC Batch
<b>Elements</b>							
Dissolved Aluminum (Al)	mg/L	0.012	0.0062	<0.0030	<0.0030	0.0030	7638739
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060	<0.00060	<0.00060	0.00060	7638739
Dissolved Arsenic (As)	mg/L	0.0033	0.0020	0.010	<0.00020	0.00020	7638739
Dissolved Barium (Ba)	mg/L	0.45	0.30	0.44	<0.010	0.010	7639857
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7638739
Dissolved Boron (B)	mg/L	0.042	0.026	0.056	<0.020	0.020	7639857
Dissolved Calcium (Ca)	mg/L	99	98	100	<0.30	0.30	7639857
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7638739
Dissolved Cobalt (Co)	mg/L	0.00084	0.0019	0.00076	<0.00030	0.00030	7638739
Dissolved Copper (Cu)	mg/L	0.0011	0.00044	0.00089	<0.00020	0.00020	7638739
Dissolved Iron (Fe)	mg/L	1.7	1.5	4.1	<0.060	0.060	7639857
Dissolved Lead (Pb)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	7638739
Dissolved Lithium (Li)	mg/L	<0.020	<0.020	<0.020	<0.020	0.020	7639857
Dissolved Magnesium (Mg)	mg/L	24	25	24	<0.20	0.20	7639857
Dissolved Manganese (Mn)	mg/L	0.24	0.35	0.26	<0.0040	0.0040	7639857
Dissolved Molybdenum (Mo)	mg/L	0.0020	0.0016	0.0035	<0.00020	0.00020	7638739
Dissolved Nickel (Ni)	mg/L	0.0017	0.0021	0.0014	<0.00050	0.00050	7638739
Dissolved Phosphorus (P)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	7639857
Dissolved Potassium (K)	mg/L	2.4	1.7	2.6	<0.30	0.30	7639857
Dissolved Selenium (Se)	mg/L	0.00089	0.00057	0.00045	<0.00020	0.00020	7638739
Dissolved Silicon (Si)	mg/L	6.9	6.4	7.4	<0.10	0.10	7639857
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	7638739
Dissolved Sodium (Na)	mg/L	11	6.3	14	<0.50	0.50	7639857
Dissolved Strontium (Sr)	mg/L	0.32	0.28	0.34	<0.020	0.020	7639857
Dissolved Sulphur (S)	mg/L	13	22	3.4	<0.20	0.20	7639857
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	7638739
Dissolved Tin (Sn)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7638739
Dissolved Titanium (Ti)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7638739
Dissolved Uranium (U)	mg/L	0.0041	0.0027	0.0027	<0.00010	0.00010	7638739
Dissolved Vanadium (V)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7638739
Dissolved Zinc (Zn)	mg/L	0.0034	<0.0030	<0.0030	<0.0030	0.0030	7638739
<b>Low Level Elements</b>							
Dissolved Mercury (Hg)	ug/L	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	7643274
RDL = Reportable Detection Limit							

Maxxam Job #: B481277  
Report Date: 2014/09/22

SLR CONSULTING (CANADA) LTD  
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Sampler Initials: KRD

### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		KP0239	KP0240	KP0241	KP0242	KP0243	KP0244	KP0245		
Sampling Date		2014/09/09 14:58	2014/09/09 15:16	2014/09/09 14:26	2014/09/09 14:42	2014/09/09 15:47	2014/09/09 16:05	2014/09/09 16:43		
COC Number		A093854	A093854	A093854	A093854	A093854	A093854	A093854		
	Units	MW14-101	MW14-102B	MW14-103	MW14-104B	MW14-105	MW14-106B	MW14-109	RDL	QC Batch
<b>Volatiles</b>										
Total Trihalomethanes	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7636931
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
Bromoform	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
Bromomethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7642840
Carbon tetrachloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
Chlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
Chlorodibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7642840
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7642840
Chloroform	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
Chloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7642840
1,2-dibromoethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
1,2-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
1,3-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
1,4-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
1,1-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
1,2-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
1,1-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
cis-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
trans-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
Dichloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7642840
1,2-dichloropropane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
cis-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
trans-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
Methyl methacrylate	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
Methyl-tert-butylether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
1,1,1,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7642840
1,1,2,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7642840
Tetrachloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
1,2,3-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7642840
1,2,4-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7642840
1,3,5-trichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
1,1,1-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
1,1,2-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
RDL = Reportable Detection Limit										

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### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		KP0239	KP0240	KP0241	KP0242	KP0243	KP0244	KP0245		
Sampling Date		2014/09/09 14:58	2014/09/09 15:16	2014/09/09 14:26	2014/09/09 14:42	2014/09/09 15:47	2014/09/09 16:05	2014/09/09 16:43		
COC Number		A093854	A093854	A093854	A093854	A093854	A093854	A093854		
	Units	MW14-101	MW14-102B	MW14-103	MW14-104B	MW14-105	MW14-106B	MW14-109	RDL	QC Batch
Trichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
Trichlorofluoromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
1,2,4-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
1,3,5-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
Vinyl chloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7642840
<b>Surrogate Recovery (%)</b>										
1,4-Difluorobenzene (sur.)	%	99	99	100	99	99	100	100	N/A	7642840
4-Bromofluorobenzene (sur.)	%	97	98	98	100	98	100	100	N/A	7642840
D4-1,2-Dichloroethane (sur.)	%	95	96	100	98	97	99	108	N/A	7642840
RDL = Reportable Detection Limit										
N/A = Not Applicable										

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### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		KP0246	KP0247		KP0248		
Sampling Date		2014/09/09 15:29	2014/09/09 16:55		2014/09/09		
COC Number		A093854	A093854		A093854		
	Units	MW13-101	MW13-102	QC Batch	TRIP BLANK	RDL	QC Batch
<b>Volatiles</b>							
Total Trihalomethanes	ug/L	<2.0	<2.0	7636931	<2.0	2.0	7640403
Bromodichloromethane	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
Bromoform	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
Bromomethane	ug/L	<2.0	<2.0	7642840	<2.0	2.0	7642840
Carbon tetrachloride	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
Chlorobenzene	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
Chlorodibromomethane	ug/L	<1.0	<1.0	7642840	<1.0	1.0	7642840
Chloroethane	ug/L	<1.0	<1.0	7642840	<1.0	1.0	7642840
Chloroform	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
Chloromethane	ug/L	<2.0	<2.0	7642840	<2.0	2.0	7642840
1,2-dibromoethane	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
1,2-dichlorobenzene	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
1,3-dichlorobenzene	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
1,4-dichlorobenzene	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
1,1-dichloroethane	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
1,2-dichloroethane	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
1,1-dichloroethene	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
cis-1,2-dichloroethene	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
trans-1,2-dichloroethene	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
Dichloromethane	ug/L	<2.0	<2.0	7642840	<2.0	2.0	7642840
1,2-dichloropropane	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
cis-1,3-dichloropropene	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
trans-1,3-dichloropropene	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
Methyl methacrylate	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
Methyl-tert-butylether (MTBE)	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
Styrene	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
1,1,1,2-tetrachloroethane	ug/L	<2.0	<2.0	7642840	<2.0	2.0	7642840
1,1,2,2-tetrachloroethane	ug/L	<2.0	<2.0	7642840	<2.0	2.0	7642840
Tetrachloroethene	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
1,2,3-trichlorobenzene	ug/L	<1.0	<1.0	7642840	<1.0	1.0	7642840
1,2,4-trichlorobenzene	ug/L	<1.0	<1.0	7642840	<1.0	1.0	7642840
1,3,5-trichlorobenzene	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
1,1,1-trichloroethane	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
1,1,2-trichloroethane	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
RDL = Reportable Detection Limit							

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### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		KP0246	KP0247		KP0248		
Sampling Date		2014/09/09 15:29	2014/09/09 16:55		2014/09/09		
COC Number		A093854	A093854		A093854		
	Units	MW13-101	MW13-102	QC Batch	TRIP BLANK	RDL	QC Batch
Trichloroethene	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
Trichlorofluoromethane	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
1,2,4-trimethylbenzene	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
1,3,5-trimethylbenzene	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
Vinyl chloride	ug/L	<0.50	<0.50	7642840	<0.50	0.50	7642840
<b>Surrogate Recovery (%)</b>							
1,4-Difluorobenzene (sur.)	%	99	100	7642840	101	N/A	7642840
4-Bromofluorobenzene (sur.)	%	102	101	7642840	102	N/A	7642840
D4-1,2-Dichloroethane (sur.)	%	96	100	7642840	102	N/A	7642840
RDL = Reportable Detection Limit N/A = Not Applicable							

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SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
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Sampler Initials: KRD

### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		KP0239	KP0240	KP0241	KP0242	KP0243	KP0244		
Sampling Date		2014/09/09 14:58	2014/09/09 15:16	2014/09/09 14:26	2014/09/09 14:42	2014/09/09 15:47	2014/09/09 16:05		
COC Number		A093854	A093854	A093854	A093854	A093854	A093854		
	Units	MW14-101	MW14-102B	MW14-103	MW14-104B	MW14-105	MW14-106B	RDL	QC Batch

Volatiles									
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7642898
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7642898
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7642898
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7642898
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7642898
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7642898
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	0.15	<0.10	<0.10	<0.10	0.10	7642898
(C6-C10)	mg/L	<0.10	<0.10	0.15	<0.10	<0.10	<0.10	0.10	7642898

#### Surrogate Recovery (%)

1,4-Difluorobenzene (sur.)	%	103	106	106	105	104	105	N/A	7642898
4-Bromofluorobenzene (sur.)	%	105	104	105	104	104	105	N/A	7642898
D4-1,2-Dichloroethane (sur.)	%	100	98	99	97	99	97	N/A	7642898

RDL = Reportable Detection Limit

N/A = Not Applicable

Maxxam ID		KP0245	KP0246	KP0247		KP0248		
Sampling Date		2014/09/09 16:43	2014/09/09 15:29	2014/09/09 16:55		2014/09/09		
COC Number		A093854	A093854	A093854		A093854		
	Units	MW14-109	MW13-101	MW13-102	QC Batch	TRIP BLANK	RDL	QC Batch

Volatiles								
Benzene	mg/L	<0.00040	<0.00040	<0.00040	7642898	<0.00040	0.00040	7646398
Toluene	mg/L	<0.00040	<0.00040	<0.00040	7642898	<0.00040	0.00040	7646398
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	7642898	<0.00040	0.00040	7646398
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	7642898	<0.00080	0.00080	7646398
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	7642898	<0.00040	0.00040	7646398
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	7642898	<0.00080	0.00080	7646398
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	7642898	<0.10	0.10	7646398
(C6-C10)	mg/L	<0.10	<0.10	<0.10	7642898	<0.10	0.10	7646398

#### Surrogate Recovery (%)

1,4-Difluorobenzene (sur.)	%	103	103	105	7642898	108	N/A	7646398
4-Bromofluorobenzene (sur.)	%	105	105	103	7642898	105	N/A	7646398
D4-1,2-Dichloroethane (sur.)	%	97	97	101	7642898	79	N/A	7646398

RDL = Reportable Detection Limit

N/A = Not Applicable

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### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	-0.7°C
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**Results relate only to the items tested.**

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### QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7637073	SCC	Spiked Blank	Alkalinity (Total as CaCO <sub>3</sub> )	2014/09/14		92	%	80 - 120
7637073	SCC	Method Blank	Alkalinity (PP as CaCO <sub>3</sub> )	2014/09/14	<0.50		mg/L	
			Alkalinity (Total as CaCO <sub>3</sub> )	2014/09/14	<0.50		mg/L	
			Bicarbonate (HCO <sub>3</sub> )	2014/09/14	<0.50		mg/L	
			Carbonate (CO <sub>3</sub> )	2014/09/14	<0.50		mg/L	
			Hydroxide (OH)	2014/09/14	<0.50		mg/L	
7637073	SCC	RPD	Alkalinity (PP as CaCO <sub>3</sub> )	2014/09/14	2.8		%	20
			Alkalinity (Total as CaCO <sub>3</sub> )	2014/09/14	0.82		%	20
			Bicarbonate (HCO <sub>3</sub> )	2014/09/14	1.4		%	20
			Carbonate (CO <sub>3</sub> )	2014/09/14	2.8		%	20
			Hydroxide (OH)	2014/09/14	NC		%	20
7637078	SCC	Spiked Blank	pH	2014/09/14		100	%	97 - 102
7637078	SCC	RPD	pH	2014/09/14	0.016		%	N/A
7637080	SCC	Spiked Blank	Conductivity	2014/09/14		102	%	90 - 110
7637080	SCC	Method Blank	Conductivity	2014/09/14	<1.0		uS/cm	
7637080	SCC	RPD	Conductivity	2014/09/14	0.46		%	20
7637235	DK9	Matrix Spike [KP0247-03]	Dissolved Organic Carbon (C)	2014/09/14		109	%	80 - 120
7637235	DK9	Spiked Blank	Dissolved Organic Carbon (C)	2014/09/14		113	%	80 - 120
7637235	DK9	Method Blank	Dissolved Organic Carbon (C)	2014/09/14	<0.50		mg/L	
7637235	DK9	RPD [KP0247-03]	Dissolved Organic Carbon (C)	2014/09/14	NC		%	20
7637338	BN2	Matrix Spike	Dissolved Nitrite (N)	2014/09/14		108	%	80 - 120
			Dissolved Nitrate (N)	2014/09/14		108	%	80 - 120
7637338	BN2	Spiked Blank	Dissolved Nitrite (N)	2014/09/14		102	%	80 - 120
			Dissolved Nitrate (N)	2014/09/14		102	%	80 - 120
7637338	BN2	Method Blank	Dissolved Nitrite (N)	2014/09/14	<0.010		mg/L	
			Dissolved Nitrate (N)	2014/09/14	<0.010		mg/L	
7637338	BN2	RPD	Dissolved Nitrite (N)	2014/09/14	NC		%	20
			Dissolved Nitrate (N)	2014/09/14	NC		%	20
7637342	BN2	Matrix Spike [KP0240-01]	Dissolved Nitrite (N)	2014/09/14		108	%	80 - 120
			Dissolved Nitrate (N)	2014/09/14		108	%	80 - 120
7637342	BN2	Spiked Blank	Dissolved Nitrite (N)	2014/09/14		103	%	80 - 120
			Dissolved Nitrate (N)	2014/09/14		103	%	80 - 120
7637342	BN2	Method Blank	Dissolved Nitrite (N)	2014/09/14	<0.010		mg/L	
			Dissolved Nitrate (N)	2014/09/14	<0.010		mg/L	
7637342	BN2	RPD [KP0240-01]	Dissolved Nitrite (N)	2014/09/14	NC		%	20
			Dissolved Nitrate (N)	2014/09/14	NC		%	20
7637594	BL5	Matrix Spike	Total Ammonia (N)	2014/09/14		91	%	80 - 120
7637594	BL5	Spiked Blank	Total Ammonia (N)	2014/09/14		98	%	80 - 120
7637594	BL5	Method Blank	Total Ammonia (N)	2014/09/14	<0.050		mg/L	
7637594	BL5	RPD	Total Ammonia (N)	2014/09/14	4.7		%	20
7638584	LY	Matrix Spike	Phenols	2014/09/15		NC	%	80 - 120
7638584	LY	Spiked Blank	Phenols	2014/09/15		99	%	80 - 120
7638584	LY	Method Blank	Phenols	2014/09/15	<0.0020		mg/L	
7638584	LY	RPD	Phenols	2014/09/15	NC		%	20
7638733	DR4	Matrix Spike [KP0239-07]	O-TERPHENYL (sur.)	2014/09/17		87	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/17		89	%	50 - 130
7638733	DR4	Spiked Blank	O-TERPHENYL (sur.)	2014/09/17		91	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/17		96	%	70 - 130
7638733	DR4	Method Blank	O-TERPHENYL (sur.)	2014/09/17		88	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/09/17	<0.10		mg/L	
7638733	DR4	RPD	F2 (C10-C16 Hydrocarbons)	2014/09/17	NC		%	40
7638739	HC7	Matrix Spike	Dissolved Aluminum (Al)	2014/09/16		104	%	80 - 120

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### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7638739	HC7	Spiked Blank	Dissolved Antimony (Sb)	2014/09/16		74 (1)	%	80 - 120
			Dissolved Arsenic (As)	2014/09/16		102	%	80 - 120
			Dissolved Beryllium (Be)	2014/09/16		97	%	80 - 120
			Dissolved Chromium (Cr)	2014/09/16		97	%	80 - 120
			Dissolved Cobalt (Co)	2014/09/16		91	%	80 - 120
			Dissolved Copper (Cu)	2014/09/16		92	%	80 - 120
			Dissolved Lead (Pb)	2014/09/16		91	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/09/16		103	%	80 - 120
			Dissolved Nickel (Ni)	2014/09/16		95	%	80 - 120
			Dissolved Selenium (Se)	2014/09/16		102	%	80 - 120
			Dissolved Silver (Ag)	2014/09/16		98	%	80 - 120
			Dissolved Thallium (Tl)	2014/09/16		93	%	80 - 120
			Dissolved Tin (Sn)	2014/09/16		97	%	80 - 120
			Dissolved Titanium (Ti)	2014/09/16		102	%	80 - 120
			Dissolved Uranium (U)	2014/09/16		100	%	80 - 120
			Dissolved Vanadium (V)	2014/09/16		101	%	80 - 120
			Dissolved Zinc (Zn)	2014/09/16		101	%	80 - 120
			Dissolved Aluminum (Al)	2014/09/15		105	%	80 - 120
			Dissolved Antimony (Sb)	2014/09/15		98	%	80 - 120
			Dissolved Arsenic (As)	2014/09/15		102	%	80 - 120
			Dissolved Beryllium (Be)	2014/09/15		105	%	80 - 120
			Dissolved Chromium (Cr)	2014/09/15		98	%	80 - 120
			Dissolved Cobalt (Co)	2014/09/15		100	%	80 - 120
			Dissolved Copper (Cu)	2014/09/15		101	%	80 - 120
			Dissolved Lead (Pb)	2014/09/15		98	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/09/15		100	%	80 - 120
			Dissolved Nickel (Ni)	2014/09/15		100	%	80 - 120
			Dissolved Selenium (Se)	2014/09/15		100	%	80 - 120
			Dissolved Silver (Ag)	2014/09/15		99	%	80 - 120
			Dissolved Thallium (Tl)	2014/09/15		99	%	80 - 120
			Dissolved Tin (Sn)	2014/09/15		98	%	80 - 120
			Dissolved Titanium (Ti)	2014/09/15		97	%	80 - 120
			Dissolved Uranium (U)	2014/09/15		101	%	80 - 120
			Dissolved Vanadium (V)	2014/09/15		102	%	80 - 120
			Dissolved Zinc (Zn)	2014/09/15		104	%	80 - 120
7638739	HC7	Method Blank	Dissolved Aluminum (Al)	2014/09/15	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2014/09/15	<0.00060		mg/L	
			Dissolved Arsenic (As)	2014/09/15	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2014/09/15	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2014/09/15	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2014/09/15	<0.00030		mg/L	
			Dissolved Copper (Cu)	2014/09/15	<0.00020		mg/L	
			Dissolved Lead (Pb)	2014/09/15	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2014/09/15	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2014/09/15	<0.00050		mg/L	
			Dissolved Selenium (Se)	2014/09/15	<0.00020		mg/L	
			Dissolved Silver (Ag)	2014/09/15	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2014/09/15	<0.00020		mg/L	
			Dissolved Tin (Sn)	2014/09/15	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2014/09/15	<0.0010		mg/L	
			Dissolved Uranium (U)	2014/09/15	<0.00010		mg/L	
			Dissolved Vanadium (V)	2014/09/15	<0.0010		mg/L	

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7638739	HC7	RPD	Dissolved Zinc (Zn)	2014/09/15	<0.0030		mg/L	
			Dissolved Aluminum (Al)	2014/09/15	10		%	20
			Dissolved Antimony (Sb)	2014/09/15	NC		%	20
			Dissolved Arsenic (As)	2014/09/15	NC		%	20
			Dissolved Beryllium (Be)	2014/09/15	NC		%	20
			Dissolved Chromium (Cr)	2014/09/15	NC		%	20
			Dissolved Cobalt (Co)	2014/09/15	NC		%	20
			Dissolved Copper (Cu)	2014/09/15	NC		%	20
			Dissolved Lead (Pb)	2014/09/15	NC		%	20
			Dissolved Molybdenum (Mo)	2014/09/15	NC		%	20
			Dissolved Nickel (Ni)	2014/09/15	NC		%	20
			Dissolved Selenium (Se)	2014/09/15	NC		%	20
			Dissolved Silver (Ag)	2014/09/15	NC		%	20
			Dissolved Thallium (Tl)	2014/09/15	NC		%	20
			Dissolved Tin (Sn)	2014/09/15	NC		%	20
			Dissolved Titanium (Ti)	2014/09/15	NC		%	20
			Dissolved Uranium (U)	2014/09/15	NC		%	20
			Dissolved Vanadium (V)	2014/09/15	NC		%	20
			Dissolved Zinc (Zn)	2014/09/15	NC		%	20
7639835	STI	Matrix Spike	Dissolved Barium (Ba)	2014/09/16		89	%	80 - 120
			Dissolved Boron (B)	2014/09/16		91	%	80 - 120
			Dissolved Calcium (Ca)	2014/09/16		94	%	80 - 120
			Dissolved Iron (Fe)	2014/09/16		90	%	80 - 120
			Dissolved Lithium (Li)	2014/09/16		83	%	80 - 120
			Dissolved Magnesium (Mg)	2014/09/16		NC	%	80 - 120
			Dissolved Manganese (Mn)	2014/09/16		92	%	80 - 120
			Dissolved Phosphorus (P)	2014/09/16		96	%	80 - 120
			Dissolved Potassium (K)	2014/09/16		93	%	80 - 120
			Dissolved Silicon (Si)	2014/09/16		NC	%	80 - 120
			Dissolved Sodium (Na)	2014/09/16		NC	%	80 - 120
			Dissolved Strontium (Sr)	2014/09/16		NC	%	80 - 120
7639835	STI	Spiked Blank	Dissolved Barium (Ba)	2014/09/16		92	%	80 - 120
			Dissolved Boron (B)	2014/09/16		96	%	80 - 120
			Dissolved Calcium (Ca)	2014/09/16		99	%	80 - 120
			Dissolved Iron (Fe)	2014/09/16		95	%	80 - 120
			Dissolved Lithium (Li)	2014/09/16		88	%	80 - 120
			Dissolved Magnesium (Mg)	2014/09/16		100	%	80 - 120
			Dissolved Manganese (Mn)	2014/09/16		97	%	80 - 120
			Dissolved Phosphorus (P)	2014/09/16		97	%	80 - 120
			Dissolved Potassium (K)	2014/09/16		100	%	80 - 120
			Dissolved Silicon (Si)	2014/09/16		95	%	80 - 120
7639835	STI	Method Blank	Dissolved Sodium (Na)	2014/09/16		96	%	80 - 120
			Dissolved Strontium (Sr)	2014/09/16		92	%	80 - 120
			Dissolved Barium (Ba)	2014/09/16	<0.010		mg/L	
			Dissolved Boron (B)	2014/09/16	<0.020		mg/L	
			Dissolved Calcium (Ca)	2014/09/16	<0.30		mg/L	
			Dissolved Iron (Fe)	2014/09/16	<0.060		mg/L	
			Dissolved Lithium (Li)	2014/09/16	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2014/09/16	<0.20		mg/L	
			Dissolved Manganese (Mn)	2014/09/16	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2014/09/16	<0.10		mg/L	
			Dissolved Potassium (K)	2014/09/16	<0.30		mg/L	

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7639835	STI	RPD	Dissolved Silicon (Si)	2014/09/16	<0.10		mg/L	
			Dissolved Sodium (Na)	2014/09/16	<0.50		mg/L	
			Dissolved Strontium (Sr)	2014/09/16	<0.020		mg/L	
			Dissolved Sulphur (S)	2014/09/16	<0.20		mg/L	
			Dissolved Barium (Ba)	2014/09/16	1.3		%	20
			Dissolved Boron (B)	2014/09/16	0.31		%	20
			Dissolved Calcium (Ca)	2014/09/16	0.54		%	20
			Dissolved Iron (Fe)	2014/09/16	NC		%	20
			Dissolved Lithium (Li)	2014/09/16	NC		%	20
			Dissolved Magnesium (Mg)	2014/09/16	1.1		%	20
			Dissolved Manganese (Mn)	2014/09/16	0.60		%	20
			Dissolved Phosphorus (P)	2014/09/16	NC		%	20
			Dissolved Potassium (K)	2014/09/16	0.053		%	20
			Dissolved Silicon (Si)	2014/09/16	0.56		%	20
			Dissolved Sodium (Na)	2014/09/16	1.1		%	20
			Dissolved Strontium (Sr)	2014/09/16	0.95		%	20
7639857	MAP	Matrix Spike [KP0241-04]	Dissolved Sulphur (S)	2014/09/16	0.81		%	20
			Dissolved Barium (Ba)	2014/09/17		97	%	80 - 120
			Dissolved Boron (B)	2014/09/17		97	%	80 - 120
			Dissolved Calcium (Ca)	2014/09/17		NC	%	80 - 120
			Dissolved Iron (Fe)	2014/09/17		NC	%	80 - 120
			Dissolved Lithium (Li)	2014/09/17		97	%	80 - 120
			Dissolved Magnesium (Mg)	2014/09/17		96	%	80 - 120
			Dissolved Manganese (Mn)	2014/09/17		97	%	80 - 120
			Dissolved Phosphorus (P)	2014/09/17		102	%	80 - 120
			Dissolved Potassium (K)	2014/09/17		112	%	80 - 120
			Dissolved Silicon (Si)	2014/09/17		95	%	80 - 120
			Dissolved Sodium (Na)	2014/09/17		99	%	80 - 120
			Dissolved Strontium (Sr)	2014/09/17		97	%	80 - 120
7639857	MAP	Spiked Blank	Dissolved Barium (Ba)	2014/09/17		94	%	80 - 120
			Dissolved Boron (B)	2014/09/17		95	%	80 - 120
			Dissolved Calcium (Ca)	2014/09/17		100	%	80 - 120
			Dissolved Iron (Fe)	2014/09/17		100	%	80 - 120
			Dissolved Lithium (Li)	2014/09/17		94	%	80 - 120
			Dissolved Magnesium (Mg)	2014/09/17		98	%	80 - 120
			Dissolved Manganese (Mn)	2014/09/17		97	%	80 - 120
			Dissolved Phosphorus (P)	2014/09/17		96	%	80 - 120
			Dissolved Potassium (K)	2014/09/17		103	%	80 - 120
			Dissolved Silicon (Si)	2014/09/17		98	%	80 - 120
			Dissolved Sodium (Na)	2014/09/17		97	%	80 - 120
			Dissolved Strontium (Sr)	2014/09/17		96	%	80 - 120
7639857	MAP	Method Blank	Dissolved Barium (Ba)	2014/09/17	<0.010		mg/L	
			Dissolved Boron (B)	2014/09/17	<0.020		mg/L	
			Dissolved Calcium (Ca)	2014/09/17	<0.30		mg/L	
			Dissolved Iron (Fe)	2014/09/17	<0.060		mg/L	
			Dissolved Lithium (Li)	2014/09/17	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2014/09/17	<0.20		mg/L	
			Dissolved Manganese (Mn)	2014/09/17	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2014/09/17	<0.10		mg/L	
			Dissolved Potassium (K)	2014/09/17	<0.30		mg/L	
			Dissolved Silicon (Si)	2014/09/17	<0.10		mg/L	
			Dissolved Sodium (Na)	2014/09/17	<0.50		mg/L	

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7639857	MAP	RPD [KP0241-04]	Dissolved Strontium (Sr)	2014/09/17	<0.020		mg/L	
			Dissolved Sulphur (S)	2014/09/17	<0.20		mg/L	
			Dissolved Barium (Ba)	2014/09/16	0.14		%	20
			Dissolved Boron (B)	2014/09/16	NC		%	20
			Dissolved Calcium (Ca)	2014/09/16	0.026		%	20
			Dissolved Iron (Fe)	2014/09/16	1.6		%	20
			Dissolved Lithium (Li)	2014/09/16	NC		%	20
			Dissolved Magnesium (Mg)	2014/09/16	0.12		%	20
			Dissolved Manganese (Mn)	2014/09/16	0.11		%	20
			Dissolved Phosphorus (P)	2014/09/16	NC		%	20
			Dissolved Potassium (K)	2014/09/16	6.6		%	20
			Dissolved Silicon (Si)	2014/09/16	0.20		%	20
			Dissolved Sodium (Na)	2014/09/16	0.68		%	20
			Dissolved Strontium (Sr)	2014/09/16	0.24		%	20
			Dissolved Sulphur (S)	2014/09/16	0.18		%	20
7640010	LY	Matrix Spike	Phenols	2014/09/16		103	%	80 - 120
7640010	LY	Spiked Blank	Phenols	2014/09/16		94	%	80 - 120
7640010	LY	Method Blank	Phenols	2014/09/16	<0.0020		mg/L	
7640010	LY	RPD	Phenols	2014/09/16	NC		%	20
7641427	BL5	Matrix Spike [KP0247-02]	Total Total Kjeldahl Nitrogen	2014/09/18		103	%	80 - 120
7641427	BL5	QC Standard	Total Total Kjeldahl Nitrogen	2014/09/18		104	%	80 - 120
7641427	BL5	Spiked Blank	Total Total Kjeldahl Nitrogen	2014/09/18		101	%	80 - 120
7641427	BL5	Method Blank	Total Total Kjeldahl Nitrogen	2014/09/18	<0.050		mg/L	
7642840	GP4	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/09/19		99	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/09/19		99	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/19		100	%	70 - 130
			Bromodichloromethane	2014/09/19		105	%	70 - 130
			Bromoform	2014/09/19		100	%	70 - 130
			Bromomethane	2014/09/19		92	%	70 - 130
			Carbon tetrachloride	2014/09/19		96	%	70 - 130
			Chlorobenzene	2014/09/19		98	%	70 - 130
			Chlorodibromomethane	2014/09/19		107	%	70 - 130
			Chloroethane	2014/09/19		84	%	70 - 130
			Chloroform	2014/09/19		106	%	70 - 130
			Chloromethane	2014/09/19		85	%	70 - 130
			1,2-dibromoethane	2014/09/19		105	%	70 - 130
			1,2-dichlorobenzene	2014/09/19		96	%	70 - 130
			1,3-dichlorobenzene	2014/09/19		98	%	70 - 130
			1,4-dichlorobenzene	2014/09/19		95	%	70 - 130
			1,1-dichloroethane	2014/09/19		97	%	70 - 130
			1,2-dichloroethane	2014/09/19		96	%	70 - 130
			1,1-dichloroethene	2014/09/19		95	%	70 - 130
			cis-1,2-dichloroethene	2014/09/19		97	%	70 - 130
			trans-1,2-dichloroethene	2014/09/19		95	%	70 - 130
			Dichloromethane	2014/09/19		93	%	70 - 130
			1,2-dichloropropane	2014/09/19		100	%	70 - 130
			cis-1,3-dichloropropene	2014/09/19		97	%	70 - 130
			trans-1,3-dichloropropene	2014/09/19		100	%	70 - 130
			Methyl methacrylate	2014/09/19		120	%	70 - 130
			Methyl-tert-butylether (MTBE)	2014/09/19		98	%	70 - 130
			Styrene	2014/09/19		106	%	70 - 130
			1,1,1,2-tetrachloroethane	2014/09/19		102	%	70 - 130

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7642840	GP4	Spiked Blank	1,1,2,2-tetrachloroethane	2014/09/19		103	%	70 - 130
			Tetrachloroethene	2014/09/19		96	%	70 - 130
			1,2,3-trichlorobenzene	2014/09/19		94	%	70 - 130
			1,2,4-trichlorobenzene	2014/09/19		91	%	70 - 130
			1,3,5-trichlorobenzene	2014/09/19		93	%	70 - 130
			1,1,1-trichloroethane	2014/09/19		97	%	70 - 130
			1,1,2-trichloroethane	2014/09/19		94	%	70 - 130
			Trichloroethene	2014/09/19		90	%	70 - 130
			Trichlorofluoromethane	2014/09/19		86	%	70 - 130
			1,2,4-trimethylbenzene	2014/09/19		96	%	70 - 130
			1,3,5-trimethylbenzene	2014/09/19		99	%	70 - 130
			Vinyl chloride	2014/09/19		91	%	70 - 130
			1,4-Difluorobenzene (sur.)	2014/09/19		101	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/09/19		101	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/19		101	%	70 - 130
			Bromodichloromethane	2014/09/19		106	%	70 - 130
			Bromoform	2014/09/19		95	%	70 - 130
			Bromomethane	2014/09/19		91	%	70 - 130
			Carbon tetrachloride	2014/09/19		95	%	70 - 130
			Chlorobenzene	2014/09/19		93	%	70 - 130
			Chlorodibromomethane	2014/09/19		99	%	70 - 130
			Chloroethane	2014/09/19		93	%	70 - 130
			Chloroform	2014/09/19		104	%	70 - 130
			Chloromethane	2014/09/19		85	%	70 - 130
			1,2-dibromoethane	2014/09/19		97	%	70 - 130
			1,2-dichlorobenzene	2014/09/19		95	%	70 - 130
			1,3-dichlorobenzene	2014/09/19		95	%	70 - 130
			1,4-dichlorobenzene	2014/09/19		94	%	70 - 130
			1,1-dichloroethane	2014/09/19		94	%	70 - 130
			1,2-dichloroethane	2014/09/19		93	%	70 - 130
			1,1-dichloroethene	2014/09/19		97	%	70 - 130
			cis-1,2-dichloroethene	2014/09/19		92	%	70 - 130
			trans-1,2-dichloroethene	2014/09/19		94	%	70 - 130
			Dichloromethane	2014/09/19		90	%	70 - 130
			1,2-dichloropropane	2014/09/19		99	%	70 - 130
			cis-1,3-dichloropropene	2014/09/19		100	%	70 - 130
			trans-1,3-dichloropropene	2014/09/19		97	%	70 - 130
			Methyl methacrylate	2014/09/19		119	%	70 - 130
			Methyl-tert-butylether (MTBE)	2014/09/19		98	%	70 - 130
			Styrene	2014/09/19		101	%	70 - 130
			1,1,1,2-tetrachloroethane	2014/09/19		98	%	70 - 130
			1,1,2,2-tetrachloroethane	2014/09/19		95	%	70 - 130
			Tetrachloroethene	2014/09/19		93	%	70 - 130
			1,2,3-trichlorobenzene	2014/09/19		94	%	70 - 130
			1,2,4-trichlorobenzene	2014/09/19		91	%	70 - 130
			1,3,5-trichlorobenzene	2014/09/19		94	%	70 - 130
			1,1,1-trichloroethane	2014/09/19		97	%	70 - 130
			1,1,2-trichloroethane	2014/09/19		98	%	70 - 130
			Trichloroethene	2014/09/19		93	%	70 - 130
			Trichlorofluoromethane	2014/09/19		90	%	70 - 130
			1,2,4-trimethylbenzene	2014/09/19		94	%	70 - 130
			1,3,5-trimethylbenzene	2014/09/19		96	%	70 - 130

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7642840	GP4	Method Blank	Vinyl chloride	2014/09/19		85	%	70 - 130
			1,4-Difluorobenzene (sur.)	2014/09/19		98	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/09/19		97	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/19		92	%	70 - 130
			Bromodichloromethane	2014/09/19	<0.50		ug/L	
			Bromoform	2014/09/19	<0.50		ug/L	
			Bromomethane	2014/09/19	<2.0		ug/L	
			Carbon tetrachloride	2014/09/19	<0.50		ug/L	
			Chlorobenzene	2014/09/19	<0.50		ug/L	
			Chlorodibromomethane	2014/09/19	<1.0		ug/L	
			Chloroethane	2014/09/19	<1.0		ug/L	
			Chloroform	2014/09/19	<0.50		ug/L	
			Chloromethane	2014/09/19	<2.0		ug/L	
			1,2-dibromoethane	2014/09/19	<0.50		ug/L	
			1,2-dichlorobenzene	2014/09/19	<0.50		ug/L	
			1,3-dichlorobenzene	2014/09/19	<0.50		ug/L	
			1,4-dichlorobenzene	2014/09/19	<0.50		ug/L	
			1,1-dichloroethane	2014/09/19	<0.50		ug/L	
			1,2-dichloroethane	2014/09/19	<0.50		ug/L	
			1,1-dichloroethene	2014/09/19	<0.50		ug/L	
			cis-1,2-dichloroethene	2014/09/19	<0.50		ug/L	
			trans-1,2-dichloroethene	2014/09/19	<0.50		ug/L	
			Dichloromethane	2014/09/19	<2.0		ug/L	
			1,2-dichloropropane	2014/09/19	<0.50		ug/L	
			cis-1,3-dichloropropene	2014/09/19	<0.50		ug/L	
			trans-1,3-dichloropropene	2014/09/19	<0.50		ug/L	
			Methyl methacrylate	2014/09/19	<0.50		ug/L	
			Methyl-tert-butylether (MTBE)	2014/09/19	<0.50		ug/L	
			Styrene	2014/09/19	<0.50		ug/L	
			1,1,1,2-tetrachloroethane	2014/09/19	<2.0		ug/L	
			1,1,2,2-tetrachloroethane	2014/09/19	<2.0		ug/L	
			Tetrachloroethene	2014/09/19	<0.50		ug/L	
			1,2,3-trichlorobenzene	2014/09/19	<1.0		ug/L	
			1,2,4-trichlorobenzene	2014/09/19	<1.0		ug/L	
			1,3,5-trichlorobenzene	2014/09/19	<0.50		ug/L	
			1,1,1-trichloroethane	2014/09/19	<0.50		ug/L	
			1,1,2-trichloroethane	2014/09/19	<0.50		ug/L	
			Trichloroethene	2014/09/19	<0.50		ug/L	
			Trichlorofluoromethane	2014/09/19	<0.50		ug/L	
			1,2,4-trimethylbenzene	2014/09/19	<0.50		ug/L	
			1,3,5-trimethylbenzene	2014/09/19	<0.50		ug/L	
			Vinyl chloride	2014/09/19	<0.50		ug/L	
7642840	GP4	RPD	Bromodichloromethane	2014/09/19	NC		%	40
			Bromoform	2014/09/19	NC		%	40
			Bromomethane	2014/09/19	NC		%	40
			Carbon tetrachloride	2014/09/19	NC		%	40
			Chlorobenzene	2014/09/19	NC		%	40
			Chlorodibromomethane	2014/09/19	NC		%	40
			Chloroethane	2014/09/19	NC		%	40
			Chloroform	2014/09/19	6.4		%	40
			Chloromethane	2014/09/19	NC		%	40
			1,2-dibromoethane	2014/09/19	NC		%	40

Maxxam Job #: B481277  
Report Date: 2014/09/22

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			1,2-dichlorobenzene	2014/09/19	NC		%	40
			1,3-dichlorobenzene	2014/09/19	NC		%	40
			1,4-dichlorobenzene	2014/09/19	NC		%	40
			1,1-dichloroethane	2014/09/19	NC		%	40
			1,2-dichloroethane	2014/09/19	NC		%	40
			1,1-dichloroethene	2014/09/19	NC		%	40
			cis-1,2-dichloroethene	2014/09/19	NC		%	40
			trans-1,2-dichloroethene	2014/09/19	NC		%	40
			Dichloromethane	2014/09/19	NC		%	40
			1,2-dichloropropane	2014/09/19	NC		%	40
			cis-1,3-dichloropropene	2014/09/19	NC		%	40
			trans-1,3-dichloropropene	2014/09/19	NC		%	40
			Methyl methacrylate	2014/09/19	NC		%	40
			Methyl-tert-butylether (MTBE)	2014/09/19	NC		%	40
			Styrene	2014/09/19	NC		%	40
			1,1,1,2-tetrachloroethane	2014/09/19	NC		%	40
			1,1,2,2-tetrachloroethane	2014/09/19	NC		%	40
			Tetrachloroethene	2014/09/19	NC		%	40
			1,2,3-trichlorobenzene	2014/09/19	NC		%	40
			1,2,4-trichlorobenzene	2014/09/19	NC		%	40
			1,3,5-trichlorobenzene	2014/09/19	NC		%	40
			1,1,1-trichloroethane	2014/09/19	NC		%	40
			1,1,2-trichloroethane	2014/09/19	NC		%	40
			Trichloroethene	2014/09/19	NC		%	40
			Trichlorofluoromethane	2014/09/19	NC		%	40
			1,2,4-trimethylbenzene	2014/09/19	NC		%	40
			1,3,5-trimethylbenzene	2014/09/19	NC		%	40
			Vinyl chloride	2014/09/19	NC		%	40
7642898	MJO	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/09/18		102	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/09/18		104	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/18		99	%	70 - 130
			Benzene	2014/09/18		100	%	70 - 130
			Toluene	2014/09/18		90	%	70 - 130
			Ethylbenzene	2014/09/18		100	%	70 - 130
			m & p-Xylene	2014/09/18		96	%	70 - 130
			o-Xylene	2014/09/18		100	%	70 - 130
			(C6-C10)	2014/09/18		104	%	70 - 130
7642898	MJO	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/09/18		101	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/09/18		104	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/18		98	%	70 - 130
			Benzene	2014/09/18		99	%	70 - 130
			Toluene	2014/09/18		89	%	70 - 130
			Ethylbenzene	2014/09/18		98	%	70 - 130
			m & p-Xylene	2014/09/18		95	%	70 - 130
			o-Xylene	2014/09/18		99	%	70 - 130
			(C6-C10)	2014/09/18		109	%	70 - 130
7642898	MJO	Method Blank	1,4-Difluorobenzene (sur.)	2014/09/18		104	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/09/18		105	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/18		98	%	70 - 130
			Benzene	2014/09/18	<0.00040		mg/L	
			Toluene	2014/09/18	<0.00040		mg/L	
			Ethylbenzene	2014/09/18	<0.00040		mg/L	

Maxxam Job #: B481277  
Report Date: 2014/09/22

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7642898	MJ0	RPD	m & p-Xylene	2014/09/18	<0.00080		mg/L	
			o-Xylene	2014/09/18	<0.00040		mg/L	
			Xylenes (Total)	2014/09/18	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2014/09/18	<0.10		mg/L	
			(C6-C10)	2014/09/18	<0.10		mg/L	
			Benzene	2014/09/18	NC		%	40
			Toluene	2014/09/18	NC		%	40
			Ethylbenzene	2014/09/18	NC		%	40
			m & p-Xylene	2014/09/18	NC		%	40
			o-Xylene	2014/09/18	NC		%	40
			Xylenes (Total)	2014/09/18	NC		%	40
			F1 (C6-C10) - BTEX	2014/09/18	NC		%	40
			(C6-C10)	2014/09/18	NC		%	40
7643274	RK3	Matrix Spike	Dissolved Mercury (Hg)	2014/09/18		111	%	80 - 120
7643274	RK3	Spiked Blank	Dissolved Mercury (Hg)	2014/09/18		118	%	80 - 120
7643274	RK3	Method Blank	Dissolved Mercury (Hg)	2014/09/18	<0.0020		ug/L	
7643274	RK3	RPD	Dissolved Mercury (Hg)	2014/09/18	NC		%	20
7645177	ZI	Matrix Spike	Dissolved Chloride (Cl)	2014/09/19		103	%	80 - 120
7645177	ZI	Spiked Blank	Dissolved Chloride (Cl)	2014/09/19		103	%	80 - 120
7645177	ZI	Method Blank	Dissolved Chloride (Cl)	2014/09/19	<1.0		mg/L	
7645177	ZI	RPD	Dissolved Chloride (Cl)	2014/09/19	NC		%	20
7645191	ZI	Matrix Spike	Dissolved Sulphate (SO4)	2014/09/19		106	%	80 - 120
7645191	ZI	Spiked Blank	Dissolved Sulphate (SO4)	2014/09/19		103	%	80 - 120
7645191	ZI	Method Blank	Dissolved Sulphate (SO4)	2014/09/19	<1.0		mg/L	
7645191	ZI	RPD	Dissolved Sulphate (SO4)	2014/09/19	NC		%	20
7646398	MJ0	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/09/21		100	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/09/21		101	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/21		76	%	70 - 130
			Benzene	2014/09/21		85	%	70 - 130
			Toluene	2014/09/21		82	%	70 - 130
			Ethylbenzene	2014/09/21		83	%	70 - 130
			m & p-Xylene	2014/09/21		82	%	70 - 130
			o-Xylene	2014/09/21		84	%	70 - 130
			(C6-C10)	2014/09/21		90	%	70 - 130
			1,4-Difluorobenzene (sur.)	2014/09/21		103	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/09/21		107	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/21		81	%	70 - 130
			Benzene	2014/09/21		90	%	70 - 130
			Toluene	2014/09/21		82	%	70 - 130
7646398	MJ0	Spiked Blank	Ethylbenzene	2014/09/21		82	%	70 - 130
			m & p-Xylene	2014/09/21		82	%	70 - 130
			o-Xylene	2014/09/21		87	%	70 - 130
			(C6-C10)	2014/09/21		94	%	70 - 130
			1,4-Difluorobenzene (sur.)	2014/09/22		107	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/09/22		106	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/09/22		80	%	70 - 130
			Benzene	2014/09/22	<0.00040		mg/L	
			Toluene	2014/09/22	<0.00040		mg/L	
			Ethylbenzene	2014/09/22	<0.00040		mg/L	
			m & p-Xylene	2014/09/22	<0.00080		mg/L	
			o-Xylene	2014/09/22	<0.00040		mg/L	
			Xylenes (Total)	2014/09/22	<0.00080		mg/L	

Maxxam Job #: B481277  
Report Date: 2014/09/22

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7646398	MJ0	RPD	F1 (C6-C10) - BTEX	2014/09/22	<0.10		mg/L	
			(C6-C10)	2014/09/22	<0.10		mg/L	
			Benzene	2014/09/22	NC		%	40
			Toluene	2014/09/22	NC		%	40
			Ethylbenzene	2014/09/22	NC		%	40
			m & p-Xylene	2014/09/22	NC		%	40
			o-Xylene	2014/09/22	NC		%	40
			Xylenes (Total)	2014/09/22	NC		%	40
			F1 (C6-C10) - BTEX	2014/09/22	NC		%	40
			(C6-C10)	2014/09/22	NC		%	40
7647495	HC	Matrix Spike	Total Total Kjeldahl Nitrogen	2014/09/22		99	%	80 - 120
7647495	HC	QC Standard	Total Total Kjeldahl Nitrogen	2014/09/22		99	%	80 - 120
7647495	HC	Spiked Blank	Total Total Kjeldahl Nitrogen	2014/09/22		84	%	80 - 120
7647495	HC	Method Blank	Total Total Kjeldahl Nitrogen	2014/09/22	<0.050		mg/L	
7647495	HC	RPD	Total Total Kjeldahl Nitrogen	2014/09/22	NC		%	20

N/A = Not Applicable

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 sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

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

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

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 too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B481277  
Report Date: 2014/09/22

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GARDEN RIVER, AB  
Sampler Initials: KRD

### VALIDATION SIGNATURE PAGE

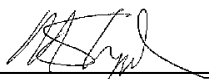
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



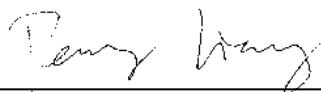
Janet Gao, Senior Analyst, Organics Department



Luba Shymushovska, Senior Analyst, Organic Department



Michael Sheppard, Organics Supervisor



Peng Liang, Analyst II

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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.



Your Project #: 200.02005.00000  
Site Location: GORDEN RIVER, AB  
Your C.O.C. #: A093147

**Attention: JASON PENTLAND**

SLR CONSULTING (CANADA) LTD  
6940 ROPER ROAD  
EDMONTON, AB  
CANADA T6B 3H9

**Report Date: 2014/11/27**

Report #: R1691141

Version: 1 - Final

## **CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B4A5751**

**Received: 2014/11/19, 15:49**

Sample Matrix: Water  
# Samples Received: 10

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO <sub>3</sub> ,HCO <sub>3</sub> ,OH	9	N/A	2014/11/22	AB SOP-00005	SM 22 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	10	N/A	2014/11/24	AB SOP-00039	CCME CWS/EPA 8260C m
Cadmium - low level CCME - Dissolved	9	N/A	2014/11/25	AB SOP-00043	EPA 200.8 R5.4 m
Chloride by Automated Colourimetry	9	N/A	2014/11/26	AB SOP-00020	SM 22-4500-Cl G m
Carbon (DOC) (1)	9	N/A	2014/11/21	CAL SOP-00077	MMCW 119 1996 m
Conductivity @25C	9	N/A	2014/11/22	AB SOP-00005	SM 22 2510 B m
CCME Hydrocarbons in Water (F2; C10-C16)	8	2014/11/21	2014/11/22	AB SOP-00040 AB SOP-00037	CCME PHC-CWS
CCME Hydrocarbons in Water (F2; C10-C16)	2	2014/11/21	2014/11/23	AB SOP-00040 AB SOP-00037	CCME PHC-CWS
Hardness	9	N/A	2014/11/21	AB WI-00065	SM 2340B
Mercury - Low Level (Dissolved)	8	2014/11/21	2014/11/21	CAL SOP-00007	EPA 1631 RE 20460 m
Mercury - Low Level (Dissolved)	1	2014/11/21	2014/11/24	CAL SOP-00007	EPA 1631 RE 20460 m
Elements by ICP - Dissolved	9	N/A	2014/11/21	AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICPMS - Dissolved	9	N/A	2014/11/21	AB SOP-00043	EPA 200.8 R5.4 m
Ion Balance	9	N/A	2014/11/21	AB WI-00065	SM 1030E
Sum of cations, anions	9	N/A	2014/11/21	AB WI-00065	SM 1030E
Ammonia-N (Total)	9	N/A	2014/11/21	AB SOP-00007	EPA 350.1 R2.0 m
Nitrate and Nitrite	9	N/A	2014/11/24	AB SOP-00023	Auto Calc
Nitrate + Nitrite-N (calculated)	9	N/A	2014/11/24	AB SOP-00023	SM 4110-B
Nitrogen, (Nitrite, Nitrate) by IC	9	N/A	2014/11/21	AB SOP-00023	SM 22 4110 B m
pH @25°C (Alkalinity titrator)	9	N/A	2014/11/22	AB SOP-00005	SM 22 4500-H+B m
Phenols (4-AAP)	9	N/A	2014/11/21	CAL SOP-00067	EPA 9066 R0 m
Sulphate by Automated Colourimetry	9	N/A	2014/11/26	AB SOP-00018	SM 22 4500-SO4 E m
Total Dissolved Solids (Calculated)	9	N/A	2014/11/26	AB WI-00065	SM 1030E
Total Trihalomethanes Calculation	10	N/A	2014/11/24	CAL SOP-00104	Auto Calc
Total Kjeldahl Nitrogen	8	2014/11/23	2014/11/23	AB SOP-00008	EPA 351.1 R1978 m
Total Kjeldahl Nitrogen	1	2014/11/23	2014/11/24	AB SOP-00008	EPA 351.1 R1978 m
VOCs in Water by HS GC/MS (Std List)	10	N/A	2014/11/21	AB SOP-00056	EPA 8260C / 5021A m

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your Project #: 200.02005.00000  
Site Location: GORDEN RIVER, AB  
Your C.O.C. #: A093147

**Attention: JASON PENTLAND**

SLR CONSULTING (CANADA) LTD  
6940 ROPER ROAD  
EDMONTON, AB  
CANADA T6B 3H9

**Report Date: 2014/11/27**

Report #: R1691141

Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B4A5751**

**Received: 2014/11/19, 15:49**

(1) DOC present in the sample should be considered as non-purgeable DOC.

**Encryption Key**

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

Carmen McKay, Project Manager

Email: CMcKay@maxxam.ca

Phone# (403)219-3683

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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.

Maxxam Job #: B4A5751  
Report Date: 2014/11/27

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GORDEN RIVER, AB  
Sampler Initials: KRD

## RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		LE6861		LE6862	LE6863		LE6864	LE6865		
Sampling Date		2014/11/18 16:40		2014/11/18 15:35	2014/11/18 14:55		2014/11/18 14:15	2014/11/18 14:35		
COC Number		A093147		A093147	A093147		A093147	A093147		
	Units	MW14-109	QC Batch	MW14-102B	MW14-101	QC Batch	MW14-104B	MW14-103	RDL	QC Batch

Calculated Parameters										
Anion Sum	meq/L	6.9	7726518	7.3	7.8	7726518	7.0	7.5	N/A	7726518
Cation Sum	meq/L	7.4	7726518	7.8	8.7	7726518	7.5	7.9	N/A	7726518
Hardness (CaCO <sub>3</sub> )	mg/L	350	7726516	350	370	7726516	340	360	0.50	7726516
Ion Balance	N/A	1.1	7726517	1.1	1.1	7726517	1.1	1.1	0.010	7726517
Dissolved Nitrate (NO <sub>3</sub> )	mg/L	0.071	7726519	0.046	0.085	7726519	0.14	0.094	0.044	7726519
Nitrate plus Nitrite (N)	mg/L	0.016	7726520	0.010	0.019	7726520	0.032	0.021	0.010	7726520
Dissolved Nitrite (NO <sub>2</sub> )	mg/L	<0.033	7726519	<0.033	<0.033	7726519	<0.033	<0.033	0.033	7726519
Total Dissolved Solids	mg/L	370	7726521	370	410	7726521	360	390	10	7726521

Misc. Inorganics										
Conductivity	uS/cm	640	7727849	680	720	7728374	660	700	1.0	7727849
Dissolved Organic Carbon (C)	mg/L	4.5	7727667	12	16	7727667	9.3	11	0.50	7727667
pH	pH	7.88	7727848	8.08	7.95	7728373	7.85	7.87	N/A	7727848

Low Level Elements										
Dissolved Cadmium (Cd)	ug/L	0.022	7726223	<0.020	<0.020	7726223	0.024	0.045	0.020	7726223

Anions										
Alkalinity (PP as CaCO <sub>3</sub> )	mg/L	<0.50	7727843	<0.50	<0.50	7728346	<0.50	<0.50	0.50	7727843
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	260	7727843	340	350	7728346	300	320	0.50	7727843
Bicarbonate (HCO <sub>3</sub> )	mg/L	320	7727843	420	430	7728346	370	390	0.50	7727843
Carbonate (CO <sub>3</sub> )	mg/L	<0.50	7727843	<0.50	<0.50	7728346	<0.50	<0.50	0.50	7727843
Hydroxide (OH)	mg/L	<0.50	7727843	<0.50	<0.50	7728346	<0.50	<0.50	0.50	7727843
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	72	7733221	11	30	7733221	40	46	1.0	7733221
Dissolved Chloride (Cl)	mg/L	4.1	7733215	6.2	5.5	7733215	4.2	4.6	1.0	7733215

Nutrients										
Total Ammonia (N)	mg/L	0.13	7728391	0.31	0.65	7728391	0.18	0.28	0.050	7728391
Total Total Kjeldahl Nitrogen	mg/L	1.4 (1)	7729365	0.88 (1)	1.5 (1)	7729365	0.92 (1)	0.86 (1)	0.50	7729365
Dissolved Nitrite (N)	mg/L	<0.010	7728042	<0.010	<0.010	7728045	<0.010	<0.010	0.010	7728045
Dissolved Nitrate (N)	mg/L	0.016	7728042	0.010	0.019	7728045	0.032	0.021	0.010	7728045

Misc. Organics										
Phenols	mg/L	<0.0020	7727470	<0.0020	<0.0020	7727470	<0.0020	<0.0020	0.0020	7727470

RDL = Reportable Detection Limit

N/A = Not Applicable

(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly

Maxxam Job #: B4A5751  
Report Date: 2014/11/27

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GORDEN RIVER, AB  
Sampler Initials: KRD

## RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		LE6866		LE6867	LE6868			LE6869		
Sampling Date		2014/11/18 16:15		2014/11/18 15:50	2014/11/18 15:15			2014/11/18 17:00		
COC Number		A093147		A093147	A093147			A093147		
	Units	MW14-105	QC Batch	MW14-106B	DUP-1	RDL	QC Batch	DUP-2	RDL	QC Batch
<b>Calculated Parameters</b>										
Anion Sum	meq/L	7.3	7726518	7.2	7.9	N/A	7726518	0.011	N/A	7726518
Cation Sum	meq/L	7.7	7726518	7.9	7.7	N/A	7726518	0.0040	N/A	7726518
Hardness (CaCO <sub>3</sub> )	mg/L	340	7726516	350	340	0.50	7726516	<0.50	0.50	7726516
Ion Balance	N/A	1.0	7726517	1.1	0.98	0.010	7726517	NC	0.010	7726517
Dissolved Nitrate (NO <sub>3</sub> )	mg/L	0.10	7726519	0.15	0.049	0.044	7726519	<0.044	0.044	7726519
Nitrate plus Nitrite (N)	mg/L	0.023	7726520	0.034	0.011	0.010	7726520	<0.010	0.010	7726520
Dissolved Nitrite (NO <sub>2</sub> )	mg/L	<0.033	7726519	<0.033	<0.033	0.033	7726519	<0.033	0.033	7726519
Total Dissolved Solids	mg/L	370	7726521	380	380	10	7726521	<10	10	7726521
<b>Misc. Inorganics</b>										
Conductivity	uS/cm	670	7727849	670	670	1.0	7727849	<1.0	1.0	7727849
Dissolved Organic Carbon (C)	mg/L	11	7727667	12	12	0.50	7727667	<0.50	0.50	7727667
pH	pH	7.83	7727848	7.86	7.88	N/A	7727848	5.44	N/A	7727848
<b>Low Level Elements</b>										
Dissolved Cadmium (Cd)	ug/L	<0.020	7726223	0.024	<0.020	0.020	7726223	<0.020	0.020	7726223
<b>Anions</b>										
Alkalinity (PP as CaCO <sub>3</sub> )	mg/L	<0.50	7727843	<0.50	<0.50	0.50	7727843	<0.50	0.50	7727843
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	330	7727843	310	370	0.50	7727843	0.53	0.50	7727843
Bicarbonate (HCO <sub>3</sub> )	mg/L	410	7727843	380	460	0.50	7727843	0.65	0.50	7727843
Carbonate (CO <sub>3</sub> )	mg/L	<0.50	7727843	<0.50	<0.50	0.50	7727843	<0.50	0.50	7727843
Hydroxide (OH)	mg/L	<0.50	7727843	<0.50	<0.50	0.50	7727843	<0.50	0.50	7727843
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	27	7733221	36	9.9	1.0	7733221	<1.0	1.0	7733221
Dissolved Chloride (Cl)	mg/L	4.6	7733215	5.2	6.3	1.0	7733215	<1.0	1.0	7733215
<b>Nutrients</b>										
Total Ammonia (N)	mg/L	0.44	7728305	0.18	0.33	0.050	7728391	<0.050	0.050	7728391
Total Total Kjeldahl Nitrogen	mg/L	1.3 (1)	7729365	0.79 (1)	0.91 (1)	0.50	7729365	<0.050	0.050	7729612
Dissolved Nitrite (N)	mg/L	<0.010	7728045	<0.010	<0.010	0.010	7728045	<0.010	0.010	7728042
Dissolved Nitrate (N)	mg/L	0.023	7728045	0.034	0.011	0.010	7728045	<0.010	0.010	7728042
<b>Misc. Organics</b>										
Phenols	mg/L	<0.0020	7727470	<0.0020	<0.0020	0.0020	7727470	<0.0020	0.0020	7727470
RDL = Reportable Detection Limit										
N/A = Not Applicable										
(1) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly										

Maxxam Job #: B4A5751  
Report Date: 2014/11/27

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GORDEN RIVER, AB  
Sampler Initials: KRD

### PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		LE6861	LE6862	LE6863	LE6864	LE6865	LE6866	LE6867		
Sampling Date		2014/11/18 16:40	2014/11/18 15:35	2014/11/18 14:55	2014/11/18 14:15	2014/11/18 14:35	2014/11/18 16:15	2014/11/18 15:50		
COC Number		A093147	A093147	A093147	A093147	A093147	A093147	A093147		
	Units	MW14-109	MW14-102B	MW14-101	MW14-104B	MW14-103	MW14-105	MW14-106B	RDL	QC Batch
<b>Hydrocarbons</b>										
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7726770
<b>Surrogate Recovery (%)</b>										
O-TERPHENYL (sur.)	%	109	105	105	101	103	98	106	N/A	7726770
RDL = Reportable Detection Limit										
N/A = Not Applicable										

Maxxam ID		LE6868	LE6869	LE6870		
Sampling Date		2014/11/18 15:15	2014/11/18 17:00	2014/11/18		
COC Number		A093147	A093147	A093147		
	Units	DUP-1	DUP-2	TRIP BLANK	RDL	QC Batch
<b>Hydrocarbons</b>						
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	0.10	7726770
<b>Surrogate Recovery (%)</b>						
O-TERPHENYL (sur.)	%	109	125	103	N/A	7726770
RDL = Reportable Detection Limit						
N/A = Not Applicable						

Maxxam Job #: B4A5751  
Report Date: 2014/11/27

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GORDEN RIVER, AB  
Sampler Initials: KRD

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		LE6861	LE6862	LE6863	LE6864	LE6865	LE6866		
Sampling Date		2014/11/18 16:40	2014/11/18 15:35	2014/11/18 14:55	2014/11/18 14:15	2014/11/18 14:35	2014/11/18 16:15		
COC Number		A093147	A093147	A093147	A093147	A093147	A093147		
	Units	MW14-109	MW14-102B	MW14-101	MW14-104B	MW14-103	MW14-105	RDL	QC Batch
<b>Elements</b>									
Dissolved Aluminum (Al)	mg/L	<0.0030	<0.0030	0.0063	<0.0030	<0.0030	<0.0030	0.0030	7727522
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00060	7727522
Dissolved Arsenic (As)	mg/L	0.0030	0.0085	0.013	0.0039	0.0056	0.0051	0.00020	7727522
Dissolved Barium (Ba)	mg/L	0.33	0.44	0.54	0.29	0.19	0.33	0.010	7726864
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7727522
Dissolved Boron (B)	mg/L	0.029	0.057	0.060	0.048	0.058	0.051	0.020	7726864
Dissolved Calcium (Ca)	mg/L	97	98	110	98	100	98	0.30	7726864
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7727522
Dissolved Cobalt (Co)	mg/L	0.0016	0.00062	0.0011	0.0010	0.0011	0.00084	0.00030	7727522
Dissolved Copper (Cu)	mg/L	0.00054	0.00034	0.00054	0.0012	0.00077	0.00046	0.00020	7727522
Dissolved Iron (Fe)	mg/L	2.9	4.6	12	3.3	4.0	5.3	0.060	7726864
Dissolved Lead (Pb)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	7727522
Dissolved Lithium (Li)	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7726864
Dissolved Magnesium (Mg)	mg/L	25	24	26	24	25	24	0.20	7726864
Dissolved Manganese (Mn)	mg/L	0.45	0.26	0.44	0.27	0.30	0.39	0.0040	7726864
Dissolved Molybdenum (Mo)	mg/L	0.0017	0.0032	0.0023	0.0023	0.0026	0.0026	0.00020	7727522
Dissolved Nickel (Ni)	mg/L	0.0022	0.0012	0.0019	0.0016	0.0018	0.0015	0.00050	7727522
Dissolved Phosphorus (P)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7726864
Dissolved Potassium (K)	mg/L	2.1	3.0	2.9	2.4	2.8	2.5	0.30	7726864
Dissolved Selenium (Se)	mg/L	0.00026	0.00033	0.00040	0.0011	0.00064	0.00057	0.00020	7727522
Dissolved Silicon (Si)	mg/L	6.1	6.7	7.6	6.4	6.4	6.8	0.10	7726864
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	7727522
Dissolved Sodium (Na)	mg/L	7.1	14	14	9.8	12	11	0.50	7726864
Dissolved Strontium (Sr)	mg/L	0.28	0.34	0.41	0.36	0.39	0.35	0.020	7726864
Dissolved Sulphur (S)	mg/L	23	3.4	10	14	16	9.1	0.20	7726864
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	7727522
Dissolved Tin (Sn)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7727522
Dissolved Titanium (Ti)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7727522
Dissolved Uranium (U)	mg/L	0.0022	0.0025	0.0013	0.0022	0.0021	0.0022	0.00010	7727522
Dissolved Vanadium (V)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7727522
Dissolved Zinc (Zn)	mg/L	0.0030	<0.0030	0.0033	0.0038	<0.0030	<0.0030	0.0030	7727522
<b>Low Level Elements</b>									
Dissolved Mercury (Hg)	ug/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	7727572
RDL = Reportable Detection Limit									

Maxxam Job #: B4A5751  
Report Date: 2014/11/27

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GORDEN RIVER, AB  
Sampler Initials: KR D

### ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		LE6867	LE6868	LE6869		
Sampling Date		2014/11/18 15:50	2014/11/18 15:15	2014/11/18 17:00		
COC Number		A093147	A093147	A093147		
	Units	MW14-106B	DUP-1	DUP-2	RDL	QC Batch
<b>Elements</b>						
Dissolved Aluminum (Al)	mg/L	0.0043	<0.0030	<0.0030	0.0030	7727522
Dissolved Antimony (Sb)	mg/L	<0.00060	<0.00060	<0.00060	0.00060	7727522
Dissolved Arsenic (As)	mg/L	0.0075	0.0083	<0.00020	0.00020	7727522
Dissolved Barium (Ba)	mg/L	0.49	0.44	<0.010	0.010	7726864
Dissolved Beryllium (Be)	mg/L	<0.0010	<0.0010	<0.0010	0.0010	7727522
Dissolved Boron (B)	mg/L	0.047	0.058	<0.020	0.020	7726864
Dissolved Calcium (Ca)	mg/L	99	98	<0.30	0.30	7726864
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	<0.0010	0.0010	7727522
Dissolved Cobalt (Co)	mg/L	0.00054	0.00057	<0.00030	0.00030	7727522
Dissolved Copper (Cu)	mg/L	0.00042	0.00034	<0.00020	0.00020	7727522
Dissolved Iron (Fe)	mg/L	6.1	4.7	<0.060	0.060	7726864
Dissolved Lead (Pb)	mg/L	<0.00020	<0.00020	<0.00020	0.00020	7727522
Dissolved Lithium (Li)	mg/L	<0.020	<0.020	<0.020	0.020	7726864
Dissolved Magnesium (Mg)	mg/L	25	24	<0.20	0.20	7726864
Dissolved Manganese (Mn)	mg/L	0.36	0.26	<0.0040	0.0040	7726864
Dissolved Molybdenum (Mo)	mg/L	0.0021	0.0030	<0.00020	0.00020	7727522
Dissolved Nickel (Ni)	mg/L	0.0011	0.0010	<0.00050	0.00050	7727522
Dissolved Phosphorus (P)	mg/L	<0.10	<0.10	<0.10	0.10	7726864
Dissolved Potassium (K)	mg/L	2.8	3.0	<0.30	0.30	7726864
Dissolved Selenium (Se)	mg/L	0.00036	0.00032	<0.00020	0.00020	7727522
Dissolved Silicon (Si)	mg/L	6.9	6.7	<0.10	0.10	7726864
Dissolved Silver (Ag)	mg/L	<0.00010	<0.00010	<0.00010	0.00010	7727522
Dissolved Sodium (Na)	mg/L	13	14	<0.50	0.50	7726864
Dissolved Strontium (Sr)	mg/L	0.35	0.34	<0.020	0.020	7726864
Dissolved Sulphur (S)	mg/L	11	3.4	<0.20	0.20	7726864
Dissolved Thallium (Tl)	mg/L	<0.00020	<0.00020	<0.00020	0.00020	7727522
Dissolved Tin (Sn)	mg/L	<0.0010	<0.0010	<0.0010	0.0010	7727522
Dissolved Titanium (Ti)	mg/L	<0.0010	<0.0010	<0.0010	0.0010	7727522
Dissolved Uranium (U)	mg/L	0.0025	0.0023	<0.00010	0.00010	7727522
Dissolved Vanadium (V)	mg/L	<0.0010	<0.0010	<0.0010	0.0010	7727522
Dissolved Zinc (Zn)	mg/L	<0.0030	<0.0030	<0.0030	0.0030	7727522
<b>Low Level Elements</b>						
Dissolved Mercury (Hg)	ug/L	0.0057	<0.0020	<0.0020	0.0020	7727574
RDL = Reportable Detection Limit						

Maxxam Job #: B4A5751  
Report Date: 2014/11/27

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GORDEN RIVER, AB  
Sampler Initials: KRD

### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		LE6861	LE6862	LE6863	LE6864	LE6865	LE6866	LE6867		
Sampling Date		2014/11/18 16:40	2014/11/18 15:35	2014/11/18 14:55	2014/11/18 14:15	2014/11/18 14:35	2014/11/18 16:15	2014/11/18 15:50		
COC Number		A093147	A093147	A093147	A093147	A093147	A093147	A093147		
	Units	MW14-109	MW14-102B	MW14-101	MW14-104B	MW14-103	MW14-105	MW14-106B	RDL	QC Batch

Volatiles										
Total Trihalomethanes	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7725932
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
Bromoform	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
Bromomethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7727076
Carbon tetrachloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
Chlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
Chlorodibromomethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7727076
Chloroethane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7727076
Chloroform	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
Chloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7727076
1,2-dibromoethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
1,2-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
1,3-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
1,4-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
1,1-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
1,2-dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
1,1-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
cis-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
trans-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
Dichloromethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7727076
1,2-dichloropropane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
cis-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
trans-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
Methyl methacrylate	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
Methyl-tert-butylether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
1,1,1,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7727076
1,1,2,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7727076
Tetrachloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
1,2,3-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7727076
1,2,4-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7727076
1,3,5-trichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
1,1,1-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
1,1,2-trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076

RDL = Reportable Detection Limit

Maxxam Job #: B4A5751  
Report Date: 2014/11/27

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GORDEN RIVER, AB  
Sampler Initials: KRD

### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		LE6861	LE6862	LE6863	LE6864	LE6865	LE6866	LE6867		
Sampling Date		2014/11/18 16:40	2014/11/18 15:35	2014/11/18 14:55	2014/11/18 14:15	2014/11/18 14:35	2014/11/18 16:15	2014/11/18 15:50		
COC Number		A093147	A093147	A093147	A093147	A093147	A093147	A093147		
	Units	MW14-109	MW14-102B	MW14-101	MW14-104B	MW14-103	MW14-105	MW14-106B	RDL	QC Batch
Trichloroethene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
Trichlorofluoromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
1,2,4-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
1,3,5-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
Vinyl chloride	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7727076
<b>Surrogate Recovery (%)</b>										
1,4-Difluorobenzene (sur.)	%	99	99	99	99	99	99	99	N/A	7727076
4-Bromofluorobenzene (sur.)	%	102	101	102	102	102	103	102	N/A	7727076
D4-1,2-Dichloroethane (sur.)	%	106	104	105	107	104	110	109	N/A	7727076
RDL = Reportable Detection Limit										
N/A = Not Applicable										

Maxxam Job #: B4A5751  
Report Date: 2014/11/27

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GORDEN RIVER, AB  
Sampler Initials: KRD

### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		LE6868	LE6869	LE6870		
Sampling Date		2014/11/18 15:15	2014/11/18 17:00	2014/11/18		
COC Number		A093147	A093147	A093147		
	Units	DUP-1	DUP-2	TRIP BLANK	RDL	QC Batch
<b>Volatiles</b>						
Total Trihalomethanes	ug/L	<2.0	<2.0	<2.0	2.0	7725932
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	0.50	7727528
Bromoform	ug/L	<0.50	<0.50	<0.50	0.50	7727528
Bromomethane	ug/L	<2.0	<2.0	<2.0	2.0	7727528
Carbon tetrachloride	ug/L	<0.50	<0.50	<0.50	0.50	7727528
Chlorobenzene	ug/L	<0.50	<0.50	<0.50	0.50	7727528
Chlorodibromomethane	ug/L	<1.0	<1.0	<1.0	1.0	7727528
Chloroethane	ug/L	<1.0	<1.0	<1.0	1.0	7727528
Chloroform	ug/L	<0.50	<0.50	<0.50	0.50	7727528
Chloromethane	ug/L	<2.0	<2.0	<2.0	2.0	7727528
1,2-dibromoethane	ug/L	<0.50	<0.50	<0.50	0.50	7727528
1,2-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	0.50	7727528
1,3-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	0.50	7727528
1,4-dichlorobenzene	ug/L	<0.50	<0.50	<0.50	0.50	7727528
1,1-dichloroethane	ug/L	<0.50	<0.50	<0.50	0.50	7727528
1,2-dichloroethane	ug/L	<0.50	<0.50	<0.50	0.50	7727528
1,1-dichloroethene	ug/L	<0.50	<0.50	<0.50	0.50	7727528
cis-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	0.50	7727528
trans-1,2-dichloroethene	ug/L	<0.50	<0.50	<0.50	0.50	7727528
Dichloromethane	ug/L	<2.0	<2.0	<2.0	2.0	7727528
1,2-dichloropropane	ug/L	<0.50	<0.50	<0.50	0.50	7727528
cis-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	0.50	7727528
trans-1,3-dichloropropene	ug/L	<0.50	<0.50	<0.50	0.50	7727528
Methyl methacrylate	ug/L	<0.50	<0.50	<0.50	0.50	7727528
Methyl-tert-butylether (MTBE)	ug/L	<0.50	<0.50	<0.50	0.50	7727528
Styrene	ug/L	<0.50	<0.50	<0.50	0.50	7727528
1,1,1,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	2.0	7727528
1,1,2,2-tetrachloroethane	ug/L	<2.0	<2.0	<2.0	2.0	7727528
Tetrachloroethene	ug/L	<0.50	<0.50	<0.50	0.50	7727528
1,2,3-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	1.0	7727528
1,2,4-trichlorobenzene	ug/L	<1.0	<1.0	<1.0	1.0	7727528
1,3,5-trichlorobenzene	ug/L	<0.50	<0.50	<0.50	0.50	7727528
1,1,1-trichloroethane	ug/L	<0.50	<0.50	<0.50	0.50	7727528
1,1,2-trichloroethane	ug/L	<0.50	<0.50	<0.50	0.50	7727528
RDL = Reportable Detection Limit						

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### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		LE6868	LE6869	LE6870		
Sampling Date		2014/11/18 15:15	2014/11/18 17:00	2014/11/18		
COC Number		A093147	A093147	A093147		
	Units	DUP-1	DUP-2	TRIP BLANK	RDL	QC Batch
Trichloroethene	ug/L	<0.50	<0.50	<0.50	0.50	7727528
Trichlorofluoromethane	ug/L	<0.50	<0.50	<0.50	0.50	7727528
1,2,4-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	0.50	7727528
1,3,5-trimethylbenzene	ug/L	<0.50	<0.50	<0.50	0.50	7727528
Vinyl chloride	ug/L	<0.50	<0.50	<0.50	0.50	7727528
<b>Surrogate Recovery (%)</b>						
1,4-Difluorobenzene (sur.)	%	100	99	100	N/A	7727528
4-Bromofluorobenzene (sur.)	%	101	101	101	N/A	7727528
D4-1,2-Dichloroethane (sur.)	%	101	98	98	N/A	7727528
RDL = Reportable Detection Limit N/A = Not Applicable						

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### VOLATILE ORGANICS BY GC-MS (WATER)

Maxxam ID		LE6861	LE6862	LE6863	LE6864	LE6865	LE6866		
Sampling Date		2014/11/18 16:40	2014/11/18 15:35	2014/11/18 14:55	2014/11/18 14:15	2014/11/18 14:35	2014/11/18 16:15		
COC Number		A093147	A093147	A093147	A093147	A093147	A093147		
	Units	MW14-109	MW14-102B	MW14-101	MW14-104B	MW14-103	MW14-105	RDL	QC Batch

Volatiles									
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7729783
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7729783
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7729783
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7729783
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7729783
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7729783
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7729783
(C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7729783

#### Surrogate Recovery (%)

1,4-Difluorobenzene (sur.)	%	106	107	105	105	105	106	N/A	7729783
4-Bromofluorobenzene (sur.)	%	109	109	109	110	109	108	N/A	7729783
D4-1,2-Dichloroethane (sur.)	%	107	105	106	106	109	107	N/A	7729783

RDL = Reportable Detection Limit

N/A = Not Applicable

Maxxam ID		LE6867	LE6868	LE6869	LE6870		
Sampling Date		2014/11/18 15:50	2014/11/18 15:15	2014/11/18 17:00	2014/11/18		
COC Number		A093147	A093147	A093147	A093147		
	Units	MW14-106B	DUP-1	DUP-2	TRIP BLANK	RDL	QC Batch

Volatiles							
Benzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7729783
Toluene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7729783
Ethylbenzene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7729783
m & p-Xylene	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7729783
o-Xylene	mg/L	<0.00040	<0.00040	<0.00040	<0.00040	0.00040	7729783
Xylenes (Total)	mg/L	<0.00080	<0.00080	<0.00080	<0.00080	0.00080	7729783
F1 (C6-C10) - BTEX	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	7729783
(C6-C10)	mg/L	<0.10	<0.10	<0.10	<0.10	0.10	7729783

#### Surrogate Recovery (%)

1,4-Difluorobenzene (sur.)	%	106	105	107	106	N/A	7729783
4-Bromofluorobenzene (sur.)	%	109	110	108	108	N/A	7729783
D4-1,2-Dichloroethane (sur.)	%	106	107	104	107	N/A	7729783

RDL = Reportable Detection Limit

N/A = Not Applicable

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### GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.0°C
Package 2	0.7°C

**Results relate only to the items tested.**

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SLR CONSULTING (CANADA) LTD  
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### QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7726770	MHF	Matrix Spike	O-TERPHENYL (sur.)	2014/11/22		109	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/11/22		99	%	50 - 130
7726770	MHF	Spiked Blank	O-TERPHENYL (sur.)	2014/11/22		111	%	50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/11/22		99	%	70 - 130
7726770	MHF	Method Blank	O-TERPHENYL (sur.)	2014/11/22		201 (1)		50 - 130
			F2 (C10-C16 Hydrocarbons)	2014/11/22	<0.10		mg/L	
7726770	MHF	RPD [LE6870-01]	F2 (C10-C16 Hydrocarbons)	2014/11/22	NC		%	40
7726864	KSF	Matrix Spike [LE6861-04]	Dissolved Barium (Ba)	2014/11/20		93	%	80 - 120
			Dissolved Boron (B)	2014/11/20		94	%	80 - 120
			Dissolved Calcium (Ca)	2014/11/20		NC	%	80 - 120
			Dissolved Iron (Fe)	2014/11/20		NC	%	80 - 120
			Dissolved Lithium (Li)	2014/11/20		95	%	80 - 120
			Dissolved Magnesium (Mg)	2014/11/20		96	%	80 - 120
			Dissolved Manganese (Mn)	2014/11/20		90	%	80 - 120
			Dissolved Phosphorus (P)	2014/11/20		99	%	80 - 120
			Dissolved Potassium (K)	2014/11/20		98	%	80 - 120
			Dissolved Silicon (Si)	2014/11/20		85	%	80 - 120
			Dissolved Sodium (Na)	2014/11/20		95	%	80 - 120
			Dissolved Strontium (Sr)	2014/11/20		93	%	80 - 120
7726864	KSF	Spiked Blank	Dissolved Barium (Ba)	2014/11/20		95	%	80 - 120
			Dissolved Boron (B)	2014/11/20		94	%	80 - 120
			Dissolved Calcium (Ca)	2014/11/20		96	%	80 - 120
			Dissolved Iron (Fe)	2014/11/20		94	%	80 - 120
			Dissolved Lithium (Li)	2014/11/20		96	%	80 - 120
			Dissolved Magnesium (Mg)	2014/11/20		99	%	80 - 120
			Dissolved Manganese (Mn)	2014/11/20		93	%	80 - 120
			Dissolved Phosphorus (P)	2014/11/20		98	%	80 - 120
			Dissolved Potassium (K)	2014/11/20		99	%	80 - 120
			Dissolved Silicon (Si)	2014/11/20		90	%	80 - 120
			Dissolved Sodium (Na)	2014/11/20		96	%	80 - 120
			Dissolved Strontium (Sr)	2014/11/20		95	%	80 - 120
7726864	KSF	Method Blank	Dissolved Barium (Ba)	2014/11/20	<0.010		mg/L	
			Dissolved Boron (B)	2014/11/20	<0.020		mg/L	
			Dissolved Calcium (Ca)	2014/11/20	<0.30		mg/L	
			Dissolved Iron (Fe)	2014/11/20	<0.060		mg/L	
			Dissolved Lithium (Li)	2014/11/20	<0.020		mg/L	
			Dissolved Magnesium (Mg)	2014/11/20	<0.20		mg/L	
			Dissolved Manganese (Mn)	2014/11/20	<0.0040		mg/L	
			Dissolved Phosphorus (P)	2014/11/20	<0.10		mg/L	
			Dissolved Potassium (K)	2014/11/20	<0.30		mg/L	
			Dissolved Silicon (Si)	2014/11/20	<0.10		mg/L	
			Dissolved Sodium (Na)	2014/11/20	<0.50		mg/L	
			Dissolved Strontium (Sr)	2014/11/20	<0.020		mg/L	
			Dissolved Sulphur (S)	2014/11/20	<0.20		mg/L	
7726864	KSF	RPD [LE6861-04]	Dissolved Barium (Ba)	2014/11/21	0.058		%	20
			Dissolved Boron (B)	2014/11/21	NC		%	20
			Dissolved Calcium (Ca)	2014/11/21	0.039		%	20
			Dissolved Iron (Fe)	2014/11/21	0.29		%	20
			Dissolved Lithium (Li)	2014/11/21	NC		%	20
			Dissolved Magnesium (Mg)	2014/11/21	0.13		%	20
			Dissolved Manganese (Mn)	2014/11/21	0.59		%	20
			Dissolved Phosphorus (P)	2014/11/21	NC		%	20

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### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
				Dissolved Potassium (K)	2014/11/21	2.4		%	20
				Dissolved Silicon (Si)	2014/11/21	0.42		%	20
				Dissolved Sodium (Na)	2014/11/21	0.22		%	20
				Dissolved Strontium (Sr)	2014/11/21	0.0071		%	20
				Dissolved Sulphur (S)	2014/11/21	0.13		%	20
7727076	GP4		Matrix Spike	1,4-Difluorobenzene (sur.)	2014/11/21		100	%	70 - 130
				4-Bromofluorobenzene (sur.)	2014/11/21		98	%	70 - 130
				D4-1,2-Dichloroethane (sur.)	2014/11/21		109	%	70 - 130
				Bromodichloromethane	2014/11/21		102	%	70 - 130
				Bromoform	2014/11/21		101	%	70 - 130
				Bromomethane	2014/11/21		112	%	70 - 130
				Carbon tetrachloride	2014/11/21		104	%	70 - 130
				Chlorobenzene	2014/11/21		96	%	70 - 130
				Chlorodibromomethane	2014/11/21		101	%	70 - 130
				Chloroethane	2014/11/21		109	%	70 - 130
				Chloroform	2014/11/21		98	%	70 - 130
				Chloromethane	2014/11/21		83	%	70 - 130
				1,2-dibromoethane	2014/11/21		110	%	70 - 130
				1,2-dichlorobenzene	2014/11/21		95	%	70 - 130
				1,3-dichlorobenzene	2014/11/21		94	%	70 - 130
				1,4-dichlorobenzene	2014/11/21		94	%	70 - 130
				1,1-dichloroethane	2014/11/21		107	%	70 - 130
				1,2-dichloroethane	2014/11/21		110	%	70 - 130
				1,1-dichloroethene	2014/11/21		106	%	70 - 130
				cis-1,2-dichloroethene	2014/11/21		110	%	70 - 130
				trans-1,2-dichloroethene	2014/11/21		107	%	70 - 130
				Dichloromethane	2014/11/21		101	%	70 - 130
				1,2-dichloropropane	2014/11/21		108	%	70 - 130
				cis-1,3-dichloropropene	2014/11/21		111	%	70 - 130
				trans-1,3-dichloropropene	2014/11/21		113	%	70 - 130
				Methyl methacrylate	2014/11/21		126	%	70 - 130
				Methyl-tert-butylether (MTBE)	2014/11/21		110	%	70 - 130
				Styrene	2014/11/21		101	%	70 - 130
				1,1,1,2-tetrachloroethane	2014/11/21		99	%	70 - 130
				1,1,2,2-tetrachloroethane	2014/11/21		103	%	70 - 130
				Tetrachloroethene	2014/11/21		93	%	70 - 130
				1,2,3-trichlorobenzene	2014/11/21		95	%	70 - 130
				1,2,4-trichlorobenzene	2014/11/21		95	%	70 - 130
				1,3,5-trichlorobenzene	2014/11/21		92	%	70 - 130
				1,1,1-trichloroethane	2014/11/21		103	%	70 - 130
				1,1,2-trichloroethane	2014/11/21		110	%	70 - 130
				Trichloroethene	2014/11/21		101	%	70 - 130
				Trichlorofluoromethane	2014/11/21		102	%	70 - 130
				1,2,4-trimethylbenzene	2014/11/21		98	%	70 - 130
				1,3,5-trimethylbenzene	2014/11/21		98	%	70 - 130
				Vinyl chloride	2014/11/21		108	%	70 - 130
7727076	GP4		Spiked Blank	1,4-Difluorobenzene (sur.)	2014/11/21		99	%	70 - 130
				4-Bromofluorobenzene (sur.)	2014/11/21		98	%	70 - 130
				D4-1,2-Dichloroethane (sur.)	2014/11/21		99	%	70 - 130
				Bromodichloromethane	2014/11/21		97	%	70 - 130
				Bromoform	2014/11/21		96	%	70 - 130
				Bromomethane	2014/11/21		105	%	70 - 130

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### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Carbon tetrachloride	2014/11/21		102	%	70 - 130
			Chlorobenzene	2014/11/21		93	%	70 - 130
			Chlorodibromomethane	2014/11/21		96	%	70 - 130
			Chloroethane	2014/11/21		106	%	70 - 130
			Chloroform	2014/11/21		93	%	70 - 130
			Chloromethane	2014/11/21		81	%	70 - 130
			1,2-dibromoethane	2014/11/21		104	%	70 - 130
			1,2-dichlorobenzene	2014/11/21		94	%	70 - 130
			1,3-dichlorobenzene	2014/11/21		96	%	70 - 130
			1,4-dichlorobenzene	2014/11/21		93	%	70 - 130
			1,1-dichloroethane	2014/11/21		102	%	70 - 130
			1,2-dichloroethane	2014/11/21		100	%	70 - 130
			1,1-dichloroethene	2014/11/21		103	%	70 - 130
			cis-1,2-dichloroethene	2014/11/21		104	%	70 - 130
			trans-1,2-dichloroethene	2014/11/21		104	%	70 - 130
			Dichloromethane	2014/11/21		94	%	70 - 130
			1,2-dichloropropane	2014/11/21		102	%	70 - 130
			cis-1,3-dichloropropene	2014/11/21		103	%	70 - 130
			trans-1,3-dichloropropene	2014/11/21		104	%	70 - 130
			Methyl methacrylate	2014/11/21		114	%	70 - 130
			Methyl-tert-butylether (MTBE)	2014/11/21		105	%	70 - 130
			Styrene	2014/11/21		101	%	70 - 130
			1,1,1,2-tetrachloroethane	2014/11/21		97	%	70 - 130
			1,1,2,2-tetrachloroethane	2014/11/21		99	%	70 - 130
			Tetrachloroethene	2014/11/21		94	%	70 - 130
			1,2,3-trichlorobenzene	2014/11/21		93	%	70 - 130
			1,2,4-trichlorobenzene	2014/11/21		91	%	70 - 130
			1,3,5-trichlorobenzene	2014/11/21		93	%	70 - 130
			1,1,1-trichloroethane	2014/11/21		100	%	70 - 130
			1,1,2-trichloroethane	2014/11/21		100	%	70 - 130
			Trichloroethene	2014/11/21		98	%	70 - 130
			Trichlorofluoromethane	2014/11/21		100	%	70 - 130
			1,2,4-trimethylbenzene	2014/11/21		101	%	70 - 130
			1,3,5-trimethylbenzene	2014/11/21		100	%	70 - 130
			Vinyl chloride	2014/11/21		106	%	70 - 130
7727076	GP4	Method Blank	1,4-Difluorobenzene (sur.)	2014/11/21		100	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/11/21		101	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/11/21		108	%	70 - 130
			Bromodichloromethane	2014/11/21	<0.50		ug/L	
			Bromoform	2014/11/21	<0.50		ug/L	
			Bromomethane	2014/11/21	<2.0		ug/L	
			Carbon tetrachloride	2014/11/21	<0.50		ug/L	
			Chlorobenzene	2014/11/21	<0.50		ug/L	
			Chlorodibromomethane	2014/11/21	<1.0		ug/L	
			Chloroethane	2014/11/21	<1.0		ug/L	
			Chloroform	2014/11/21	<0.50		ug/L	
			Chloromethane	2014/11/21	<2.0		ug/L	
			1,2-dibromoethane	2014/11/21	<0.50		ug/L	
			1,2-dichlorobenzene	2014/11/21	<0.50		ug/L	
			1,3-dichlorobenzene	2014/11/21	<0.50		ug/L	
			1,4-dichlorobenzene	2014/11/21	<0.50		ug/L	
			1,1-dichloroethane	2014/11/21	<0.50		ug/L	

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### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			1,2-dichloroethane	2014/11/21	<0.50		ug/L	
			1,1-dichloroethene	2014/11/21	<0.50		ug/L	
			cis-1,2-dichloroethene	2014/11/21	<0.50		ug/L	
			trans-1,2-dichloroethene	2014/11/21	<0.50		ug/L	
			Dichloromethane	2014/11/21	<2.0		ug/L	
			1,2-dichloropropane	2014/11/21	<0.50		ug/L	
			cis-1,3-dichloropropene	2014/11/21	<0.50		ug/L	
			trans-1,3-dichloropropene	2014/11/21	<0.50		ug/L	
			Methyl methacrylate	2014/11/21	<0.50		ug/L	
			Methyl-tert-butylether (MTBE)	2014/11/21	<0.50		ug/L	
			Styrene	2014/11/21	<0.50		ug/L	
			1,1,1,2-tetrachloroethane	2014/11/21	<2.0		ug/L	
			1,1,2,2-tetrachloroethane	2014/11/21	<2.0		ug/L	
			Tetrachloroethene	2014/11/21	<0.50		ug/L	
			1,2,3-trichlorobenzene	2014/11/21	<1.0		ug/L	
			1,2,4-trichlorobenzene	2014/11/21	<1.0		ug/L	
			1,3,5-trichlorobenzene	2014/11/21	<0.50		ug/L	
			1,1,1-trichloroethane	2014/11/21	<0.50		ug/L	
			1,1,2-trichloroethane	2014/11/21	<0.50		ug/L	
			Trichloroethene	2014/11/21	<0.50		ug/L	
			Trichlorofluoromethane	2014/11/21	<0.50		ug/L	
			1,2,4-trimethylbenzene	2014/11/21	<0.50		ug/L	
			1,3,5-trimethylbenzene	2014/11/21	<0.50		ug/L	
			Vinyl chloride	2014/11/21	<0.50		ug/L	
7727076	GP4	RPD	1,2-dibromoethane	2014/11/21	NC		%	40
			1,2-dichloroethane	2014/11/21	NC		%	40
7727470	AP1	Matrix Spike	Phenols	2014/11/21		103	%	80 - 120
7727470	AP1	Spiked Blank	Phenols	2014/11/21		99	%	80 - 120
7727470	AP1	Method Blank	Phenols	2014/11/21	<0.0020		mg/L	
7727470	AP1	RPD	Phenols	2014/11/21	NC		%	20
7727522	HC7	Matrix Spike	Dissolved Aluminum (Al)	2014/11/22		99	%	80 - 120
			Dissolved Antimony (Sb)	2014/11/22		68 (2)	%	80 - 120
			Dissolved Arsenic (As)	2014/11/22		111	%	80 - 120
			Dissolved Beryllium (Be)	2014/11/22		107	%	80 - 120
			Dissolved Chromium (Cr)	2014/11/22		116	%	80 - 120
			Dissolved Cobalt (Co)	2014/11/22		107	%	80 - 120
			Dissolved Copper (Cu)	2014/11/22		108	%	80 - 120
			Dissolved Lead (Pb)	2014/11/22		107	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/11/22		111	%	80 - 120
			Dissolved Nickel (Ni)	2014/11/22		107	%	80 - 120
			Dissolved Selenium (Se)	2014/11/22		113	%	80 - 120
			Dissolved Silver (Ag)	2014/11/22		106	%	80 - 120
			Dissolved Thallium (Tl)	2014/11/22		106	%	80 - 120
			Dissolved Tin (Sn)	2014/11/22		102	%	80 - 120
			Dissolved Titanium (Ti)	2014/11/22		113	%	80 - 120
			Dissolved Uranium (U)	2014/11/22		111	%	80 - 120
			Dissolved Vanadium (V)	2014/11/22		114	%	80 - 120
			Dissolved Zinc (Zn)	2014/11/22		111	%	80 - 120
7727522	HC7	Spiked Blank	Dissolved Aluminum (Al)	2014/11/21		104	%	80 - 120
			Dissolved Antimony (Sb)	2014/11/21		103	%	80 - 120
			Dissolved Arsenic (As)	2014/11/21		100	%	80 - 120
			Dissolved Beryllium (Be)	2014/11/21		104	%	80 - 120

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7727522	HC7	Method Blank	Dissolved Chromium (Cr)	2014/11/21		96	%	80 - 120
			Dissolved Cobalt (Co)	2014/11/21		98	%	80 - 120
			Dissolved Copper (Cu)	2014/11/21		100	%	80 - 120
			Dissolved Lead (Pb)	2014/11/21		98	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/11/21		100	%	80 - 120
			Dissolved Nickel (Ni)	2014/11/21		98	%	80 - 120
			Dissolved Selenium (Se)	2014/11/21		101	%	80 - 120
			Dissolved Silver (Ag)	2014/11/21		98	%	80 - 120
			Dissolved Thallium (Tl)	2014/11/21		97	%	80 - 120
			Dissolved Tin (Sn)	2014/11/21		98	%	80 - 120
			Dissolved Titanium (Ti)	2014/11/21		98	%	80 - 120
			Dissolved Uranium (U)	2014/11/21		97	%	80 - 120
			Dissolved Vanadium (V)	2014/11/21		100	%	80 - 120
			Dissolved Zinc (Zn)	2014/11/21		107	%	80 - 120
			Dissolved Aluminum (Al)	2014/11/21	<0.0030		mg/L	
			Dissolved Antimony (Sb)	2014/11/21	<0.00060		mg/L	
			Dissolved Arsenic (As)	2014/11/21	<0.00020		mg/L	
			Dissolved Beryllium (Be)	2014/11/21	<0.0010		mg/L	
			Dissolved Chromium (Cr)	2014/11/21	<0.0010		mg/L	
			Dissolved Cobalt (Co)	2014/11/21	<0.00030		mg/L	
			Dissolved Copper (Cu)	2014/11/21	<0.00020		mg/L	
			Dissolved Lead (Pb)	2014/11/21	<0.00020		mg/L	
			Dissolved Molybdenum (Mo)	2014/11/21	<0.00020		mg/L	
			Dissolved Nickel (Ni)	2014/11/21	<0.00050		mg/L	
			Dissolved Selenium (Se)	2014/11/21	<0.00020		mg/L	
			Dissolved Silver (Ag)	2014/11/21	<0.00010		mg/L	
			Dissolved Thallium (Tl)	2014/11/21	<0.00020		mg/L	
			Dissolved Tin (Sn)	2014/11/21	<0.0010		mg/L	
			Dissolved Titanium (Ti)	2014/11/21	<0.0010		mg/L	
			Dissolved Uranium (U)	2014/11/21	<0.00010		mg/L	
			Dissolved Vanadium (V)	2014/11/21	<0.0010		mg/L	
			Dissolved Zinc (Zn)	2014/11/21	<0.0030		mg/L	
7727522	HC7	RPD	Dissolved Aluminum (Al)	2014/11/21	NC		%	20
			Dissolved Antimony (Sb)	2014/11/21	NC		%	20
			Dissolved Arsenic (As)	2014/11/21	NC		%	20
			Dissolved Beryllium (Be)	2014/11/21	NC		%	20
			Dissolved Chromium (Cr)	2014/11/21	NC		%	20
			Dissolved Cobalt (Co)	2014/11/21	NC		%	20
			Dissolved Copper (Cu)	2014/11/21	NC		%	20
			Dissolved Lead (Pb)	2014/11/21	NC		%	20
			Dissolved Molybdenum (Mo)	2014/11/21	4.0		%	20
			Dissolved Nickel (Ni)	2014/11/21	NC		%	20
			Dissolved Selenium (Se)	2014/11/21	NC		%	20
			Dissolved Silver (Ag)	2014/11/21	NC		%	20
			Dissolved Thallium (Tl)	2014/11/21	NC		%	20
			Dissolved Tin (Sn)	2014/11/21	NC		%	20
			Dissolved Titanium (Ti)	2014/11/21	NC		%	20
			Dissolved Uranium (U)	2014/11/21	0.26		%	20
			Dissolved Vanadium (V)	2014/11/21	NC		%	20
			Dissolved Zinc (Zn)	2014/11/21	NC		%	20
7727528	SLZ	Matrix Spike [LE6869-08]	1,4-Difluorobenzene (sur.)	2014/11/21		100	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/11/21		96	%	70 - 130

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QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
				D4-1,2-Dichloroethane (sur.)	2014/11/21		99	%	70 - 130
				Bromodichloromethane	2014/11/21		103	%	70 - 130
				Bromoform	2014/11/21		99	%	70 - 130
				Bromomethane	2014/11/21		103	%	70 - 130
				Carbon tetrachloride	2014/11/21		111	%	70 - 130
				Chlorobenzene	2014/11/21		100	%	70 - 130
				Chlorodibromomethane	2014/11/21		101	%	70 - 130
				Chloroethane	2014/11/21		112	%	70 - 130
				Chloroform	2014/11/21		100	%	70 - 130
				Chloromethane	2014/11/21		93	%	70 - 130
				1,2-dibromoethane	2014/11/21		106	%	70 - 130
				1,2-dichlorobenzene	2014/11/21		99	%	70 - 130
				1,3-dichlorobenzene	2014/11/21		101	%	70 - 130
				1,4-dichlorobenzene	2014/11/21		100	%	70 - 130
				1,1-dichloroethane	2014/11/21		109	%	70 - 130
				1,2-dichloroethane	2014/11/21		104	%	70 - 130
				1,1-dichloroethene	2014/11/21		113	%	70 - 130
				cis-1,2-dichloroethene	2014/11/21		110	%	70 - 130
				trans-1,2-dichloroethene	2014/11/21		112	%	70 - 130
				Dichloromethane	2014/11/21		99	%	70 - 130
				1,2-dichloropropane	2014/11/21		107	%	70 - 130
				cis-1,3-dichloropropene	2014/11/21		84	%	70 - 130
				trans-1,3-dichloropropene	2014/11/21		80	%	70 - 130
				Methyl methacrylate	2014/11/21		114	%	70 - 130
				Methyl-tert-butylether (MTBE)	2014/11/21		105	%	70 - 130
				Styrene	2014/11/21		107	%	70 - 130
				1,1,1,2-tetrachloroethane	2014/11/21		104	%	70 - 130
				1,1,2,2-tetrachloroethane	2014/11/21		100	%	70 - 130
				Tetrachloroethene	2014/11/21		104	%	70 - 130
				1,2,3-trichlorobenzene	2014/11/21		95	%	70 - 130
				1,2,4-trichlorobenzene	2014/11/21		99	%	70 - 130
				1,3,5-trichlorobenzene	2014/11/21		101	%	70 - 130
				1,1,1-trichloroethane	2014/11/21		107	%	70 - 130
				1,1,2-trichloroethane	2014/11/21		104	%	70 - 130
				Trichloroethene	2014/11/21		107	%	70 - 130
				Trichlorofluoromethane	2014/11/21		111	%	70 - 130
				1,2,4-trimethylbenzene	2014/11/21		107	%	70 - 130
				1,3,5-trimethylbenzene	2014/11/21		107	%	70 - 130
				Vinyl chloride	2014/11/21		112	%	70 - 130
7727528	SLZ		Spiked Blank	1,4-Difluorobenzene (sur.)	2014/11/21		100	%	70 - 130
				4-Bromofluorobenzene (sur.)	2014/11/21		97	%	70 - 130
				D4-1,2-Dichloroethane (sur.)	2014/11/21		114	%	70 - 130
				Bromodichloromethane	2014/11/21		110	%	70 - 130
				Bromoform	2014/11/21		111	%	70 - 130
				Bromomethane	2014/11/21		112	%	70 - 130
				Carbon tetrachloride	2014/11/21		111	%	70 - 130
				Chlorobenzene	2014/11/21		102	%	70 - 130
				Chlorodibromomethane	2014/11/21		110	%	70 - 130
				Chloroethane	2014/11/21		113	%	70 - 130
				Chloroform	2014/11/21		105	%	70 - 130
				Chloromethane	2014/11/21		85	%	70 - 130
				1,2-dibromoethane	2014/11/21		120	%	70 - 130

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7727528	SLZ	Method Blank	1,2-dichlorobenzene	2014/11/21		102	%	70 - 130
			1,3-dichlorobenzene	2014/11/21		100	%	70 - 130
			1,4-dichlorobenzene	2014/11/21		100	%	70 - 130
			1,1-dichloroethane	2014/11/21		113	%	70 - 130
			1,2-dichloroethane	2014/11/21		118	%	70 - 130
			1,1-dichloroethene	2014/11/21		112	%	70 - 130
			cis-1,2-dichloroethene	2014/11/21		116	%	70 - 130
			trans-1,2-dichloroethene	2014/11/21		112	%	70 - 130
			Dichloromethane	2014/11/21		107	%	70 - 130
			1,2-dichloropropane	2014/11/21		115	%	70 - 130
			cis-1,3-dichloropropene	2014/11/21		98	%	70 - 130
			trans-1,3-dichloropropene	2014/11/21		103	%	70 - 130
			Methyl methacrylate	2014/11/21		129	%	70 - 130
			Methyl-tert-butylether (MTBE)	2014/11/21		113	%	70 - 130
			Styrene	2014/11/21		110	%	70 - 130
			1,1,1,2-tetrachloroethane	2014/11/21		107	%	70 - 130
			1,1,2,2-tetrachloroethane	2014/11/21		114	%	70 - 130
			Tetrachloroethene	2014/11/21		100	%	70 - 130
			1,2,3-trichlorobenzene	2014/11/21		96	%	70 - 130
			1,2,4-trichlorobenzene	2014/11/21		95	%	70 - 130
			1,3,5-trichlorobenzene	2014/11/21		94	%	70 - 130
			1,1,1-trichloroethane	2014/11/21		109	%	70 - 130
			1,1,2-trichloroethane	2014/11/21		117	%	70 - 130
			Trichloroethene	2014/11/21		107	%	70 - 130
			Trichlorofluoromethane	2014/11/21		109	%	70 - 130
			1,2,4-trimethylbenzene	2014/11/21		105	%	70 - 130
			1,3,5-trimethylbenzene	2014/11/21		103	%	70 - 130
			Vinyl chloride	2014/11/21		86	%	70 - 130
			1,4-Difluorobenzene (sur.)	2014/11/21		98	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/11/21		101	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/11/21		99	%	70 - 130
			Bromodichloromethane	2014/11/21	<0.50		ug/L	
			Bromoform	2014/11/21	<0.50		ug/L	
			Bromomethane	2014/11/21	<2.0		ug/L	
			Carbon tetrachloride	2014/11/21	<0.50		ug/L	
			Chlorobenzene	2014/11/21	<0.50		ug/L	
			Chlorodibromomethane	2014/11/21	<1.0		ug/L	
			Chloroethane	2014/11/21	<1.0		ug/L	
			Chloroform	2014/11/21	<0.50		ug/L	
			Chloromethane	2014/11/21	<2.0		ug/L	
			1,2-dibromoethane	2014/11/21	<0.50		ug/L	
			1,2-dichlorobenzene	2014/11/21	<0.50		ug/L	
			1,3-dichlorobenzene	2014/11/21	<0.50		ug/L	
			1,4-dichlorobenzene	2014/11/21	<0.50		ug/L	
			1,1-dichloroethane	2014/11/21	<0.50		ug/L	
			1,2-dichloroethane	2014/11/21	<0.50		ug/L	
			1,1-dichloroethene	2014/11/21	<0.50		ug/L	
			cis-1,2-dichloroethene	2014/11/21	<0.50		ug/L	
			trans-1,2-dichloroethene	2014/11/21	<0.50		ug/L	
			Dichloromethane	2014/11/21	<2.0		ug/L	
			1,2-dichloropropane	2014/11/21	<0.50		ug/L	
			cis-1,3-dichloropropene	2014/11/21	<0.50		ug/L	

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7727528	SLZ	RPD [LE6868-08]	trans-1,3-dichloropropene	2014/11/21	<0.50		ug/L	
			Methyl methacrylate	2014/11/21	<0.50		ug/L	
			Methyl-tert-butylether (MTBE)	2014/11/21	<0.50		ug/L	
			Styrene	2014/11/21	<0.50		ug/L	
			1,1,1,2-tetrachloroethane	2014/11/21	<2.0		ug/L	
			1,1,2,2-tetrachloroethane	2014/11/21	<2.0		ug/L	
			Tetrachloroethene	2014/11/21	<0.50		ug/L	
			1,2,3-trichlorobenzene	2014/11/21	<1.0		ug/L	
			1,2,4-trichlorobenzene	2014/11/21	<1.0		ug/L	
			1,3,5-trichlorobenzene	2014/11/21	<0.50		ug/L	
			1,1,1-trichloroethane	2014/11/21	<0.50		ug/L	
			1,1,2-trichloroethane	2014/11/21	<0.50		ug/L	
			Trichloroethene	2014/11/21	<0.50		ug/L	
			Trichlorofluoromethane	2014/11/21	<0.50		ug/L	
			1,2,4-trimethylbenzene	2014/11/21	<0.50		ug/L	
			1,3,5-trimethylbenzene	2014/11/21	<0.50		ug/L	
			Vinyl chloride	2014/11/21	<0.50		ug/L	
			Bromodichloromethane	2014/11/21	NC		%	40
			Bromoform	2014/11/21	NC		%	40
			Bromomethane	2014/11/21	NC		%	40
			Carbon tetrachloride	2014/11/21	NC		%	40
			Chlorobenzene	2014/11/21	NC		%	40
			Chlorodibromomethane	2014/11/21	NC		%	40
			Chloroethane	2014/11/21	NC		%	40
			Chloroform	2014/11/21	NC		%	40
			Chloromethane	2014/11/21	NC		%	40
			1,2-dibromoethane	2014/11/21	NC		%	40
			1,2-dichlorobenzene	2014/11/21	NC		%	40
			1,3-dichlorobenzene	2014/11/21	NC		%	40
			1,4-dichlorobenzene	2014/11/21	NC		%	40
			1,1-dichloroethane	2014/11/21	NC		%	40
			1,2-dichloroethane	2014/11/21	NC		%	40
			1,1-dichloroethene	2014/11/21	NC		%	40
			cis-1,2-dichloroethene	2014/11/21	NC		%	40
			trans-1,2-dichloroethene	2014/11/21	NC		%	40
			Dichloromethane	2014/11/21	NC		%	40
			1,2-dichloropropane	2014/11/21	NC		%	40
			cis-1,3-dichloropropene	2014/11/21	NC		%	40
			trans-1,3-dichloropropene	2014/11/21	NC		%	40
			Methyl methacrylate	2014/11/21	NC		%	40
			Methyl-tert-butylether (MTBE)	2014/11/21	NC		%	40
			Styrene	2014/11/21	NC		%	40
			1,1,1,2-tetrachloroethane	2014/11/21	NC		%	40
			1,1,2,2-tetrachloroethane	2014/11/21	NC		%	40
			Tetrachloroethene	2014/11/21	NC		%	40
			1,2,3-trichlorobenzene	2014/11/21	NC		%	40
			1,2,4-trichlorobenzene	2014/11/21	NC		%	40
			1,3,5-trichlorobenzene	2014/11/21	NC		%	40
			1,1,1-trichloroethane	2014/11/21	NC		%	40
			1,1,2-trichloroethane	2014/11/21	NC		%	40
			Trichloroethene	2014/11/21	NC		%	40
			Trichlorofluoromethane	2014/11/21	NC		%	40

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			1,2,4-trimethylbenzene	2014/11/21	NC		%	40
			1,3,5-trimethylbenzene	2014/11/21	NC		%	40
			Vinyl chloride	2014/11/21	NC		%	40
7727572	RK3	Matrix Spike	Dissolved Mercury (Hg)	2014/11/21		107	%	80 - 120
7727572	RK3	Spiked Blank	Dissolved Mercury (Hg)	2014/11/21		105	%	80 - 120
7727572	RK3	Method Blank	Dissolved Mercury (Hg)	2014/11/21	<0.0020		ug/L	
7727572	RK3	RPD	Dissolved Mercury (Hg)	2014/11/21	NC		%	20
7727574	RK3	Matrix Spike	Dissolved Mercury (Hg)	2014/11/21		94	%	80 - 120
7727574	RK3	Spiked Blank	Dissolved Mercury (Hg)	2014/11/24		119	%	80 - 120
7727574	RK3	Method Blank	Dissolved Mercury (Hg)	2014/11/21	<0.0020		ug/L	
7727574	RK3	RPD	Dissolved Mercury (Hg)	2014/11/21	NC		%	20
7727667	LY	Matrix Spike [LE6861-03]	Dissolved Organic Carbon (C)	2014/11/21		114	%	80 - 120
7727667	LY	Spiked Blank	Dissolved Organic Carbon (C)	2014/11/21		99	%	80 - 120
7727667	LY	Method Blank	Dissolved Organic Carbon (C)	2014/11/21	<0.50		mg/L	
7727667	LY	RPD [LE6861-03]	Dissolved Organic Carbon (C)	2014/11/21	2.6		%	20
7727843	SCC	Spiked Blank	Alkalinity (Total as CaCO3)	2014/11/21		95	%	80 - 120
7727843	SCC	Method Blank	Alkalinity (PP as CaCO3)	2014/11/21	<0.50		mg/L	
			Alkalinity (Total as CaCO3)	2014/11/21	<0.50		mg/L	
			Bicarbonate (HCO3)	2014/11/21	<0.50		mg/L	
			Carbonate (CO3)	2014/11/21	<0.50		mg/L	
			Hydroxide (OH)	2014/11/21	<0.50		mg/L	
7727843	SCC	RPD	Alkalinity (PP as CaCO3)	2014/11/21	NC		%	20
			Alkalinity (Total as CaCO3)	2014/11/21	0.75		%	20
			Bicarbonate (HCO3)	2014/11/21	0.76		%	20
			Carbonate (CO3)	2014/11/21	NC		%	20
			Hydroxide (OH)	2014/11/21	NC		%	20
7727848	SCC	Spiked Blank	pH	2014/11/21		100	%	97 - 103
7727848	SCC	RPD	pH	2014/11/21	1.4		%	N/A
7727849	SCC	Spiked Blank	Conductivity	2014/11/21		101	%	90 - 110
7727849	SCC	Method Blank	Conductivity	2014/11/21	<1.0		uS/cm	
7727849	SCC	RPD	Conductivity	2014/11/21	0.22		%	20
7728042	JLD	Matrix Spike	Dissolved Nitrite (N)	2014/11/21		104	%	80 - 120
			Dissolved Nitrate (N)	2014/11/21		101	%	80 - 120
7728042	JLD	Spiked Blank	Dissolved Nitrite (N)	2014/11/21		103	%	80 - 120
			Dissolved Nitrate (N)	2014/11/21		102	%	80 - 120
7728042	JLD	Method Blank	Dissolved Nitrite (N)	2014/11/21	<0.010		mg/L	
			Dissolved Nitrate (N)	2014/11/21	<0.010		mg/L	
7728042	JLD	RPD	Dissolved Nitrite (N)	2014/11/21	NC		%	20
			Dissolved Nitrate (N)	2014/11/21	0.57		%	20
7728045	JLD	Matrix Spike	Dissolved Nitrite (N)	2014/11/21		101	%	80 - 120
			Dissolved Nitrate (N)	2014/11/21		101	%	80 - 120
7728045	JLD	Spiked Blank	Dissolved Nitrite (N)	2014/11/21		102	%	80 - 120
			Dissolved Nitrate (N)	2014/11/21		102	%	80 - 120
7728045	JLD	Method Blank	Dissolved Nitrite (N)	2014/11/21	<0.010		mg/L	
			Dissolved Nitrate (N)	2014/11/21	<0.010		mg/L	
7728045	JLD	RPD	Dissolved Nitrite (N)	2014/11/21	NC		%	20
			Dissolved Nitrate (N)	2014/11/21	NC		%	20
7728305	BL5	Matrix Spike	Total Ammonia (N)	2014/11/21		NC	%	80 - 120
7728305	BL5	Spiked Blank	Total Ammonia (N)	2014/11/21		97	%	80 - 120
7728305	BL5	Method Blank	Total Ammonia (N)	2014/11/21	<0.050		mg/L	
7728305	BL5	RPD	Total Ammonia (N)	2014/11/21	8.1		%	20
7728346	SCC	Spiked Blank	Alkalinity (Total as CaCO3)	2014/11/22		100	%	80 - 120

Maxxam Job #: B4A5751  
Report Date: 2014/11/27

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GORDEN RIVER, AB  
Sampler Initials: KRD

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7728346	SCC	Method Blank	Alkalinity (PP as CaCO <sub>3</sub> )	2014/11/22	<0.50		mg/L	
			Alkalinity (Total as CaCO <sub>3</sub> )	2014/11/22	<0.50		mg/L	
			Bicarbonate (HCO <sub>3</sub> )	2014/11/22	<0.50		mg/L	
			Carbonate (CO <sub>3</sub> )	2014/11/22	<0.50		mg/L	
			Hydroxide (OH)	2014/11/22	<0.50		mg/L	
7728346	SCC	RPD	Alkalinity (PP as CaCO <sub>3</sub> )	2014/11/22	NC		%	20
			Alkalinity (Total as CaCO <sub>3</sub> )	2014/11/22	1.6		%	20
			Bicarbonate (HCO <sub>3</sub> )	2014/11/22	1.6		%	20
			Carbonate (CO <sub>3</sub> )	2014/11/22	NC		%	20
			Hydroxide (OH)	2014/11/22	NC		%	20
7728373	SCC	Spiked Blank	pH	2014/11/22		100	%	97 - 103
7728373	SCC	RPD	pH	2014/11/22	0.11		%	N/A
7728374	SCC	Spiked Blank	Conductivity	2014/11/22		102	%	90 - 110
7728374	SCC	Method Blank	Conductivity	2014/11/22	<1.0		uS/cm	
7728374	SCC	RPD	Conductivity	2014/11/22	1.3		%	20
7728391	BL5	Matrix Spike	Total Ammonia (N)	2014/11/21		NC	%	80 - 120
7728391	BL5	Spiked Blank	Total Ammonia (N)	2014/11/21		85	%	80 - 120
7728391	BL5	Method Blank	Total Ammonia (N)	2014/11/21	<0.050		mg/L	
7728391	BL5	RPD	Total Ammonia (N)	2014/11/21	4.4		%	20
7729365	BL5	Matrix Spike	Total Total Kjeldahl Nitrogen	2014/11/23		96	%	80 - 120
7729365	BL5	QC Standard	Total Total Kjeldahl Nitrogen	2014/11/23		98	%	80 - 120
7729365	BL5	Spiked Blank	Total Total Kjeldahl Nitrogen	2014/11/23		101	%	80 - 120
7729365	BL5	Method Blank	Total Total Kjeldahl Nitrogen	2014/11/23	<0.050		mg/L	
7729365	BL5	RPD	Total Total Kjeldahl Nitrogen	2014/11/23	NC		%	20
7729612	CAS	Matrix Spike	Total Total Kjeldahl Nitrogen	2014/11/24		89	%	80 - 120
7729612	CAS	QC Standard	Total Total Kjeldahl Nitrogen	2014/11/24		95	%	80 - 120
7729612	CAS	Spiked Blank	Total Total Kjeldahl Nitrogen	2014/11/24		96	%	80 - 120
7729612	CAS	Method Blank	Total Total Kjeldahl Nitrogen	2014/11/24	<0.050		mg/L	
7729612	CAS	RPD	Total Total Kjeldahl Nitrogen	2014/11/24	NC		%	20
7729783	MZ	Matrix Spike	1,4-Difluorobenzene (sur.)	2014/11/24		105	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/11/24		130	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/11/24		92	%	70 - 130
			Benzene	2014/11/24		84	%	70 - 130
			Toluene	2014/11/24		81	%	70 - 130
			Ethylbenzene	2014/11/24		83	%	70 - 130
			m & p-Xylene	2014/11/24		81	%	70 - 130
			o-Xylene	2014/11/24		79	%	70 - 130
			(C6-C10)	2014/11/24		72	%	70 - 130
7729783	MZ	Spiked Blank	1,4-Difluorobenzene (sur.)	2014/11/24		106	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/11/24		110	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/11/24		103	%	70 - 130
			Benzene	2014/11/24		91	%	70 - 130
			Toluene	2014/11/24		89	%	70 - 130
			Ethylbenzene	2014/11/24		95	%	70 - 130
			m & p-Xylene	2014/11/24		91	%	70 - 130
			o-Xylene	2014/11/24		89	%	70 - 130
			(C6-C10)	2014/11/24		107	%	70 - 130
7729783	MZ	Method Blank	1,4-Difluorobenzene (sur.)	2014/11/24		107	%	70 - 130
			4-Bromofluorobenzene (sur.)	2014/11/24		109	%	70 - 130
			D4-1,2-Dichloroethane (sur.)	2014/11/24		104	%	70 - 130
			Benzene	2014/11/24	<0.00040		mg/L	
			Toluene	2014/11/24	<0.00040		mg/L	

Maxxam Job #: B4A5751  
Report Date: 2014/11/27

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GORDEN RIVER, AB  
Sampler Initials: KRD

### QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
7729783	MZ	RPD	Ethylbenzene	2014/11/24	<0.00040		mg/L	
			m & p-Xylene	2014/11/24	<0.00080		mg/L	
			o-Xylene	2014/11/24	<0.00040		mg/L	
			Xylenes (Total)	2014/11/24	<0.00080		mg/L	
			F1 (C6-C10) - BTEX	2014/11/24	<0.10		mg/L	
			(C6-C10)	2014/11/24	<0.10		mg/L	
			Benzene	2014/11/24	NC		%	40
			Toluene	2014/11/24	NC		%	40
			Ethylbenzene	2014/11/24	NC		%	40
			m & p-Xylene	2014/11/24	NC		%	40
			o-Xylene	2014/11/24	NC		%	40
			Xylenes (Total)	2014/11/24	NC		%	40
			F1 (C6-C10) - BTEX	2014/11/24	NC		%	40
			(C6-C10)	2014/11/24	NC		%	40
7733215	TN4	Matrix Spike [LE6861-01]	Dissolved Chloride (Cl)	2014/11/26		99	%	80 - 120
7733215	TN4	Spiked Blank	Dissolved Chloride (Cl)	2014/11/26		99	%	80 - 120
7733215	TN4	Method Blank	Dissolved Chloride (Cl)	2014/11/26	<1.0		mg/L	
7733215	TN4	RPD [LE6861-01]	Dissolved Chloride (Cl)	2014/11/26	NC		%	20
7733221	TN4	Matrix Spike [LE6861-01]	Dissolved Sulphate (SO4)	2014/11/26		NC	%	80 - 120
7733221	TN4	Spiked Blank	Dissolved Sulphate (SO4)	2014/11/26		105	%	80 - 120
7733221	TN4	Method Blank	Dissolved Sulphate (SO4)	2014/11/26	<1.0		mg/L	
7733221	TN4	RPD [LE6861-01]	Dissolved Sulphate (SO4)	2014/11/26	0.94		%	20

N/A = Not Applicable

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 sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

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

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

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 too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Surrogate recovery exceeds acceptance criteria (high recovery). As results are non-detect, there is no impact on data quality.

(2) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Maxxam Job #: B4A5751  
Report Date: 2014/11/27

SLR CONSULTING (CANADA) LTD  
Client Project #: 200.02005.00000  
Site Location: GORDEN RIVER, AB  
Sampler Initials: KRD

### VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Luba Shymushovska, Senior Analyst, Organic Department



Michelle Fritz Gatehouse, Senior Analyst

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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.

Company:	Invoice To: <u>SLR Consulting (Canada) Ltd</u>	C/O Report Address: <input type="checkbox"/>	Report To:	Same as Invoice <input checked="" type="checkbox"/>	Report Distribution (E-Mail):	<b>REGULATORY GUIDELINES:</b> <input type="checkbox"/> AT1 <input checked="" type="checkbox"/> CCME <input type="checkbox"/> Regulated Drinking Water <input type="checkbox"/> Other:
Contact:	<u>Jason Pentland</u>				<u>j.pentland@slrconsulting.com</u>	
Address:	<u>6940 Roper Road</u>					
	Prov: <u>Alberta</u>	PC: <u>T6B 3H9</u>	Prov:			
Contact #s:	Ph: <u>780-490-7893</u>	Cell: <u>780-721-1804</u>	Ph:			

All samples are held for 60 calendar days after sample receipt, unless specified otherwise.

PO #:  
Project # / Name: 200 02005. 0000  
Site Location: Garden River, AB  
Quote #: 840105  
Sampled By: KRD / AF

SERVICE REQUESTED: ☐ RUSH (Contact lab to reserve)  
Date Required: \_\_\_\_\_  
☒ REGULAR (5 to 7 Days)

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	BTEX F	Sieve (#)	Regulation	Salinity	Assessment	Basic C		<input type="checkbox"/> BTEX	<input checked="" type="checkbox"/> BTEX	<input checked="" type="checkbox"/> Rout	<input type="checkbox"/> TOC	Total	Dissolved	Mercury	Air	T	To	HOLD -
1	MW 14-109	—	GW	14/11/16 16:40								X	X	X	X	X	X	X	X	X		
2	MW 14-102B	—		15:35								X	X	X	X	X	X	X	X	X		
3	MW 14-108	—		14:55								X	X	X	X	X	X	X	X	X		
4	MW 14-104 B	—		14:15								X	X	X	X	X	X	X	X	X		
5	MW 14-103	—		14:35								X	X	X	X	X	X	X	X	X		
6	MW 14-105	—		16:15								X	X	X	X	X	X	X	X	X		
7	MW 14-106B	—		15:50								X	X	X	X	X	X	X	X	X		
8	DUP -1	—		15:15								X	X	X	X	X	X	X	X	X		
9	DUP -2	—	▼   ▼	17:00								X	X	X	X	X	X	X	X	X		
10	TRIP BLANK	—	—	—								X	X									
11																						
12																						

19-Nov-14 15:49  
Desira Hopkinson  
  
B4A5751 JUL INS-0087  
MAK

Please indicate Filtered, Preserved or Both (F, P, F/P)

Relinquished By (Signature/Print): <u>Kyle DAVIES</u>	Date (YY/MM/DD): <u>14/11/19</u>	Time (24:00): <u>15:45</u>
Relinquished By (Signature/Print):	Date (YY/MM/DD):	Time (24:00):
Special Instructions:		# of Jars Used & Not Submitted: <u>0</u>

LAB USE ONLY			
Received By: <i>[Signature]</i>	Date: 11/11/19	Time: 1349	Maxxam Job #:
		Custody Seal	Temperature
Lab Comments: SAUD ZHIDEEMAN 2014/11/20 Minder 07:30			4/4/4 0/0/2

AB FCD-00331 Rev3 2010/05

Maxxam Analytics International Corporation o/a Maxxam Analytics

0,0,1 Ice/yes  
3,1,2 Cbeal/yes

## **APPENDIX E**

### **Hydraulic Conductivity Test Results**

Groundwater Characterization Report  
Landfill and Air Strip  
Garden River, Alberta  
SLR Project No. 200.20022.00000

**Analysis Report**

Project: Garden River Landfill

Number: 200.20005.00000

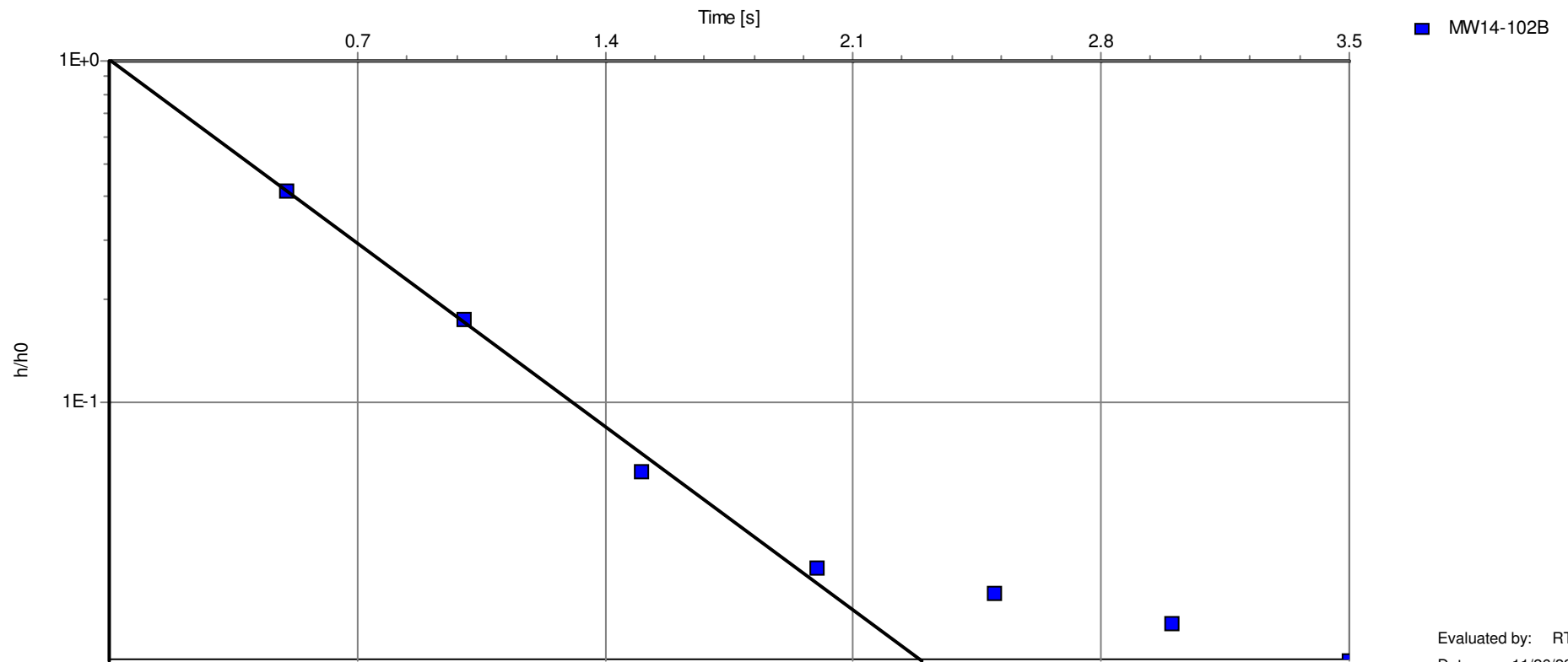
Client: Parks Canada

**Slug Test: MW14-102B RH Test 1****Analysis Method: Bouwer & Rice**

Comments:

Saturated screen length = 1.39 [m] Max. Head Change = 0.40 [m]  
R (eff) not used in analysis

MW102B RH Test 1 [Bouwer &amp; Rice]

Analysis results:

Conductivity: 3.79E-4 [m/s]

Test parameters:

Test Well: MW14-102B

Screen radius: 0.0254 [m]

Screen length: 3.1 [m]

r(eff): 0.044 [m]

Aquifer thickness: 5 [m]

Boring radius: 0.0762 [m]

**Analysis Report**

Project: Garden River Landfill

Number: 200.20005.00000

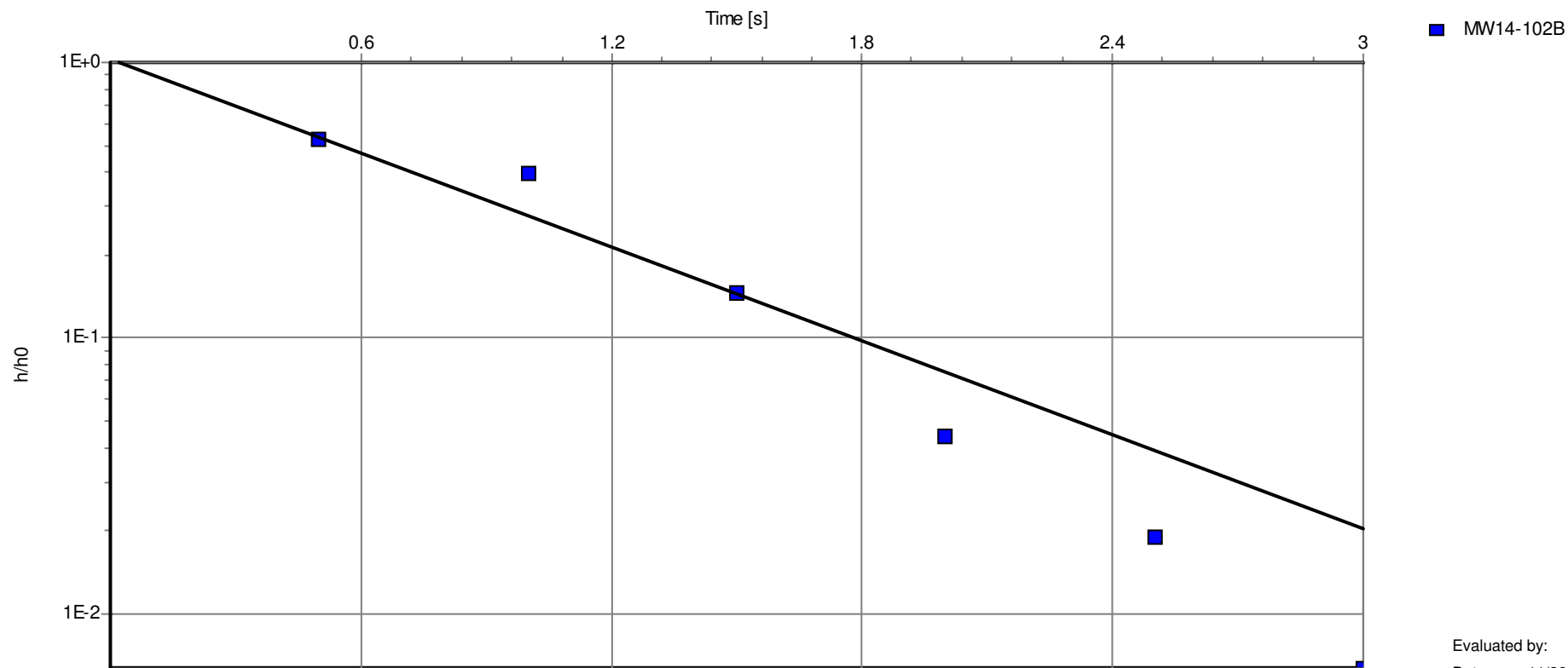
Client: Parks Canada

**Slug Test: MW14-102B RH Test 2****Analysis Method: Bouwer & Rice**

Comments:

Saturated screen length = 1.39 [m] Max. Head Change = 0.32 [m]  
R (eff) not used in analysis

MW14-102B RH Test 2 [Bouwer &amp; Rice]

Evaluated by: RT  
Date: 11/26/2014Analysis results:

Conductivity: 2.80E-4 [m/s]

Test parameters:

Test Well: MW14-102B

Screen radius: 0.0254 [m]

Screen length: 3.1 [m]

r(eff): 0.044 [m]

Aquifer thickness: 5 [m]

Boring radius: 0.0762 [m]

**Analysis Report**

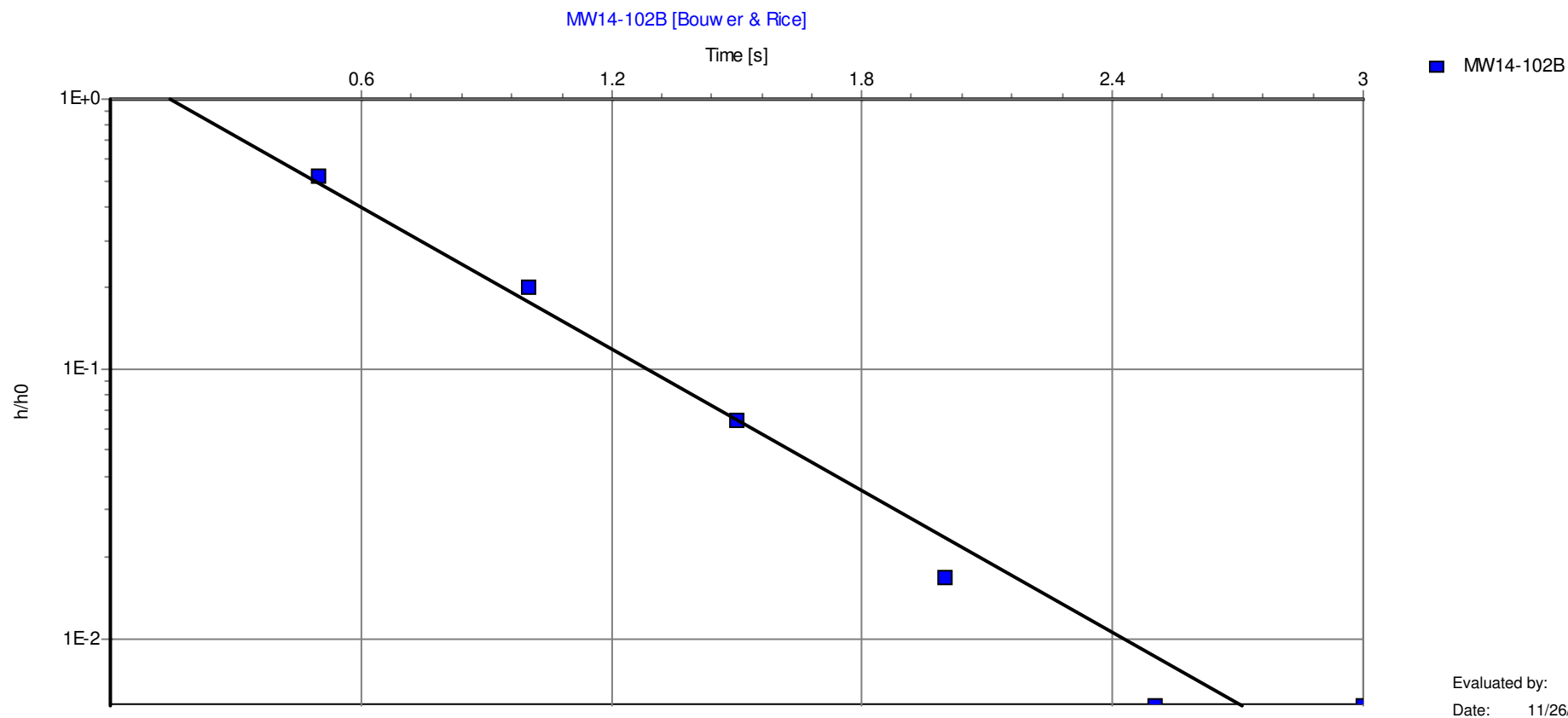
Project: Garden River Landfill

Number: 200.20005.00000

Client: Parks Canada

**Slug Test: MW14-102B RH Test 3****Analysis Method: Bouwer & Rice**

Comments:

Saturated screen length = 1.39 [m] Max. Head Change = 0.36 [m]  
R (eff) not used in analysisAnalysis results:

Conductivity: 4.33E-4 [m/s]

Test parameters:

Test Well: MW14-102B

Screen radius: 0.0254 [m]

Screen length: 3.1 [m]

r(eff): 0.044 [m]

Aquifer thickness: 5 [m]

Boring radius: 0.0762 [m]

**Analysis Report**

Project: Garden River Landfill

Number: 200.20005.00000

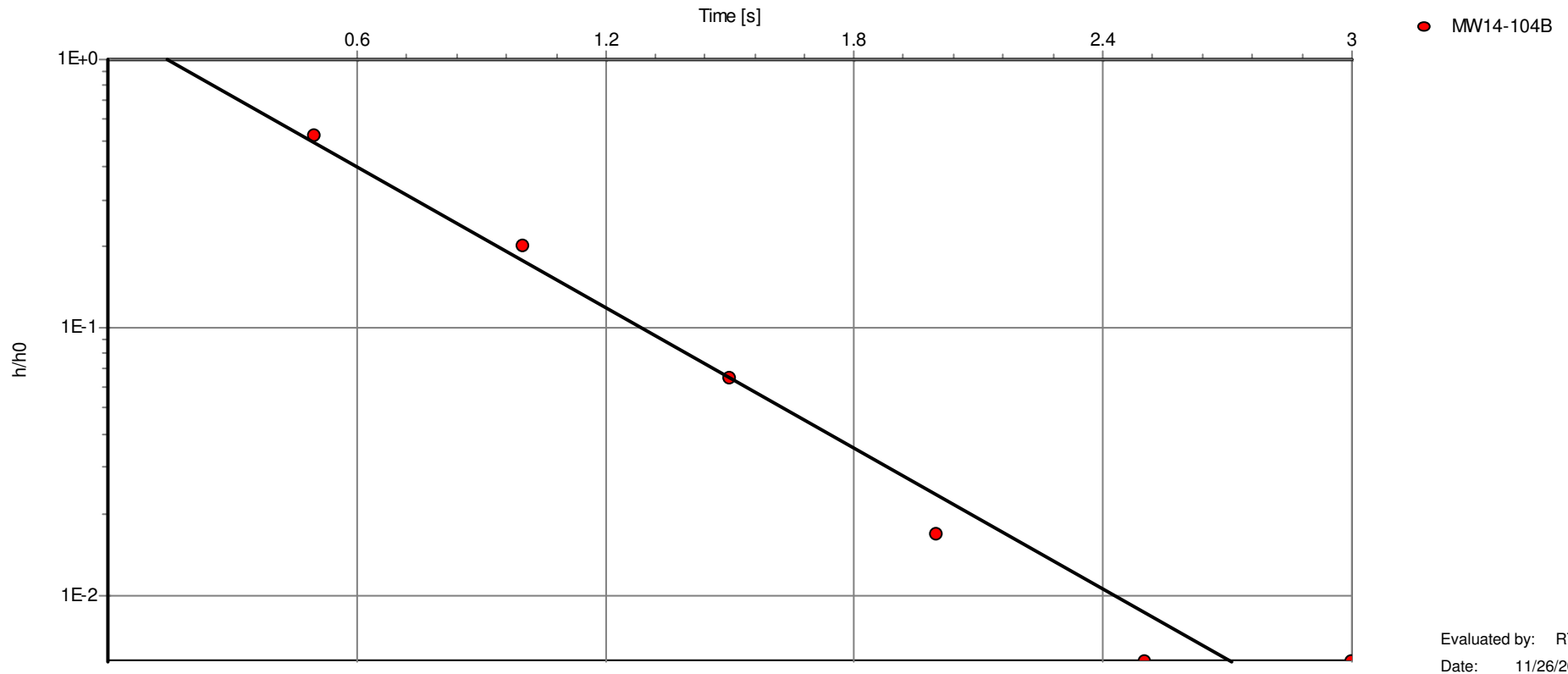
Client: Parks Canada

**Slug Test: MW14-104B RH Test 1****Analysis Method: Bouwer & Rice**

Comments:

Saturated screen length = 1.82 [m] Max. Head Change = 0.36 [m]  
R (eff) not used in analysis

MW14-104B RH Test 1 [Bouwer &amp; Rice]

Analysis results:

Conductivity: 4.65E-4 [m/s]

Test parameters:

Test Well: MW14-104B

Screen radius: 0.0254 [m]

Screen length: 3.1 [m]

r(eff): 0.044 [m]

Aquifer thickness: 5 [m]

Boring radius: 0.0762 [m]

**Analysis Report**

Project: Garden River Landfill

Number: 200.20005.00000

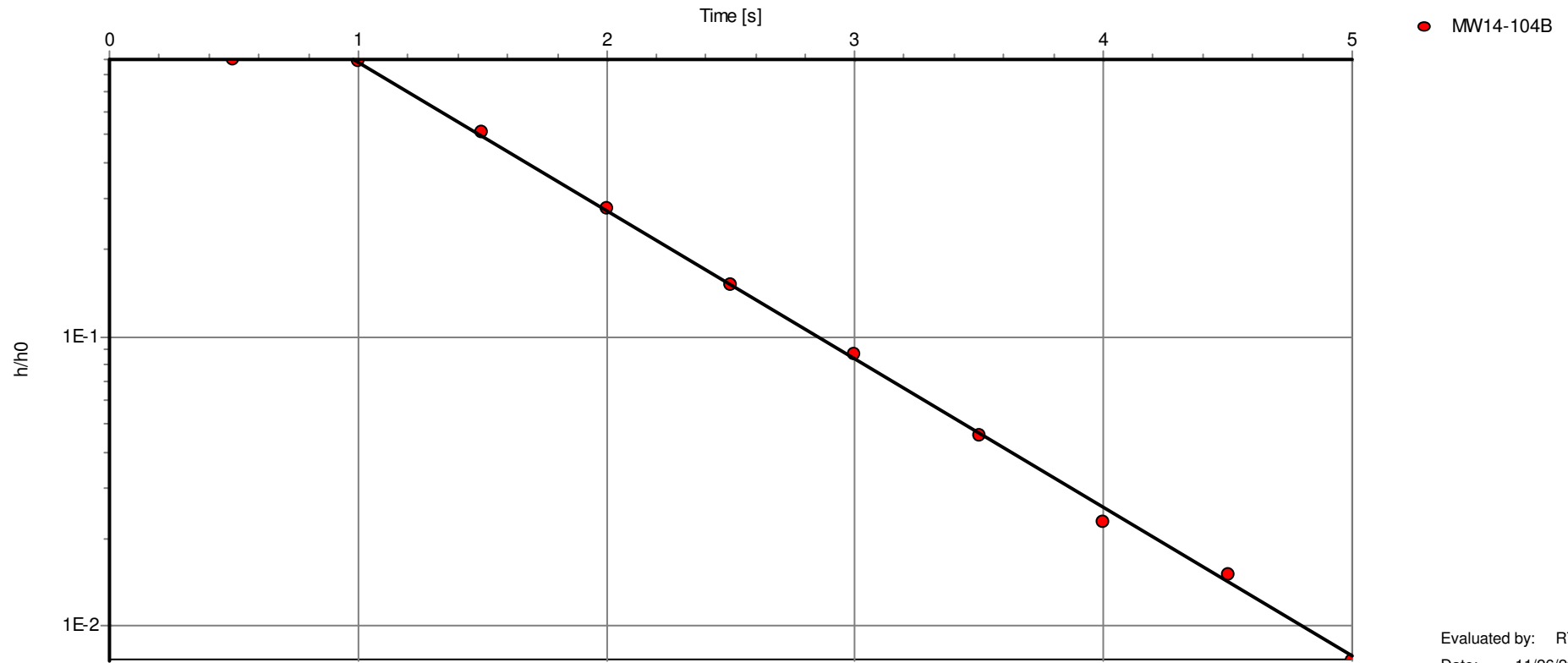
Client: Parks Canada

**Slug Test: MW14-104B RH Test 2****Analysis Method: Bouwer & Rice**

Comments:

Saturated screen length = 1.82 [m] Max. Head Change = 0.26 [m]  
R (eff) not used in analysis

MW14-104B RH Test 2 [Bouwer &amp; Rice]

Evaluated by: RT  
Date: 11/26/2014Analysis results:

Conductivity: 2.71E-4 [m/s]

Test parameters:

Test Well: MW14-104B

Screen radius: 0.0254 [m]

Screen length: 3.1 [m]

r(eff): 0.044 [m]

Aquifer thickness: 5 [m]

Boring radius: 0.0762 [m]

**Analysis Report**

Project: Garden River Landfill

Number: 200.20005.00000

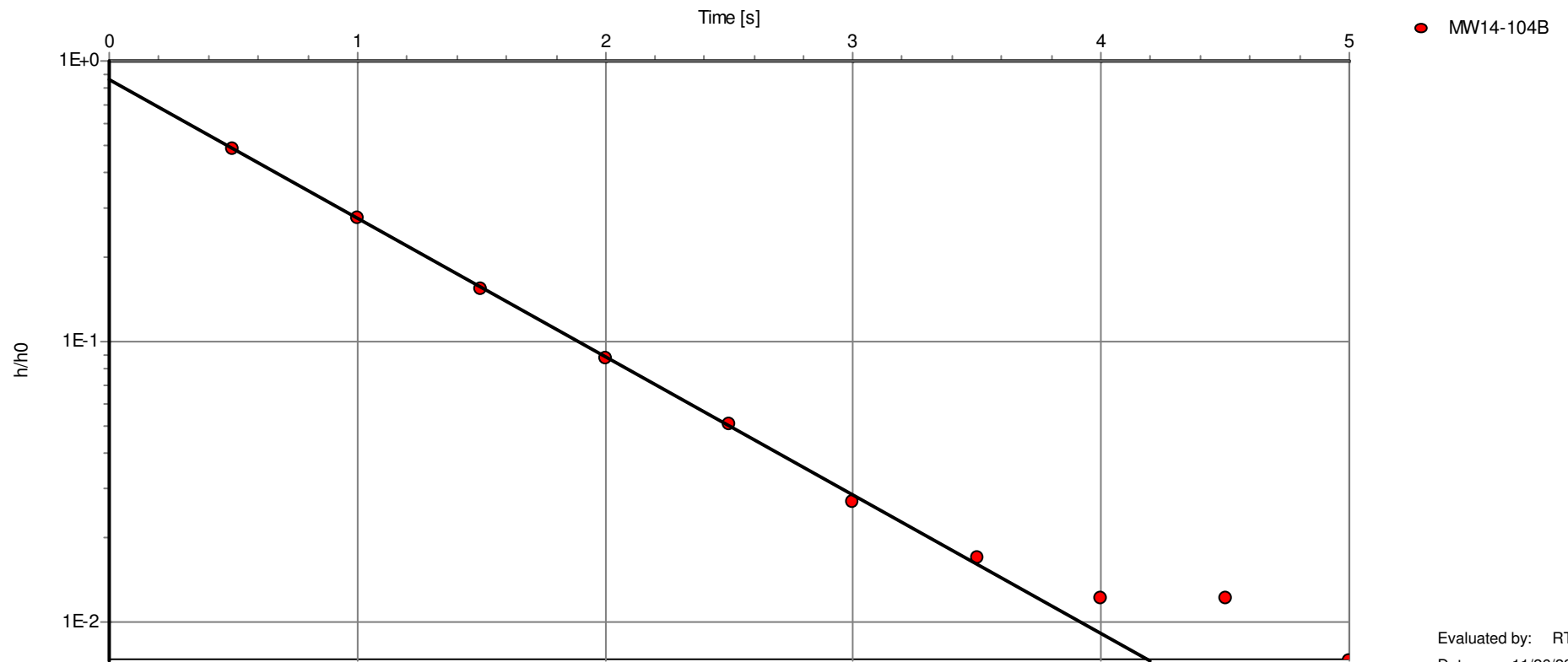
Client: Parks Canada

**Slug Test: MW14-104B RH Test 3****Analysis Method: Bouwer & Rice**

Comments:

Saturated screen length = 1.82 [m] Max. Head Change = 0.41 [m]  
R (eff) not used in analysis

MW14-104B RH Test 3 [Bouwer &amp; Rice]

**Analysis results:**

Conductivity: 2.61E-4 [m/s]

**Test parameters:**

Test Well: MW14-104B

Screen radius: 0.0254 [m]

Screen length: 3.1 [m]

r(eff): 0.044 [m]

Aquifer thickness: 5 [m]

Boring radius: 0.0762 [m]

**Analysis Report**

Project: Garden River Landfill

Number: 200.20005.00000

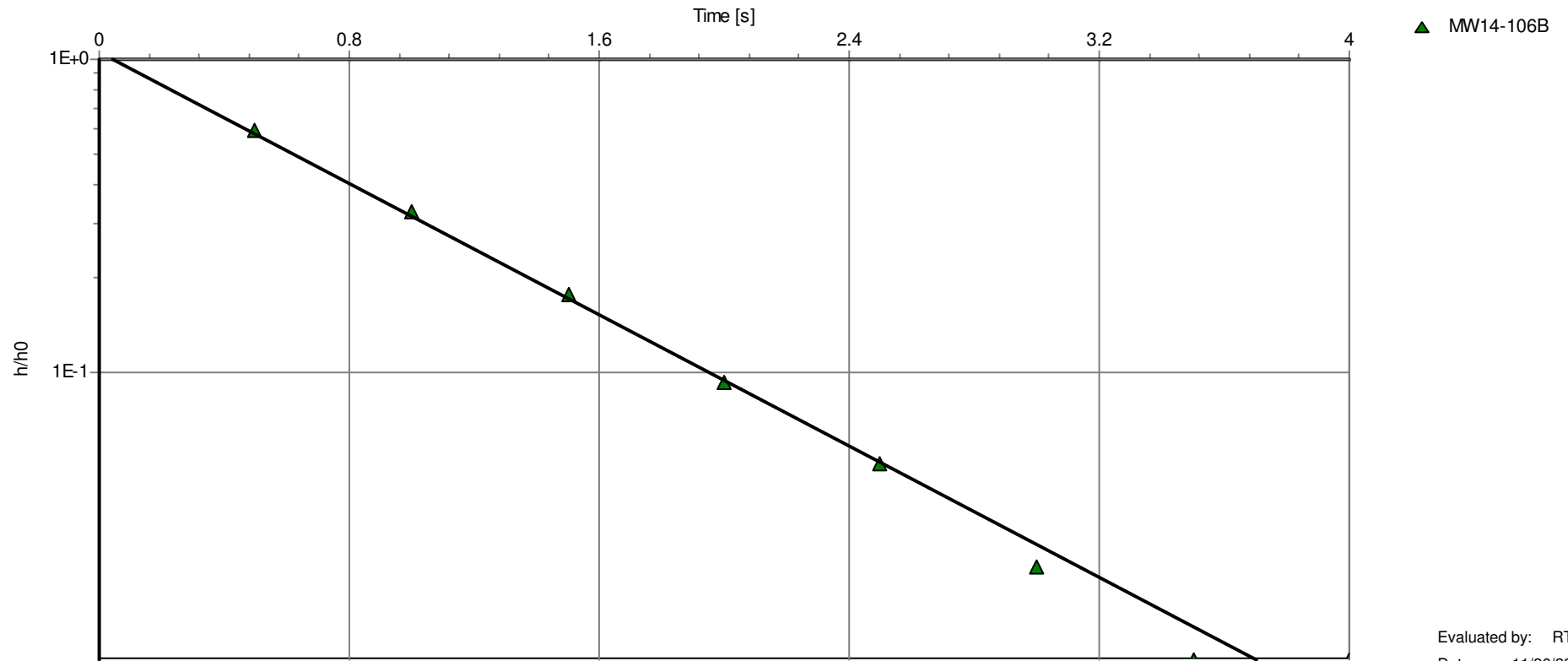
Client: Parks Canada

**Slug Test: MW14-106B RH Test 2****Analysis Method: Bouwer & Rice**

Comments:

Saturated screen length = 1.84 [m] Max. Head Change = 0.33 [m]  
R (eff) not used in analysis

MW14-106B RH Test 2 [Bouwer &amp; Rice]

Evaluated by: RT  
Date: 11/26/2014Analysis results:

Conductivity: 2.79E-4 [m/s]

Test parameters:

Test Well: MW14-106B

Screen radius: 0.0254 [m]

Screen length: 3.1 [m]

r(eff): 0.044 [m]

Aquifer thickness: 5 [m]

Boring radius: 0.0762 [m]



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**Markham, ON**

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**Nanaimo, BC**

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