

December 18, 2014

Project No. 12-1021-0006

Michelle Unger, B.Sc. Teck Resources Ltd. Bag 2000 Kimberley, BC Canada V1A 3E1 Fax: 250-427-8451

## ENVIRONMENTAL SITE ASSESSMENT – SITE LANDFILL, SÄ DENA HES MINE, YUKON TERRITORY

Dear Ms. Unger,

Kēyeh Néjeh Golder Corp. (KNG) is pleased to submit this letter report entitled *Environmental Site Assessment* – *Site Landfill, Sä Dena Hes Mine, Yukon Territory* to Teck Resources Ltd. (Teck). The report was prepared in response to the work plan and cost estimate submitted to Teck on August 26, 2014. The technical program was led by Golder Associates Ltd. (Golder).

The attached letter report was prepared on our behalf by Golder, in accordance with the scope of work outlined in KNG's August 26th proposal.

We trust the information contained in this letter report is adequate for your review. Should you have any questions concerning the Environmental Site Assessment, please contact Andrew Bruemmer at 604-296-2740 or andrew\_bruemmer@golder.com.

Yours very truly,

KĒYEH NEJÉH GOLDER CORP.

Jeff Bailey, M.A., RPCA Managing Director, Kēyeh Néjeh Golder Corp.

JB/lih

Attachment: Letter Report

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December 18, 2014

Reference No. 1210210006-024-L-Rev0-11000

Michelle Unger Teck Resources Limited Bag 2000 Kimberley, BC V1A 3E1

#### ENVIRONMENTAL SITE ASSESSMENT – SITE LANDFILL, SÄ DENA HES MINE, YUKON TERRITORY

Dear Michelle;

Golder Associates Ltd. (Golder) was retained by Kēyeh Néjeh Golder Corporation (KNG) and Teck Resources Limited (Teck) to complete an environmental site assessment (ESA) of the landfill facility currently being constructed at the Sä Dena Hes mine. The Sä Dena Hes mine is located approximately 70 km by road from Watson Lake, Yukon (the Site). The landfill is under construction as part of the approved Detailed Decommissioning & Reclamation Plan for the mine property.

## 1.0 BACKGROUND

As part of the overall decommissioning and reclamation of the Site, a landfill is being constructed near the former North Creek pump house. The purpose of the landfill is to deposit demolition debris from the mill site, former camp and office buildings, as well as miscellaneous Site debris collected throughout the property. Golder understands that deposited, inert materials consist primarily of metal cladding, piping, concrete and wood debris.

During routine monitoring of the landfill construction, localized sheen and odors were observed on stagnant ponded water adjacent to the deposition cells. Surface water samples that were collected on July 16, 2014 contained measurable concentrations of selected metals and toluene.

Based on the observation of sheen on the ponded surface water, the analytical results for the water sample that was analyzed, and concerns from the local community, further assessment of the landfill area was considered warranted. During a telephone conversation with Golder on August 12, 2014, Teck requested a Phase II ESA of the landfill area, including an evaluation of groundwater quality.

# 1.1 Objective and Scope of Work

The overall objective of the Phase II ESA was to document whether deposited waste material at the landfill has potentially impacted local groundwater and/or surface water receptors.

In order to meet the project objective, Golder completed the following scope of work:

- Drilling of four (4) boreholes and installation of 4 groundwater monitoring wells;
- Collection of groundwater samples from the 4 newly-installed monitoring wells and 2 pre-existing monitoring wells at the Site;

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America



- Collection of three (3) surface water samples from North Creek. A second round of surface water sampling from the 3 locations was also conducted by SRK Consulting;
- Completion of one test pit and submission of one soil sample for grain size analysis;
- Data analysis and interpretation of the assessment results; and
- Preparation of a report documenting the findings of the ESA (this letter report).

# 2.0 REGULATORY FRAMEWORK

In the Yukon Territory, environmental matters pertaining to contaminated sites generally fall under the jurisdiction of Environment Yukon, pursuant to the *Environment Act* 

In the Yukon Territory, the two key regulations under the *Environment Act* relating to the assessment and remediation of contaminated sites are the Contaminated Sites Regulation (CSR) (Environment Yukon), and the Special Waste Regulations (SWR) (Environment Yukon, updated April 1, 2009).

The CSR provides Generic Numerical Water Standards (Schedule 3) for use in the assessment of water quality at sites subject to investigation (Environment Yukon, 2002). Water Quality Standards are divided into four different categories based on water use and include: standards based on the protection of freshwater and marine aquatic life (AW-F/AW-M), standards based on the use of water for irrigation purposes (IW), standards based on the consumption of water by livestock (LW), and standards based on the consumption of drinking water by humans (DW).

Based on the potential groundwater uses near the Site, water quality standards for the protection of freshwater aquatic life were used to screen the analytical laboratory results.

Environment Yukon *Protocol 6: Application of Water Quality Standards* (Protocol 6) provides guidance on the application of water quality standards to groundwater or receiving water body (surface water). When water monitoring is conducted from surface water, CSR-AW standards should be divided by a factor of 10, to account for dilution effects within the groundwater aquifer. The factor of 10 has been applied in the comparison of the surface water results described in Section 4.3 of this letter report.

In addition, the Canadian Water Quality Guidelines for the Protection of Aquatic Life (CCME-AW) were included in the assessment of surface water conditions on-Site.

# 3.0 FIELD METHODS

#### 3.1 Health and Safety

During the completion of the landfill ESA, Golder followed the overall Health and Safety plan that was adopted for the Site assessment work at the mine site. The Health and Safety plan was updated to incorporate specific hazards related to the drilling work and daily tailgate meetings were held prior to the beginning of each field day.

A site-specific Health and Safety Plan was also provided to Golder and Teck by the drilling company (Impact Drilling), prior mobilizing to the Site.



# 3.2 Borehole Drilling and Monitoring Well Installation

Golder retained Impact Drilling Ltd, of Whitehorse, YT, to complete the borehole drilling and monitoring well installations for the Phase II ESA. Drilling at the Site was completed between September 10 and 12, 2014, using a truck-mounted air-rotary drill rig.

Four boreholes (MW14-01 to MW14-04) were advanced at the Site, and completed as monitoring wells. The boreholes were generally advanced to a depth of approximately 15 m below ground surface (bgs), with the exception of MW14-03, which was advanced to a depth of approximately 6 m bgs. MW14-01 was installed to evaluate up-gradient (i.e., background) groundwater quality in the vicinity of the landfill while MW14-02 to MW14-04 were installed to evaluate potential impacts from the constructed landfill cells.

The soil conditions encountered during drilling, and the results of field testing, were recorded and logged in the field by Golder staff, and were reported on the borehole logs. Final drilling depths were determined by the depth to the water table elevation at each location. Borehole logs are included in Attachment 1.

A surveying contractor hired by Teck surveyed the location and elevation of the top of each well and the elevations were provided to Golder. The surveyed elevation and depth to water allowed the groundwater elevation at each location to be determined and the groundwater flow directions to be assessed.

# 3.3 Monitoring Well Development and Groundwater Sampling

During the groundwater monitoring program, groundwater samples were collected using standard Golder procedures. The depths to groundwater were initially measured using a water level meter in order to calculate the volume of water in the well. Groundwater samples were collected from the four newly-installed monitoring wells, as well as two historical monitoring well locations downgradient of the landfill (TH09-91 and TH10-91).

Due to the depth to water in the majority of the wells a dedicated disposable bailer was used to remove water from each well. Approximately three well volumes were removed with the bailer. Water was collected from the bailers at regular intervals and parameters consisting of pH, temperature and electrical conductivity were measured using a handheld meter. Once more than three well volumes was removed and the parameters had stabilized (i.e., changes in pH, temperature and electrical conductivity measurements between three successive readings were less than 10%), samples were collected in pre-cleaned containers supplied by Maxxam Laboratory (Maxxam) for analysis of Benzene, Toluene, Ethylbenzene, Xylenes (BTEX), Volatile Petroleum Hydrocarbons (VPHw), Light and Heavy Extractable Petroleum Hydrocarbons (LEPHw/HEPH), Polycyclic Aromatic Hydrocarbons (PAH), Volatile Organic Compounds (VOCs), dissolved metals and anions. The collected samples were stored in coolers with ice and shipped to Maxxam under standard Golder Chain-of-Custody procedures.

The groundwater development and sampling field forms are included in Attachment 2.



# 3.4 Surface Water Sampling

Three surface water samples were collected from North Creek on September 8, 2014. The surface water sampling locations were selected to document water quality up-gradient of the landfill (SW14-01), adjacent to the landfill (SW14-02), and down-gradient of the landfill (SW14-03).

Surface water samples were collected in pre-cleaned containers provided by the laboratory and submitted for analysis of total metals, BTEX/VPHw, LEPHw/HEPH, PAHs, and anions.

A second round of surface water samples was collected by SRK Consulting on October 11, 2014. An additional sample (MH12) located down gradient of the landfill was included, providing four samples during the second round of sampling, which were submitted for analysis of total and dissolved metals.

Field sampling information is included in Attachment 2.

## 3.5 Laboratory Analyses

Maxxam Analytics (Maxxam), of Burnaby, BC, performed chemical analyses for groundwater and surface water samples collected as part of the landfill ESA, while ALS Laboratory (ALS) analyzed the soil sample collected for grain-size analysis. Environmental samples were transported to Whitehorse in coolers with ice packs and chain-of-custody forms; groundwater and surface water samples were subsequently shipped via Air North to Maxxam's laboratory in Burnaby, BC, while soil samples were delivered to the ALS laboratory in Whitehorse. Information pertaining to sampling location, and the identity of duplicate samples, was not provided to the laboratory to ensure that unbiased analytical procedures were observed, and that the results of the duplicate analyses could be used to assess the quality of the laboratory analyses. Copies of the analytical reports, and the corresponding Chain of Custody forms, are presented in Attachment 4.

The laboratory methods used by ALS and Maxxam to complete the analyses followed accepted provincial/territorial and national methods.

# 3.6 Quality Assurance and Quality Control

To document that the sampling and analytical data were interpretable, meaningful and reproducible, conformance to a Golder quality assurance and quality control (QA/QC) program was followed. This involved using QA/QC measures in both the collection (field program) and analysis (laboratory) of samples. The following discussion includes a brief summary of the QA/QC measures implemented by Golder during the field program and during the data review, as well as the QA/QC measures implemented by the analytical laboratory.

The quality assurance (QA) measures used in the collection, preservation and shipment of samples included the following management controls:

- Sampling methods were consistent with established Golder protocols and provincial/federal requirements;
- Field notes were recorded during each stage of the investigation;
- Sample locations were recorded, marked and surveyed in the field; and
- Samples were subsequently transported to the laboratory using Golder chain-of-custody procedures.



The quality control (QC) measures established for the field program included the following technical aspects:

- Submission of blind field duplicate samples (i.e., paired sample analyses). A blind field duplicate sample is a second sample of a certain media (e.g., soil or water) from the same location that is submitted to the analytical laboratory under a separate label such that the laboratory has no prior knowledge that it is a duplicate.
- The relative percent difference (RPD) between paired sample results was used to assess duplicate sample data. The RPD is a measure of the variability between two outcomes from the same procedure or process and is calculated by:

$$RPD(\%) = absolute\left(\frac{(x_1 - x_2)}{average(x_1, x_2)}\right) \times 100$$

where  $x_1$  is the original sample result and  $x_2$  is the paired analysis result.

Where the concentration of a given parameter is less than five times the method detection limit (MDL), the laboratory results are considered to be less precise and the RPD is not calculated. For parameters with concentrations less than five times the MDL, the difference factor (DF) between paired analyses results is calculated by:

$$DF = absolute\left(\frac{(x_1 - x_2)}{MDL}\right)$$

where  $x_1$  is the original sample result and  $x_2$  is the paired analysis result.

Golder's internal data quality objectives (DQOs) for environmental samples are as follows:

- A RPD less than or equal to 20% for groundwater samples submitted for analysis; and
- A DF less than or equal to 2.0.

Where the DQO was exceeded, further investigation of the data quality was required. Data not meeting the DQOs were examined on a case-by-case basis.

The following DQOs and criteria were established for the laboratory analytical program:

- The chemical laboratory that was used must have achieved proficiency certification by the Canadian Association for Laboratory Accreditation Inc. (CALA) for the analyses conducted;
- Laboratory paired analyses results should be within laboratory-applied certified values for inorganic elements and organic compounds;
- Analytical recovery results for reference materials or spiked standards should be within laboratory-applied certified values for inorganic elements and organic compounds;
- Analytical blanks should be less than the detection limits used for the specific analysis; and
- Each laboratory analytical batch should include at least one analytical blank, one matrix spike and one laboratory duplicate sample.

Reports from the laboratory were reviewed internally prior to submission to Golder. If internal QA/QC problems were encountered, the field samples and internal QA/QC samples were re-analyzed. Data quality issues identified by the laboratory were communicated to Golder at the time of data delivery.



# 4.0 RESULTS

## 4.1 Field Observations

The geology encountered during the drilling at the landfill consisted of primarily sand, sand and gravel, and silty sand to the maximum depth investigated at 16.7 m depth. Based on test pits that were completed within the footprint of the landfill in 2012, the silty sand layer is present at a depth of approximately 2.5 to 3.0 m bgs. The grey phyllite bedrock that typically underlies the overburden at the Site was not encountered during drilling at the landfill. Borehole logs are provided in Attachment 1.

Groundwater samples collected from the 2014 monitoring wells were generally cloudy in color, which is considered indicative of the elevated silt content of the soil stratigraphy, while groundwater at historical wells TH09-91 and TH09-10 was clear. Hydrocarbon-like odors or sheen were not observed during groundwater sample collection. At each monitoring well location, the depth to water was recorded, and ranged from approximately 5.1 m bgs to 14.5 m bgs. Depths to groundwater and calculated groundwater elevations are shown on Table 1, below.

Monitoring Well Location	TOC <sup>1</sup> Elevation (m)	Ground Elevation (m)	Depth to Bottom <sup>2</sup> (m)	Depth to Water <sup>3</sup> (m)	Groundwater Elevation (m)						
MW14-01	1040.87	1039.87	15.85	14.12	1026.75						
MW14-02	1034.37	1033.32	16.16	14.48	1019.89						
MW14-03	1031.26	1030.14	7.20	5.14	1026.12						
MW14-04	1029.98	1028.82	13.88	10.13	1019.85						
TH09-91*	1008.60	1008.08	12.155	5.335	1003.27						
TH10-91*	1014.38	1013.33	18.910	11.345	1003.04						

#### Table 1: Groundwater Elevations, September 27, 2014

Table Notes:

1. TOC = Top of Well Casing

2. Depth to bottom measured from TOC

3. Depth to water measured from TOC

\* TOC measured from Top of Protective Casing

Surface water samples were collected on two separate events. Surface water samples were generally clear and did not exhibit any odors or sheen. During the monitoring event completed on October 11, the flow rate in North Creek was observed to range between 9 and 13 L/s.

# 4.2 Groundwater Analytical Results

The analytical groundwater results are presented on Tables 2A (inorganics), 2B (petroleum hydrocarbons) and 2C (VOCs) at the end of this letter report.

The results provided by the laboratory indicate that concentrations of the following parameters were greater than the applicable CSR AW standards:

The cadmium concentration at MW14-03 (2.65 μg/L) was greater than the applicable standard of 0.6 μg/L.

Concentrations of hydrocarbon-based parameters and volatile organic compounds were less than the applicable standards and/or less than the laboratory detection limits.



# 4.3 Surface Water Analytical Results

The analytical surface water results are presented on Tables 3A (total metals), 3B (dissolved metals), and 3C (hydrocarbons) at the end of this letter report.

The results provided by the laboratory indicate that concentrations of the following parameters were greater than the applicable CSR AW standards:

Concentrations of cadmium (0.13 μg/L) and lead (6.23 μg/L) at sampling location SW14-03, during the September 8 monitoring round.

The results provided by the laboratory indicate that concentrations of the following parameters were greater than the applicable CCME AW guidelines:

- Concentrations of fluoride (130 µg/L) at sampling location SW14-01, during the September 8 monitoring round; and
- Concentrations of aluminum (236 μg/L), cadmium (0.13 μg/L) and iron (374 μg/L) at sampling location SW14-03, during the September 8 monitoring round.

Concentrations of hydrocarbon-based parameters were less than the applicable standards and less than the laboratory detection limits.

## 4.4 Grain Size Analysis

One soil sample was analyzed by ALS for grain-size distribution. The particle distribution curve is presented in Attachment 3.

Based on the sieve analysis, the soil consists of approximately 46% fine-grained material (consisting primarily of silt) and 41% medium to fine sand. The soil is described as a silty-sand and, based on the Hazen approximation, is considered to have a hydraulic conductivity (k) of approximately 1 x  $10^{-5}$  cm/s. The Hazen approximation estimates k values as a function the effective diameter (d<sub>10</sub>) of the soil matrix. This hydraulic conductivity is similar to the results from response testing completed at monitoring wells on the Site screened in the overburden soils.

# 4.5 Hydrogeological Conditions

#### 4.5.1 Principal Aquifer

It is inferred that groundwater at the Site occurs in a shallow unconfined aquifer composed primarily of unconsolidated sand with silt, gravel and cobbles.

#### 4.5.2 Groundwater Elevations and Flow Directions

Groundwater elevations were measured at monitoring wells installed at the landfill on September 27, 2014 as shown in Table 1, above. The depth to groundwater ranged between 5.1 and 14.5 m bgs and, based on survey information provided by Teck, is inferred to be located approximately 3 m below the base of the landfill cells. The groundwater flow direction was inferred to be to the east and the water table gradient was 0.07 m/m.



## 4.5.3 Estimated Average Linear Groundwater Velocity

Using the hydraulic conductivity of the shallow aquifer of approximately  $1 \times 10^{-5}$  m/s obtained from the grain size analysis, and the horizontal hydraulic gradient across the Site of 0.07 m/m to the east; the average linear groundwater velocity can be calculated using the following equation:

$$V = (Ki)/n$$

Where: V: is the groundwater velocity in metres per second (m/s).

- K: is the hydraulic conductivity in m/s as determined by slug testing
- i: is the horizontal hydraulic gradient (m/m)
- n: is the porosity which is estimated to be approximately 0.35 (Fetter, 1994) in well sorted gravel and sand mixtures.

The resulting groundwater velocity is estimated to be approximately  $2 \times 10^{-6}$  m/s or approximately sixty (60) metres per year. Groundwater at the Site may travel faster, or slower, than this estimate due to inaccuracies or seasonal variations in these parameters.

# 4.6 Results of QA/QC Analyses

#### 4.6.1 Golder QA/QC Program

Seven groundwater and eight surface water samples were submitted for laboratory analyses. The representation of duplicate samples by parameter is provided in Table 4, below.

Sample Medium	Analytical Parameter	Total Samples Analyzed	Duplicate Samples Analyzed	% Duplicates
	Dissolved Metals	7	1	14.3
Groundwater Petroleum Hydrocarbo		7	1	14.3
Groundwater	Volatile Organic Compounds	7	1	14.3
	Total Metals	8	1	12.5
Surface Water	Dissolved Metals	8	1	12.5
	Petroleum Hydrocarbons	3	-	-

#### **Table 4: Duplicate Samples Analysis**

Results of the field duplicate analyses are presented in Table 5 at the end of this letter report. The RPD and DF values that were calculated as part of the QA/QC program met the DQOs outlined for this ESA, with the following exceptions:

- The DF for zinc for the Golder groundwater duplicate pair collected at MW14-02 (COC numbers 22807-05 and 22807-06) was 4.1. The associated analytical results were an order of magnitude less than the applicable standard, and thus considered reliable.
- The RPDs for total dissolved solids, ammonia, iron and lead (total metals) for the SRK surface water duplicate pair collected at MH12 (COC numbers KS6050 and KS6051) were 25%, 33%, 21%, and 23% respectively. The associated analytical results were an order of magnitude less than the applicable standard, and thus considered reliable.



#### 4.6.2 Laboratory QA/QC Program

A review of the Maxxam laboratory reports identified the following soil QA/QC items for surface water and groundwater samples:

- The PAH surrogate terphenly-D14 recovery was outside Maxxam DQOs for Golder groundwater samples COC numbers 22807-03 and 22807-07, and Golder surface water sample COC number 20769-01. The laboratory reported the overall quality control for this analysis meets acceptable criteria, therefore the associated samples are considered unaffected;
- The RPD for 1, 2-dichlorethane was raised due to sample matrix interference for Golder groundwater sample COC number 22807-03. However, the associated result was non-detect by the laboratory and below applicable standards;
- The RPD for dichloromethane was raised due to sample matrix interference for Golder groundwater samples COC numbers 22807-06 and 22807-07. However, the associated results were non-detect by the laboratory and below applicable standards;
- The RPD for internal laboratory analysis of 1, 2-dibromomethane was outside Maxxam DQOs in one QC batch. The associated Golder groundwater analytical results were reviewed and are considered reliable, as results were either below the laboratory reporting limits or below applicable standards;
- The spiked blank recovery for internal laboratory analysis of trichlorofluoromethane was outside Maxxam DQOs in one QC batch. The associated Golder groundwater analytical results were reviewed and are considered reliable, as results were either below the laboratory reporting limits or below applicable standards;
- The matrix spike recoveries for internal laboratory analyses of nitrite and dibenz(a,h)anthracene were outside Maxxam DQOs in one QC batch. The associated Golder groundwater analytical results were reviewed and are considered reliable, as results were either below the laboratory reporting limits or below applicable standards; and
- The laboratory recommended hold times for turbidity and nitrate plus nitrite analyses were exceeded by one day with the second round of surface water samples collected by SRK (COC numbers KW1287, KW1288, KW1289, KS6050, KS6051). Similarly, Golder groundwater samples were received past the recommended laboratory hold times for nitrate plus nitrite analyses (COC numbers 22807-01 to 07). The associated analytical results in both cases were an order of magnitude less than applicable standards and guidelines, and thus considered reliable.

# 5.0 DISCUSSION

This Phase II ESA investigated the potential impact of waste materials at the landfill to local groundwater and surface water receptors, as shown by a general Key Plan presented as Figure 1 at the end of this letter report.

To evaluate groundwater quality, four new groundwater monitoring wells were installed and subsequently sampled, in addition to sampling two pre-existing wells on site down-gradient of the landfill. Surface water quality was assessed by samples taken from North Creek, including one background sample collected up-gradient of the landfill and the two remaining samples collected down-gradient of the landfill.



Although concentrations of hydrocarbon-based parameters and volatile organic compounds were less than the applicable CSR standards and/or less than laboratory detection limits, certain metals parameters, in both groundwater and surface water, were reported at concentrations above the applicable standards and/or guidelines. The northwest monitoring well, MW14-03, had a cadmium concentration approximately 4 times greater than the applicable CSR standard; however, cadmium concentrations at remaining monitoring wells, including down-gradient locations, were less than the applicable standards. The cadmium result is considered an isolated anomaly.

Hydrocarbon-based parameters in surface water were less than the applicable CSR standards, while concentrations of aluminum, cadmium, iron and lead were above the CSR standards and/or CCME Guidelines at sampling location SW14-03 furthest down-gradient of the landfill. However, analytical results for subsequent sampling events at SW14-03 and further down-gradient at MH12 were less than applicable standards and guidelines. The elevated metals results are considered isolated and may be due to locally elevated turbidity in the water, as concentrations at both up-gradient and down-gradient locations were less than the applicable standards and guidelines. The elevated fluoride concentration at SW14-01 (above the applicable CCME guideline) is also considered isolated, and may be indicative of naturally elevated concentrations in surface water.

In order to develop a hydrogeological model for the landfill area, Golder completed grain size analysis and groundwater flow calculations to determine the potential impacts to aquatic receiving bodies. Based on the hydrogeological information that was collected, groundwater flow is inferred to be towards the east, at a velocity of approximately 60 metres per year. Based on the distance from the eastern limit of the landfill to the intersection with North Creek (inferred to be in the vicinity of historical well locations TH91-09 and TH91-10), it is estimated that groundwater would discharge to the creek after a period of approximately 2 to 3 years.

# 6.0 CONCLUSION AND RECOMMENDATIONS

Golder has completed a Phase II ESA of the landfill facility at the Sä Dena Hes mine, located approximately 70 km from Watson Lake, Yukon. The Phase II ESA was requested by Teck as part of maintaining a constructed, on-Site landfill and as part of their environmental due diligence in support of the closure of Sä Dena Hes Mine.

The objectives of this Phase II ESA were to determine whether the constructed landfill may have impacted groundwater and/or surface water quality at the Site.

Based on the groundwater and surface water results of the Phase II ESA, these objectives have been met. Although exceedances of fluoride, aluminum, cadmium, iron and lead were observed in surface water, the concentrations are not considered to be due to the construction of the landfill. The surface water quality may be due to naturally-elevated concentrations or entrainment of sediments and fine-grained particles during the sampling event. The elevated concentration of cadmium in groundwater is also not considered to be related to the landfilled material and may be related to entrainment of sediment in the groundwater sample.

It is recommended that an additional monitoring round be completed at the landfill in the spring of 2015 at the 6 monitoring wells and down-gradient surface water locations. This second monitoring event will establish baseline water quality data for both low-flow and high-flow seasons. Additional, longer-term groundwater monitoring is recommended at MW14-04, in accordance with the proposed long-term groundwater monitoring plan for the overall mine property. It is also recommended that historical monitoring well locations TH09-91 and TH10-91 be maintained in good condition such that future monitoring can be conducted, if necessary.

If, based on the future collected data, it appears that the landfill materials are impacting local groundwater quality, the proposed monitoring plan should be revised and updated.



# 7.0 STUDY LIMITATIONS

This report was prepared for the exclusive use of Teck Resources Ltd. The report, which specifically includes all tables, figures and attachments, is based on data and information collected during the assessment conducted by Golder Associates Ltd., and is based solely on the conditions of the property at the time of the field investigation, supplemented by historical information and data obtained by Golder Associates Ltd., as described in this report.

The assessment of environmental conditions and possible hazards at this site has been made using the results of chemical analyses of discrete surface water and groundwater samples from a limited number of locations. The site conditions between sampling locations have been inferred based on conditions observed at monitoring well locations and surface water monitoring points. Additional study, including further subsurface investigation, can reduce inherent uncertainties associated with this type of study. However, it is never possible, even with exhaustive sampling and testing, to dismiss the possibility that part of a site may be contaminated and remains undetected.

The services performed as described in this report were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken based on this report.

The content of this report is based on information collected during our investigation, our present understanding of the site conditions, and our professional judgement in light of such information available at the time of this report. This report provides a professional opinion, and therefore no warranty is either expressed, implied or made as to the conclusions, advice and recommendations offered in this report. This report does not provide a legal opinion regarding compliance with applicable laws. With respect to regulatory compliance issues, it should be noted that regulatory statutes and the interpretation of regulatory statutes are subject to change.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, Golder Associates Ltd. should be requested to re-evaluate the conclusions of this report, and to provide amendments, as required.



#### 8.0 CLOSURE

We trust that the contents of this letter report are sufficient for your current review purposes. Should you have any questions or concerns, please do not hesitate to contact the undersigned at 604-296-4200.

Yours very truly,

#### GOLDER ASSOCIATES LTD.

Adm Brom

Andrew Bruemmer, P.Eng. Project Manager

AB/GJH/ch

Gay Houla

Gary Hamilton, P.Geo. Project Director

Attachments:	Figure 1 – Sample Location Plan
	Tables 2A, 2B, 2C – Results of Groundwater Analyses
	Table 3A, 3B, 3C – Results of Surface Water Analyses
	Table 5 – Results of QA/QC Analyses
	Attachment 1 – Borehole and Monitoring Well Logs
	Attachment 2 – Groundwater Development and Sampling Forms
	Attachment 3 – Grain Size Distribution Curve
	Attachment 4 – Laboratory Analytical Results and Chains of Custody

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#### LANDFILL SITE AND DEPOSITION ZONES



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2013 CAMP AND OFFICE DEPOSITION CELL HISTORICAL DEBRIS DEPOSITION ZONE JDS MILL DEMOLITION DEBRIS CELL MISCELLANEOUS SITE DEBRIS DEPOSITION CELL SURFACE WATER DRAINAGE CHANNEL SURFACE WATER SAMPLING LOCATION

2014 MONITORING WELL LOCATION

HISTORICAL MONITORING WELL LOCATION

CONTOUR - ft WATERCOURSE

#### REFERENCE

CONTOURS OBTAINED FROM CANVEC © DEPARTMENT OF NATURAL RESOURCES CANADA. ALL RIGHTS RESERVED. LANDFILL SITE AND DEPOSITION ZONES FROM AMEC FIGURE SDH05\_FIG\_03\_R0. ORTHOPHOTO OBTAINED FROM THE CLIENT. DATUM: NAD83 PROJECTION: UTM ZONE 9

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	Golder	00	CHECK	AB	16 Dec. 2014	FIGURE	:1					
	Associat	C3	REVIEW	GJH	16 Dec. 2014							

Location Sample Control Number Date Sampled QA/QC	Aquatic Life CSR-AW (freshwater)	TH10-91 22807-01 27-Sep-14	TH09-91 22807-02 27-Sep-14	MW14-04 22807-03 27-Sep-14	MW14-03 22807-04 27-Sep-14	MW14-02 22807-05 27-Sep-14 FDA	MW14-02 22807-06 27-Sep-14 FD	MW14-01 22807-07 27-Sep-14
<b>Physical Tests</b> pH (field, pH units) Hardness (as CaCO <sub>3</sub> )		7.60 80700	7.59 95400	7.58 176000	7.33 200000	7.84 205000	7.84 207000	7.32 227000
Anions and Nutrients Chloride (Cl) Fluoride (F) Nitrate (as N) Nitrite (as N) Nitrate and nitrite (as N) Sulfate (SO <sub>4</sub> )	2,000-3,000 400,000 200-2,000 400,000 1,000,000	710 63 <20 23.7 39 <500	550 88 <20 <5.0 <20 500	620 220 262 <5.0 262 20200	1200 69 182 <5.0 182 19400	970 46 131 <5.0 131 1050	870 44 123 <5.0 123 1050	1000 140 187 <5.0 187 21700
Dissolved Metals Aluminum Antimony Arsenic Barium Beryllium Bismuth Boron Cadmium Calcium Chromium	200 50 10,000 53 50,000 0.1 - 0.6 H 10 <sup>VI</sup> /90 <sup>III</sup> V	<3.0 <0.50 <0.1 19.2 <0.1 <1.0 <50 0.014 24600 <1.0	7.2 <0.50 <0.1 24.0 <0.1 <1.0 <50 0.011 30300 <1.0	8.9 <0.50 0.33 57.1 <0.1 <1.0 <50 0.09 58600 <1.0	5.0 <0.50 0.31 44.6 <0.1 <1.0 <50 2.65 69400 <1.0	11 <0.50 0.42 317 <0.1 <1.0 <50 0.039 65100 <1.0	9.8 <0.50 0.42 312 <0.1 <1.0 <50 0.036 66200 <1.0	23.6 <0.50 0.28 86.6 <0.1 <50 0.168 73300 <1.0
Cobalt Copper Iron Lead Lithium Magnesium Manganese Mercury	9 20-90 H 40-160 H	<0.5 0.84 2630 <0.20 <5.0 4700 135 <0.010	<0.5 0.31 320 <0.20 <5.0 4750 67.3 <0.010	0.75 0.56 9.0 <0.20 <5.0 7130 216 <0.010	0.58 5.34 <5.0 0.58 <5.0 6520 54.4 <0.010	<0.5 0.32 8.3 <0.20 <5.0 10300 10.2 <0.010	<0.5 0.22 8.1 <0.20 <5.0 10100 10.4 <0.010	0.67 0.59 39.7 0.49 <5.0 10600 283 <0.010
Molybdenum Nickel Potassium Selenium Silicon Silver Sodium	10,000 250-1500 H 10 0.5-15 H	<1.0 <1.0 631 <0.10 560 <0.020 1140 102	<1.0 <1.0 371 0.12 920 <0.020 954 130	1.9 3.1 1140 0.27 3560 <0.020 3420 206	1.9 1.8 915 0.26 3130 <0.020 3080 259	<1.0 <1.0 675 <0.10 3790 <0.020 1100 225	<1.0 <1.0 641 <0.10 3830 <0.020 1050 222	2.2 3.1 1130 1.01 3500 <0.020 3190 204
Strontium Sulphur Thallium Tin Titanium Uranium Vanadium Zinc Zirconium	3 1,000 3,000 75 - 2400 H	<ul> <li>&lt;3000</li> <li>&lt;0.050</li> <li>&lt;5.0</li> <li>&lt;5.0</li> <li>&lt;0.10</li> <li>&lt;5.0</li> <li>6.6</li> <li>&lt;0.50</li> </ul>	<3000 <0.050 <5.0 <5.0 0.21 <5.0 <5.0 <0.50	206 6700 <0.050 <5.0 <5.0 0.98 <5.0 <5.0 <0.50	259 6300 <0.050 <5.0 5.0 1.2 <5.0 22.8 <0.50	<pre>&gt;225 &lt;3000 &lt;0.050 &lt;5.0 &lt;5.0 0.73 &lt;5.0 33.0 &lt;0.50</pre>	<pre>&lt;3000 &lt;0.050 &lt;5.0 &lt;5.0 0.75 &lt;5.0 12.5 &lt;0.50</pre>	204 7900 <0.050 <5.0 <5.0 0.5 <5.0 <5.0 <0.50

Notes:

Results are expressed in micrograms per litre ( $\mu g/L),$  unless otherwise indicated.

Standards shown are from the Yukon Contaminated Sites Regulation Schedule 3 (updated to September 30, 2002).

AW = standards for the protection of freshwater aquatic life

MCS: most conservative standard based on applicable site-specific standards

QA/QC = Quality Assurance/ Quality Control

H = Hardness-dependant; V = Valence-dependant guideline; Cl = Chloride concentration-dependant guideline

FDA/FD = field duplicate available/field duplicate

#### TABLE 2B Results of Groundwater Analysis - Petroleum Hydrocarbons Teck - Landfill ESA Sä Dena Hes Mine, Yukon

Location		TH10-91	TH09-91	MW14-04	MW14-03	MW14-02	MW14-02	MW14-01
Sample Control Number	Aquatic Life 0	22807-01	22807-02		22807-04	22807-05	22807-06	22807-07
Date Sampled	Aquatic Life CSR-AW	27-Sep-14	27-Sep-14	27-Sep-14	27-Sep-14			27-Sep-14
QA/QC	(freshwater)					FDA	FD	
Volatile Organic Compounds								
Benzene	4,000	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Ethylbenzene	2,000	<0.40	<0.40 <0.40	<0.40 <0.40	<0.40	<0.40 <0.40	<0.40 <0.40	<0.40
Methyl t-butyl ether (MTBE)	2,000	<4.0	<4.0	<4.0	<0.40 <4.0	<0.40 <4.0	<4.0	<4.0
Styrene	720	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	390	0.59	<0.40	<0.30	0.42	<0.40	<0.30	<0.40
ortho-Xylene	390	<0.33	<0.40 <0.40	<0.40 <0.40	<0.42	<0.40	<0.40	<0.40
,		<0.40	<0.40 <0.40	<0.40 <0.40	<0.40 <0.40	<0.40	<0.40 <0.40	<0.40
meta- & para-Xylene								
Xylenes, total		<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Hydrocarbons								
EPHw10-19	5,000	<200	<200	<200	<200	<200	<200	<200
EPHw19-32		<200	<200	<200	<200	<200	<200	<200
LEPHw	500	<200	<200	<200	<200	<200	<200	<200
HEPHw		<200	<200	<200	<200	<200	<200	<200
Volatile Hydrocarbons (VH6-10)	15,000	370	<300	<300	<300	<300	<300	<300
VPHw (C6-C10)	1,500	370	<300	<300	<300	<300	<300	<300
Polycyclic Aromatic Hydrocarbons								
2-Methylnaphthalene		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	60	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Acenaphthylene	00	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Acridine	0.5	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Anthracene	1	< 0.010	< 0.010	< 0.010	< 0.010	<0.010	<0.010	< 0.010
Benz(a)anthracene	1	<0.010	< 0.010	< 0.010	<0.010	<0.010	<0.010	<0.010
Benzo(a)pyrene	0.1	<0.0090	< 0.0090	< 0.0090	<0.0090	<0.0090	<0.0090	< 0.0090
Benzo(b,j)fluoranthene	0.1	<0.0000	<0.0000	<0.0000	<0.0000	<0.050	<0.0000	<0.050
Benzo(g,h,i)perylene		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Benzo(g,n,)perviene Benzo(k)fluoranthene		<0.050	<0.050	<0.050	< 0.050	<0.050	<0.050	<0.050
Chrysene		<0.050	<0.050	<0.050	<0.050	<0.050 <0.050	<0.050	<0.050
Dibenz(a,h)anthracene		<0.050	<0.050	<0.050	< 0.050	<0.050	<0.050	<0.050
Fluoranthene	2	<0.030	<0.030	<0.030	<0.050 0.021	<0.030 <0.020	<0.030	<0.030
Fluorene	120	<0.020 <0.050	<0.020	<0.020 <0.050	<0.021	<0.020 <0.050	<0.020 <0.050	<0.020 <0.050
Indeno(1,2,3-c,d)pyrene	120	<0.050 <0.050						
Naphthalene	10	<0.050 <0.10						
Phenanthrene	3	<0.10 <0.050						
	0.2	< 0.030	<0.030	<0.050 0.023	<0.050 0.026	<0.030	<0.050	<0.030 <0.020
Pyrene Quinoline	34	<0.020 <0.24	<0.020 <0.24	0.023 <0.24	<0.026 <0.24	<0.020 <0.24	<0.020 <0.24	<0.020 <0.24
High Molecular Weight PAH`s	34	<0.24 <0.050						
Low Molecular Weight PAH's		<0.050 <0.24						
Total PAH		<0.24 <0.24						
		<b>NU.24</b>	NU.24	<b>NU.24</b>	NU.24	N0.24	<b>NU.24</b>	NU.24

Notes:

Results are expressed in micrograms per litre ( $\mu$ g/L), unless otherwise indicated.

Standards shown are from the Yukon Contaminated Sites Regulation Schedule 3 (updated to September 30, 2002).

AW = standards for the protection of freshwater aquatic life

MCS: most conservative standard based on applicable site-specific standards

QA/QC = Quality Assurance/ Quality Control

italics denotes detection limits that are greater than applicable standards

FDA/FD = field duplicate available/field duplicate

#### TABLE 2C Results of Groundwater Analysis - Volatile Organic Compounds Teck - Landfill ESA Sä Dena Hes Mine, Yukon

Location Sample Control Number Date Sampled QA/QC	Aquatic Life CSR-AW (freshwater)	MCS	TH10-91 22807-01 27-Sep-14	TH09-91 22807-02 27-Sep-14	MW14-04 22807-03 27-Sep-14	MW14-03 22807-04 27-Sep-14	MW14-02 22807-05 27-Sep-14 FDA	MW14-02 22807-06 27-Sep-14 FD	MW14-01 22807-07 27-Sep-14
Volatiles									
Bromodichloromethane			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromoform			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromomethane			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Carbon tetrachloride	130		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chlorodibromomethane			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloromethane			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chlorobenzene	13	F	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroethane			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	20	F	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dibromoethane			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-dichlorobenzene			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-dichlorobenzene	1500		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-dichlorobenzene	260		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-dichloroethane			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-dichloroethane	1,000		< 0.50	<0.50	<0.87	<0.50	<0.50	<0.50	<0.50
1,1-dichloroethene			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,2-dichloroethene			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,2-dichloroethene			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dichloromethane	980		<6.2	<2.0	<6.1	<6.6	<2.0	<4.1	<4.5
1,2-dichloropropane			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
cis-1,3-dichloropropene			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
trans-1,3-dichloropropene			<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,1-trichloroethane			< 0.50	<0.50	<0.50	1.9	<0.50	<0.50	<0.50
1,1,2-trichloroethane			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethene	200		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane			<4.0	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
1,1,1,2-tetrachloroethane			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-tetrachloroethane			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethene	1100		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl chloride			<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Notes:

Results are expressed in micrograms per litre ( $\mu$ g/L), unless otherwise indicated.

Standards shown are from the Yukon Contaminated Sites Regulation (updated to September 30, 2002).

SCN = sample control number

AW = standards for the protection of freshwater aquatic life

MCS: most conservative standard based on applicable site-specific standards

QA/QC = Quality Assurance/ Quality Control

FDA/FD = field duplicate available/field duplicate

F = freshwater dependant

#### TABLE 3A Results of Surface Water Analysis - Total Metals Teck - Landfill ESA Sä Dena Hes Mine, Yukon

Location					SW14-01	SW14-01	SW14-02	SW14-02	SW14-03	SW14-03	MH12	MH12
Sample Control Number	Aquatic Life		Aquatic Life	]	20769-01	KW1287	20769-02	KW1288	20769-03	KW1289	KS6050	KS6051
Date Sampled	CSR <sup>1</sup> -AW	MCS	CCME <sup>2</sup> -AW	MCS	8-Sep-14	11-Oct-14	8-Sep-14	11-Oct-14	8-Sep-14	11-Oct-14	26-Sep-14	26-Sep-14
QA/QC	(freshwater)	Σ	(freshwater)	Σ					1		FDA	FD
				_								
Physical Tests				_								
pH (field, pH units)			6.5-9.0		7.07	7.98	7.62	8.11	7.74	8.09	8.18	8.16
Hardness (Total as CaCO <sub>3</sub> )			-	_	151000	150000	179000	165000	175000	166000	175000	179000
Anions and Nutrients												
Ammonia (as N)(total)	131 - 1,840	pН	0.021-231	pH,T	-	15	-	5.3	-	10	23	32
Chloride (dissolved Cl)	101 1,010	P	120,000	p, .	<500	1300	<500	<500	<500	740	<500	640
Fluoride (F)	200 - 300	Н	120,000		130	120	110	100	110	110	-	-
Nitrate (as N)	40,000		13,000		32	51	47	62	40	56	22	22
Nitrite (as N)	20 - 200	CI	60	NO <sub>2</sub> -N								
Nitrate and nitrite (as N)			60	NO <sub>2</sub> -N	l <5 32	<5	<5 47	<5	<5	<5	<5	<5
	40,000					51		62	40	56	22	22
Sulfate (dissolved SO <sub>4</sub> )	100,000				6160	5950	11300	10500	10700	10400	9800	9600
Total Metals												
Aluminum			5-100	pН	8.2	28.1	9	15.2	236	33.5	60.4	56.1
Antimony	20			_ ·	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Arsenic	5		5	1	1.12	1.11	1.07	0.88	1.24	0.82	0.90	0.87
Barium	1,000			_	62.5	62.9	75.6	70.1	81.9	74.3	80.6	80.2
Beryllium	5.3				<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Bismuth	0.0				<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Boron			1,500	٦ - ١	<50	<50	<50	<50	<50	<50	<50	<50
Cadmium	0.01 - 0.06	н	0.09		0.034	0.043	0.056	0.050	0.13	0.044	0.057	0.047
Calcium	0.01 - 0.00		0.05	1	51700	50800	60900	56100	59500	56300	59700	61000
		V		v								
Chromium	1.0 <sup>VI</sup> /9.0 <sup>III</sup>	v	1.0 <sup>VI</sup> /8.9 <sup>II</sup>	v	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cobalt	0.9			٦	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Copper	2 - 9	Н	2 - 4	н	<0.50	<0.50	<0.50	<0.50	0.69	<0.50	<0.50	<0.50
Iron		_	300		34	67	20	36	374	57	90	73
Lead	4 - 16	Н	1 - 7	н	0.47	0.84	1.6	0.61	6.23	1.13	2.21	1.76
Lithium					<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
Magnesium					5410	5520	6600	6020	6350	6100	6240	6430
Manganese				_	27.6	32.2	11.9	11.5	27.1	6.2	5.1	3.4
Mercury	0.1		0.026		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.050	<0.050
Molybdenum	1,000		73		1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.2
Nickel	25 - 150	Н	25 - 150	н	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Potassium					379	312	602	418	726	408	430	436
Selenium	1.0		1	]	0.49	0.54	0.64	0.62	0.56	0.59	0.54	0.53
Silicon			•	-	4230	4160	3990	3950	4390	3810	4130	4210
Silver	0.05 - 1.5	н	0.1		<0.020	<0.020	<0.020	<0.020	0.021	<0.020	<0.020	<0.020
Sodium				-	941	843	1250	984	1060	975	1100	1090
Strontium					174	183	213	214	234	213	222	227
Sulphur					<3000	<3000	3300	<3000	8600	<3000	<3000	<3000
Thallium	0.3				<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Fin	0.0				<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
litanium	100				<5.0	<5.0	<5.0	<5.0	6.9	<5.0	<5.0	<5.0
	300		15	ן ר								
Jranium (anadium	300		10		0.61	0.65	0.91	0.89	0.89	0.88	0.93	0.95
/anadium	7.5 040		20	ן ר	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
	7.5 - 240	Н	30	l l	<5.0	<5.0	6	<5.0	11.3	<5.0	5.9	<5.0
Zirconium					<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50

Notes:

Results are expressed in micrograms per litre ( $\mu$ g/L), unless otherwise indicated.

Standards shown are from the Yukon Contaminated Sites Regulation Schedule 3 (updated to September 30, 2002), divided by a factor of 10 for assumed dilution of groundwater concentrations into surface water

receptors.

2. Standards shown are from the Canadian Council of Ministers Canadian Environmental Quality Guidelines

of the Environment, updated from time to time.

AW = standards for the protection of freshwater aquatic life

QA/QC = Quality Assurance/ Quality Control

pH = pH-dependant; H = Hardness-dependant; V = Valence-dependant; CI = Chloride concentration-

dependant guidelines

italics denotes detection limits that are greater than applicable standards

(-) = Not analyzed

#### TABLE 3B Results of Surface Water Analysis - Dissolved Metals Teck - Landfill ESA Sä Dena Hes Mine, Yukon

			Sä Dena Hes Min	ie, ru	KON				
Location Sample Control Number Date Sampled QA/QC	Aquatic Life CSR <sup>1</sup> -AW (freshwater)	MCS	Aquatic Life CCME <sup>2</sup> -AW (freshwater)	MCS	MH12 KS6050 26-Sep-14 FDA	MH12 KS6051 26-Sep-14 FD	SW14-01 KW1287 11-Oct-14	SW14-02 KW1288 11-Oct-14	SW14-03 KW1289 11-Oct-14
Physical Properties Hardness (Dissolved as CaCO <sub>3</sub> ) Total Suspended Soilds Total Dissolved Soilds Turbidity (NTU units) Miscellaneous Inorganics			2 - 8 avg max increase	]	174000 1600 178000 -	170000 2100 229000 -	144000 <4000 144000 0.57	161000 <4000 170000 0.31	169000 <4000 180000 1.17
Alkanlinity (as CaCO <sub>3</sub> ) Bicarbonate (HCO <sub>3</sub> ) Carbonate (CO <sub>3</sub> ) Hydroxide (OH)					161000 196000 <500 <500	161000 196000 <500 <500	140000 171000 <500 <500	156000 190000 <500 <500	155000 189000 <500 <500
Dissolved Metals Aluminum Antimony Arsenic Barium Beryllium Bismuth Boron Cadmium Calcium Chromium Cobalt Copper	20 5 1,000 5.3 5,000 0.01 - 0.06 1.0 <sup>VI</sup> /9.0 <sup>III</sup> 0.9 2 - 9	н У Н	5-100 5 1,500 0.09 1.0 <sup>V</sup> /8.9 <sup>III</sup> 2 - 4	]рн ] ] ] н	<3.0 <0.50 0.75 74.1 <0.10 <1.0 <50 0.038 59700 <1.0 <0.50 0.25	3.5 <0.50 0.76 75.9 <0.10 <1.0 <50 0.041 58100 <1.0 <0.50 0.24	4.2 <0.50 1.08 57.3 <0.10 <1.0 <50 0.034 48800 <1.0 <0.50 0.24	$\begin{array}{c} 3.6 \\ < 0.50 \\ 0.79 \\ 66.6 \\ < 0.10 \\ < 1.0 \\ < 50 \\ 0.044 \\ 54400 \\ < 1.0 \\ < 0.50 \\ 0.27 \end{array}$	<3.0 <0.50 0.75 70.0 <0.10 <1.0 <50 0.037 57200 <1.0 <0.50 0.22
Iron Lead Lithium Magnesium Manganese Mercury Molybdenum	<u> </u>	]н ]	300 1 - 7 0.026 73	<u>-</u> н	<5.0 0.21 <5.0 6010 1.4 <0.050 1.3	<5.0 0.21 <5.0 5990 1.3 <0.050 1.3	22.9 <0.20 <5.0 5490 28.7 <0.010 1.3	7.6 <0.20 <5.0 6090 8.6 <0.010 1.3	<5.0 <0.20 <5.0 6230 3.0 <0.010 1.2
Nickel Potassium Selenium Silicon Silver Sodium Strontium	25 - 150 1.0 0.05 - 1.5	]н ] ]н	25 - 150 1.0 0.1	] H ] ]	<1.0 481 0.58 4270 <0.020 1100 222	<1.0 476 0.61 4050 <0.020 1100 222	<1.0 358 0.45 4100 <0.020 909 177	<1.0 439 0.60 3780 <0.020 1070 213	<1.0 461 0.61 4010 <0.020 1050 216
Sulphur Sulphur Thallium Tin Titanium Uranium Vanadium Zinc	0.3 100 300 7.5 - 240	] ] ]н	0.8		222 3600 <0.050 <5.0 <5.0 0.91 <5.0 <5.0	222 4100 <0.050 <5.0 <5.0 0.93 <5.0 <5.0	<0000 <0.050 <5.0 <5.0 0.65 <5.0 <5.0	213 3500 <0.050 <5.0 <5.0 0.93 <5.0 <5.0	216 3700 <0.050 <5.0 <5.0 0.89 <5.0 <5.0
Zirconium				-	<0.50	<0.50	<0.50	<0.50	<0.50

Notes:

Results are expressed in micrograms per litre ( $\mu$ g/L), unless otherwise indicated.

Standards shown are from the Yukon Contaminated Sites Regulation Schedule 3 (updated to September 30, 2002), divided by a factor of 10 for assumed dilution of groundwater concentrations into surface water

receptors.

2. Standards shown are from the Canadian Council of Ministers Canadian Environmental Quality Guidelines of the Environment, updated from time to time.

AW = standards for the protection of freshwater aquatic life

QA/QC = Quality Assurance/ Quality Control

$$\label{eq:pH} \begin{split} pH = pH-dependant; H = Hardness-dependant; V = Valence-dependant; CI = Chloride concentration-dependant guidelines \\ italics denotes detection limits that are greater than applicable standards \end{split}$$

(-) = Not analyzed

	Sa Dena He	<u>es Mine, Yukon</u>			
Location			SW14-01	SW14-02	SW14-03
Sample Control Number	Aquatic Life	Aquatic Life	20769-01	20769-02	20769-03
Date Sampled	CSR <sup>1</sup> -AW	CCME <sup>2</sup> -AW	8-Sep-14	8-Sep-14	8-Sep-14
QA/QC	(freshwater)	(freshwater)	-		
Volatile Organic Compounds					
Benzene	400	370	<0.40	<0.40	<0.40
Ethylbenzene	200	90	<0.40	<0.40	<0.40 <0.40
Methyl t-butyl ether (MTBE)	200	10000	<0:40 <4.0	<4.0	<0.40 <4.0
Styrene	72		<0.40	<0.40	<4.0 <0.40
-		72			
Toluene	39	2	<0.40	<0.40	<0.40
ortho-Xylene			<0.40	<0.40	< 0.40
meta- & para-Xylene			<0.40	<0.40	<0.40
Xylenes, total			<0.40	<0.40	<0.40
Hydrocarbons					
EPHw10-19	500		<200	<200	<200
EPHw19-32			<200	<200	<200
LEPHw	50		<200	<200	<200
HEPHw			<200	<200	<200
Volatile Hydrocarbons (VH6-10)	1,500		<300	<300	<300
VPHw (C6-C10)	150		<300	<300	<300
()					
Polycyclic Aromatic Hydrocarbons					
2-Methylnaphthalene			<0.10	<0.10	<0.10
Acenaphthene	6.0	5.8	<0.050	<0.050	<0.050
Acenaphthylene	·		< 0.050	<0.050	<0.050
Acridine	0.05	4.4	< 0.050	<0.050	<0.050
Anthracene	0.1	0.012	<0.010	<0.010	<0.010
Benz(a)anthracene	0.1	0.018	<0.010	<0.010	<0.010
Benzo(a)pyrene	0.01	0.015	<0.0090	<0.0090	<0.0090
Benzo(b,j)fluoranthene			<0.050	<0.050	<0.050
Benzo(g,h,i)perylene			<0.050	<0.050	<0.050
Benzo(k)fluoranthene			<0.050	<0.050	<0.050
Chrysene			< 0.050	<0.050	<0.050
Dibenz(a,h)anthracene			<0.050	<0.050	<0.050
Fluoranthene	0.2	0.04	<0.020	<0.020	<0.020
Fluorene	12	3	< 0.050	<0.050	< 0.050
Indeno(1,2,3-c,d)pyrene		<u> </u>	< 0.050	<0.050	< 0.050
Naphthalene	1	1.1	<0.10	<0.10	<0.10
Phenanthrene	0.3	0.4	<0.050	<0.050	<0.050
Pyrene	0.02	0.025	<0.020	<0.030	<0.030
Quinoline	3.4	3.4	<0.24	<0.24	<0.020
Notos:	0.4	5.7	<b>NU.24</b>	NU.24	NU.24

Notes:

Results are expressed in micrograms per litre ( $\mu$ g/L), unless otherwise indicated.

1. Standards shown are from the Yukon Contaminated Sites Regulation Schedule 3 (updated to

September 30, 2002), divided by an dilution factor of 10 for assumed groundwater concentrations in receiving surface water samples.

2. Standards shown are from the Canadian Council of Ministers Canadian Environmental Quality Guidelines of the Environment, updated from time to time.

AW = standards for the protection of freshwater aquatic life

MCS: most conservative standard based on applicable site-specific standards

QA/QC = Quality Assurance/ Quality Control

italics denotes detection limits that are greater than applicable standards

(-) = Not analyzed

#### TABLE 5A QAQC Results of Groundwater Analysis - Dissolved Metals Teck - Landfill ESA Sä Dena Hes Mine, Yukon

Location		MW14-02	MW14-02			
Sample Control Number	Method	22807-05	22807-06		Relative	Difference
Date Sampled Quality Assurance	Detection Limit	27-Sep-14 FDA	27-Sep-14 FD	Mean	Percent Difference	Factor (DF)
Physical Tests						
Hardness (as CaCO <sub>3</sub> )	500	205000	207000	206000	1%	NA
Anions and Nutrients						
Chloride (Cl)	500	970	870	920	NA	0.20
Fluoride (F)	10	46	44	45	NA	0.20
Nitrate (as N)	20	131	123	127	6%	NA
Nitrite (as N)	5.0	<5	<5	NC	NC	NA
Nitrate and nitrite (as N)	20	131	123	127	6%	NA
Sulfate (SO <sub>4</sub> )	500	1050	1050	1050	NA	0.00
Dissolved Metals					• • •	
Aluminum	3.0	11	9.8	10.4	NA	0.40
Antimony	0.50	<0.50	<0.50	NC	NC	NA
Arsenic	0.10	0.42	0.42	0.4	NA	0.00
Barium	1.0	317	312	314.5	2%	NA
Beryllium	0.10	<0.1	<0.1	NC	NC	NA
Bismuth	1.0	<1.0	<1.0	NC	NC	NA
Boron	50	<50	<50	NC	NC	NA
Cadmium	0.010	0.039	0.036	0.0	NA	0.30
Calcium	50	65100	66200	65650	2%	NA
Chromium	1.0	<1.0	<1.0	NC	NC	NA
Cobalt	0.50	<0.5	<0.5	NC	NC	NA
Copper	0.20	0.32	0.22	0.3	NA	0.50
Iron	5.0	8.3	8.1	8.2	NA	0.04
Lead	0.2	<0.20	<0.20	NC	NC	NA
Lithium	5	<5.0	<5.0	NC	NC	NA
Magnesium	50	10300	10100	10200	2%	NA
Manganese	1.0	10.2	10.4	10.3	2%	NA
Mercury	0.010	<0.010	<0.010	NC	NC	NA
Molybdenum	1.0	<1.0	<1.0	NC	NC	NA
Nickel	1.0	<1.0	<1.0	NC	NC	NA
Potassium	50	675	641	658	5%	NA
Selenium	0.10	<0.10	<0.10	NC	NC	NA
Silicon	100	3790	3830	3810	1%	NA
Silver	0.020	< 0.020	<0.020	NC	NC	NA
Sodium	50	1100	1050	1075	5%	NA
Strontium	1.0	225	222	223.5	1%	NA
Sulphur	3000	<3000	<3000	NC	NC	NA
Thallium	0.05	< 0.050	<0.050	NC	NC	NA
Tin	5.0	<5.0	<5.0	NC	NC	NA
Titanium	5.0	<5.0	<5.0	NC	NC	NA
Uranium	0.10	0.73	0.75	0.74	3%	NA
Vanadium	5.0	<5.0	<5.0	NC	NC	NA
Zinc	5.0	33.0	12.5	22.75	NA	4.10
Zirconium	0.50	<0.50	<0.50	NC	NC	NA
	0.50	<b>CO.30</b>	<0.50		110	11/1

Notes:

Results are expressed in microgram per litre ( $\mu$ g/L), unless otherwise indicated.

Mean = average of two values.

Relative percent difference = the difference between two values divided by the mean of the two values.

Difference factor = absolute difference between two values divided by the method detection limit.

Difference factor is calculated when the concentration is within five times the detection limit.

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines.

FDA = Field Duplicate Available; FD = Field Duplicate; NC = Not Calculated; NA = Not Applicable

#### TABLE 5B QAQC Results of Groundwater Analysis - Petroleum Hydrocarbons Teck - Landfill ESA Sä Dena Hes Mine, Yukon

Location		MW14-02	MW14-02			
Sample Control Number	Method	22807-05	22807-06		Relative	Difference
Date Sample	Detection			Mean	Percent	Factor
Quality Assurance	Limit	27-Sep-14 FDA	27-Sep-14 FD	Wear	Difference	(DF)
		T DA	ΓD		Difference	
Volatile Organic Compounds						
Benzene	0.40	<0.40	<0.40	NC	NC	NA
Ethylbenzene	0.40	<0.40	<0.40	NC	NC	NA
Methyl t-butyl ether (MTBE)	4.0	<4.0	<4.0	NC	NC	NA
Styrene	0.50	<0.50	<0.50	NC	NC	NA
Toluene	0.40	<0.40	<0.40	NC	NC	NA
ortho-Xylene	0.40	<0.40 <0.40	<0.40 <0.40	NC	NC	NA
	0.40		<0.40 <0.40	NC	NC	NA
meta- & para-Xylene		< 0.40		-	-	
Xylenes, total	0.40	<0.40	<0.40	NC	NC	NA
Hydrocarbons						
EPH10-19	200	<200	<200	NC	NC	NA
EPH19-32	200	<200	<200	NC	NC	NA
LEPH	200	<200	<200	NC	NC	NA
HEPH	200	<200	<200	NC	NC	NA
Volatile Hydrocarbons (VH6-10)	300	<300	<300	NC	NC	NA
				NC	NC	
VPH (C6-C10)	300	<300	<300	NC	NC	NA
Polycyclic Aromatic Hydrocarbons						
2-Methylnaphthalene	0.10	<0.10	<0.10	NC	NC	NA
Acenaphthene	0.050	< 0.050	< 0.050	NC	NC	NA
Acenaphthylene	0.050	< 0.050	<0.050	NC	NC	NA
Acridine	0.050	< 0.050	< 0.050	NC	NC	NA
Anthracene	0.010	< 0.010	< 0.010	NC	NC	NA
Benz(a)anthracene	0.010	< 0.010	<0.010	NC	NC	NA
Benzo(a)pyrene	0.0090	< 0.0090	< 0.0090	NC	NC	NA
Benzo(b,j)fluoranthene	0.050	<0.050	<0.050	NC	NC	NA
Benzo(g,h,i)perylene	0.050	<0.050	<0.050	NC	NC	NA
Benzo(k)fluoranthene	0.050	<0.050	<0.050	NC	NC	NA
Chrysene	0.050	<0.050	<0.050	NC	NC	NA
Dibenz(a,h)anthracene	0.050	<0.050	<0.050	NC	NC	NA
Fluoranthene	0.020	<0.030	<0.030	NC	NC	NA
Fluorene	0.020	<0.020	<0.020 <0.050	NC	NC	NA
Indeno(1,2,3-c,d)pyrene	0.050	< 0.050	< 0.050	NC	NC	NA
Naphthalene	0.050	<0.050	< 0.050	NC	NC	NA
Phenanthrene	0.050	<0.10	<0.10	NC	NC	NA
Pyrene	0.050	< 0.030	< 0.030	NC	NC	NA
Quinoline	0.020	<0.020	<0.020 <0.24	NC	NC	NA
Low Molecular Weight PAH`s	0.24	<0.24 <0.050	<0.24 <0.050	NC	NC	NA
	0.050	<0.050 <0.24	<0.050 <0.24	NC	NC	NA
High Molecular Weight PAH`s Total PAH	0.24 0.24	<0.24 <0.24	<0.24 <0.24	NC	NC	NA
I Ulai FAI I	0.24	<0.24	<0.24	NC	NC	INA

Notes:

Results are expressed in micrograms per litre ( $\mu$ g/L), unless otherwise indicated.

Mean = average of two values.

Relative percent difference = the difference between two values divided by the mean of the two values.

Difference factor = absolute difference between two values divided by the method detection limit.

Difference factor is calculated when the concentration is within five times the detection limit.

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines.

FDA = Field Duplicate Available; FD = Field Duplicate; NC = Not Calculated; NA = Not Applicable

#### TABLE 5C QAQC Results of Groundwater Analysis - Volatile Organic Compounds Teck - Landfill ESA Sä Dena Hes Mine, Yukon

Location Sample Control Number Date Sampled Quality Assurance	Detection	MW14-02 22807-05 27-Sep-14 FDA	MW14-02 22807-06 27-Sep-14 FD	Mean	Relative Percent Difference	Difference Factor (DF)
Volatiles						
Bromodichloromethane	1.0	<1.0	<1.0	NC	NC	NA
Bromoform	1.0	<1.0	<1.0	NC	NC	NA
Bromomethane	1.0	<1.0	<1.0	NC	NC	NA
Carbon tetrachloride	0.50	<0.50	<0.50	NC	NC	NA
Chlorodibromomethane	1.0	<1.0	<1.0	NC	NC	NA
Chloromethane	1.0	<1.0	<1.0	NC	NC	NA
Chlorobenzene	0.50	<0.50	<0.50	NC	NC	NA
Chloroethane	1.0	<1.0	<1.0	NC	NC	NA
Chloroform	1.0	<1.0	<1.0	NC	NC	NA
1.2-dibromoethane	0.20	<0.20	<0.20	NC	NC	NA
1.2-dichlorobenzene	0.50	<0.50	<0.50	NC	NC	NA
1,3-dichlorobenzene	0.50	<0.50	<0.50	NC	NC	NA
1.4-dichlorobenzene	0.50	<0.50	<0.50	NC	NC	NA
1.1-dichloroethane	0.50	< 0.50	<0.50	NC	NC	NA
1.2-dichloroethane	0.50	< 0.50	<0.50	NC	NC	NA
1,1-dichloroethene	0.50	<0.50	<0.50	NC	NC	NA
cis-1,2-dichloroethene	1.0	<1.0	<1.0	NC	NC	NA
trans-1,2-dichloroethene	1.0	<1.0	<1.0	NC	NC	NA
Dichloromethane	2.8	<2.0	<4.1	NC	NC	NA
1,2-dichloropropane	0.50	< 0.50	<0.50	NC	NC	NA
cis-1,3-dichloropropene	1.0	<1.0	<1.0	NC	NC	NA
trans-1,3-dichloropropene	1.0	<1.0	<1.0	NC	NC	NA
1,1,1-trichloroethane	0.50	<0.50	<0.50	NC	NC	NA
1.1.2-trichloroethane	0.50	<0.50	<0.50	NC	NC	NA
Trichloroethene	0.50	<0.50	<0.50	NC	NC	NA
Trichlorofluoromethane	4.0	<4.0	<4.0	NC	NC	NA
1,1,1,2-tetrachloroethane	0.50	<0.50	<0.50	NC	NC	NA
1,1,2,2-tetrachloroethane	0.50	<0.50	<0.50	NC	NC	NA
Tetrachloroethene	0.50	<0.50	<0.50	NC	NC	NA
Vinyl chloride	0.50	<0.50	<0.50	NC	NC	NA

Notes:

Results are expressed in microgram per litre ( $\mu$ g/L), unless otherwise indicated.

Mean = average of two values.

Relative percent difference = the difference between two values divided by the mean of the two values. Difference factor = absolute difference between two values divided by the method detection limit.

Difference factor = absolute difference between two values divided by the method detection limit.

Difference factor is calculated when the concentration is within five times the detection limit.

Bold text indicates that the RPD or DF exceeds Golder's internal QA/QC guidelines.

FDA = Field Duplicate Available; FD = Field Duplicate; NC = Not Calculated; NA = Not Applicable

# **ATTACHMENT 1**

Monitoring Well Logs

PROJECT No.: 12-1021-0006 / 11000 CLIENT: Teck Resources Ltd. PROJECT: Sä Dena Hes Mine Closure LOCATION: Landfill N: 6712303.22 E: 507861.35

#### **RECORD OF MONITORING WELL: MW14-01**

SHEET 1 OF 2 DATUM: NAD 83

DRILLING DATE: September 10, 2014 DRILLING CONTRACTOR: Impact Drilling

	D HOD	SOIL PROFILE				SA	MPL	ES		PID ppm				Ф	DYN/ RESI	AMIC F STAN	PENET CE, BL	RATIO OWS/0	N ).3n	ģŕ	PIEZOMETE STANDPIP	
METRES	DRILLING RIG DRILLING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH	NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	5 PID ppm	10	15	20			ER CO		IT PER		ADDITIONAL LAB. TESTING	OR THERMISTO INSTALLATI	
			STI	(m)			BL		ž	50	100	150	20	0					40		Stick-up	[
0		Ground Surface FILL - (SW) SAND, fine sand, trace to some silt; brown-grey; non-cohesive,		1039.87 0.00								+									Concrete	P
1		dry. -no odour or staining																			Bentonite Chips	
2																					Soil Cuttings	
																					Bentonite Chips	
4	8	(SW) SAND, fine sand, some silt; grey; non-cohesive, dry. -no odour or staining		1036.82	SA1																Soil Cuttings	
5	Foremost DR1 Air Rotarv			1033.77																	Bentonite Chips	
7		(SW/GW) SAND and GRAVEL, coarse to fine sand and gravel; brown-grey, non-cohesive, dry to moist. -no odour or staining	0,00,00,00,00,00,00,00,00,00,00,00,00,0	6.10		-															Soil Cuttings	
8			0,000,000,000,000,000,000,000,000,000,																		Slough	
9		(SW) SAND, fine sand; light brown, sub-angular cobbles; non-cohesive, dry. -no odour or staining	000 000	<u>1030.73</u> 9.14	SA3	-															Bentonite Chips	INV.
10		CONTINUED NEXT PAGE			[	† –					1-		-†				$\lceil - \rceil$					
DEF		SCALE		•						Golde	r	<b>I</b>	sc	DIL CLA	SSIFI	CATIC	I		ED: LO	)		

PROJECT No.: 12-1021-0006 / 11000 CLIENT: Teck Resources Ltd. PROJECT: Sä Dena Hes Mine Closure LOCATION: Landfill N: 6712303.22 E: 507861.35

#### **RECORD OF MONITORING WELL: MW14-01**

SHEET 2 OF 2 DATUM: NAD 83

DRILLING DATE: September 10, 2014 DRILLING CONTRACTOR: Impact Drilling

	-	<b>_</b>				-					-												1	
щ	Ċ	물물	SOIL PROFILE		<b>.</b>		SA	MPL	ES		PID ppm					⊕	DYN RES	AMIC I ISTAN	PENET CE, BL	RATIONS.	ON /0.3n	ں _	PIEZOMETE STANDPIPE	
DEPTH SCALE METRES	a C	DRILLING METHOD		STRATA PLOT		ъ		3m	ö	%		5	10	15	2	0					80	ADDITIONAL LAB. TESTING	OR THERMISTO	
ET ET		NG	DESCRIPTION	TA PI	ELEV.	NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	PID						WAT	ER C			RCENT	ΞΞΨ.	INSTALLATIO	DN NC
	a	빌		TRA'	DEPTH (m)	Ŋ	Ѓ-	LOV	Ğ	ECO MECO	ppm						Wpł		-01		— WI	LAB		
	+			ν,				-		-		50	100	150	20	00	1	0 2	20	30	40		4	
- 10			(SW) SAND, fine sand; light brown,		;							-	_	_						-				
			sub-angular cobbles; non-cohesive,																					
			dry. -no odour or staining <i>(continued)</i>																				Bentonite Chips	
11																								
																							Silica Sand	
12					1027.68																			
			(SW/GW) SAND and GRAVEL, coarse to fine sand and gravel; brown;	. <u>0</u>	12.19	SA4																		
			non-cohesive, wet.	.O. (																			Water level	
			-no odour or staining	. <u>0</u> (																			Water level observed in <u>v</u> open hole	
13				0.00	· ·																		during drilling	
10				0.00																				E.
	ost D	Air Rotary		0.00																				
	Foremost DR12	Air		0.00																			Slotted PVC	
	1			0.00																			pipe	
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		_	End of Monitoring Well.	0.00	1023.11 16.76								-							-			[	
17																								
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										L						011 01					4.010			
יח	=D-	ты с	SCALE						Â	$\overline{\mathbf{x}}$					S	OIL CL/	ASSIFI	CATIC			Л: GAC GED: L			
									lā		G	old	er	_							GED: L KED: A			
1	: 5	U							V		AS	SOCÌ	ate	S					U		NED. P	u.		

PROJECT No.: 12-1021-0006 / 11000 CLIENT: Teck Resources Ltd. PROJECT: Sä Dena Hes Mine Closure LOCATION: Landfill N: 6712330.40 E: 507967.18

#### **RECORD OF MONITORING WELL: MW14-02**

SHEET 1 OF 2 DATUM: NAD 83

DRILLING DATE: September 9, 2014 DRILLING CONTRACTOR: Impact Drilling

	۵ بارو		SOIL PROFILE		ı —		SA	MPL	ES		PID ppm				$\oplus$	DYN/ RESI	AMIC I ISTAN	PENET CE, BL	RATIO	N ).3n	μģ	PIEZOMETE STANDPIPE	
METRES	DRILLING RIG	C ME		PLOT	ELEV.	3ER	щ	/0.3m	No	RY %	5 PID	10	15	20	D			40 6 L ONTEN			ADDITIONAL LAB. TESTING	OR THERMISTO	)R
ME	DRILL		DESCRIPTION	STRATA PLOT	DEPTH (m)		TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	PID ppm					WA1 Wp H					ADD. LAB.	INSTALLATIC	JIN
_		+	0	ST	1033.32			B	_	~	50	100	150	20	0	1				10		Stick-up	
0		+	Ground Surface FILL - (SW) SAND, coarse to fine sand, some coarse to fine gravel; light	$\boxtimes$	0.00																	Concrete	P
			brown, sub-angular cobbles;																				
			non-cohesive, dry. -no odour or staining		*																	Desta dia Obier	
1																						Bentonite Chips	
																							И
																							I
2					• •																		ĺ
					*																	Soil Cuttings	1
																							1
3						<b>C 1</b>																	1
-			-increased sand and moisture content from 3m to 6m depth.			SA1																	1
																						Bentonite Chips	ľ
					*																	Dontorinto orispo	
4					•																		H
																							H
	2																						Ĥ
5	Foremost DR12	Rotary																				Soil Cuttings	H
	Forem	Ar																					1
																							1
																							1
6			(SW) SAND, fine sand, trace to some	×	1027.22 6.10	SA2																	H
			silt; light brown; non-cohesive, dry to moist, loose.																				
			-no odour or staining																			Bentonite Chips	
7																							
																							H
																							1
																							1
8					:																		1
																						Soil Cuttings	1
																							I H
9																							H
			-decreased silt and moisture content from 9.1m to 12.1m depth.			SA3																	H
			· · · · · · · · · · · · · · · · · · ·																				H
																							1
10	_ L	- -		<u></u>	+		+ -	-				1-	- -	-+			<u> </u>	<b> </b> -	┣-				. ଏ
				1	I	L	<u> </u>	L	Â	~	2			SC	DIL CLA	SSIFI	CATIO						
DEF	РТН 50	ISC	CALE						(Ē	/A`	Gold Associ	er						I		ed: Lo Ed: Ae			

PROJECT No.: 12-1021-0006 / 11000 CLIENT: Teck Resources Ltd. PROJECT: Sä Dena Hes Mine Closure LOCATION: Landfill N: 6712330.40 E: 507967.18

#### **RECORD OF MONITORING WELL: MW14-02**

SHEET 2 OF 2 DATUM: NAD 83

DRILLING DATE: September 9, 2014 DRILLING CONTRACTOR: Impact Drilling

			p	SOIL PROFILE			Г	¢^	MPL	Ee		PID							DYN		PENET	RATIO	N N		PIEZOMETER,	
ALE	METRES	DRILLING RIG	E.		F	1		3A	1	-		ppm						$\oplus$			PENET CE, BL		· · ·	ADDITIONAL LAB. TESTING	STANDPIPE	
1 SC	TRE	ŊG	Μ		STRATA PLOT	ELEV.	Ë		BLOWS/0.3m	ö	CORE RECOVERY %		5	10		15	20						80	TION	THERMISTOR	
LT L	Ξ	SILL	IN	DESCRIPTION	ATA	DEPTH	NUMBER	TYPE	WS/	CORE No.	COR	PID ppm												B. T	INSTALLATION	
B		ä	ЫЩ.		STR/	(m)	Ž	Ľ	BLO	8	REC		50	100		50	200		Wpł		V		— WI 40	⋖┘		
-							$\vdash$						50	100	)	150	200	)		0 2	20 :	30 ·	40			
-	10			(SW) SAND, fine sand, trace to some		-							-													
E				silt; light brown; non-cohesive, dry to moist, loose.																						
E				-no odour or staining (continued)																						
E																										
E																									Bentonite Chips	
_	11																									-
E																										
E																										
E																										. •.
E																									Silica Sand	
_	12																									<u>-</u> 13-
_				- increased moisture content from			SA4																			1
_				12.1m to 16.1m depth.																						-
_																										
_		312																							l ŝe	1
_	13	Foremost DR12	Air Rotary																							<u>-</u>
_		Dremo	Air																							
-		щ																							Slotted PVC pipe	1
																										1
_																									Water level	<u>-</u>
-	14					2																			Water level observed in open hole during drilling	
																									during drilling	Ë.
-																										
-																										1
																										-
-	15																									
																									Slough	
-	16					; 1017.17																				
-				End of Monitoring Well.		16.15																				
-																										
	17																									-
-	18																									_
-	10																									
-	19					1																				_
	19					1																				-
						1																				
_	20																									-
	20																									-
		L				I	1	I	<u> </u>		-	G				1	SC	IL CLA	SSIFI	CATIC	ON SY	STEM	: GAC	S	I	
	DE	PT	нs	CALE					1		78	E C	al	ler	•							LOGG	BED: LO	С		
	1 :	50	)							V	P	As	<u>50</u> C	ia	tes						C	HECK	ED: A	3		
-	-	-	-				_		_		_				-		_						_			_

PROJECT No.: 12-1021-0006 / 11000 CLIENT: Teck Resources Ltd. PROJECT: Sä Dena Hes Mine Closure LOCATION: Landfill N: 6712442.82 E: 507922.23

#### **RECORD OF MONITORING WELL: MW14-03**

SHEET 1 OF 1 DATUM: NAD 83

DRILLING DATE: September 12, 2014 DRILLING CONTRACTOR: Impact Drilling

щ		ڻ ن	₽	SOIL PROFILE			Γ	SA	MPL	.ES		PID ppn						•	DYN RES	AMIC I ISTAN	PENET CE, BL	RATIO	ON ) /0.3n	.0	PIEZOMETE	
DEPTH SCALE	VIELIKES	DRILLING RIG	ING METH	DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %		5	1	0	15	2	20	2	0	40 I ONTEN	60 IT PE	80 RCENT	ADDITIONAL LAB. TESTING	OR THERMISTO INSTALLATIO	R
DEF	<	DRI	DRILL		STRAI	DEPTH (m)	Ñ	۲ ۲	BLOW	СO	RECO	ppn	n 50	1	00	150	2	□ ∞	Wph		V	V 30	— WI 40	AD		
	0			Ground Surface		1030.14																Ĩ			Stick-up	
	1		-	FILL - (SW/GW) SAND and GRAVEL, coarse to fine sand and gravel; brown; non-cohesive, dry to moist. -no odour or staining (SW) SAND, coarse to medium sand, some silt; brown; non-cohesive, moist to wet. -no odour or staining		0.00	5																		Concrete Bentonite Chips	
				Ū																					Soil Cuttings Slough	
	2																								Bentonite Chips	
	3	112					SA1																		Silica Sand	
	4	Foremost DR12	Air Rotary																						Slotted PVC pipe	
	6			-wet at 4.5m depth.																					Water level observed in <b>Y</b> open hole during drilling	
NVIRO) jhlee 12/17/14	7					1022.22																			Slough	
National IM Server GINT_CAL_WITIONLM Unique Project D: Output FormBC_BOREHOLE (EWVIRO) jive 12/17/14	9			End of Monitoring Well.		7.92																				
National IM Server:G	DEI 1 :			CALE	_	1	1	1		G	Ì	Å	Go	olde Dcia	r	5	S	I OIL CL	ASSIFI	CATIC		LOG	1: GAC GED: L KED: A	С	1	

PROJECT No.: 12-1021-0006 / 11000 CLIENT: Teck Resources Ltd. PROJECT: Sä Dena Hes Mine Closure LOCATION: Landfill N: 6712365.23 E: 508005.45

#### **RECORD OF MONITORING WELL: MW14-04**

SHEET 1 OF 2 DATUM: NAD 83

DRILLING DATE: September 11, 2014 DRILLING CONTRACTOR: Impact Drilling

1	U	ПОН	SOIL PROFILE				SA	MPL	ES		PID ppm					Ð	DYN RES	AMIC ISTAN	PENET CE, BL	RATIC	0.3n	-19	PIEZOMETE STANDPIPI	
METRES	DRILLING RIG	ILLING MET	DESCRIPTION	STRATA PLOT	ELEV. DEPTH	NUMBER	TYPE	BLOWS/0.3m	CORE No.	CORE RECOVERY %	PID ppm	5	10	15	2	20	WA	TER C				ADDITIONAL LAB. TESTING	OR THERMISTO INSTALLATIO	
		-		STF	(m)			B	0	RE		50	100	150	2	00					40		Stick-up	[
0			Ground Surface FILL - (SW/GW) SAND and GRAVEL, coarse to fine sand and gravel; brown; non-cohesive, dry to	$\bigotimes$	1028.82																		Concrete	A A
1			moist. -no odour or staining																				Bentonite Chips	
2																							Soil Cuttings	
3	12		(SW) SAND, medium to fine sand, some coarse to fine gravel, some silt, brown; non-cohesive, dry to moist. -no odour or staining		1025.77																		Bentonite Chips	
5	Foremost DR12	Air Rotary				SA2																	Soil Cuttings	
7																							Bentonite Chips	
																							Slough	
8																							Bentonite Chips	
9		-	(SM) SILTY SAND, coarse to fine; brown; non-cohesive, wet.		<u>1019.68</u> 9.14	-SA3																	Silica Sand	
		_			1	Ļ.	<u> </u>	_	L.			<u> </u>	4-				<u> </u>	<u> </u>	<u> </u>	·		.	Water level	

PROJECT No.: 12-1021-0006 / 11000 CLIENT: Teck Resources Ltd. PROJECT: Sä Dena Hes Mine Closure LOCATION: Landfill N: 6712365.23 E: 508005.45

#### **RECORD OF MONITORING WELL: MW14-04**

SHEET 2 OF 2 DATUM: NAD 83

DRILLING DATE: September 11, 2014 DRILLING CONTRACTOR: Impact Drilling

Щ		<u>ں</u>	ДOH	SOIL PROFILE				SA	MPLE	s		PID ppm						•	DYN. RES	AMIC F STAN	PENET CE, BL	RATIC	0N 0.3n	-19	PIEZOMETE STANDPIP	ER, E
DEPTH SCALE	ETRES	DRILLING RIG	NG MET	DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	түре	BLOWS/0.3m	CORE No.	CORE RECOVERY %	PID	5	10	1	5	20							ADDITIONAL LAB. TESTING	OR THERMISTO INSTALLATIO	OR
DEP.	Σ	DRIL	DRILLI	DESCRIPTION	STRAT	DEPTH (m)	MUN	ΤY	BLOW	CORI	RECOV	ppm	50	100	1!	50	200		Wpł		-0	V	— WI 40	ADC LAB.		
_	10			(SM) SILTY SAND, coarse to fine;	মাল								-									-			open hole	
	11	Foremost DR12	Air Rotary	(SM) SILT SAIND, Coarse to line, brown; non-cohesive, wet. (continued)			SA4																		open hole during drilling Silica Sand Slotted PVC pipe	
				End of Monitoring Well.		1016.32 12.50																				
	13 14 15 16																									
E (ENVIRO) jhlee 12/17/14	40																									-
National IM Server GINT_GAU_NATIONALIM Unique Project ID : Output FormIBC_BOREHOLE (ENVIRO) jHee 12/17/14	18 19 20																									
d Server:G	DF	рті	 H SI	CALE	1			1		Â	Ň	G				1	SO	L CLA	SSIFI	CATIC			I: GACS GED: LC			
National II	1 :			- ·						Z	Ð	<b>FG</b> As	i <b>ol</b> ( <u>50C</u>	ier iat	es								ED: LC			

# **ATTACHMENT 2**

# **Groundwater Development and Sampling Forms**

oject Name:	Sa	Dunc	Hes			Project	No.:	12-1	021-	0006	110000 /
cation:	Lon	11:21				Date:			pt.27		
eather:	alan	4	Tem	perature:	nGC	Comple					
S Coordinates						Reviewe	ed By:				
ONITORING	WELL I	NFORMA	TION					_			
ime of Measurem						Tidally	Influenced:		es 🖾 No	C	
epth to Product:		n	n	Product Thic	kness:	-			es 🖄 No		
epth to Water (A)	):	1-1.120n	n below	Ф ТОР			eadspace:	÷	-	ppm	
epth to Bottom of	f Weli (B):	15.845 n	n below	<b>Г</b> ТОР		One W	lell Volume:				
iameter of Stand	pipe:	51 n	nm				-				(2.0 inch) diameter well
Vell Condition:		good				(B-A)**	1.1 =	Li	tres - for a	a 38 mm	(1.5 inch) diameter well
	LIST	0									
ump 🕅 Waterr			Multime	əter	Mode	VSI SSEM	RS 17 R	Rental I	Fauinmen	+ NKT	Hydrolift
X Hydroli				np Meter		el:			-4-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-6-	. 101	/ mparoarti
	(Турез	)		ctivity Meter		el:		ield Bi	Jmp		
D Perista				ed Oxygen M		el:					□ pH7
D Subme	ersible		ORP (F	Redex) Meter	m Mode	el:			)		
D Bladde	r		Organie	c Vapour Me	ter Mode	el:		J 1413	us/cm		
ump Details:			D.O.	Ampoule			DF	ield Ca	alibration		
	ODMENIA		10					-			
ELL DEVEL		-		10		1					
	Well. Vol. X			= <u>10</u>	litres				Finish:		
vg. Flow Rate:		Um	in.				intake depth	י: עריין		1	
				Cond I							
	/olume	Temp.	pH		Specific Con	id. Redox	Diss. O <sub>2</sub> *	Wa	ter Level		Demailer
	ernoved	Temp. (°C)	pH (Units)	µS/cr	n or mS/cm	id. Redox (mV)	Diss. O <sub>2</sub> * (mg/L)	Wa	ter Level (m)		Remarks
	ernoved (L)	(°C)	(Units)	µS/cr (c		(mV)	(mg/L)	Wa		hu	
Time R	ernoved (L)	(°C) 3.0		µS/cr (d	n or mS/cm sircle one)	Redox	(mg/L)	Wa			Remarks
Time R	emoved (L) 2 4 C	(°C) 3.0	(Únits)	µS/cr (d	m or mS/cm sircle one) えつタマ	(mV)	(mg/L) 중.니니			win	14 brunny nord
Time R 16:58 17:00	ernoved (L) 4 4 C	(°C) 3.0 2.7	(Únits) 8.00 7.61	µSła (a	m or mS/cm hircle one) コンタマ 니のり、0	(mV)	(mg/L) 8.44 8.23		(m)	win	14 brunny nord
Time R 16:58 17:20 17:06	ernoved (L) 4 4 6	(°C) 3.0 2.7 a.1	(Únits) 8.00 7.61 7.32	µSta (a	n or mS/cm <i>sircle one)</i> 2092 4092 38623	(mV) 130.2	(mg/L) 8.44 8.27 4.41	14.	(m)	wm 56.	14 brunny nord
Time         R           16:5%	ernoved (L) 4 4 6	(°C) 3.0 2.7 a.7 2.7	(Únits) 8.00 7.61 7.32 7.33	µSta (a	m or mS/cm sircle one) 2092 -109.0 386.3 388.0	(mV) 130.2 -300 	(mg/L) 8.44 8.27 4.41 8.16	14.	(m) 485@	wm 56.	14 brunny nord
Time         R           16:5%	ernoved (L) 4 4 6	(°C) 3.0 2.7 a.7 2.7	(Únits) 8.00 7.61 7.32 7.33	µSta (a	m or mS/cm sircle one) 2092 -109.0 386.3 388.0	(mV) 130.2 -300 	(mg/L) 8.44 8.27 4.41 8.16	14.	(m) 485@	wm 56.	14 brunny nord
Time         R           10:58         12:00           17:00         12:10	emoved (L) 2 4 4 6 8 10	(°C) 3.0 2.7 a.1 2.7 2.4	(Únits) 8.00 7.61 7.32 7.33	µSta (a	m or mS/cm sircle one) 2092 -109.0 386.3 388.0	(mV) 130.2 -300 	(mg/L) 8.44 8.27 4.41 8.16	14.	(m) 485@	wm 56.	14 brunny nord
Time         R           16:5%	emoved (L) 2 4 4 6 8 10	(°C) 3.0 2.7 a.1 2.7 2.4	(Únits) 8.00 7.61 7.32 7.33	µSta (a	m or mS/cm sircle one) 2092 -109.0 386.3 388.0	(mV) 130.2 -300 	(mg/L) 8.44 8.27 4.41 8.16	14.	(m) 485@	wm 56.	14 brunny nord
Time         R           10:58         12:00           17:00         12:10	emoved (L) 2 4 4 6 8 10	(°C) 3.0 2.7 a.1 2.7 2.4	(Únits) 8.00 7.61 7.32 7.33	µSta (a	m or mS/cm sircle one) 2092 -109.0 386.3 388.0	(mV) 130.2 -300 	(mg/L) 8.44 8.27 4.41 8.16	14.	(m) 485@	wm 56.	14 brunny nord
Time         R           16:5%         11:00           17:10         11:14           * Record DO in           omments:         Odour:	emoved (L) 2 4 2 4 2 3 10 Mg/L, not pe	(°C) 3.0 2.7 3.1 2.7 2.4 rcentage	(Únits) 8.00 7.61 7.32 7.33 7.33	µSka (c	n or mS/cm sircle one) 2092 4092 4092 3862 3862 3862 4.1	(mV) 130.2 100.2 10.	(mg/L) 8.44 8.27 4.41 8.16	14.	(m) 485@	wm 56.	14 brunny nord
Time         R           16:5%         17:00           17:10         17:10           17:10	emoved (L) 2 4 2 4 2 10 Mg/L, not pe 1) Yes I M	(°C) 3.0 2.7 2.7 2.7 2.4 rcentage	(Únits) 8.00 7.61 7.33 7.33 7.32 1.32	rocarbon-lik	n or mS/cm <i>sircle one</i> ) 2093 4093 386 386 386 10 10 10 10 10 10 10 10 10 10	redox (mV) 130.2 7303 130.1 130.2 130.2 130.2 130.2	(mg/L) 8.44 8.27 4.41 8.16 8.16 8.49	14.	(m) 485@	wm 56.	14 brunny nord
Time         R           16:5%         12:00           17:00         12:10           17:10         12:14           * Record DO in         10           omments:         0           Odour:         12           Sheen:         12	emoved (L) 2 4 2 4 2 10 Mg/L, not pe 1) Yes I M	(°C) 3.0 2.7 2.7 2.7 2.4 rcentage	(Únits) 8.00 7.61 7.33 7.33 7.32 1.32	rocarbon-lik	n or mS/cm sircle one) 2092 4092 4092 3862 3862 3862 4.1	redox (mV) 130.2 7303 130.1 130.2 130.2 130.2 130.2	(mg/L) 8.44 8.27 4.41 8.16 8.16 8.49	14.	(m) 485@	wm 56.	14 brunny nord
Time         R           16:5%         17:00           17:10         17:10           17:10	emoved (L) 2 4 2 4 2 10 Mg/L, not pe 1) Yes I M	(°C) 3.0 2.7 2.7 2.7 2.4 rcentage	(Únits) 8.00 7.61 7.33 7.33 7.32 1.32	rocarbon-lik	n or mS/cm sircle one) 2093 4093 386,0 386,0 386,0 386,0 386,0 111111111111111111111111111111111111	tallic-like	(mg/L) 8.44 8.27 4.41 8.16 8.16 8.49	14.	(m) 485@	wm 56.	14 brunny nord
Time         R           16:5%         17:00           17:10         17:10           17:10	emoved (L) 2 4 2 4 2 3 10 10 Mg/L, not pe 1 Yes IN 1 Yes IN 1 Yes IN 1 ear II	(°C) 3.0 2.7 2.7 2.7 2.4 rcentage	(Únits)	Irocarbon-lik	n or mS/cm <i>iircle one</i> ) 2093 4093 4093 388 388 0 388 0 10 10 10 10 10 10 10 10 10	tallic-like I Very	(mg/L) 8.44 8.27 4.41 8.16 8.16 8.49 Silty	14.	(m) 485@	102	14 brunny nord
Time         R           16:5%         12:00           17:00         17:00           17:10         17:10           17:10         17:10           17:10         17:10           17:10         17:10           17:10         17:10           17:10         17:10           17:10         17:10           17:10         17:10           17:10         17:10           17:10         17:10           17:10         14           * Record DO in         10           omments:         0           Odour:         10           Sheen:         10           Turbidity:         C           Analysis         10	ernoved (L) 2 4 10 10 Mg/L, not pe 1 Yes IN 1 Yes IN 1 Yes IN 1 Yes IN 1 Yes IN 1 Yes IN 1 T 1 T 1 T	(°C) 3.0 2.7 a.7 2.7 2.4 rcentage No If yes I I I I I I I rpe	(Únits) 8.00 7.61 7.33 7.33 7.32 1.32	rocarbon-lik	n or mS/cm <i>iircle one</i> ) 2093 4093 4093 388 388 0 388 0 10 10 10 10 10 10 10 10 10	tallic-like	(mg/L) 8.44 8.27 4.41 8.16 8.16 8.49	14.	(m) 495 <i>C</i> 1.520 <i>C</i>	102	Preservatives
Time     R       10:5%     11:00       11:00     11:00       11:10     11:00       11:10     11:00       * Record DO in       * Record DO in       mments:       Odour:       Sheen:       Turbidity:       C       Analysis       LEPH/HEP1H	emoved (L) 2 4 C 8 10 Mg/L, not pe Mg/L, not pe 1 Yes IN 1 Yes IN 1 Yes IN 1 Yes IN 1 Yes IN 1 Plastic	(°C) 3.0 2.7 a.7 2.4 rcentage No If yes No If yes I I I I I I rpe	(Únits)	Irocarbon-lik	n or mS/cm sircle one) 2092 4092 386,0 386,0 386,0 386,0 386,0 11111111 Container 250 mL 500	tallic-like I Very	(mg/L) 8.44 8.27 4.41 8.16 8.16 8.49 Silty	14.	(m) Ч <i>Ұ ५ €</i> ⊾ <i>қ</i> ҵ <i>० €</i>	w/m 52. 102 102	Preservatives
Time         R           10:5%	ernoved (L) 2 4 10 10 Mg/L, not pe 1 Yes IN 1 Yes IN 1 Yes IN 1 Yes IN 1 Yes IN 1 Yes IN 1 T 1 T 1 T	(°C) 3.0 2.7 a.7 2.7 2.4 rcentage No If yes I I I I I I I rpe	(Únits)	Irocarbon-lik	n or mS/cm sircle one) 2092 4092 386,0 386,0 386,0 386,0 386,0 11111111 Container 250 mL 500	tallic-like I Very	(mg/L) 8.44 8.27 4.41 8.16 8.16 8.49 Silty	14.	(m) 495 <i>C</i> 1.520 <i>C</i>	102	Preservatives Scol-bis scol-bis
Time         R           10:5%	emoved (L) 2 4 2 7 10 10 10 10 10 10 10 10 10 10	(°C) 3.0 2.7 a.7 2.4 1.7 2.4 rcentage No If yes I I I I I I /pe X Glass X Glass	(Únits)	Irocarbon-lik	n or mS/cm sircle one) 2092 4092 386,0 386,0 386,0 386,0 386,0 11111111 Container 250 mL 500	tallic-like I Very	(mg/L) 8.44 8.27 4.41 8.16 8.16 8.49 Silty	14.	(m) 4950	IoL Jol IoL	Preservatives
Time         R           10:5%         11:00           11:00         11:00           11:10	ernoved (L) 2 4 2 4 2 10 10 10 10 10 10 10 10 10 10	(°C) 3. () 2. ¬ 2. ¬ 2. ¬ 2. ¬ 2. ¬ 2	(Únits)	Irocarbon-lik	n or mS/cm sircle one) 2092 4092 386,0 386,0 386,0 386,0 386,0 111111111 Container 250 mL 500	tallic-like I Very	(mg/L) 8.44 8.27 4.41 8.16 8.16 8.49 Silty	14.	(m)	Idl           Idl	Preservatives Sod bis nitric coid
Time         R           10:5%         11:00           11:00         11:00           11:10	ernoved (L) 2 4 2 4 2 10 10 10 10 10 10 10 10 10 10	(°C) 3.0 2.7 3.7 2.7 2.7 2.4 rcentage No If yes I I I I I I /pe 2 Glass 2 Glass 2 Glass	(Únits)	Irocarbon-lik	n or mS/cm sircle one) 2092 4092 386,0 386,0 386,0 386,0 386,0 111111111 Container 250 mL 500	tallic-like I Very	(mg/L) 8.44 8.27 4.41 8.16 8.16 8.49 Silty	14.	(m) 49500 1.5200 Filte 1.5200 1.5		Preservatives Sod bis sod bis nitric coid HC1
Time         R           10:5%         11:00           11:00         11:00           11:10	ernoved (L) 2 4 2 4 2 3 10 10 10 10 10 10 10 10 10 10	(°C) 3. () 2. () 3. () 3. () 3. () 4. () 3. () 4. () 3. () 4. () 3. () 4. () 3. () 4. () 3. () 4. () 4. () 5. () 4. () 5. () 4. () 5. () 5. () 4. () 5.	(Únits)	Irocarbon-lik	n or mS/cm sircle one) 2092 4092 386,0 386,0 386,0 386,0 386,0 111111111 Container 250 mL 500	tallic-like I Very	(mg/L) 8.44 8.27 4.41 8.16 8.16 8.49 Silty	14.	(m) 49500 1.5200 Filte 1 Yes 1 Yes 1 Yes 1 Yes 1 Yes		Preservatives Sod bis sod bis nitric coid HC1

April 26, 2013



roject Name:	Sa	Den	a Hes			Project	No.:	12-1021	-0006	Alooc/
ocation:		cndf,11				Date:			as according to	
eather:	0	lerde	Tem	perature:	~6°C	Comple		LC		
PS Coordina						Review	-			
MONITOR	ING WELL	NEODM			10		1			
Time of Measu						Tidally	Influenced:	⊡Yes ⊠i		
Depth to Prod				Product Thic	kness:		urized:	□ Yes 🖾		
Depth to Wate		14.400		TOP				ш 100 д.		
		16.160		TOP			Vell Volume:			
Diameter of St			mm						a 51 mm	(2.0 inch) diameter well
Well Condition		Good								(1.5 inch) diameter well
		2								
EQUIPME		de-	1.1. 1						1100	11 1 1101
Pump XW			Multim		Model:	51 5561	TTS R R	tental Equipme	nt: 151	; Hydrolift
	drolift iler (Type: ]	1242		np Meter	Model:			iold Dum-		
	nier (Type: <u>1</u> ristaltic	cm.)		ctivity Meter	Model:	1	U F	ield Bump		
	bmersible			ed Oxygen I Redex) Meter	Veter Model:	6	— '-	эрна ЭрН10		□ pH7
			`	c Vapour Me		94 · · ·		] 1413 us/cm		
			-		- 100061.				-	
Pump Details:		_	U D.O.	Ampoule				ield Calibratior	) 	
WELL DEV	ELOPMEN	T/PURGI	NG							
Purge Volume:	Well, Vol. >	(3)	1.36	= 10.09	litres	Start:		Finish:		0.
Ava. Flow Rate	e:		-			Sample	intake depth			
									9.6	
	Mahama	-		[ [ Cond	Specific Cond	1.1		- 10 million		-
Time	Volume Removed	Temp.	pH		Specific Cond.	Redox	Diss. O2*	Water Leve		Remarks
Time		(°C)	(Units)	μS/a	Specific Cond. m or mS/cm circle one)	Redox (mV)	Diss. O <sub>2</sub> * (mg/L)	Water Leve (m)	-	Remarks
Time	Removed (L) ໂ			µ\$/a (¢ 98	m or mS/cm circle one)	(mV) ४५.८	(mg/L)		-	Remarks
Time 15:43 15:43	Removed (L) 2	(°C) 4.9 4.4	(Units) 7,81 7,76	µSta (c 987 36	m or mS/cm bircle one) 9 5,3	(mV)	(mg/L)	(m)	- Fry	
Time 15:43 15:43 15:55	Removed (L) 2 4	(°C) 4.9 4.9 4.9	(Units) 7,81 7,76 1,77	0184 987 36 36	m or mS/cm circle one) G 5,3 0,9	(mV) 85.C 67,9 76.3	(mg/L) - 49-7 - 49-7 - 6,05		- Fry	of to wat day 10
Time 15:43 15:55 16:07	Removed (L) 2 4 5 6	(°C) 4.9 4.9 4.9 4.9	(Units) 7, <u>81</u> 7,76 1,77 7,80	4 (0 98 36 36 30	m or mS/cm bircle one) 9	(mV) 85.6 67,9 76.3 79.2	(mg/L) - 48-7 +0,05 9,45	(m)	- Fry	of to wat day 10
Time 15:43 15:43 15:55	Removed (L) 2 4	(°C) 4.9 4.9 4.9	(Units) 7,81 7,76 1,77	4 (0 98 36 36 30	m or mS/cm circle one) G 5,3 0,9	(mV) 85.C 67,9 76.3	(mg/L) - 49-7 - 49-7 - 6,05	(m)	- Fry	of to wat day 10
Time 15:43 15:55 16:07	Removed (L) 2 4 5 6	(°C) 4.9 4.9 4.9 4.9	(Units) 7, <u>81</u> 7,76 1,77 7,80	4 (0 98 36 36 30	m or mS/cm bircle one) 9	(mV) 85.6 67,9 76.3 79.2	(mg/L) - 48-7 +0,05 9,45	(m)	- Fry	of to wat day 10
Time 15:43 15:55 16:07	Removed (L) 2 4 5 6	(°C) 4.9 4.9 4.9 4.9	(Units) 7, <u>81</u> 7,76 1,77 7,80	4 (0 98 36 36 30	m or mS/cm bircle one) 9	(mV) 85.6 67,9 76.3 79.2	(mg/L) - 48-7 +0,05 9,45	(m)	- Fry	of to wat day 10
Time <u>15:43</u> <u>15:55</u> <u>16:07</u> <u>16:1</u> )	Removed (L) 2 4 5 8 10	(°C) 4.9 4.1 4.9 4.7	(Units) 7, <u>81</u> 7,76 1,77 7,80	4 (0 98 36 36 30	m or mS/cm bircle one) 9	(mV) 85.6 67,9 76.3 79.2	(mg/L) - 48-7 +0,05 9,45	(m)	- Fry	of to wat day 10
Time <u>15:43</u> <u>15:55</u> <u>16:07</u> <u>16:1</u> )	Removed (L) 2 4 5 6	(°C) 4.9 4.1 4.9 4.7	(Units) 7, <u>81</u> 7,76 1,77 7,80	4 (0 98 36 36 30	m or mS/cm bircle one) 9	(mV) 85.6 67,9 76.3 79.2	(mg/L) - 48-7 +0,05 9,45	(m)	- Fry	of to wat day 10
Time <u>15:43</u> <u>15:55</u> <u>16:07</u> <u>16:1)</u>	Removed (L) 2 4 3 10 0 0 in Mg/L, not p	(°C) <u>4.9</u> <u>4.9</u> <u>4.9</u> <u>4.7</u> <u>4.7</u> <u>ercentage</u>	(Units) 7, <u>81</u> 7,76 1,77 7,80	4 (0 98 36 36 30	m or mS/cm bircle one) 9	(mV) 85.6 67,9 76.3 79.2	(mg/L) - 48-7 +0,05 9,45	(m)	- Fry	of to wat day 10
Time 15.43 15.55 16:07 16:1) * Record Du Comments: Odour:	Removed (L) 2 4 10 D in Mg/L, not p	(°C) 4.9 4.9 4.9 4.7 ercentage	(Units) フ, 名   フ, フ ( コ, つ ( コ, つ ( フ, 오) フ・ 오) フ・ 오) フ・ 오)	μS/a (α 98 36 36 36	m or mS/cm <u>Sircle one)</u> 9 5,3 0,9 53.2 57.4 57.4	(mV) <u>85.</u> <u>67</u> ,9 <u>76.3</u> <u>77.2</u> <u>84.9</u>	(mg/L) - 48-7 +0,05 9,45	(m)	- Fry	of to wat day 10
Time 15:43 15:55 16:07 16:07 16:13 * Record Du comments: Odour: Sheen:	Removed (L) 2 4 30 10 D in Mg/L, not p	(°C) 4.9 4.9 4.9 4.7 ercentage	(Units) 7, 8 \ 7, 7 \ 1, 7 \ 7, 5 \ 7, 7, 5 \ 7, 5 \ 7	yS/a (c 3( 3( 3) 3( 3) 3( 3) 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	m or mS/cm <u>Sircle one)</u>	(mV) <u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	(mg/L) - 18:51 - 18:51 - 18:54 - 19:52 - 19:52	(m)	- Fry	of to wat day 10
Time 15.43 15.55 16:07 16:1) * Record Du Comments: Odour:	Removed (L) 2 4 30 10 D in Mg/L, not p	(°C) 4.9 4.9 4.9 4.7 ercentage	(Units) 7, 8 \ 7, 7 \ 1, 7 \ 7, 5 \ 7, 7, 5 \ 7, 5 \ 7	yS/a (c 3( 3( 3) 3( 3) 3( 3) 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	m or mS/cm <u>Sircle one)</u> 9 5,3 0,9 53.2 57.4 57.4	(mV) <u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	(mg/L) - 48-7 +0,05 9,45	(m)	- Fry	of to wat day 10
Time 15:43 15:55 16:07 16:07 10:1) * Record Du comments: Odour: Sheen:	Removed (L) 2 4 30 10 D in Mg/L, not p	(°C) 4.9 4.9 4.9 4.7 ercentage	(Units) 7, 8 \ 7, 7 \ 1, 7 \ 7, 5 \ 7, 7, 5 \ 7, 5 \ 7	yS/a (c 3( 3( 3) 3( 3) 3( 3) 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	m or mS/cm sircle one)	(mV) <u><u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u></u>	(mg/L) - 18:51 - 18:51 - 18:54 - 19:52 - 19:52	(m)	- Fry	of to wat day 10
Time 15:43 15:55 16:07 16:07 10:10 * Record Do omments: Odour: Sheen:	Removed (L) 2 4 10 0 D in Mg/L, not p O in Mg/L, not p Clear I	(°C) 4.9 4.9 4.9 4.7 ercentage	(Units) 7,81 7,71 7,80 7,	I I I I I I I	m or mS/cm sircle one)	(mV) <u><u><u></u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	(mg/L) - 16, 05 9, 45 8, 54	(m)	- Fry	of to wat day 10
Time 15:43 15:55 16:07 16:07 16:17 10:	Removed (L) 2 4 30 0 0 in Mg/L, not p 0 0 in Mg/L, not p Clear I 3 5	(°C) 4.9 4.9 4.7 4.7 ercentage (No If yes I I I I I I I ype	(Units) 7, 8 \ 7, 7 \ 1, 7 \ 7, 5 \ 7, 7, 5 \ 7, 5 \ 7	yS/a (c 3( 3( 3) 3( 3) 3( 3) 4 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	m or mS/cm sircle one)	(mV) <u><u><u></u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	(mg/L) - 18:51 - 18:51 - 18:54 - 19:52 - 19:52	(m) 1 1 41, 740 C 1 4 1, 735 1 5 1 5 1 5 1 5 1 5 1 5 1 5 1		Preservatives
Time 15:43 15:55 16:07 16:07 16:1) * Record Do * Record Do omments: Odour: Sheen: Turbidity:	Removed (L) 2 4 3 3 4 10 0 0 in Mg/L, not p 0 0 in Mg/L, not p 2 Clear I 3 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(°C) 4.9 4.9 4.7 4.7 ercentage No If yes I I I I I I I ype ba Glass	(Units) 7,81 7,71 1,77 7.80 7.	I I I I I I I	m or mS/cm <i>Sircle one</i> )	(mV) <u><u><u></u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	(mg/L) - 16, 05 9, 45 8, 54	(m)	tered	Preservatives
Time IS: 43 IS: 55 Ib: 07 Ib: 07	Removed (L) 2 4 30 30 30 31 31 31 32 32 32 32 32 32 32 32 32 32 32 32 32	(°C) 4.9 4.9 4.9 4.7 4.7 ercentage (No If yes No If yes I I I I I I ype 24 Glass 24 Glass	(Units) 7,81 7,71 7,80 7,	I I I I I I I	m or mS/cm <i>Sircle one</i> )	(mV) <u><u><u></u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	(mg/L) - 16, 05 9, 45 8, 54	(m)		Preservatives Soci-bis soci bis.
Time 15:43 15:55 16:07 16:1) * Record D omments: Odour: Sheen: Turbidity: Analysis LEPH/HEP RTEX/VPH Dis. Meta	Removed (L) 2 4 3 3 4 10 0 0 in Mg/L, not p 0 0 in Mg/L, not p 0 0 in Mg/L, not p 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	(°C) 4.9 4.9 4.9 4.7 4.7 ercentage (No If yes I I I I I I I ype 24 Glass D Glass □ Glass	(Units) 7,81 7,71 1,77 7.80 7.	I I I I I I I	m or mS/cm <i>Sircle one</i> )	(mV) <u><u><u></u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	(mg/L) - 16, 05 9, 45 8, 54	(m) 1   4, 740 C 1   4, 735 4 L Fi 4 L Yes 1 Yes 1 Yes	tered	Preservatives
Time 15:43 15:55 16:07 16:1) * Record D omments: Odour: Sheen: Turbidity: Analysis LEPH/HEP BTEX/VPH Dis. Meta Dis. 14:	Removed (L) 2 4 30 30 30 31 31 31 32 32 32 32 32 32 32 32 32 32 32 32 32	(°C) 4.9 4.9 4.9 4.7 4.7 ercentage (No If yes I I I I I I ype 2 Glass Glass Glass	(Units) 7,81 7,71 1,77 7.80 7.	I I I I I I I	m or mS/cm <i>Sircle one</i> )	(mV) <u><u><u></u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	(mg/L) - 16, 05 9, 45 8, 54	(m)	tered	Preservatives Scol bis. nitric coid
Time IS: 43 IS: 55 IC: 07 IC: 1) * Record DO comments: Odour: Sheen: Turbidity: Analysis LEPH/HEP RTEX/VPH Dis. Meta	Removed (L) 2 4 10 2 0 in Mg/L, not p 0 0 in Mg/L, not p 0 0 in Mg/L, not p 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	(°C) 4.9 4.9 4.7 4.7 ercentage (No If yes I I I I I I I ype Xa Glass Glass Glass Glass Glass	(Units) 7,81 7,71 1,77 7.80 7.	I I I I I I I	m or mS/cm <i>Sircle one</i> )	(mV) <u><u><u></u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u><u></u></u>	(mg/L) - 16, 05 9, 45 8, 54	(m) 1   4, 740 g 1   4, 735 1   5, 735 4 L Fi 9 Yes 0 Yes 0 Yes 0 Yes	tered	Preservatives Scol bis. nitric coid

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April 26, 2013



roject Name: ocation: /eather: PS Coordinates		Den Lurdf.	)		~6°C	Date:					0/11000/
MONITORING Time of Measurem Depth to Product: Depth to Water (A) Depth to Bottom of Diameter of Stand Well Condition:	nent: ): f Well (B):	14:2 5.140	<i>O</i> m m below m below mm	Product Thicł 剤 TOP 頃 TOP	ness:	m Press Well H One V (B-A)		⊡ Ye : 2 Lit	tres - for	lo _ ppm a 51 mm	(2.0 inch) diameter well (1.5 inch) diameter well
EQUIPMENT Pump X Waterr X Hydrol Bailer Perista Subme Bladde Pump Details:	a ift (Types <u>∏</u> iltic ersible	ut.)	Condu Dissolv ORP (I Organi	eler mp Meter ctivity Meter /ed Oxygen N Redex) Meter c Vapour Met	Model: Model: eter Model: Model:	<u>Y51 556 f</u>		Field Bu pH4 pH10 1413	ımp		
Avg. Flow Rate:		3	4	= <u>12.</u>	litres	Start: Sample	intake dept		Finish:		
	emoved (L) 3 0 9	Temp. (*C) <u>8.7</u> <u>8.7</u> <u>8.7</u> <u>8.7</u> <u>8.7</u> <u>8.5</u>	pH (Units) 7.53 7.34 7.34 7.33 7.33	μS/cm (ci 97( 34) 34	or mS/cm rcle one)	Redox (mV) 33.9 30.5 55.4 66.4	Diss. 02* (mg/L) ]. 77 - 29.3 - 27.5 - 27.5 - 27.7	S	er Level (m)		Remarks
* Record DO in	Mg/L, not pe	ercentage									
Sheen:	Yes □I Yes □I lear II	No If yes	s 🗆 Hyd		OR □ Metall		y Silty			5	
Analysis	[ т	/pe	40 mL	120 mL	Container Siz 250 mL 500 n	1	2 L	4 L	Filte	ered	Preservatives
	D Plastic	🛛 🔀 Glass			2				🗆 Yes	S No	sod bis
LEPH HEPIT	D Plastic	🕅 Glass	3						□ Yes	DX No	sod bis.
BTEXIUPH	M Plastic	Glass							DX Yes	🗆 No	nitric acid
BTEXIUPH Dis. Metals	year recorde		1						Yes	D No	HCI
BTEXIUPH Dis. Metals Dis. Hy	D Plastic	Glass	1-1-1					-		1	1
BTEXIUPH Dis. Motals		Glass Glass		5					□ Yes	XNO	
BTEXIUPH Dis. Metals Dis. Hy	D Plastic			2					Yes     Yes	No No	

April 26, 2013



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Temperature: $-(a^{\circ}C$ Completed By: $\BoxC$ S Coordinates:       Reviewed By: $\BoxC$ Tidally Influenced: $\Box$ Yes $\blacksquare$ No         Yesurized: $\Box$ Yes $\blacksquare$ No         Depth to Poduct: $\Box$ m       pressurized: $\Box$ Yes $\blacksquare$ No         Depth to Poduct: $\Box$ m       pressurized: $\Box$ Yes $\blacksquare$ No         Depth to Poduct: $\Box$ m       pressurized: $\Box$ Yes $\blacksquare$ No         Depth to Poduct: $\Box$ m       Pressurized: $\Box$ Yes $\blacksquare$ No         Depth to Poduct: $\Box$ m       Pressurized: $\Box$ Yes $\blacksquare$ No         Mutimeter       Model: $\Box$ Although Period Perio	oject Name:			a Hes				Project I				/11000/
Reviewed By:           MONITORING WELL INFORMATION           module Thickness:         Tidally Influenced:         Uses         X No           appth to Product:	ocation:							Date:		Sept.2	7/14	
ADNITORING WELL INFORMATION       Tidelly Influenced:       □ Yes       Yes       Yes         ime of Mess/trement:       □ 1/3       m broduct Thickness:       m Pressurizeat:       □ Yes       Yes         septih to Motion Of Standpipe:       0.13       m broduct Thickness:       m Pressurizeat:       □ Yes       Yes       Yes         septih to Motion Of Standpipe:       51       mm       (BAY2.0 = 1.41)       Uitres - for a 51 mm (2.0 inch) diameter well         SQUIPMENT LIST       mp (Yesterra)       Multimeter       Modet:       □ Pitremp Meter       Modet:       □ Pitremp Meter         Conductive Vistor       Purger       Purger       Multimeter       Modet:       □ Pitremp Meter       □ Pitremp Meter         Conductive Vistor       Purger       Purger       Modet:       □ Pitremp Meter       □ Pitremp Me	eather:	Cla	idy	Tem	perature:	-10	°C	Complet	ed By:	LC	- C.	
ime of Meastivement:	PS Coordinates:							Reviewe	d By:			
Time         Toduct:         Time         Product Trickness:         m         Pressurad:         U Yes         Ø No           bepth to Water (A):         [0,13] m bolow         @TOP         Well Headspace:	MONITORING	WELL I										d
Depth to Bettorn of Well (B):         10.13         m below         Ø TOP         Well Headspace:          ppm           Depth to Bettorn of Well (B):         1.5         m         (B A/2.0 = 1.4)         Litres - for a 51 mm (2.0 incl) diameter well           Sequence of Standardse:	ime of Measureme	ent:	12:15	1				Tidally	Influenced:	🗆 Yes  🗷	No	1.2.2
Depth to Bottom of Well (B):       13.91 5 m below       Ø TOP       One Well Volume:         Diameter of Standppe:       SI       mm       (B.A)?2.0 =       7.14)       Litres - for a 38 mm (2.0 incl) diameter well         Bellow Filt       Good These finction       (B.A)?2.0 =       7.14)       Litres - for a 38 mm (2.0 incl) diameter well         COULPMENT LIST       Multimeter       Model:       (B.A)?2.0 =       7.14)       Litres - for a 38 mm (2.0 incl) diameter well         COULPMENT LIST       Multimeter       Model:       (B.A)?2.0 =       7.14)       Litres - for a 38 mm (2.0 incl) diameter well         Conductivity Meter       Model:       D Field Bump       D Field Bump       D PH7         D Submersible       Organic Vapour Meter       Model:       D PH7       D PH7         D Bladder       Organic Vapour Meter       Model:       D PH7       D PH7         Vell Vol. X 3       7.5       =	Depth to Product:		- r	n I	Product Thic	kness:	m	Pressu	rized:	🗆 Yes 🛛 🕅	No	
Name of Standpipe:       Simm       (B-A)*2.0 = 1.4%       Lites - for a 51 mm (2.0 inch) diameter well         Well Condition:       (B-A)*1.1 =       Lites - for a 38 mm (1.5 inch) diameter well         COUPMENT LIST       (B-A)*1.1 =       Lites - for a 38 mm (1.5 inch) diameter well         Well Condition:       (B-A)*1.1 =       Lites - for a 38 mm (1.5 inch) diameter well         Will Condition:       (B-A)*2.0 =       1.4%       Lites - for a 38 mm (1.5 inch) diameter well         COUPMENT LIST       Multimeter       Modet       Dissibility Meter       Modet       Dissibility Meter       Modet         Condictivity Meter       Modet       Dissibility Meter       Modet       Dissibility Meter       Modet       Dissibility         Submersible       ORP (Rodex) Meter       Modet       Dissibility       Dissibility       Dissibility       Dissibility         Vump CVELL DEVELOPMENT/PURGING       Immediation       Immediation       Immediation       Immediation         Visition Renoved       Time       Temp, PH       Dissibility Meter       Sample inside depth       Remarks         Visition Renoved       Temp, PH       Don for Specific Cond.       Redox Mill Meter       Redox Specific Cond.       Redox Specific Cond.       Remarks         Value 1, 1, 2, 1, 3, 4, 1, 3, 2, 2, 1, 1, 3, 4, 1, 2, 2, 3, 1, 1	Depth to Water (A):				-						ppm	
Vell Condition:					ТОР							
COUPMENT LIST         Multimater         Model:         YS1 556 MPS         Ø Rental Equipment:         VS1 7 Higd/sGlift           Ymp & Weitera >         Multimater         Model:         PS1 556 MPS         Ø Rental Equipment:         VS1 7 Higd/sGlift           Ymp & Weitera >         Prove (X)         Benductivity Meter         Model:         PH4         PH4         PH7           Bladder         ORP (Redex) Meter         Model:         PH4         PH7         PH7           Submersible         ORP (Redex) Meter         Model:         PH4         PH7         PH7           Bladder         Organic Vapour Meter         Model:         PH4         PH7         PH7           Verture:         Velt Vol X 3         1.5         = 22.5         litree         Start:         Finish:         PH7           Volume:         Velt Vol X 3         1.5         = 22.5         litree         Sample intake depth:         PH7         PH7           Yourne Removed         Time         Velt Vol X 3         1.5         PH 10         Ph4         Ph4         PH7         PH7           Yourne Removed         Temp         PH         Don X         Sample intake depth:         PH7         PH7         PH7         PH7         PH7 <td< td=""><td></td><td></td><td></td><td></td><td>A 15</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>					A 15							
Nume         Wilsterra         Multimeter         Model:         YS1         Highronit         YS1         Highronit         YS1         Highronit         Highronit         YS1         Highronit         Hi	Vell Condition:		good	newi	nstall			(B-A)-1	.1 =	Litres - t	or a 38 mm	(1.5 Inch) diameter wei
X Hydrolit § PYSE       pH/Temp Neter       Model:        Field Bump         Conductivity Meter       Model:        pH4        pH7         Conductivity Meter       Model:        pH4        pH7         Bladder       ORP (Redex) Meter       Model:        pH10          Bladder       Organic Vapour Meter       Model:        pH113 us/cm	EQUIPMENT L	IST										
X Hydrolit § PYSE       pH/Temp Neter       Model:        Field Bump         Conductivity Meter       Model:        pH4        pH7         Conductivity Meter       Model:        pH4        pH7         Bladder       ORP (Redex) Meter       Model:        pH10          Bladder       Organic Vapour Meter       Model:        pH113 us/cm	omp 🕅 Waterra	2.		Multime	eter		Model: <u>YS</u>	1 556M	PS Ø R	ental Equipri	ient: NSI	Hydrolift
March (1)         Billier (Type: 1/4 ± A)         Conductivity Meter         Model:	Hydrolif	13 purge	36	pH/Tem	np Meter		Model:					
Submersible         ORP (Redex) Meter         Model:         D pH10	amp4 🎗 Bailer	(Type:	wt. )	Conduc	tivity Meter							
Bladder         Organic Vapour Meter         Model:         Image: Construction           'ump Details:         D.O. Ampoule         Field Calibration           'ump Details:         D.O. Ampoule         Field Calibration           'urge Volume:         Well. Vol. X 3         1.5         = 22.5         litres         Start:         Finish:           'urge Volume:         Well. Vol. X 3         1.5         = 22.5         litres         Start:         Finish:           'urge Volume:         Well. Vol. X 3         1.5         = 22.5         litres         Start:         Finish:           'urge Volume:         Well. Vol. X 3         1.5         = 22.5         litres         Start:         Finish:           'urge Volume:         Well. Vol. X 3         1.4         1.438         Cond '0.5 Specific Cond. '(urge one)'         (mgA)         Mater Level (mgA)         Remarks           (13:36         4.4.4         1.385         6.0052, 1         -55.3         1.0         mucles, vcs.pt/h, b/.           13:38         4.4.4         1.438         6.0252, 1         -0.02         -0.02         -0.02           14:38         4.5         1.4         3.4.2         -119.2         0.6.2         0.02         -0.02           14:3												
Pump Details:         D.O. Ampoule         Field Calibration           VELL DEVELOPMENT/PURGING         Finish:         Start:         Finish:           View Volume:         Well, Vol. X         7         -         2         2.5         litres         Start:         Finish:           View Volume:         Well, Vol. X         7         -         -         2.4.5         litres         Start:         Finish:           Time         Volume:         Unin.         Dend (1)         Specific Cond.         Redox         Diss. 0;*         Water Level         Remarks           13:32         3         4.4         7.5K         341.2         71.2.9         7.02         multip, 10/h, 10/h           13:38         4         4.4         7.5K         341.2         71.2.9         7.02         multip, 10/h, 10/h           14:38         4         4.4         7.5K         341.2         71.2.9         7.02         multip, 10/h, 10/h           14:3         15         4.4         7.5K         71.5.3         6.6C         0.51         multip, 10/h           14:3         15         1.5         7.5K         71.3.3         6.75         10.60         multip, 10/h           15:1         15 <td></td> <td></td> <td></td> <td>•</td> <td>,</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>				•	,							
VELL DEVELOPMENT/PURGING         vige Volume:       Well Vol. X 3       7.5       = 7.2.5       litres       Start:	Bladder			Organic	Vapour Me	ter I	Model:			J 1413 us/cm	-	
urge Volume:       Well. Vol. X       7       _       =       22.5       litres       Start:	Pump Details:			D.O.	Ampoule					ield Calibrati	on	
urge Volume:       Well. Vol. X       7       _       =       22.5       litres       Start:		OPMENT	/PURGI	NG								
vg. Flow Rate:       Umin.       Sample intake depth:         Time       Volume Removed       Temp. (C)       pH (Units)       D Cond (2) Specific Cond. µSkm or mS/cm       Redox       Diss. Opt (my/L)       Water Level (my/L)       Remarks         19:3 b       3       H.H       1.35%       (a,O)%, T       - 55.3       1.10       Ph Uky, Vol, t/lky, b/l         13:3 c       H.H       1.35%       (a,O)%, T       - 55.3       1.10       Ph Uky, Vol, t/lky, b/l         14:3 c       H.H       3.22.5       - 119.2       - 73.29       1.02%       Im Uky, Vol, t/lky, b/l         14:3 c       H.H       3.22.5       - 119.2       L.S.Ø       Im Uky, Vol, t/lky, b/l         13:1                14:2 f                 13:1 f                   14:3 f                    15:1 f					=~22.5	litres		Start:		Finis	1:	
Time         Removed (L)         Time         Remarks         Remarks           13:30         3         1.4         1.20         (L)         (mV)												
Time         Removed (L)         Time         Remarks         Remarks           13:30         3         1.4         1.20         (L)         (mV)		olumo			Cond )	7 Specific	Cond				T	
(i)       (i)       (iii)       (iii)       (iii)       (iii)         13:2 b       3       H.H       1       13:8       (a) (3; 7)       - (5; 2; 7)       7:10       rh Uk, vapilky basis         13:8       4       H.H       7; 5]       3:41.2       - 7(2; 1)       rh Uk, vapilky basis         13:8       4       H.H       7; 5]       3:41.2       - 7(2; 1)       rh Uk, vapilky basis         13:4       -14:3       14:2       -7(2; 1)       -14:3; 2)       1.5 (2; 1)       -14:4; 2)         13:4       -15       -1, 4       -14:3; 2)       1.5 (2; 1)       -14:4; 2)       1.5 (2; 1)         13:0       15:5       -1, 5; 3       -1, 5; 3       -1, 5; 3       -1, 5; 3       -1, 5; 3         13:1       25       7; 5; 7; 5; 7; 5; 7; 14; 2       -1, 7; 6; 7; 10       -1, 6; 5; 3       -1, 6; 5; 3         14:3:11       25       7; 5; 7; 5; 7; 7; 5; 7; 14; 2       -1, 7; 7; 7; 7; 10       -1, 6; 5; 3       -1, 6; 5; 3         14:3:11       25       7; 5; 7; 5; 7; 5; 7; 14; 2       -1, 7; 7; 7; 7; 7; 7; 7; 7; 7; 7; 7; 7; 7;	1 1				· · · · ·						el	Remarks
138       4       4.4       7.51       341.2       -92.9       7.02       4         43       4.4       7.41       322.5       119.8       0.60       1         49       12       4.4       7.49       326.3       -14.2       1.58       10.81         54       15       4.4       7.54       326.3       -14.2       1.58       10.81         54       15       4.4       7.54       326.3       -14.3       1.58       10.81         54       15       4.4       7.54       326.3       -14.3       1.58       10.81         54       15       4.4       7.54       326.3       -174.9       1.653       1.60         13: a1       18       14.4       7.58       7.58       514.2       1.74.9       7.10       1.60         14: a1       1.55       7.58       7.14.2       1.74.9       7.10       1.641         * Record DO in Mg/L, not percentage       -174.9       7.10       1.641       1.641       1.641         Odour:       Yes       No       If yes       Hydrocarbon-like       OR       Metallic-like         Turbidity:       Clear       11111111111111111111111111111111				10				_		((1))		· · · · · · · · · · · · · · · · · · ·
H3       H4       1.41       322.5       113.8       0.60         H3       H2       1.41       320.3       -143.2       1.50       10.51         S4       J.S       H.4       7.54       320.1       -162.7       (e.53       10.60         H3: 0       1.8       H.4       7.54       320.1       -162.7       (e.53       10.60         H3: 0       1.8       H.4       7.58       714.2       -174.9       710       10.60         M3: 11       2.5       H.5       7.58       714.2       -174.9       710       10.60         M3: 11       2.5       H.5       7.58       714.2       -174.9       710       10.60         M3: 11       2.5       H.5       7.58       714.2       -174.9       710       10.60         Mais       1.5       7.58       714.2       -174.9       710       10.60       10.60         Mais       1.1       2.5       1.1       2.5       10.60       10.60       10.60         Odour:       Yes       No       If yes       Hydrocarbon-like       Record DO in Mg/L, not percentage       11.2       1.2       4.1       Filtered       Preservatives </td <td>10 2 -</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>m</td> <td>when versilly be</td>	10 2 -										m	when versilly be
44       1.44       320.3       1113.2       0.50       10.51         54       15       4.4       7.54       320.1       -162.7       (e.53)         13: 0 1       15       4.4       7.54       320.1       -162.7       (e.53)         13: 0 1       15       4.4       7.54       320.1       -162.7       (e.53)         13: 0 1       15       4.4       7.57       7.58       314.2       -174.9       7.10       1000000000000000000000000000000000000		19										
Superiod       15       14.4       7.54       3.6.1       16.33       6.53         13: 01       15       14.4       7.52       3.5.2       173.3       6.95       10.60         13: 01       15       1.5       7.58       314.2       174.9       7.0       10.60         * Record DO in Mg/L, not percentage         omments:         Odour:       1 Yes       No       If yes       Hydrocarbon-like       OR       Metallic-like         Turbidity:       Clear       111111111111111111111111111111111111										10.54	_	
13: 01       18       14       15: 0       113: 3       6:85       10: 60         13: 11       25       1,5       7:58       314: 2       -174.9       7:00       100       100       100         * Record DO in Mg/L, not percentage         omments:         Odour:       1 Yes       No       If yes       111111111111111111111111111111111111										10.51		
M3:11       2.5       4.5       7.58       314, 2       -174, 4       7.10       Mpmuth         * Record DO in Mg/L, not percentage         omments:         Odour:       Yes       No       If yes										10.60		
* Record DO in Mg/L, not percentage         * Record DO in Mg/L, not percentage         omments:         Odour:       Yes       No       If yes         Sheen:       Yes       No       If yes       Hydrocarbon-like       OR       Metallic-like         Turbidity:       Clear       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		25	4.5									1. pronto
Analysis       Type       Hydrocarbon-like       OR       Metallic-like         Yes       No       If yes       Hydrocarbon-like       OR       Metallic-like         Turbidity:       Clear       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII		24										1 stable
Odour:       I Yes       No       If yes       Hydrocarbon-like       OR       Metallic-like         Sheen:       I Yes       No       If yes       I Hydrocarbon-like       OR       Metallic-like         Turbidity:       Clear       I I I I I I I I I I I I I I I I I I I	* Record DO in N	/lg/L, not pe	ercentage									
Sheen:       I Yes       No       If yes       Hydrocarbon-like       OR       Metallic-like         Turbidity:       Clear       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	omments:					1						
Turbidity:       Clear       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Odour:	Yes □I	No If yes	3 - J -								
Analysis     Type     Container Size     Filtered     Preservatives       LEPH/HEP1H     Plastic     M Glass     A     I     250 mL     500 mL     1 L     2 L     4 L     Preservatives       BTEX/VPH     Plastic     M Glass     A     I     Preservatives     I     I     Yes     M No     Soci-     500 mL     1 L     2 L     4 L     Preservatives       BTEX/VPH     Plastic     M Glass     A     I     I     Yes     M No     Soci-     500 mL     500 mL     1 L     2 L     4 L     Preservatives       Dis. Metals     Plastic     Glass     I     I     I     Yes     No     Soci-     500 mL       Dis. Metals     Plastic     Glass     I     I     I     I     I     I       Anicols     M Plastic     Glass     I     I     I     I     I     I       Incols     M I     I     I     I     I     Yes     No     I	Sheen:							like				
Analysis       Type       40 mL       120 mL       250 mL       500 mL       1 L       2 L       4 L       Preservatives         LEPH/HEP1+       □ Plastic       120 mL       120 mL       250 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       10 No       10 No </td <td>Turbidity: Cle</td> <td>ear II</td> <td>IIIIII</td> <td>IIIIII</td> <td>IIIIII</td> <td>IIIII</td> <td>101</td> <td>Very</td> <td>Silty</td> <td></td> <td></td> <td></td>	Turbidity: Cle	ear II	IIIIII	IIIIII	IIIIII	IIIII	101	Very	Silty			
Analysis       Type       40 mL       120 mL       250 mL       500 mL       1 L       2 L       4 L       Preservatives         LEPH/HEP1+       □ Plastic       120 mL       120 mL       250 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       □ Yes       10 No       500 mL       1 L       2 L       4 L       10 No       10 No </td <td>r</td> <td>1</td> <td></td> <td>1 24</td> <td></td> <td>0</td> <td></td> <td></td> <td></td> <td>- m</td> <td></td> <td>÷ .</td>	r	1		1 24		0				- m		÷ .
LEPH/HEP1H       □ Plastic       bl Glass       0       □ Yes       bl No       Soci-bis         BTEX/UPH       □ Plastic       © Glass       3       □ Yes       bl No       Soci-bis         Dis. Metals       Image: Plastic       □ Glass       0       Yes       DNo       Mitric coid         Dis. Metals       Image: Plastic       □ Glass       0       Yes       DNo       Mitric coid         Dis. Ha       □ Plastic       Image: Glass       1       Image: Plastic       Image: Pl		Ty	уре	40 ml	120 ml			1 11	21	41	Filtered	Preservatives
BTEX/UPH       □ Plastic       I Glass       3       □ Yes       I No       Scol. bic.         Dis. Metals       III Plastic       □ Glass       III Cold       III Cold       III Cold         Dis. H       □ Plastic       □ Glass       III Cold       III Cold       III Cold         Dis. H       □ Plastic       □ Glass       III Cold       III Cold       III Cold         Anions       III Cold       III Cold       III Cold       III Cold       III Cold         Interview       □ Plastic       □ Glass       III Cold       III Cold       III Cold         □ Plastic       □ Glass       III Cold       III Cold       III Cold       III Cold         □ Plastic       □ Glass       III Cold       III Cold       III Cold       III Cold         □ Plastic       □ Glass       III Cold       IIII Cold       IIIII Cold       IIII Cold         □ Plastic       □ Glass       IIII Cold       IIII Cold       IIII Cold       IIIII Cold         □ Plastic       □ Glass       IIII Cold       IIIII Cold       IIIII Cold       IIIII Cold         □ Plastic       □ Glass       IIIII Cold       IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Analysis		M Glass	40 /11	120 ML	the second se	500 mL	1 1 6	21		s Na No	East his
Dis. Metals       Image: Plastic       Glass       Diffic code         Dis. Hay       Image: Plastic       Image:				2								
Dis. Ho     Image: Plastic general sector of the sector of t	LEPHTHEPH			1								
Anicols         Selection         I         Image: Yes         Selection         Image: Yes         Selection         Image: Yes	LEPHTHEPIH BTEXIVPH						1					
□ Plastic     □ Glass     □ Yes     □ No       □ Plastic     □ Glass     □ Yes     □ No	LEPHYHEPIH BTEX/UPH Dis. Metals			ji:	L			111				
	LEPH/HEPIH BTEX/UPH Dis. Metals Dis. Ha	D Plastic	□ Glass							ΠYε	s 🗆 No	
SCN No. 22807-03 Consumables: UWaterra Tubing UHDPE/Tefion Tubing Groundwater Filter	LEPH/HEPIH BTEX/UPH Dis. Metals Dis. Hy	□ Plastic É Plastic				-		-				
	LEPH/HEPIH BTEX/UPH Dis. Metals Dis. Hy	Plastic Plastic Plastic Plastic	Glass			1.1.5		]		ΠYε	s 🗆 No	J

April 26, 2013



	•			VATER PLING E		_07M	ENT	Deve A Purg			We	No.: WHATE
oject Name: cation: eather:	LAD	Denc		LANEL perature:			Project I Date: Complet		Se	ot, 23	1004	/11000 /
S Coordinates:							Reviewe	d By:				
MONITORING ime of Measurem Depth to Product: Depth to Water (A): Depth to Bottom of Diameter of Standp Vell Condition:	ent:  Well (B): .1 ipe: 102	0:10 Ar - n 5.335 n 2.155 n	n F n below J n below L	Product Thicl 1 TOP 1 TOP	kness:	m	Pressu Well He One W (B-A)*2	eadspace: ell Volume: $x^2 27$	□ Ye  2 <u>8</u> Lii	es 🕅 No	ppm 51 mm (	2.0 inch) diameter well 1.5 inch) diameter well
Pump XWaterra A Hydrolii Comple A Bailer Bailer Bailer Bladder Bladder Pump Details:	(Types )	2 Wt.)	Conduc Dissolv ORP (R Organic	eter np Meter ttivity Meter ed Oxygen N tedex) Meter 2 Vapour Me Ampoule	Neter f	Model: _ Model: _ Model: _ Model: _	51 556 M	۹ ت	Tield Bu pH4 pH10 1 pH10	ımp		7 Hijdvolift
	ODMENIT				1.							
VELL DEVEL Purge Volume: Ng. Flow Rate:	Well. Vol. X		3	= 81.8. ~ 821				10-55 ntake dept		Finish:	<u></u>	
	(L)	Temp. (°C)	pH (Units)	· ·	<b>⊠ Specific</b> m or mS/c ircle one)		Redox (mV)	Diss. O <sub>2</sub> * (mg/L)		ter Level (m)		Remarks
		3.1	7.82		74		-106.9	232	NE	.34	5.	34
		2.8	7.83		8.7		-134.6	1.65			-	
		2.6	7.61		0.3		-137.6	2.67	5	35	mon	ing ben brown
			7.57		0,2		-90.7	3.47	5.		1	
			1.57		2.6		-10.1	4,28	1			-
		2.6	7.57		13.0		-69.0					
	2.0	.)	7,59		34		- 62.1	4.9)	5,1	35	1	V-
* Record DO in	Mg/L, not per	centage										
	Yes X			Irocarbon-lik		7 Motelli	liko					2
			N				Very	Silty				
Analysis	Ту	pe	40 mL	120 mL	250 mL	ainer Sizo 500 ml		2 L	4 L	Filte	ered	Preservatives
LEPHTHEPIH	D Plastic	🕅 Glass	-		8		9			□ Yes	No No	Sod bis
BTEXIVPH	D Plastic	🕱 Glass	3							□ Yes	DX No	sod bis
Dis. Metals	Plastic	Glass	1					-		D Yes		Initic acid
Dis. Hy	Plastic	Si Glass					1		_	Yes Ves		HCI
Anians	Plastic	Glass										
		Glass Glass								□ Yes □'Yes		
												1
	- KU /	-02	Consumable	es: 🗆 Wate	rra Tubing		П НГ	OPE/Teflon	Lubing	2		🗙 Groundwater Filter
SCN No.	0001	- \			n Tubing						'	•



Project Nam Location: Weather: GPS Coordi		-	avel Pi	t bu (	Land fi iperature:	11		Date:	ted By:	Se	st. 27	1/14	/11000/
MONITO Time of Mea Depth to Pro Depth to Wa Depth to Bo Diameter of Well Conditi	sureme iduct: ter (A): tom of Standp	ent: Well (B): ipe:	9:30 	n below n below	Product Thic ق TOP TOP مناقب ما			N Pressu Well H One W (B-A)*2	irized: eadspace: /ell Volume 2.0 =	□ Ye 	es 🕅 No - 1.78 ( tres - for a	ррт (Чі́лсь, а 51 mm	ti ( 0.05) : 0.00 M di an de lu (2.0 inch) diame (1.5 inch) diame
	Waterra Hydrolif Bailer Peristal Submer Bladder	t (Type: <u>L</u> tic sible	Nt.)	Condu Dissolv ORP (F Organi	eter np Meter ctivity Meter red Oxygen M Redex) Meter c Vapour Me Ampoule	Meter	Model: Model: _ Model: _ Model: _	51 556 M	0	Field BL pH4 pH10 1413	ımp		
WELL DE Purge Volum Avg, Flow R	e:	Well, Vol. X	3 6	2	= <u>185</u>	litres	e.		intake dep		Finish:	11	-
Time		olume emoved (L)	Temp. (°C)	pH (Units)		Specific m or mS/c circle one)		Redox (mV)	Diss. O <sub>2</sub> (mg/L)		ter Level (m)	1	Remarks
9:57 10:02 10:07 10:13 10:13 10:19	3	0 0 10 0	2.9 3.7 2.7 2.7 2.7 2.8	7.6 7.37 7.38 7.44 7.52 7.52	2000	60 58.4 58.8 6.2 5.8 72.9		-1545 -98.0 -76.7 -71.2 -65.7 -65.7	3.96 4.10 4.80 5.92 5.94 5.66			1	lin nuada
10:30	8	10	2.7	7.58	27	1.6		-61.0 -981	6.31 5.70	11	.365	star	ile, by te
Comments: Odour: Sheen: Turbidity		Yes X	No Ifyes No Ifyes IIIIII	s 🔲 Hye	drocarbon-lik IIIIIII			Very	r Silty		5	Ч. И.	4
Analy	sis	Т	уре	40 mL	120 mL	250 mL	500 m	-	2 L	4 L		ered	Preservativ
LEPH-HE BTEXIUP Dis. Me	A	Plastic     Plastic     Plastic     Plastic	Xal Glass Xal Glass □ Glass	3		a		-			⊡ Yes ⊡ Yes DX Yes	b≩ No D2X No □ No	sod bis sod bis nitric coid
Dis 14	3	Plastic     Plastic     Plastic     Plastic     Plastic     Plastic	Glass	1							©¥Yes □Yes □Yes □Yes	⊡ No	HCI
SCN No. Field Du	)	2807	- 01			on Tubing	_Scm		DPE/Tefloi .O. Ampou				X Groundwater □ Footvalve
April 26, 2013	Vol.	UPDATE PRC	DJECT 2013IM	lord Files - Apri ए मे		nent and Sam	pling Data	tocx	00	R	emil	SP.	Ø.

What .			OUNDV D SAMF				IENT	'	velopn rging/S	nent Samplin	g Wel	1 No.: <u>MW14-c</u>
Project Name: Location: Weather: GPS Coordinates:		nor Hi	Tem	esa fill, 41 perature:	5°C		Project Date: Comple Reviewe	ted By:		-1021 ~pt 1 3		6/11000
MONITORING Time of Measureme Depth to Product: Depth to Water (A): Depth to Bottom of M Diameter of Standpi Well Condition:	vnt: - Well (B): pe:	9:30 12.69 15.140	m F m below X m below 1	100	60cm		Pressu Well H One W (B-A)*2	urized: eadspace /ell Volum	⊡Y s: ne: <b>°1</b> L	itres - for a	o _ ppm a 51 mm (	2.0 inch) diameter well 1.5 inch) diameter well
EQUIPMENT L Pump D Waterra Hydrolift Bailer Peristalt Submer Bladder Pump Details:	(WY. NLIA (Type: iic sible	/	Conduc Dissolve ORP (R Organic	ter ip Meter tivity Meter ed Oxygen N edex) Meter Vapour Met Ampoule	leter	Model: Model: Model: Model:			Field B	ump		□ pH7
	OPMENT			29.4	litres	wse	Start: Sample	intake de	pth:	Finish:	:	
Time         Re           q: 44         1           : 48         1           : 48         1           : 50         1           : 54         1	5	Temp. (°C) 3.59 3.25 3.25 2.93 3.25 3.16	pH (Units) 6.72 6.71 6.74 6.74 6.70 6.82	2	<b>Specific</b> for mS/c wele one) 148 552 476 189 654 156		Redox (mV) - 15: 7 - 20.5 - 20.5 - 20.0 - 21.9 - 19.7 - 26.3	Diss. O (mg/L 5. 2 4. 88 5. 6 6. 6 7. 54	) 	ater Level (m)	bre bre	Remarks
Sheen:	Yes Xi Yes Xi	No Ifye No Ifye		rocarbon-like				' Silty				
Analysis	ту	/pe	40 mL	120 mL	Conta 250 mL	ainer Size 500 ml		2 L	4 L	Filt	ered	Preservatives
	Plastic     Plastic     Plastic     Plastic     Plastic     Plastic     Plastic     Plastic     Plastic	Glass     Glass     Glass     Glass     Glass     Glass     Glass     Glass	V	05	an	pl	٤			<ul> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> <li>Yes</li> </ul>	No     No     No     No     No     No     No     No     No     No	
SCN No.	Plastic	Glass	Consumable		rra Tubing n Tubing	_1(on		DPE/Teflo .O. Ampo		9		] Groundwater Filter Footvalve

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Y.				VATER D		.OPMI	ENT	PLDeve Purg			g Wel	1 No.: MW14-08
roject Name: ocation: /eather: :PS Coordinate	Sa	andy	s land	ESA FIL <u>YT</u> perature:	S°C		Project Date: Complet Reviewe	ted By:	Sep	+.10		000
MONITORI		1										
Time of Measur		13:00					Tidally	Influenced	· 🗆 Ye	s KRNo	0	
Depth to Produc		MA		Product Thickn	ess: M	A m	Pressu			s 🖪 No		
Depth to Water		14.010		TOP	<u>, , , , , , , , , , , , , , , , , , , </u>			eadspace:		JA _		
Depth to Bottom				EL TOP				ell Volume		<u></u>		
Diameter of Sta		SI		`			(B-A)*2	2.0 = 4.2	) Lit	res - for a	a 51 mm (:	2.0 inch) diameter we
Well Condition:				w install			(B-A)*1	1.1 = 🔁	Lit	res - for a	a 38 mm (*	1.5 inch) diameter we
EQUIPMEN		0				NC	L LID	557				
, .	erra (munu	a.( )	Multime		N	Nodel: 1	I MIS	<u>556 -</u> F	Rental E	Equipmen	t:	
🗆 Hyd				np Meter	N	Nodel:						
	er (Type:		) Conduc	-	۸ - tor			P		πŋp		
Peri				ed Oxygen Me						-		□ pH7
	mersible		•	Redex) Meter								
Black	der		Organio	c Vapour Meter	- N	noder:						
Pump Details:			D.O.	Ampoule				- F	Field Ca	libration		
Purge Volume: Ng. Flow Rate: Time 13:06 1:13 17 17				(circ 180 180	L plw Specific or mS/c cle one)	Cond. m		Diss. O <sub>2</sub> * (mg/L) 9.02 8.24 7.74 8.34	h:	Finish: er Level (m)	001	Remarks why why silly l close
22	20	4.68	6.90	136			30.6	8.48				o odar.
1:24	24	5.34	692	13			-31.5	9.93				
1:27	28	5.37	6.98	14	23		34.9	9.40				
omments: Odour: Sheen: Turbidity:	🗆 Yes 🕻	(No Ifye XNo Ifye	s 🗆 Hyd	drocarbon-like				Silty				
					Conta	ainer Size						
Analysis	~	Туре	40 mL	120 mL 3	250 mL	500 mL	1 L	2 L	4 L	Filte	ered	Preservatives
	🗇 Plasti	ic 🛛 Glass								□ Yes	🗆 No	
	D Plasti						4			□ Yes		
	□ Plasti			na	50	A.C	VIA			🗆 Yes	🗆 No	
	🗆 Plasti			10	20	wy	re			🗆 Yes	🗆 No	
	🗆 Plasti					1				🗆 Yes	🗇 No	
	🗆 Plasti									□ Yes		
	🗆 Plasti	c 🛛 Glass								🗆 Yes		
SCN No. Field Dup	•		Consumabl	es: X Waterra				DPE/Teflon O. Ampoul				l Groundwater Filter (Footvalve



S.			ATER D		OPME	ENT	Dev Purç		nent Sampling	Well	No.: <u>MW14-0</u>
ocation:	014 Lena a Dena Claudy Way pt	HES LOI Temp		T S°		Project I Date: Complet Reviewe	ed By:		1021.		6/11000
MONITORING WEL	INFORMA										
Time of Measurement: Depth to Product: Depth to Water (A): Depth to Bottom of Well (B) Diameter of Standpipe: Well Condition:	<u>14:40</u> <u>MA</u> <u>3.890</u> <u>6.045</u> <u>6.045</u> <u>81</u>	a P a below a below	roduct Thickr TOP しん STOP Staken fr いのsta	1,140 S	50	Pressu Well He One W (B-A)*2	eadspace: ell Volume	⊡ Ye ^ 2: 3_1Li*	tres - for a	ppm 51 mm (2	2.0 inch) diameter well I.5 inch) diameter well
EQUIPMENT LIST Pump Z Waterra (WWW Hydrolift Bailer (Type: Peristaltic Submersible Bladder Pump Details:		Dissolve ORP (Re	p Meter iivity Meter ed Oxygen Me edex) Meter Vapour Mete	M M eter M M	odel: odel: odel: odel:	SIMPS	0 	Field Bu	Juub		— pH7
WELL DEVELOPME	NT/PURGI	NG									
Purge Volume: Well. Vo Avg. Flow Rate:	ıх <u>С</u>	>=	25,8	Litres	50.	Start: Sample i	ntake dep	th:	Finish:		
Time         Volume Removed (L)           14:49         5           1:51         10           .53         15           1:55         20           V:57         25	Temp. (°C) 8.69 8.60 8.60 8.63 8.69	pH (Units) 6.69 6.69 6.59 6.59 6.89	(cir 26	or mS/cn de one) 14 30 244	n.	Redox (mV) - ( 5. 9 - 4. 8 - 7. 4 - 13. 2 - 17. 9	Diss. O <sub>2</sub> (mg/L) 8.6/ 7.90 7.90 7.49 7.20 6.82		ter Level (m)	-	Sancly/ ilty t clack
* Record DO in Mg/L, no	ot percentage									MO	2011.0.1
Comments: Odour: □ Yes Sheen: □ Yes Turbidity: Clear	No Ifyes No Ifyes	s 🗆 Hyd	rocarbon-like				Silty				
Analysis	Туре	40	120 mL	Contai 250 mL	iner Size 500 mL	1L	2 L	4 L	Filte	ered	Preservatives
		40 mL		200 IIIL	500 ML		2 L	4 L	□ Yes □ Yes	D No	
		Inn	5	1100	nh				🗆 Yes	🗆 No	-
	istic 🛛 Glass				YK				□ Yes □ Yes □ Yes	□ No □ No □ No	
SCN No.	istic 🛛 Glass	Consumable	es: 🗆 Water	ra Tubing		а ні	DPE/Teflo	n Tubin	g	<u> </u>	Groundwater Filter
Field Dup.			Silicor	Tubing		D D	O. Ampou	iles	-	&	Footvalve

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S.				ATER DE		IENT				Well	No. MW14-C
Project Name: .ocation: Veather: SPS Coordinates:	Sal		Temp	endfill	2 2	Project M Date: Complet Reviewe	ed By:		21-00		(100)0
MONITORING Time of Measuremen Depth to Product: Depth to Water (A): Depth to Bottom of V Diameter of Standpip Well Condition: EQUIPMENT L	nt: 13 N Vell (B): 13 oe:	100 m 100 m 100 m 100 m	n P n below y n below Z	noduct Thickness: LTOP LTOP LTOP LIY	om S.U	n Pressu Well He One W (B-A)*2 (B-A)*1	eadspace: ell Volume 0 = 7. 1 = 7.	□ Ye  <u>'</u> Lit	s A No A res - for a res - for a	, ppm 51 mm (2 38 mm (1	.0 inch) diameter we .5 inch) diameter we
Pump X Waterra Hydrolift Bailer ( Peristalti Submers Bladder Pump Details:	(Type:		Dissolve ORP (Re Organic		Model: Model: Model: Model:	SIMPS		Field Bu □ pH4 □ pH10 □ 1413	mp 		⊐ pH7
WELL DEVELC Purge Volume: V Avg. Flow Rate:	Vell. Vol. X	(	<u> </u>	- <u>44.58</u> 1			intake depl		Finish:		
Time Ren	blume moved (L)	Гетр (°C)	pH (Units)	Cond. Spe US/cm or criticle of	ecific Cond. mS/cm	Redox (mV)	Diss. O <sub>2</sub> <sup>2</sup> (mg/L)	* Wat	ter Level (m)	Dojun	Remarks
13:50	10 S 15 C 20 C 15 H 30 S 35 S	.34 .04 .24 .11 .38	7.2 7.10 7.05 7.11 7.12 7.12	1254 1809 1621 1824 1824 1824 1423 1369		-477 -41.4 -340 -41.9 -47.9 -47.9	4.33 4.35 4.24 4.72 4.62 4.61 3.86			mir	ky brun oolar
Comments: Odour: Sheen:	Yes DN Yes DN	o If yes o If yes	<u>7.12</u> ss □ Hyd	rocarbon-like C	R D Metall	- 42 6	3.7)				
Turbidity: Cle	ear III		-		Container Si	ze	1		Filte	ered	Preservatives
	Plastic     Plastic     Plastic     Plastic     Plastic     Plastic     Plastic     Plastic     Plastic     Plastic	□ Glass □ Glass □ Glass □ Glass □ Glass □ Glass	40 mL	120 mL 250	) mL 500 n	η <u>Γ</u> 1Γ	2 L	4 L	☐ Yes ☐ Yes ☐ Yes ☐ Yes ☐ Yes ☐ Yes	No     No	
SCN No Field Dup.	☐ Plastic	Glass	Consumabl	es: X Waterra T □ Silicon Tu			DPE/Teflo .O. Ampou		9		] Groundwater Filter (Footvalve

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ect Name: ation:		a Dena ek by <sup>s</sup>		- Mare			Project Date:	No.:		12-100 H. 87	23	<u></u>	13:1
ther:	Par	by Claice	ly Te	emperature	: _0°0		Comple	eted By:	IC				_
Coordinates	: wa	y pt.	082				Review	red By:	AB				_
UIPMENT	LIST							_					
ltimeter			Model:	VSI	1P5 556	/\$	Rental E	quipment	:	-			
Temp Meter			Model:			_							
nductivity Mete	ər		Model:	a			Field Bu	mp			_	(ä	
solved Oxyge	n Meter		Model:				🗆 pH4	-			_ D pH	7	
P (Redex) Me			Model:	5 <del></del>			🗆 pH10	-					
janic Vapour I	Meter		Model:				□ 1413		0 47		0	1-1-	1
D.O. Ampoule						X	Field Ca	libration	Calit	nete ,	in size	freuler. J	nan
	ORMAT	ION							_		/	_	
uatic Environm		Fresh		□ Marine		Estuarin	е	Photogr	aph No	.(s):			
Located Sam		Type (see	diment):					ID:		14-01			
	ATED O		~				V out		-	D Other			
	w Meter	Model:			of Sample C		K Grab						
w_ thod: □ Flo □ Ve □ Ve	w Meter I locity Head locity Temp.	Model: Rod (ruler	):m/s □ Cond. □	Water Dept	h	DS Re	/ cn	n fre	e fl	Sal			
<u>w</u> thod: □ Flo □ Ve □ Ve <b>Time</b>	w Meter I locity Head locity <b>Temp</b> . (°C)	Nodel: Rod (ruler <b>pH</b> (Units)	):m/s m/s □ Cond. ⊡ µS/cm (cir	Water Dept Specific C or mS/cm de one)	h ond. TE (g/	DS Re L) (C	cn edox DRP)	f(e 	2 fl (%)	Sal (ppt)	, cree	Remarks	
<u>w</u> thod: □ Flo □ Ve □ Ve <b>Time</b>	w Meter I locity Head locity <b>Temp</b> . (°C)	Model: Rod (ruler	):m/s □ Cond. ⊡ µS/cm	Water Dept Specific C or mS/cm de one)	h	DS Re L) (C	/ cn	n fre	2 fl (%)	Sal (ppt)	cree cleer,	Remarks	1
<u>w</u> thod: □ Flo □ Ve □ Ve <b>Time</b>	w Meter I locity Head locity <b>Temp</b> . (°C)	Nodel: Rod (ruler <b>pH</b> (Units)	):m/s m/s □ Cond. ⊡ µS/cm (cir	Water Dept Specific C or mS/cm de one)	h ond. TE (g/	DS Re L) (C	cn edox DRP)	f(e 	2 fl (%)	Sal (ppt)	cree cleer, switc	Remarks	mo
w thod: □ Flo □ Ve □ Ve Time	w Meter I locity Head locity <b>Temp</b> . (°C)	Nodel: Rod (ruler <b>pH</b> (Units)	):m/s m/s □ Cond. ⊡ µS/cm (cir	Water Dept Specific C or mS/cm de one)	h ond. TE (g/	DS Re L) (C	cn edox DRP)	f(e 	2 fl (%)	Sal (ppt)	cree cleer, switc	Remarks	mo
<u>w</u> thod: □ Flo □ Ve □ Ve <b>Time</b>	w Meter I locity Head locity <b>Temp</b> . (°C)	Nodel: Rod (ruler <b>pH</b> (Units)	):m/s m/s □ Cond. ⊡ µS/cm (cir	Water Dept Specific C or mS/cm de one)	h ond. TE (g/	DS Re L) (C	cn edox DRP)	f(e 	2 fl (%)	Sal (ppt)	cree cleer, switc	Remarks	mo
w thod: □ Flo □ Vel Time 3:(5 3 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	w Meter I locity Head locity Temp. (°C) 3 .28	Nodel: Rod (ruler <b>pH</b> (Units)	):m/s m/s 	Water Dept Specific C or mS/cm de one)	h ond. TE (g/	DS Re L) (C	cn edox DRP)	f(e 	2 fl (%)	Sal (ppt)	cree cleer, switc	Remarks	mo
w thod: □ Flo □ Vel Time 3:(5 3:(5 3: 0dour: □	W Meter I locity Head locity (°C) 3 .28	Nodel: Rod (ruler pH (Units) 7,07	):m/s m/s 	Water Dept Specific C or mS/cm de one)	n ond. TE (g/	2 <b>S Re</b> (L) (C	édox DRP)	f(e 	2 fl (%)	Sal (ppt)	cree cleer, switc	Remarks	mo
w thod: □ Flo □ Vel □ Vel 3: (5 3: (5) 3: (5 3: (5 3: (5 3: (5) 3: (5)	W Meter I locity Head locity Temp. (°C) 3 .23	Nodel: Rod (ruler (Units) 7,07 No If ye	):m/s m/s 	Water Dept	h ond. TE (g/       	DS Re (C) (C) (C) (C) (C) (C) (C) (C) (C) (C)	, cn edox )RP) 0, S	f(e 	2 fl (%)	Sal (ppt)	cree cleer, switc	Remarks	mo
w thod: □ Flo □ Vel Time 1 3:(5 3:(5 3: 0dour: □ Sheen: □	W Meter I locity Head locity Temp. (°C) 3 .23	Nodel: Rod (ruler (Units) 7,07 No If ye	):m/s m/s 	Water Dept Specific C or mS/cm cle one) B B	h ond. TE (g/ N	DS Re (L) (C ) ) ) Metallic-li             	, cn edox )RP) 0, S	 Diss. ( (mg/L) or ۹، (۵	2 fl (%)	Sal (ppt)	cree cleer, switc	Remarks	mo
w thod: □ Flo □ Vel Time 1 3:(5 3 3:(5 3 3: 3:(5 3 3 3:(5 3 3 3:(5 3 3 3 3:(5 3 3 3 3:(5 3 3 3 3 3 3 3 3 5 5 5 1 3 1 1 1 1 1 1 1	W Meter I locity Head locity (°C) 3 .2.8	Nodel: Rod (ruler pH (Units) 7,07 No If ye	):m/s	Water Dept Specific C gr mS/cm cle one)	h ond. TE (g/ 	DS Re (C) (C) (C) (C) (C) (C) (C) (C) (C) (C)	/ edox )RP) 0, S ke   Ver	n f(e Diss. ( (mg/L) or q, (6) y Silty	2 fl	Sal (ppt)	cree cleer, switc	Remarks	Ma
w thod: □ Flo □ Vel	W Meter I locity Head locity (°C) 3 , 2 8 3 Yes 1 1 Yes 1 2 Yes 1 2 Yes 1 1 Yes 1 Yes 1 1 Yes 1 Yes 1 1 Yes 1 Ye	Aodel: Rod (ruler pH (Units) 7,07 No If ye No If ye	):m/s m/s 	Water Dept Specific C or mS/cm cle one) B B	h ond. TE (g/ N	DS Re /L) (C )	, cn edox )RP) 0, s , s ke	 Diss. ( (mg/L) or ۹، (۵	2 fl (%)	Sal (ppt) A Filt	cree cleer, Swra Veg ered	Remarks	Ma
w thod: □ Flo □ Vel Time 1 3:(5 3 3:(5 3 3:(5 3 3:(5 3 3:(5 3 3) 3:(5 3) 3:(5	W Meter I locity Head locity (°C) 3 . 2 8 3 . 2 8 3 . 2 8 3 . 2 8 5 Plastic	Model: Rod (ruler pH (Units) 7,07 No If ye No If ye No If ye I I	):m/s  [] Cond []	Water Dept Specific C gr mS/cm cle one)	h ond. TE (g/ 	DS Re (C) (C) (C) (C) (C) (C) (C) (C) (C) (C)	/ edox )RP) 0, S ke   Ver	n f(e Diss. ( (mg/L) or q, (6) y Silty	2 fl	Sal (ppt) A Filt	Cree Cleer, Starto Ves ered	Remarks no odo i trees i trees Preserva sod bis	Ma
w         thod:       □         □       ∨e         □       ∨e         □       ∨e         Time       □         3:       (5)         3:       (5)         mments:       □         Odour:       □         Sheen:       □         Turbidity:       C         Analysis       ⊆         EPIH/HEPH         TEX/VPH	W Meter I locity Head locity (°C) 3 , 2 8 3 , 2 8 3 Yes 3 3 Yes	Aodel: Rod (ruler pH (Units) 7,07 ANO If ye Mo If ye (Class A Glass	):m/s	Water Dept	h ond. TE (g/ 	DS Re /L) (C )	/ edox )RP) 0, S ke   Ver	n f(e Diss. ( (mg/L) or q, (6) y Silty	2 fl	Sal (ppt) A Filt	Cree Cleer Swr Veg ered XNo	Remarks ne oda ureline i trees i trees	atives
	W Meter I locity Head locity (°C) 3 .2 8 9 Yes 0 9 Yes 0 1 Yes 0	Aodel: Rod (ruler pH (Units) 7,07 ANO If ye No If ye No If ye O If ye Glass Class	):m/s m/s G/Com G/G 	Water Dept Specific C gr mS/cm cle one)	h ond. TE (g/ 	DS Re /L) (C )	/ edox )RP) 0, S ke   Ver	n f(e Diss. ( (mg/L) or q, (6) y Silty	2 fl	Sal (ppt) A Filt Pes Yes	Clear, Starter Veg ered A No A No	Remarks no odd ineline i trees i trees	atives
w thod: □ Flo □ Vel Time 3: (5 3: (5))))))))))))))))))))))))))))))))))))	W Meter I locity Head locity (°C) 3 .2 8 9 Yes 0 9 Yes 0 1 Yes 0 2 I Yes 0 2 I Yes 0 1	Aodel: Rod (ruler pH (Units) 7,07 No If ye No If ye No If ye I I I I Stass Class Class	):m/s  [] Cond []	Water Dept	h ond. TE (g/ 	DS Re /L) (C )	/ cn edox JRP) 0, 5 ke   Ver	n f(e Diss. ( (mg/L) or q, (6) y Silty	2 fl	Sal (ppt) A Filt Yes Yes Yes	cree cleer, Swr(c Veg ered A No A No A No	Remarks	atives
w thod: □ Flo □ Vel Time 3: (5 3: (5))))))))))))))))))))))))))))))))))))	W Meter I locity Head locity Temp. (°C) 3 , 2 8 9 , 3 8	Aodel: Rod (ruler pH (Units) 7,07 7,07 7,07 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	):m/s m/s G/Com G/G 	Water Dept	h ond. TE (g/ 	DS Re /L) (C )	/ edox )RP) 0, S ke   Ver	n f(e Diss. ( (mg/L) or q, (6) y Silty	2 fl	Sal (ppt) A Filt Yes Yes Yes Yes	Clear, Starrie Veg ered A No A No A No A No	Remarks no odd ineline i trees i trees	atives
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ather:				mperature:		Comp	pleted By:	LC	,		
S Coordinates	· · · · · · · · · · · · · · · · · · ·		101				wed By:	AB			
QUIPMENT	LIST										
ultimeter			Model:	YSIMPS	SSG	Rental	Equipment	:			
I/Temp Meter			Model:								
onductivity Mete	er		Model:			D Field B	ump				
ssolved Oxygei	n Meter		Model:			□ pH4	52			D pH7	7
RP (Redex) Me	ter		Model:	1		🗆 pH1	0				
ganic Vapour N	Neter		Model:			□ 141;	3 us/cm				
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20769-02

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EQUIPMENT	LIST												
Multimeter			Model:	2			Rental	Equipment	:	2	_		
pH/Temp Meter			Model:				Circled D						
Conductivity Met Dissolved Oxyge			Model: Model:	2			Field B	-		_	 □ pH	7	
ORP (Redex) Me			Model:				D pH10	-					
Organic Vapour I			Model:	8			□ 1413						
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STATION INF Aquatic Environn Co-Located Sam	nent:	ON □ Fresh Type (sec	diment):	□ Marine		🗆 Estuari	ne	Photogr			/		
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BTECNPH	D Plastic	🗶 Glass	7							□ Yes	No No	Sod bis	
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L	Plastic	Glass						= <u></u>		□ Yes	D No	1	
SCN No.	2,07	69-	0 <u>3</u>	Consumabl	les: 🗆 S	yringes / F	ilters _			_ 00	ther		
I:\New Field Forms\FC	RMS\Done\Su	face Water Sa	ampling Data d	bax									



# Attachment 2 - Surface Water Sampling Information (provided by SRK for the October 11, 2014 sampling event)

	Provideo	l by Golder	Oct. 1	1, 2014
Sample Location	Easting	Northing	Easting	Northing
SW14-01	507863	6712232	507863	6712231
SW14-02	508098	671280	508173	6712484
SW14-03	508478.37	6712748.05	508473	6712751

Table 1: GPS Coordinates of North Creek monitoring sites

Grab water samples were collected at each of the above sampling locations, using methods that are consistent with standard methods. Water was visibly clear and some snow melt / run-off was underway at the time of sample collection. Field measurements, shown in the table below, were made using a calibrated Oakton PCTestr35 (pH, temperature, conductivity) and a calibrated Lamotte 2020we Turbidimeter. Flow rate was measured at SW14-02 and SW14-03, using a Swoffer 2100 current velocity meter (calibrated, and using the current velocity averaging function), the measurements are in the range of visual estimates of flow (also shown in table below).

The landfill area showed no ponding nor surface flow on October 11, 2014. The surface soils were slightly moist, with the odd puddle, due to snowmelt. There was some surface flow, (likely run-off, but the flow was not walked to its source) flowing into North Creek just upstream of SW14-02, from the south bank of the creek.

			Turbidity	Temperature	рН	EC			Flow Rate
Site	Date	Time	(NTU)	(°C)		(µS/cm)	(L/s)	(L/min)	Method
SW14-01	10/11/2014	11:03	0.59	1.8	8.0	280			
SW14-02	10/11/2014	12:15	0.24	2.2	8.4	316	9	540	Area / Velocity (Swoffer)
SW14-03	10/11/2014	13:39	1.18	2.2	8.5	319	13	780	Area / Velocity (Swoffer)

Table 2: North Creek Water Quality – Field Measurements on October 11, 2014

Water samples were kept cool and shipped to Maxxam Analytics for analysis. Parameters tested include those that are required under the site's existing Water Licence (Yukon Water Licence QZ99-045) for sites that are tested during a period of temporary closure.

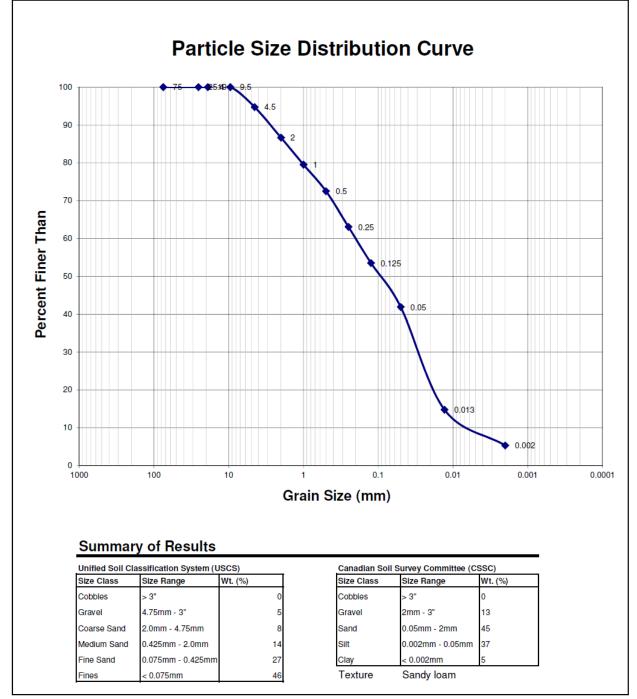
# **ATTACHMENT 3**

# **Grain Size Distribution Curve**



ALS Laboratory Group ANALYTICAL CHEMISTRY & TESTING SERVICES Environmental Division

819-58th Street, Saskatoon, SK S7K 6X5



Method Reference: Can. Soc. Soil Sci. (1993) Method 47.2

# **ATTACHMENT 4**

Laboratory Analytical Results and Chains of Custody

Your Project #: 12-1021-0006 Site Location: PHASE# 9000/1104 Your C.O.C. #: 20769

#### **Attention:Andrew Bruemmer**

GOLDER ASSOCIATES LTD 4260 STILL CREEK DRIVE Suite 500 BURNABY, BC Canada V5C 6C6

> Report Date: 2014/09/18 Report #: R1645444 Version: 1

## **CERTIFICATE OF ANALYSIS**

## MAXXAM JOB #: B480183

Received: 2014/09/10, 16:30

Sample Matrix: Water # Samples Received: 3

		Date	Date		
Analyses	Quantity	Extracted	Analyzed	Laboratory Method	Analytical Method
BTEX/MTBE LH, VH, F1 SIM/MS	3	2014/09/11	2014/09/12	BBY8-SOP-00010	EPA 8260c R3
Chloride by Automated Colourimetry	3	N/A	2014/09/11	BBY6SOP-00011	SM 22 4500-Cl- G m
Fluoride	3	N/A	2014/09/12	BBY6SOP-00048	SM 22 4500-F C m
Hardness Total (calculated as CaCO3)	1	N/A	2014/09/11	BBY7SOP-00002	EPA 6020a R1 m
Hardness Total (calculated as CaCO3)	2	N/A	2014/09/15	BBY7SOP-00002	EPA 6020a R1 m
Mercury (Total) by CVAF	3	2014/09/17	2014/09/17	BBY7SOP-00015	BCMOE BCLM Oct2013 m
Extrac. Pet HC when LEPH/HEPH required	1	2014/09/13	2014/09/18	BBY8SOP-00029	BCMOE EPH w 07/99
Extrac. Pet HC when LEPH/HEPH required	2	2014/09/15	2014/09/16	BBY8SOP-00029	BCMOE EPH w 07/99
Na, K, Ca, Mg, S by CRC ICPMS (total)	1	2014/09/10	2014/09/11	BBY7SOP-00002	EPA 6020A R1 m
Na, K, Ca, Mg, S by CRC ICPMS (total)	2	2014/09/10	2014/09/15	BBY7SOP-00002	EPA 6020A R1 m
Elements by CRC ICPMS (total)	1	2014/09/11	2014/09/11	BBY7SOP-00002	EPA 6020A R1 m
Elements by CRC ICPMS (total)	2	2014/09/11	2014/09/12	BBY7SOP-00002	EPA 6020A R1 m
Nitrate + Nitrite (N)	3	N/A	2014/09/11	BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrite (N) by CFA	3	N/A	2014/09/11	BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrogen - Nitrate (as N)	3	N/A	2014/09/12	BBY6SOP-00010	SM 22 4500-NO3 I m
PAH in Water by GC/MS (SIM)	1	2014/09/13	2014/09/13	BBY8SOP-00021	EPA 8270d R4 m
PAH in Water by GC/MS (SIM)	2	2014/09/15	2014/09/15	BBY8SOP-00021	EPA 8270d R4 m
Total LMW, HMW, Total PAH Calc	1	N/A	2014/09/15	BBY WI-00033	Auto Calc
Total LMW, HMW, Total PAH Calc	2	N/A	2014/09/16	BBY WI-00033	Auto Calc
Sulphate by Automated Colourimetry	3	N/A	2014/09/12	BBY6SOP-00017	SM 22 4500-SO42- E m
EPH less PAH in Water by GC/FID	1	N/A	2014/09/16	BBY WI-00033	Auto Calc
EPH less PAH in Water by GC/FID	1	N/A	2014/09/17	BBY WI-00033	Auto Calc
EPH less PAH in Water by GC/FID	1	N/A	2014/09/18	BBY WI-00033	Auto Calc
Volatile HC-BTEX	3	N/A	2014/09/12	BBY WI-00033	Auto Calc

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



Maxam A Bureau Veritas Group Company

> Your Project #: 12-1021-0006 Site Location: PHASE# 9000/1104 Your C.O.C. #: 20769

#### Attention:Andrew Bruemmer

GOLDER ASSOCIATES LTD 4260 STILL CREEK DRIVE Suite 500 BURNABY, BC Canada V5C 6C6

> Report Date: 2014/09/18 Report #: R1645444 Version: 1

## **CERTIFICATE OF ANALYSIS**

MAXXAM JOB #: B480183 Received: 2014/09/10, 16:30

**Encryption Key** 

Please direct all questions regarding this Certificate of Analysis to your Project Manager. Namita Sahni, Burnaby Project Manager Email: NSahni@maxxam.ca Phone# (604)639-2614

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.



#### **RESULTS OF CHEMICAL ANALYSES OF WATER**

Maxxam ID		KO3585		KO3586		KO3587			
Sampling Date		2014/09/08		2014/09/08		2014/09/08			
COC Number		20769		20769		20769			
	Units	20769-01	QC Batch	20769-02	QC Batch	20769-03	RDL	QC Batch	
Misc. Inorganics									
Fluoride (F)	mg/L	0.130	7636245	0.110	7636245	0.110	0.010	7636245	
Anions									
Dissolved Sulphate (SO4)	mg/L	6.16	7636331	11.3	7636323	10.7	0.50	7636323	
Dissolved Chloride (Cl)	mg/L	<0.50	7634828	<0.50	7634826	<0.50	0.50	7634828	
RDL = Reportable Detection Limit									



# BCCSR BTEX/VPH IN WATER (WATER)

Maxxam ID		KO3585	KO3586	KO3587		
Sampling Date		2014/09/08	2014/09/08	2014/09/08		
COC Number		20769	20769	20769		
	Units	20769-01	20769-02	20769-03	RDL	QC Batch
Volatiles						
VPH (VHW6 to 10 - BTEX)	ug/L	<300	<300	<300	300	7632162
Methyl-tert-butylether (MTBE)	ug/L	<4.0	<4.0	<4.0	4.0	7634016
Benzene	ug/L	<0.40	<0.40	<0.40	0.40	7634016
Toluene	ug/L	<0.40	<0.40	<0.40	0.40	7634016
Ethylbenzene	ug/L	<0.40	<0.40	<0.40	0.40	7634016
m & p-Xylene	ug/L	<0.40	<0.40	<0.40	0.40	7634016
o-Xylene	ug/L	<0.40	<0.40	<0.40	0.40	7634016
Styrene	ug/L	<0.40	<0.40	<0.40	0.40	7634016
Xylenes (Total)	ug/L	<0.40	<0.40	<0.40	0.40	7634016
VH C6-C10	ug/L	<300	<300	<300	300	7634016
Surrogate Recovery (%)						
1,4-Difluorobenzene (sur.)	%	101	100	101		7634016
4-Bromofluorobenzene (sur.)	%	104	106	104		7634016
D4-1,2-Dichloroethane (sur.)	%	98	98	98		7634016
RDL = Reportable Detection Limi	it					



# LEPH & HEPH WITH CSR/CCME PAH IN WATER (WATER)

Maxxam ID		KO3585	KO3586		KO3587		
Sampling Date		2014/09/08	2014/09/08		2014/09/08		
COC Number		20769	20769		20769		
	Units	20769-01	20769-02	QC Batch	20769-03	RDL	QC Batch
Polycyclic Aromatics							
Low Molecular Weight PAH`s	ug/L	<0.24	<0.24	7632129	<0.24	0.24	7632129
High Molecular Weight PAH`s	ug/L	<0.050	<0.050	7632129	<0.050	0.050	7632129
Total PAH	ug/L	<0.24	<0.24	7632129	<0.24	0.24	7632129
Naphthalene	ug/L	<0.10	<0.10	7638144	<0.10	0.10	7636573
2-Methylnaphthalene	ug/L	<0.10	<0.10	7638144	<0.10	0.10	7636573
Quinoline	ug/L	<0.24	<0.24	7638144	<0.24	0.24	7636573
Acenaphthylene	ug/L	<0.050	<0.050	7638144	<0.050	0.050	7636573
Acenaphthene	ug/L	<0.050	<0.050	7638144	<0.050	0.050	7636573
Fluorene	ug/L	<0.050	<0.050	7638144	< 0.050	0.050	7636573
Phenanthrene	ug/L	<0.050	<0.050	7638144	<0.050	0.050	7636573
Anthracene	ug/L	<0.010	<0.010	7638144	< 0.010	0.010	7636573
Acridine	ug/L	<0.050	<0.050	7638144	<0.050	0.050	7636573
Fluoranthene	ug/L	<0.020	<0.020	7638144	<0.020	0.020	7636573
Pyrene	ug/L	<0.020	<0.020	7638144	< 0.020	0.020	7636573
Benzo(a)anthracene	ug/L	< 0.010	<0.010	7638144	< 0.010	0.010	7636573
Chrysene	ug/L	<0.050	<0.050	7638144	<0.050	0.050	7636573
Benzo(b&j)fluoranthene	ug/L	<0.050	<0.050	7638144	<0.050	0.050	7636573
Benzo(k)fluoranthene	ug/L	<0.050	<0.050	7638144	<0.050	0.050	7636573
Benzo(a)pyrene	ug/L	<0.0090	<0.0090	7638144	<0.0090	0.0090	7636573
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	<0.050	7638144	<0.050	0.050	7636573
Dibenz(a,h)anthracene	ug/L	<0.050	<0.050	7638144	<0.050	0.050	7636573
Benzo(g,h,i)perylene	ug/L	<0.050	<0.050	7638144	<0.050	0.050	7636573
Calculated Parameters							
LEPH (C10-C19 less PAH)	mg/L	<0.20	<0.20	7632131	<0.20	0.20	7632131
HEPH (C19-C32 less PAH)	mg/L	<0.20	<0.20	7632131	<0.20	0.20	7632131
Ext. Pet. Hydrocarbon							
EPH (C10-C19)	mg/L	<0.20	<0.20	7638152	<0.20	0.20	7636575
EPH (C19-C32)	mg/L	<0.20	<0.20	7638152	<0.20	0.20	7636575
Surrogate Recovery (%)							
O-TERPHENYL (sur.)	%	104	104	7638152	103		7636575
D10-ANTHRACENE (sur.)	%	107	109	7638144	123		7636573
D8-ACENAPHTHYLENE (sur.)	%	83	92	7638144	94		7636573
D8-NAPHTHALENE (sur.)	%	74	87	7638144	88		7636573
D9-Acridine	%	84	86	7638144	87		7636573
RDL = Reportable Detection Lin	nit						



#### LEPH & HEPH WITH CSR/CCME PAH IN WATER (WATER)

Maxxam ID		KO3585	KO3586		KO3587		
Sampling Date		2014/09/08	2014/09/08		2014/09/08		
COC Number		20769	20769		20769		
	Units	20769-01	20769-02	QC Batch	20769-03	RDL	QC Batch
TERPHENYL-D14 (sur.)	%	57 (1)	83	7638144	86		7636573
		-	•	•			

RDL = Reportable Detection Limit

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.



## CSR TOTAL METALS IN WATER WITH CV HG (WATER)

Maxxam ID		KO3585	KO3586		KO3587		
Sampling Date		2014/09/08	2014/09/08		2014/09/08		
COC Number		20769	20769		20769		
	Units	20769-01	20769-02	QC Batch	20769-03	RDL	QC Batch
Calculated Parameters							
Total Hardness (CaCO3)	mg/L	151	179	7633277	175	0.50	7633277
Elements				•		•	
Total Mercury (Hg)	ug/L	<0.010	<0.010	7641493	<0.010	0.010	7641493
Total Metals by ICPMS			•			•	
Total Aluminum (Al)	mg/L	0.0082	0.0090	7634646	0.236	0.0030	7634091
Total Antimony (Sb)	mg/L	<0.00050	<0.00050	7634646	<0.00050	0.00050	7634091
Total Arsenic (As)	mg/L	0.00112	0.00107	7634646	0.00124	0.00010	7634091
Total Barium (Ba)	mg/L	0.0625	0.0756	7634646	0.0819	0.0010	7634091
Total Beryllium (Be)	mg/L	<0.00010	<0.00010	7634646	<0.00010	0.00010	7634091
Total Bismuth (Bi)	mg/L	<0.0010	<0.0010	7634646	<0.0010	0.0010	7634091
Total Boron (B)	mg/L	<0.050	<0.050	7634646	<0.050	0.050	7634091
Total Cadmium (Cd)	mg/L	0.000034	0.000056	7634646	0.000130	0.000010	7634091
Total Chromium (Cr)	mg/L	<0.0010	<0.0010	7634646	<0.0010	0.0010	7634091
Total Cobalt (Co)	mg/L	<0.00050	<0.00050	7634646	<0.00050	0.00050	7634091
Total Copper (Cu)	mg/L	<0.00050	<0.00050	7634646	0.00069	0.00050	7634091
Total Iron (Fe)	mg/L	0.034	0.020	7634646	0.374	0.010	7634091
Total Lead (Pb)	mg/L	0.00047	0.00160	7634646	0.00623	0.00020	7634091
Total Lithium (Li)	mg/L	<0.0050	<0.0050	7634646	<0.0050	0.0050	7634091
Total Manganese (Mn)	mg/L	0.0276	0.0119	7634646	0.0271	0.0010	7634091
Total Molybdenum (Mo)	mg/L	0.0013	0.0013	7634646	0.0013	0.0010	7634091
Total Nickel (Ni)	mg/L	<0.0010	<0.0010	7634646	<0.0010	0.0010	7634091
Total Selenium (Se)	mg/L	0.00049	0.00064	7634646	0.00056	0.00010	7634091
Total Silicon (Si)	mg/L	4.23	3.99	7634646	4.39	0.10	7634091
Total Silver (Ag)	mg/L	<0.000020	<0.000020	7634646	0.000021	0.000020	7634091
Total Strontium (Sr)	mg/L	0.174	0.213	7634646	0.234	0.0010	7634091
Total Thallium (Tl)	mg/L	<0.000050	<0.000050	7634646	<0.000050	0.000050	7634091
Total Tin (Sn)	mg/L	<0.0050	<0.0050	7634646	<0.0050	0.0050	7634091
Total Titanium (Ti)	mg/L	<0.0050	<0.0050	7634646	0.0069	0.0050	7634091
Total Uranium (U)	mg/L	0.00061	0.00091	7634646	0.00089	0.00010	7634091
Total Vanadium (V)	mg/L	<0.0050	<0.0050	7634646	<0.0050	0.0050	7634091
Total Zinc (Zn)	mg/L	<0.0050	0.0060	7634646	0.0113	0.0050	7634091
Total Zirconium (Zr)	mg/L	<0.00050	<0.00050	7634646	<0.00050	0.00050	7634091
Total Calcium (Ca)	mg/L	51.7	60.9	7632517	59.5	0.050	7632517
Total Magnesium (Mg)	mg/L	5.41	6.60	7632517	6.35	0.050	7632517
Total Potassium (K)	mg/L	0.379	0.602	7632517	0.726	0.050	7632517



# CSR TOTAL METALS IN WATER WITH CV HG (WATER)

Maxxam ID		KO3585	KO3586		KO3587		
Sampling Date		2014/09/08	2014/09/08		2014/09/08		
COC Number		20769	20769		20769		
	Units	20769-01	20769-02	QC Batch	20769-03	RDL	QC Batch
Total Sodium (Na)	mg/L	0.941	1.25	7632517	1.06	0.050	7632517
Total Sulphur (S)	mg/L	<3.0	3.3	7632517	8.6	3.0	7632517
RDL = Reportable Detection I	imit						



# NITRITE & NITRATE IN WATER (WATER)

Maxxam ID		KO3585		KO3586	KO3587				
Sampling Date		2014/09/08		2014/09/08	2014/09/08				
COC Number		20769		20769	20769				
	Units	20769-01	QC Batch	20769-02	20769-03	RDL	QC Batch		
ANIONS									
Nitrite (N)	mg/L	<0.0050	7634716	<0.0050	<0.0050	0.0050	7634713		
Calculated Parameters									
Nitrate (N)	mg/L	0.032	7632229	0.047	0.040	0.020	7632229		
Nutrients									
Nitrate plus Nitrite (N)	mg/L	0.032	7634715	0.047	0.040	0.020	7634712		
RDL = Reportable Detection Limit									



Success Through Science®

GOLDER ASSOCIATES LTD Client Project #: 12-1021-0006 Site Location: PHASE# 9000/1104 Sampler Initials: LC

### **GENERAL COMMENTS**

Results relate only to the items tested.



## **QUALITY ASSURANCE REPORT**

GOLDER ASSOCIATES LTD Client Project #: 12-1021-0006

Т

Site Location: PHASE# 9000/1104 Sampler Initials: LC

Tr534016         1.4-Diffuorobenzene (sur.)         2014/09/11         97         70 - 130         98         70 - 130         102         %           T634016         4.Bronofluorobenzene (sur.)         2014/09/11         108         70 - 130         104         70 - 130         102         %           T636016         D-1.2-Dichlorochtane (sur.)         2014/09/11         108         70 - 130         104         %            T636573         DE-ANCHARCTNE (sur.)         2014/09/13         91         60 - 130         106         %            T636573         DE-ACRIAPHTHYLENE (sur.)         2014/09/13         89         50 - 130         94         50 - 130         88         %            T636573         DE-Acriane         2014/09/13         89         50 - 130         84         50 - 130         78         %            T636575         D-TERPHEXPL (sur.)         2014/09/15         114         50 - 130         112         50 - 130         113         %            T638344         DE-ACRIAPHTHYLENE (sur.)         2014/09/15         107         50 - 130         103         108         %            T638344         DE-ACRIAPHTHYLENE (sur.)         2014/09	r			Matrix Spike		Spiked Blank		Method Blank		RPD	
7634016         4-Bromofluorobenzene (sur.)         2014/09/11         108         70 - 130         104         70 - 130         102         %            7634016         D4.1,2-bitchiorethane (sur.)         2014/09/11         95         70 - 130         104         %            7636573         DB-ARTHACKE (sur.)         2014/09/13         96         50 - 130         94         50 - 130         88         %            7636573         DB-ANPHTALENE (sur.)         2014/09/13         89         50 - 130         94         50 - 130         88         %            7636573         DB-ANPHTALENE (sur.)         2014/09/13         89         50 - 130         90         50 - 130         89         %            7636573         DE-NAPHTALENE (sur.)         2014/09/13         114         50 - 130         105         60 - 130         113         %             763534         40 - ACENAPHTHYLENE (sur.)         2014/09/15         107         50 - 130         104         50 - 130         98         %           7638144         DE-NAPHTHYLENE (sur.)         2014/09/15         107         50 - 130         104         50 - 130         98	QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7634016         D4-1,2-Dichloroethane (sur.)         2014/09/11         95         70-130         95         70-130         104         %            7636573         D10-ANTHRACENE (sur.)         2014/09/13         111         60-130         119         60-130         188         %            7636573         D5-ACRAMPHTHALENE (sur.)         2014/09/13         89         50-130         89         50-130         83         %             7636573         D5-ACRIAMPHTHALENE (sur.)         2014/09/13         89         50-130         89         50-130         78         %            7636573         D5-Acridine         2014/09/13         84         60-130         112         50-130         89         %            7638573         DFARPHENYL-D14 (sur.)         2014/09/15         111         60-130         113         %                  50-130         104         50-130         198         %                50-130         104         50-130         108         %           <	7634016	1,4-Difluorobenzene (sur.)	2014/09/11	97	70 - 130	98	70 - 130	102	%		
7636573         D10-ANTHRACENE (sur.)         2014/09/13         111         60-130         119         60-130         106         %            7636573         DS-ACENAPHTHYLENE (sur.)         2014/09/13         96         50-130         88         %            7636573         DS-AMPHTHALENE (sur.)         2014/09/13         89         50-130         88         %            7636573         DS-AMPHTHALENE (sur.)         2014/09/13         89         50-130         90         50-130         78         %            7636573         TERHENTV-D14 (sur.)         2014/09/15         111         60-130         1105         60-130         113         %            7638144         DIO-ANTHRACENE (sur.)         2014/09/15         111         60-130         1108         %             7638144         DB-ARPHTHYLENE (sur.)         2014/09/15         105         50-130         93         50-130         89         %             7638144         DB-ARPHTHYLENE (sur.)         2014/09/15         89         50-130         90         50-130         93         %             7638140         DS-ARPHTHYLENE (	7634016	4-Bromofluorobenzene (sur.)	2014/09/11	108	70 - 130	104	70 - 130	102	%		
7636573         D8-ACENAPHTHYLENE (sur.)         2014/09/13         96         50 - 130         94         50 - 130         88         %            7636573         D8-AACHINE (sur.)         2014/09/13         89         50 - 130         89         50 - 130         83         %            7636573         D8-AACHINE         2014/09/13         89         50 - 130         89         50 - 130         89         %            7636573         D8-AACHINE         2014/09/15         114         50 - 130         105         60 - 130         89         %             7636574         D-TERPHENYL-D14 (sur.)         2014/09/15         111         60 - 130         112         50 - 130         108         %             7638140         D8-ACRAPHTHYLENE (sur.)         2014/09/15         105         50 - 130         104         50 - 130         89         %                 76         730         90         70 - 130         89         %              76         730         70         730         70         730	7634016	D4-1,2-Dichloroethane (sur.)	2014/09/11	95	70 - 130	95	70 - 130	104	%		
7636573         D8-NAPHTHALENE (sur.)         2014/09/13         89         50 - 130         83         %            7636573         D9-Acridine         2014/09/13         89         50 - 130         90         50 - 130         78         %           7636573         TERPHENYL-D14 (sur.)         2014/09/13         84         60 - 130         105         60 - 130         89         %            7636575         C-ERPHENYL-D14 (sur.)         2014/09/15         114         60 - 130         112         50 - 130         113         %            7638144         D0-ACTERMENYL (sur.)         2014/09/15         107         50 - 130         104         50 - 130         92         %            7638144         D8-ACPENAPHTHYLENE (sur.)         2014/09/15         105         50 - 130         94         50 - 130         92         %             7638144         D8-ANPHTHALENE (sur.)         2014/09/15         105         50 - 130         90         50 - 130         93         %              7638145         D8-ANPHTHALENE (sur.)         2014/09/16         106         50 - 130         106         50 - 130         93         %	7636573	D10-ANTHRACENE (sur.)	2014/09/13	111	60 - 130	119	60 - 130	106	%		
7636573         D9-Acridine         2014/09/13         89         50 - 130         90         50 - 130         78         %            7636573         TERPHENVL-D14 (sur.)         2014/09/13         84         60 - 130         105         60 - 130         89         %            7636575         O-TERPHENVL_Sur.)         2014/09/15         114         50 - 130         112         50 - 130         108         %            7638144         D1-ANTHRACENE (sur.)         2014/09/15         107         50 - 130         104         50 - 130         92         %            7638144         D8-ACENAPHTHALENE (sur.)         2014/09/15         107         50 - 130         104         50 - 130         92         %            7638144         D8-ACHAPHTHALENE (sur.)         2014/09/15         105         50 - 130         103         60 - 130         103         60 - 130         103         60 - 130         105         50 - 130         103         60 - 130         103         60 - 130         103         60 - 130         103         60 - 130         103         60 - 130         103         60 - 130         103         103         103         103         103         103	7636573	D8-ACENAPHTHYLENE (sur.)	2014/09/13	96	50 - 130	94	50 - 130	88	%		
7636573         TERPHENYL-D14 (sur.)         2014/09/13         84         60 - 130         105         60 - 130         89         %            7636575         O-TERPHENYL (sur.)         2014/09/15         114         50 - 130         112         50 - 130         113         %            7638144         D10-ANTHRACENE (sur.)         2014/09/15         107         50 - 130         119         60 - 130         108         %            7638144         D8-ACRAPHTHYLENE (sur.)         2014/09/15         107         50 - 130         99         50 - 130         89         %             7638144         D8-ACRAPHTHYLENE (sur.)         2014/09/15         89         50 - 130         90         50 - 130         93         %             7638144         D8-ARPHTHALENE (sur.)         2014/09/15         89         70 - 130         90         50 - 130         106         50 - 130         109         %              60 - 130         103         60 - 130         109         %                 50 - 130         100         50 - 130	7636573	D8-NAPHTHALENE (sur.)	2014/09/13	89	50 - 130	89	50 - 130	83	%		
7636575         O-TERPHENYL (sur.)         2014/09/15         114         50 - 130         112         50 - 130         113         %            7638144         D0-ANTHRACENE (sur.)         2014/09/15         111         60 - 130         104         50 - 130         92         %            7638144         D8-ACENAPHTHYLENE (sur.)         2014/09/15         107         50 - 130         99         50 - 130         89         %            7638144         D8-ACENAPHTHALENE (sur.)         2014/09/15         105         50 - 130         99         50 - 130         89         %            7638144         D9-Acridine         2014/09/15         92         60 - 130         103         60 - 130         93         %            7638144         TERPHENYL-014 (sur.)         2014/09/16         106         50 - 130         106         50 - 130         109         %             7634016         Benzene         2014/09/11         83         70 - 130         90         70 - 130         <0.40	7636573	D9-Acridine	2014/09/13	89	50 - 130	90	50 - 130	78	%		
7638144         D10-ANTHRACENE (sur.)         2014/09/15         111         60 - 130         119         60 - 130         108         %            7638144         D8-ACENAPHTHYLENE (sur.)         2014/09/15         107         50 - 130         99         50 - 130         92         %            7638144         D8-ACRIME         2014/09/15         105         50 - 130         99         50 - 130         92         %            7638144         D8-ACRIME         2014/09/15         89         50 - 130         90         50 - 130         93         %            7638145         D-FRPHENYL (sur.)         2014/09/16         106         50 - 130         103         60 - 130         109         %            7638152         O-TERPHENYL (sur.)         2014/09/11         89         70 - 130         90         70 - 130         40.40         ug/L         NC         30           7634016         Benzene         2014/09/11         89         70 - 130         83         70 - 130         40.40         ug/L         NC         30           7634016         m & p-Xylene         2014/09/11         88         70 - 130         86         70 - 130         <0.40<	7636573	TERPHENYL-D14 (sur.)	2014/09/13	84	60 - 130	105	60 - 130	89	%		
7638144         D8-ACENAPHTHYLENE (sur.)         2014/09/15         107         50 - 130         104         50 - 130         92         %            7638144         D8-AAPHTHALENE (sur.)         2014/09/15         89         50 - 130         99         50 - 130         89         %            7638144         D9-Acridine         2014/09/15         89         50 - 130         90         50 - 130         79         %            7638144         D8-AAPHTHALENE (sur.)         2014/09/15         92         60 - 130         103         60 - 130         93         %            7638152         O-TERPHENVL-D14 (sur.)         2014/09/16         106         50 - 130         106         50 - 130         109         %           7634016         Benzene         2014/09/11         89         70 - 130         90         70 - 130         <0.40	7636575	O-TERPHENYL (sur.)	2014/09/15	114	50 - 130	112	50 - 130	113	%		
7638144         D8-NAPHTHALENE (sur.)         2014/09/15         105         50 - 130         99         50 - 130         89         %            7638144         D9-Acridine         2014/09/15         89         50 - 130         90         50 - 130         79         %            7638144         TERPHENYL-D14 (sur.)         2014/09/15         92         60 - 130         103         60 - 130         93         %            7638152         O-TERPHENYL (sur.)         2014/09/11         89         70 - 130         90         70 - 130         <0.40	7638144	D10-ANTHRACENE (sur.)	2014/09/15	111	60 - 130	119	60 - 130	108	%		
7638144         D9-Acridine         2014/09/15         89         50 - 130         90         50 - 130         79         %            7638144         TERPHENYL-D14 (sur.)         2014/09/15         92         60 - 130         103         60 - 130         93         %            7638152         O-TERPHENYL (sur.)         2014/09/16         106         50 - 130         106         50 - 130         109         %            7634016         Benzene         2014/09/11         89         70 - 130         90         70 - 130         <0.40	7638144	D8-ACENAPHTHYLENE (sur.)	2014/09/15	107	50 - 130	104	50 - 130	92	%		
7638144         TERPHENYL-D14 (sur.)         2014/09/15         92         60 - 130         103         60 - 130         93         %            7638152         O-TERPHENYL (sur.)         2014/09/16         106         50 - 130         106         50 - 130         109         %            7634016         Benzene         2014/09/11         89         70 - 130         90         70 - 130         <0.40	7638144	D8-NAPHTHALENE (sur.)	2014/09/15	105	50 - 130	99	50 - 130	89	%		
7638152         O-TERPHENYL (sur.)         2014/09/16         106         50 - 130         109         %         ////////////////////////////////////	7638144	D9-Acridine	2014/09/15	89	50 - 130	90	50 - 130	79	%		
7634016         Benzene         2014/09/11         89         70 · 130         90         70 · 130         <0.40         ug/L         NC         30           7634016         Ethylbenzene         2014/09/11         90         70 · 130         90         70 · 130         <0.40	7638144	TERPHENYL-D14 (sur.)	2014/09/15	92	60 - 130	103	60 - 130	93	%		
7634016         Ethylbenzene         2014/09/11         90         70 · 130         90         70 · 130         <0.40         ug/L         NC         30           7634016         m & p-Xylene         2014/09/11         83         70 · 130         83         70 · 130         <0.40	7638152	O-TERPHENYL (sur.)	2014/09/16	106	50 - 130	106	50 - 130	109	%		
7634016         m & p-Xylene         2014/09/11         83         70 - 130         83         70 - 130         <0.40         ug/L         NC         30           7634016         Methyl-tert-butylether (MTBE)         2014/09/11         88         70 - 130         90         70 - 130         <4.0	7634016	Benzene	2014/09/11	89	70 - 130	90	70 - 130	<0.40	ug/L	NC	30
7634016         Methyl-tert-butylether (MTBE)         2014/09/11         88         70 - 130         90         70 - 130         <4.0         ug/L         NC         30           7634016         o-Xylene         2014/09/11         86         70 - 130         86         70 - 130         <0.40	7634016	Ethylbenzene	2014/09/11	90	70 - 130	90	70 - 130	<0.40	ug/L	NC	30
7634016         o-Xylene         2014/09/11         86         70 - 130         86         70 - 130         <0.40         ug/L         NC         30           7634016         Styrene         2014/09/11         97         70 - 130         101         70 - 130         <0.40	7634016	m & p-Xylene	2014/09/11	83	70 - 130	83	70 - 130	<0.40	ug/L	NC	30
7634016         Styrene         2014/09/11         97         70 - 130         101         70 - 130         <0.40         ug/L         NC         30           7634016         Toluene         2014/09/11         85         70 - 130         85         70 - 130         <0.40	7634016	Methyl-tert-butylether (MTBE)	2014/09/11	88	70 - 130	90	70 - 130	<4.0	ug/L	NC	30
7634016Toluene2014/09/118570 - 1308570 - 130<0.40ug/LNC307634016VH C6-C102014/09/118770 - 130<300	7634016	o-Xylene	2014/09/11	86	70 - 130	86	70 - 130	<0.40	ug/L	NC	30
7634016VH C6-C102014/09/11C8770 - 130<300ug/LNC307634016Xylenes (Total)2014/09/11NC80 - 120<	7634016	Styrene	2014/09/11	97	70 - 130	101	70 - 130	<0.40	ug/L		
7634016         Xylenes (Total)         2014/09/11         NC         80 - 120         112         80 - 120         <0.40         ug/L         NC         30           7634091         Total Aluminum (Al)         2014/09/11         NC         80 - 120         112         80 - 120         <0.0030	7634016	Toluene	2014/09/11	85	70 - 130	85	70 - 130	<0.40	ug/L	NC	30
7634091       Total Aluminum (Al)       2014/09/11       NC       80 - 120       112       80 - 120       <0.0030       mg/L       18       20         7634091       Total Antimony (Sb)       2014/09/11       107       80 - 120       97       80 - 120       <0.0030	7634016	VH C6-C10	2014/09/11			87	70 - 130	<300	ug/L	NC	30
7634091       Total Antimony (Sb)       2014/09/11       107       80 - 120       97       80 - 120       <0.00050       mg/L       NC       20         7634091       Total Arsenic (As)       2014/09/11       103       80 - 120       100       80 - 120       <0.00010	7634016	Xylenes (Total)	2014/09/11					<0.40	ug/L	NC	30
7634091         Total Arsenic (As)         2014/09/11         103         80 - 120         100         80 - 120         <0.00010         mg/L         4.4         20           7634091         Total Barium (Ba)         2014/09/11         NC         80 - 120         100         80 - 120         <0.0010	7634091	Total Aluminum (Al)	2014/09/11	NC	80 - 120	112	80 - 120	<0.0030	mg/L	18	20
7634091         Total Barium (Ba)         2014/09/11         NC         80 - 120         100         80 - 120         <0.0010         mg/L         0.77         20           7634091         Total Beryllium (Be)         2014/09/11         108         80 - 120         103         80 - 120         <0.0010	7634091	Total Antimony (Sb)	2014/09/11	107	80 - 120	97	80 - 120	<0.00050	mg/L	NC	20
7634091         Total Beryllium (Be)         2014/09/11         108         80 - 120         103         80 - 120         mg/L         NC         20           7634091         Total Bismuth (Bi)         2014/09/11         105         80 - 120         97         80 - 120         <0.0010	7634091	Total Arsenic (As)	2014/09/11	103	80 - 120	100	80 - 120	<0.00010	mg/L	4.4	20
7634091         Total Bismuth (Bi)         2014/09/11         105         80 - 120         97         80 - 120         <0.0010         mg/L         NC         20           7634091         Total Boron (B)         2014/09/11         105         80 - 120         97         80 - 120         <0.0010	7634091	Total Barium (Ba)	2014/09/11	NC	80 - 120	100	80 - 120	<0.0010	mg/L	0.77	20
7634091         Total Boron (B)         2014/09/11         <0.050         mg/L         NC         20	7634091	Total Beryllium (Be)	2014/09/11	108	80 - 120	103	80 - 120	<0.00010	mg/L	NC	20
	7634091	Total Bismuth (Bi)	2014/09/11	105	80 - 120	97	80 - 120	<0.0010	mg/L	NC	20
7634091 Total Cadmium (Cd) 2014/09/11 103 80 - 120 102 80 - 120 <0.000010 mg/L 1.6 20	7634091	Total Boron (B)	2014/09/11					<0.050	mg/L	NC	20
	7634091	Total Cadmium (Cd)	2014/09/11	103	80 - 120	102	80 - 120	<0.000010	mg/L	1.6	20

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# QUALITY ASSURANCE REPORT(CONT'D)

GOLDER ASSOCIATES LTD Client Project #: 12-1021-0006

Т

Site Location: PHASE# 9000/1104 Sampler Initials: LC

			Matrix	Spike	Spiked	Blank	Method	Method Blank		D
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7634091	Total Chromium (Cr)	2014/09/11	100	80 - 120	96	80 - 120	<0.0010	mg/L	NC	20
7634091	Total Cobalt (Co)	2014/09/11	97	80 - 120	93	80 - 120	<0.00050	mg/L	NC	20
7634091	Total Copper (Cu)	2014/09/11	95	80 - 120	91	80 - 120	<0.00050	mg/L	NC	20
7634091	Total Iron (Fe)	2014/09/11	NC	80 - 120	105	80 - 120	<0.010	mg/L	12	20
7634091	Total Lead (Pb)	2014/09/11	NC	80 - 120	99	80 - 120	<0.00020	mg/L	0.53	20
7634091	Total Lithium (Li)	2014/09/11	109	80 - 120	110	80 - 120	<0.0050	mg/L	NC	20
7634091	Total Manganese (Mn)	2014/09/11	NC	80 - 120	100	80 - 120	<0.0010	mg/L	2.1	20
7634091	Total Molybdenum (Mo)	2014/09/11	NC	80 - 120	107	80 - 120	<0.0010	mg/L	NC	20
7634091	Total Nickel (Ni)	2014/09/11	89	80 - 120	97	80 - 120	<0.0010	mg/L	NC	20
7634091	Total Selenium (Se)	2014/09/11	103	80 - 120	97	80 - 120	<0.00010	mg/L	8.4	20
7634091	Total Silicon (Si)	2014/09/11					<0.10	mg/L	1.2	20
7634091	Total Silver (Ag)	2014/09/11	115	80 - 120	101	80 - 120	<0.000020	mg/L	NC	20
7634091	Total Strontium (Sr)	2014/09/11	NC	80 - 120	109	80 - 120	<0.0010	mg/L	2.4	20
7634091	Total Thallium (TI)	2014/09/11	100	80 - 120	85	80 - 120	<0.000050	mg/L	NC	20
7634091	Total Tin (Sn)	2014/09/11	106	80 - 120	99	80 - 120	<0.0050	mg/L	NC	20
7634091	Total Titanium (Ti)	2014/09/11	NC	80 - 120	103	80 - 120	<0.0050	mg/L	NC	20
7634091	Total Uranium (U)	2014/09/11	99	80 - 120	97	80 - 120	<0.00010	mg/L	1.0	20
7634091	Total Vanadium (V)	2014/09/11	109	80 - 120	101	80 - 120	<0.0050	mg/L	NC	20
7634091	Total Zinc (Zn)	2014/09/11	NC	80 - 120	93	80 - 120	<0.0050	mg/L	NC	20
7634091	Total Zirconium (Zr)	2014/09/11					<0.00050	mg/L	NC	20
7634646	Total Aluminum (Al)	2014/09/12	101	80 - 120	106	80 - 120	<0.0030	mg/L	NC	20
7634646	Total Antimony (Sb)	2014/09/12	102	80 - 120	108	80 - 120	<0.00050	mg/L	NC	20
7634646	Total Arsenic (As)	2014/09/12	111	80 - 120	107	80 - 120	<0.00010	mg/L	11	20
7634646	Total Barium (Ba)	2014/09/12	NC	80 - 120	103	80 - 120	<0.0010	mg/L	1.9	20
7634646	Total Beryllium (Be)	2014/09/12	98	80 - 120	100	80 - 120	<0.00010	mg/L	NC	20
7634646	Total Bismuth (Bi)	2014/09/12	94	80 - 120	103	80 - 120	<0.0010	mg/L	NC	20
7634646	Total Boron (B)	2014/09/12					<0.050	mg/L	NC	20
7634646	Total Cadmium (Cd)	2014/09/12	99	80 - 120	102	80 - 120	<0.000010	mg/L	NC	20
7634646	Total Chromium (Cr)	2014/09/12	103	80 - 120	105	80 - 120	<0.0010	mg/L	NC	20
7634646	Total Cobalt (Co)	2014/09/12	100	80 - 120	105	80 - 120	<0.00050	mg/L	NC	20
7634646	Total Copper (Cu)	2014/09/12	98	80 - 120	106	80 - 120	<0.00050	mg/L	NC	20
7634646	Total Iron (Fe)	2014/09/12	103	80 - 120	106	80 - 120	<0.010	mg/L	NC	20



# QUALITY ASSURANCE REPORT(CONT'D)

GOLDER ASSOCIATES LTD Client Project #: 12-1021-0006

Т

Site Location: PHASE# 9000/1104 Sampler Initials: LC

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7634646	Total Lead (Pb)	2014/09/12	99	80 - 120	103	80 - 120	<0.00020	mg/L	NC	20
7634646	Total Lithium (Li)	2014/09/12	98	80 - 120	97	80 - 120	<0.0050	mg/L	NC	20
7634646	Total Manganese (Mn)	2014/09/12	NC	80 - 120	103	80 - 120	<0.0010	mg/L	0.31	20
7634646	Total Molybdenum (Mo)	2014/09/12	NC	80 - 120	96	80 - 120	<0.0010	mg/L	NC	20
7634646	Total Nickel (Ni)	2014/09/12	99	80 - 120	102	80 - 120	<0.0010	mg/L	NC	20
7634646	Total Selenium (Se)	2014/09/12	101	80 - 120	100	80 - 120	<0.00010	mg/L	NC	20
7634646	Total Silicon (Si)	2014/09/12					<0.10	mg/L	2.9	20
7634646	Total Silver (Ag)	2014/09/12	92	80 - 120	95	80 - 120	<0.000020	mg/L	NC	20
7634646	Total Strontium (Sr)	2014/09/12	NC	80 - 120	99	80 - 120	<0.0010	mg/L	4.6	20
7634646	Total Thallium (TI)	2014/09/12	93	80 - 120	98	80 - 120	<0.000050	mg/L	NC	20
7634646	Total Tin (Sn)	2014/09/12	99	80 - 120	104	80 - 120	<0.0050	mg/L	NC	20
7634646	Total Titanium (Ti)	2014/09/12	95	80 - 120	107	80 - 120	<0.0050	mg/L	NC	20
7634646	Total Uranium (U)	2014/09/12	95	80 - 120	97	80 - 120	<0.00010	mg/L	3.3	20
7634646	Total Vanadium (V)	2014/09/12	103	80 - 120	107	80 - 120	<0.0050	mg/L	NC	20
7634646	Total Zinc (Zn)	2014/09/12	107	80 - 120	107	80 - 120	<0.0050	mg/L	NC	20
7634646	Total Zirconium (Zr)	2014/09/12					<0.00050	mg/L	NC	20
7634712	Nitrate plus Nitrite (N)	2014/09/11	109	80 - 120	107	80 - 120	<0.020	mg/L	NC	25
7634713	Nitrite (N)	2014/09/11	103	80 - 120	103	80 - 120	<0.0050	mg/L	NC	20
7634715	Nitrate plus Nitrite (N)	2014/09/11	NC	80 - 120	106	80 - 120	<0.020	mg/L	0.44	25
7634716	Nitrite (N)	2014/09/11	78 (1)	80 - 120	102	80 - 120	<0.0050	mg/L	NC	20
7634826	Dissolved Chloride (Cl)	2014/09/11	98	80 - 120	98	80 - 120	<0.50	mg/L	NC	20
7634828	Dissolved Chloride (Cl)	2014/09/11	NC	80 - 120	102	80 - 120	<0.50	mg/L	0.54	20
7636245	Fluoride (F)	2014/09/12	90	80 - 120	96	80 - 120	<0.010	mg/L	4.0	20
7636323	Dissolved Sulphate (SO4)	2014/09/12	NC	80 - 120	97	80 - 120	<0.50	mg/L	4.8	20
7636331	Dissolved Sulphate (SO4)	2014/09/12	NC	80 - 120	101	80 - 120	<0.50	mg/L	2.6	20
7636573	2-Methylnaphthalene	2014/09/13	81	50 - 130	70	50 - 130	<0.10	ug/L	NC	40
7636573	Acenaphthene	2014/09/13	92	50 - 130	81	50 - 130	<0.050	ug/L	0	40
7636573	Acenaphthylene	2014/09/13	94	50 - 130	84	50 - 130	<0.050	ug/L	NC	40
7636573	Acridine	2014/09/13	87	50 - 130	82	50 - 130	<0.050	ug/L	NC	40
7636573	Anthracene	2014/09/13	108	60 - 130	106	60 - 130	<0.010	ug/L	3.2	40
7636573	Benzo(a)anthracene	2014/09/13	99	60 - 130	102	60 - 130	<0.010	ug/L	NC	40
7636573	Benzo(a)pyrene	2014/09/13	94	60 - 130	103	60 - 130	<0.0090	ug/L	NC	40



# QUALITY ASSURANCE REPORT(CONT'D)

GOLDER ASSOCIATES LTD Client Project #: 12-1021-0006

Т

Site Location: PHASE# 9000/1104 Sampler Initials: LC

			Matrix Spike		Spiked	Blank	Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7636573	Benzo(b&j)fluoranthene	2014/09/13	94	60 - 130	104	60 - 130	<0.050	ug/L	NC	40
7636573	Benzo(g,h,i)perylene	2014/09/13	92	60 - 130	108	60 - 130	<0.050	ug/L	NC	40
7636573	Benzo(k)fluoranthene	2014/09/13	95	60 - 130	112	60 - 130	<0.050	ug/L	NC	40
7636573	Chrysene	2014/09/13	95	60 - 130	100	60 - 130	<0.050	ug/L	NC	40
7636573	Dibenz(a,h)anthracene	2014/09/13	79	60 - 130	93	60 - 130	<0.050	ug/L	NC	40
7636573	Fluoranthene	2014/09/13	105	60 - 130	101	60 - 130	<0.020	ug/L	1.0	40
7636573	Fluorene	2014/09/13	102	50 - 130	94	50 - 130	<0.050	ug/L	0.95	40
7636573	Indeno(1,2,3-cd)pyrene	2014/09/13	84	60 - 130	98	60 - 130	<0.050	ug/L	NC	40
7636573	Naphthalene	2014/09/13	72	50 - 130	69	50 - 130	<0.10	ug/L	1.6	40
7636573	Phenanthrene	2014/09/13	91	60 - 130	90	60 - 130	<0.050	ug/L	NC	40
7636573	Pyrene	2014/09/13	102	60 - 130	99	60 - 130	<0.020	ug/L	0.91	40
7636573	Quinoline	2014/09/13	105	50 - 130	101	50 - 130	<0.24	ug/L	NC	40
7636575	EPH (C10-C19)	2014/09/15	108	50 - 130	101	50 - 130	<0.20	mg/L	NC	30
7636575	EPH (C19-C32)	2014/09/15	117	50 - 130	109	50 - 130	<0.20	mg/L	NC	30
7638144	2-Methylnaphthalene	2014/09/15	53	50 - 130	54	50 - 130	<0.10	ug/L	NC	40
7638144	Acenaphthene	2014/09/15	70	50 - 130	65	50 - 130	<0.050	ug/L	NC	40
7638144	Acenaphthylene	2014/09/15	71	50 - 130	69	50 - 130	<0.050	ug/L	NC	40
7638144	Acridine	2014/09/15	67	50 - 130	72	50 - 130	<0.050	ug/L	NC	40
7638144	Anthracene	2014/09/15	84	60 - 130	84	60 - 130	<0.010	ug/L	NC	40
7638144	Benzo(a)anthracene	2014/09/15	74	60 - 130	86	60 - 130	<0.010	ug/L	NC	40
7638144	Benzo(a)pyrene	2014/09/15	70	60 - 130	84	60 - 130	<0.0090	ug/L	NC	40
7638144	Benzo(b&j)fluoranthene	2014/09/15	76	60 - 130	77	60 - 130	<0.050	ug/L	NC	40
7638144	Benzo(g,h,i)perylene	2014/09/15	66	60 - 130	83	60 - 130	<0.050	ug/L	NC	40
7638144	Benzo(k)fluoranthene	2014/09/15	77	60 - 130	83	60 - 130	<0.050	ug/L	NC	40
7638144	Chrysene	2014/09/15	71	60 - 130	86	60 - 130	<0.050	ug/L	NC	40
7638144	Dibenz(a,h)anthracene	2014/09/15	55 (1)	60 - 130	82	60 - 130	<0.050	ug/L	NC	40
7638144	Fluoranthene	2014/09/15	79	60 - 130	85	60 - 130	<0.020	ug/L	NC	40
7638144	Fluorene	2014/09/15	82	50 - 130	75	50 - 130	<0.050	ug/L	NC	40
7638144	Indeno(1,2,3-cd)pyrene	2014/09/15	60	60 - 130	83	60 - 130	<0.050	ug/L	NC	40
7638144	Naphthalene	2014/09/15	50	50 - 130	64	50 - 130	<0.10	ug/L	NC	40
7638144	Phenanthrene	2014/09/15	75	60 - 130	83	60 - 130	<0.050	ug/L	NC	40
7638144	Pyrene	2014/09/15	77	60 - 130	86	60 - 130	<0.020	ug/L	NC	40

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386



Success Through Science®

Maxxam Job #: B480183 Report Date: 2014/09/18

## **QUALITY ASSURANCE REPORT(CONT'D)**

GOLDER ASSOCIATES LTD Client Project #: 12-1021-0006

Site Location: PHASE# 9000/1104 Sampler Initials: LC

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7638144	Quinoline	2014/09/15	87	50 - 130	98	50 - 130	<0.24	ug/L	NC	40
7638152	EPH (C10-C19)	2014/09/16	79	50 - 130	71	50 - 130	<0.20	mg/L	NC	30
7638152	EPH (C19-C32)	2014/09/16	86	50 - 130	79	50 - 130	<0.20	mg/L	NC	30
7641493	Total Mercury (Hg)	2014/09/17	98	80 - 120	89	80 - 120	<0.010	ug/L	NC	20

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.

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.



Report Date: 2014/09/18

GOLDER ASSOCIATES LTD Client Project #: 12-1021-0006 Site Location: PHASE# 9000/1104 Sampler Initials: LC

## VALIDATION SIGNATURE PAGE

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

Jucly to

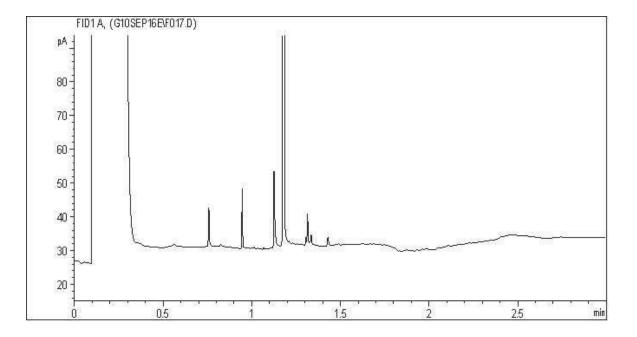
Andy Lu, Data Validation Coordinator

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.

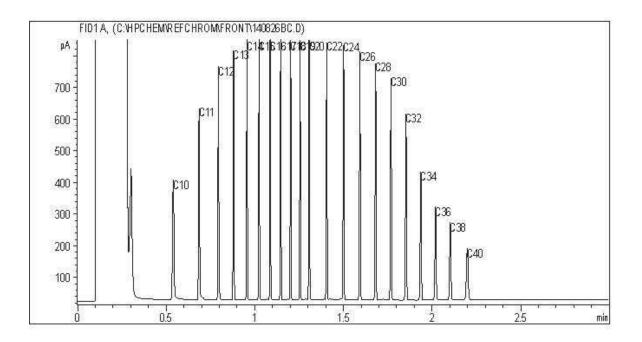
	Gold	ler tiates		Proje	ct Number:	2-1021	-0006/9	000/110	1-1		1	aborat	tory Na	ime:	Maxy	cam			
500-4260 Still Creek Drive												Address: 4606 Conada Way, Bunaby BC Tel/Fax: 639 2614 Namita Sahni							
Burnaby, Brit Telephone: 6				Gold	er Contact:	uemania	Golder   Arrtypu	E-mail Address:	@g	older.c	om 1	Fel/Fax	16	39	2614	1 1	Var	t: mita	Sahni
Office the fi	inal report	s should be s	ent to:					_	_				Analy	ses Re	quired				
Tel: 604	0 Still Cre y, BC V5C -298-6623 4-298-5253	6C6	Abb Tel:	-2790 Gladwin Roa ootsford, BC V2T 4S 604-850-8786 : 604-850-8756		2640 Dougi Victoria, 80 Tel: 250-881 Fax: 250-88	V8T 4M1 -7372		Containers *	EPHLIN PAH)	Hd	4015	ercury	8					
Sample Cor Number (S				Sample Matrix (over)	Date Sampled (D/M/Y)				Number of Containers *	CIEPH CHEPH (IN	BREX/UPH	Total Netols	Total Mercury	RAIGHTS				RUSH	Remarks (over)
20769	-01			Swithce	8/9/14			8	1	X	X	X	X	×			5		K03585
1	-02			1	1				1	1	1	1	1	1		20			K03581
~	-03			V	V					1	1	1	1	J					K0358-
	-04													v					
	-05																		
	-06																		
_	-07																		
	-08															Ð	-		
_	-09				_				_					M.			1		
	-10												III W		HGWLY.	ll.	4		
_	-11							-		_ B48	0183						-		
Sampler' Sigr		e atlacan		Relinquished by:	Signature		Golder	Sept.	9/	14	Tim	he		Rec	eived by: S	Signature	-	Com	npany
Sample Storage (%) CAC Relinquished by: Signature			Company	Date	the second s			Time Received by: Signa			Signature	ture Company		ipany					
Comments:			Method of Shipment: A.( NorAn			(ALC)				Ø	ed for Lab by: Date Date Date Time 16:52								
				Shipped by:			Shipment Condit Seal Intact:	ion:		Term	p (°C)	Co	oler op	ened		ate			Time

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#### Extrac. Pet HC when LEPH/HEPH required Chromatogram



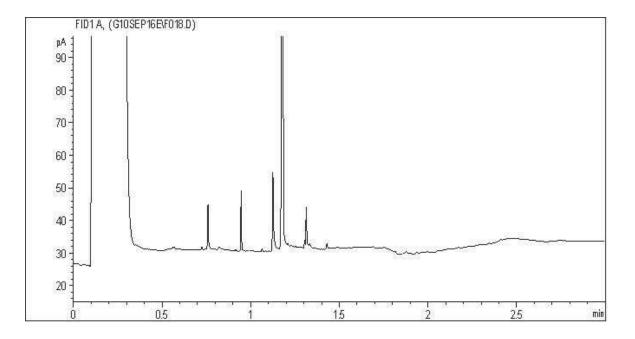
Carbon Range Distribution - Reference Chromatogram



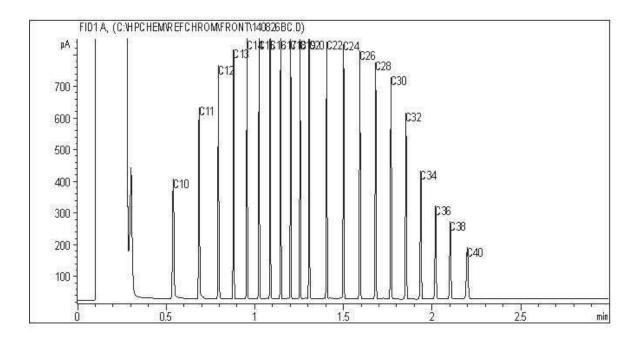
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:C4C12Diesel:C8C22Varsol:C8C12Lubricating Oils:C20C40Note: This information is provided for reference purposes only. Should detailed chemist interpretationor fingerprinting be required, please contact the laboratory.

#### Extrac. Pet HC when LEPH/HEPH required Chromatogram



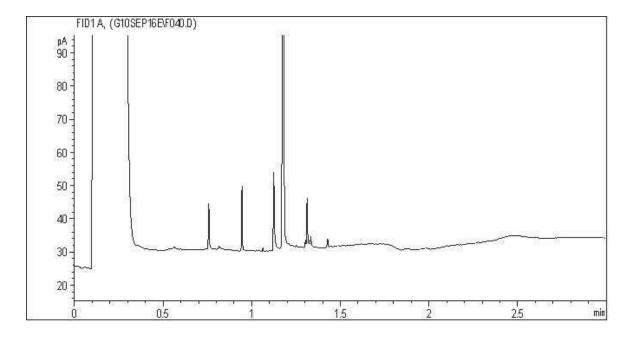
Carbon Range Distribution - Reference Chromatogram



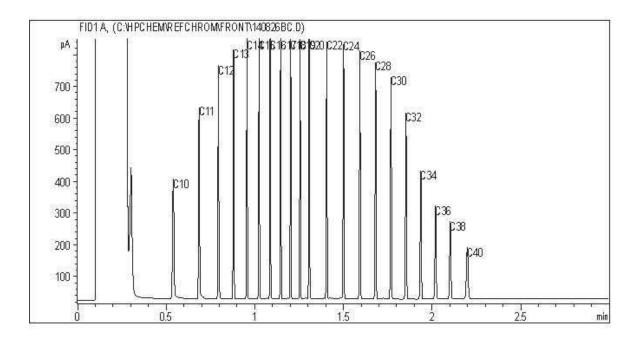
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:C4-C12Diesel:C8-C22Varsol:C8-C12Lubricating Oils:C20-C40Note: This information is provided for reference purposes only. Should detailed chemist interpretationor fingerprinting be required, please contact the laboratory.

#### Extrac. Pet HC when LEPH/HEPH required Chromatogram



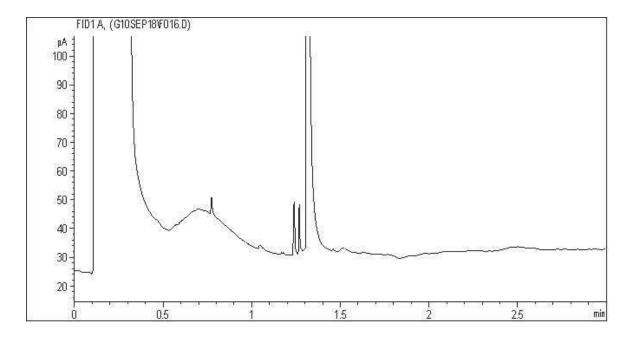
Carbon Range Distribution - Reference Chromatogram



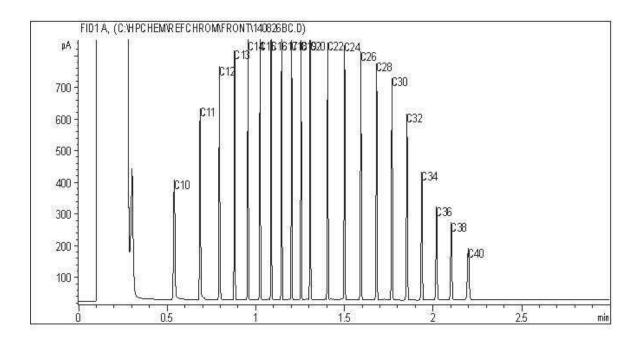
TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:C4C12Diesel:C8C22Varsol:C8C12Lubricating Oils:C20C40Note: This information is provided for reference purposes only. Should detailed chemist interpretationor fingerprinting be required, please contact the laboratory.

#### Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:C4-C12Diesel:C8-C22Varsol:C8-C12Lubricating Oils:C20-C40Note: This information is provided for reference purposes only. Should detailed chemist interpretationor fingerprinting be required, please contact the laboratory.



Your P.O. #: 8470 Your Project #: SRK 1CT008.043 / LFN Site Location: SA DENA HES - MONTHLY MONITORING / WATSON LAKE, YUKON Your C.O.C. #: 08397233, 08397232

#### Attention: L. Barazzuol

SRK CONSULTING SRKCONSU-VAN SUITE 2200 1066 W. HASTINGS ST. VANCOUVER, BC Canada V6E 3X2

> Report Date: 2014/10/17 Report #: R1665289 Version: 3R

## CERTIFICATE OF ANALYSIS - REVISED REPORT

### MAXXAM JOB #: B487137 Received: 2014/09/29, 14:20

Sample Matrix: Water # Samples Received: 4

		Date	Date	
Analyses	Quantity	Extracted	Analyzed Laboratory Method	Analytical Method
Alkalinity - Water	2	2014/09/30	2014/09/30 BBY6SOP-00026	SM 22 2320 B m
Alkalinity - Water	2	2014/09/30	2014/10/01 BBY6SOP-00026	SM 22 2320 B m
Chloride by Automated Colourimetry	4	N/A	2014/09/30 BBY6SOP-00011	SM 22 4500-CI- G m
Cyanide SAD (strong acid dissociable)	4	N/A	2014/10/03 BBY6SOP-00004	SM 22 4500-CN O m
Colour (True)	4	N/A	2014/10/01 BBY6SOP-00021	SM 22 2120 B m
Carbon (DOC) - field filtered/preserved (1)	2	N/A	2014/10/01 BBY6SOP-00003	SM 22 5310 C m
Carbon (DOC) - field filtered/preserved (1)	2	N/A	2014/10/02 BBY6SOP-00003	SM 22 5310 C m
Conductance - water	2	N/A	2014/09/30 BBY6SOP-00026	SM 22 2510 B m
Conductance - water	2	N/A	2014/10/01 BBY6SOP-00026	SM 22 2510 B m
Hardness Total (calculated as CaCO3)	4	N/A	2014/10/02 BBY7SOP-00002	EPA 6020a R1 m
Hardness (calculated as CaCO3)	3	N/A	2014/10/03 BBY7SOP-00002	EPA 6020a R1 m
Hardness (calculated as CaCO3)	1	N/A	2014/10/07 BBY7SOP-00002	EPA 6020a R1 m
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	4	N/A	2014/10/03 BBY7SOP-00002	EPA 6020A R1 m
Elements by CRC ICPMS (dissolved)	4	N/A	2014/10/02 BBY7SOP-00002	EPA 6020A R1 m
Na, K, Ca, Mg, S by CRC ICPMS (total)	4	2014/09/30	2014/10/02 BBY7SOP-00002	EPA 6020A R1 m
Elements by CRC ICPMS (total)	2	2014/09/30	2014/10/01 BBY7SOP-00002	EPA 6020A R1 m
Elements by CRC ICPMS (total)	2	2014/09/30	2014/10/02 BBY7SOP-00002	EPA 6020A R1 m
Ammonia-N (Preserved)	2	N/A	2014/10/01 BBY6SOP-00009	SM 22 4500-NH3- G m
Ammonia-N (Preserved)	2	N/A	2014/10/02 BBY6SOP-00009	SM 22 4500-NH3- G m
Nitrate + Nitrite (N)	4	N/A	2014/09/30 BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrite (N) by CFA	4	N/A	2014/09/30 BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrogen - Nitrate (as N)	4	N/A	2014/10/01 BBY6SOP-00010	SM 22 4500-NO3 I m
Filter and HNO3 Preserve for Metals	4	N/A	2014/09/30 BBY7 WI-00004	BCMOE Reqs 08/14
pH Water (2)	2	N/A	2014/09/30 BBY6SOP-00026	SM 22 4500-H+ B m
pH Water (2)	2	N/A	2014/10/01 BBY6SOP-00026	SM 22 4500-H+ B m
Sulphate by Automated Colourimetry	4	N/A	2014/09/30 BBY6SOP-00017	SM 22 4500-SO42- E m
Total Dissolved Solids (Filt. Residue)	3	2014/10/01	2014/10/02 BBY6SOP-00033	SM 22 2540 C m
Total Dissolved Solids (Filt. Residue)	1	2014/10/02	2014/10/03 BBY6SOP-00033	SM 22 2540 C m
Carbon (Total Organic) (3)	2	N/A	2014/10/01 BBY6SOP-00003	SM 22 5310 C m
Carbon (Total Organic) (3)	2	N/A	2014/10/02 BBY6SOP-00003	SM 22 5310 C m
Total Suspended Solids-Low Level	4	2014/09/30	2014/10/01 BBY6SOP-00034	SM 22 2540 D
Turbidity	2	N/A	2014/09/30 BBY6SOP-00027	SM 22 2130 B m

\* 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.

(2) The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.
 (3) TOC present in the sample should be considered as non-purgeable TOC.

**Encryption Key** 

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

Ken Pomeroy, Project Manager Email: KPomeroy@maxxam.ca Phone# (604) 638-5020

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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.

Total cover pages: 1



Sampler Initials: JC

## **RESULTS OF CHEMICAL ANALYSES OF WATER**

Maxxam ID		KS6046	KS6048		KS6050		
Sampling Date		2014/09/26	2014/09/26		2014/09/26		
222.1		15:55	10:55		12:50		
COC Number	UNITS	08397233 MH-30	08397233 MH-15	QC Batch	08397232 MH-12	RDL	QC Batch
		1011-30	IVIN-15		IVITI-12		QC Batch
Calculated Parameters							
Filter and HNO3 Preservation	N/A	FIELD	FIELD	ONSITE	FIELD	N/A	ONSITE
Misc. Inorganics							
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00058	0.00057	7665656	0.00053	0.00050	7665656
Dissolved Organic Carbon (C)	mg/L	3.31	1.93	7661729	1.97	0.50	7663719
Alkalinity (Total as CaCO3)	mg/L	164	201	7659512	161	0.50	7659972
Total Organic Carbon (C)	mg/L	3.65	3.88	7661733	1.55	0.50	7663724
Alkalinity (PP as CaCO3)	mg/L	0.70	3.52	7659512	<0.50	0.50	7659972
Bicarbonate (HCO3)	mg/L	199	236	7659512	196	0.50	7659972
Carbonate (CO3)	mg/L	0.84	4.22	7659512	<0.50	0.50	7659972
Hydroxide (OH)	mg/L	<0.50	<0.50	7659512	<0.50	0.50	7659972
Anions							
Dissolved Sulphate (SO4)	mg/L	3.88	2.50	7660147	9.80	0.50	7660150
Dissolved Chloride (CI)	mg/L	<0.50	0.66	7660146	<0.50	0.50	7660148
MISCELLANEOUS							
True Colour	Col. Unit	10.0 (1)	5.0 (1)	7659726	<5.0 (1)	5.0	7659726
Nutrients							
Total Ammonia (N)	mg/L	0.0078	0.0068	7662233	0.023	0.0050	7663981
Physical Properties							
Conductivity	uS/cm	302	360	7659514	323	1.0	7660003
рН	рН	8.30	8.39	7659515	8.18		7660002
Physical Properties							
Total Suspended Solids	mg/L	<1.0	1.1	7658912	1.6	1.0	7658912
Total Dissolved Solids	mg/L	166	194	7660880	178	10	7660880
Turbidity	NTU	1.18 (1)	0.86 (1)	7659427		0.10	

RDL = Reportable Detection Limit (1) Sample analysed past hold time: sample was received on the hold time expiry date which did not allow sufficient time for preparation and analysis.



Maxxam Job #: B487137 Report Date: 2014/10/17 SRK CONSULTING Client Project #: SRK 1CT008.043 / LFN Site Location: SA DENA HES - MONTHLY MONITORING / WATSON LAKE, YUKON Your P.O. #: 8470

Sampler Initials: JC

## **RESULTS OF CHEMICAL ANALYSES OF WATER**

Maxxam ID		KS6051		
Sampling Date		2014/09/26		
		13:15	_	
COC Number	UNITS	08397232 MH-12D	RDL	QC Batch
		MIT-120		
Calculated Parameters				
Filter and HNO3 Preservation	N/A	FIELD	N/A	ONSITE
Misc. Inorganics				
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00054	0.00050	7665656
Dissolved Organic Carbon (C)	mg/L	2.09	0.50	7663719
Alkalinity (Total as CaCO3)	mg/L	161	0.50	7659972
Total Organic Carbon (C)	mg/L	1.96	0.50	7663723
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	7659972
Bicarbonate (HCO3)	mg/L	196	0.50	7659972
Carbonate (CO3)	mg/L	<0.50	0.50	7659972
Hydroxide (OH)	mg/L	<0.50	0.50	7659972
Anions				
Dissolved Sulphate (SO4)	mg/L	9.60	0.50	7660150
Dissolved Chloride (Cl)	mg/L	0.64	0.50	7660148
MISCELLANEOUS				
True Colour	Col. Unit	<5.0 (1)	5.0	7659726
Nutrients				
Total Ammonia (N)	mg/L	0.032	0.0050	7663980
Physical Properties				
Conductivity	uS/cm	324	1.0	7660003
рН	pН	8.16		7660002
Physical Properties				
Total Suspended Solids	mg/L	2.1	1.0	7658912
Total Dissolved Solids	mg/L	229	10	7662751

RDL = Reportable Detection Limit

(1) Sample analysed past hold time: sample was received on the hold time expiry date which did not allow sufficient time for preparation and analysis.



Sampler Initials: JC

# CSR DISSOLVED METALS IN WATER (WATER)

Maxxam ID		KS6046		KS6048	KS6050	KS6051		
Sampling Date		2014/09/26		2014/09/26	2014/09/26	2014/09/26		
		15:55		10:55	12:50	13:15	_	
COC Number		08397233 MH-30	QC Batch	08397233 MH-15	08397232 MH-12	08397232 MH-12D	RDL	QC Batch
		MIT-50		MIT-15	WIII-12	MIT-120	INDE	NO Daten
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	160	7667444	196	174	170	0.50	7658767
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	ug/L	4.7	7662499	3.7	<3.0	3.5	3.0	7662499
Dissolved Antimony (Sb)	ug/L	<0.50	7662499	<0.50	<0.50	<0.50	0.50	7662499
Dissolved Arsenic (As)	ug/L	0.19	7662499	0.33	0.75	0.76	0.10	7662499
Dissolved Barium (Ba)	ug/L	195	7662499	159	74.1	75.9	1.0	7662499
Dissolved Beryllium (Be)	ug/L	<0.10	7662499	<0.10	<0.10	<0.10	0.10	7662499
Dissolved Bismuth (Bi)	ug/L	<1.0	7662499	<1.0	<1.0	<1.0	1.0	7662499
Dissolved Boron (B)	ug/L	<50	7662499	<50	<50	<50	50	7662499
Dissolved Cadmium (Cd)	ug/L	0.019	7662499	<0.010	0.038	0.041	0.010	7662499
Dissolved Chromium (Cr)	ug/L	<1.0	7662499	<1.0	<1.0	<1.0	1.0	7662499
Dissolved Cobalt (Co)	ug/L	<0.50	7662499	<0.50	<0.50	<0.50	0.50	7662499
Dissolved Copper (Cu)	ug/L	0.28	7662499	0.24	0.25	0.24	0.20	7662499
Dissolved Iron (Fe)	ug/L	210	7662499	108	<5.0	<5.0	5.0	7662499
Dissolved Lead (Pb)	ug/L	<0.20	7662499	<0.20	0.21	0.21	0.20	7662499
Dissolved Lithium (Li)	ug/L	<5.0	7662499	<5.0	<5.0	<5.0	5.0	7662499
Dissolved Manganese (Mn)	ug/L	13.2	7662499	10.7	1.4	1.3	1.0	7662499
Dissolved Mercury (Hg)	ug/L	<0.050	7662499	<0.050	<0.050	<0.050	0.050	7662499
Dissolved Molybdenum (Mo)	ug/L	1.3	7662499	1.5	1.3	1.3	1.0	7662499
Dissolved Nickel (Ni)	ug/L	<1.0	7662499	<1.0	<1.0	<1.0	1.0	7662499
Dissolved Selenium (Se)	ug/L	0.47	7662499	0.29	0.58	0.61	0.10	7662499
Dissolved Silicon (Si)	ug/L	2960	7662499	3960	4270	4050	100	7662499
Dissolved Silver (Ag)	ug/L	<0.020	7662499	<0.020	<0.020	<0.020	0.020	7662499
Dissolved Strontium (Sr)	ug/L	116	7662499	182	222	222	1.0	7662499
Dissolved Thallium (TI)	ug/L	<0.050	7662499	<0.050	<0.050	<0.050	0.050	7662499
Dissolved Tin (Sn)	ug/L	<5.0	7662499	<5.0	<5.0	<5.0	5.0	7662499
Dissolved Titanium (Ti)	ug/L	<5.0	7662499	<5.0	<5.0	<5.0	5.0	7662499
Dissolved Uranium (U)	ug/L	1.36	7662499	0.72	0.91	0.93	0.10	7662499
Dissolved Vanadium (V)	ug/L	<5.0	7662499	<5.0	<5.0	<5.0	5.0	7662499
Dissolved Zinc (Zn)	ug/L	<5.0	7662499	<5.0	<5.0	<5.0	5.0	7662499
Dissolved Zirconium (Zr)	ug/L	<0.50	7662499	<0.50	<0.50	<0.50	0.50	7662499

RDL = Reportable Detection Limit



Maxxam Job #: B487137 Report Date: 2014/10/17 SRK CONSULTING Client Project #: SRK 1CT008.043 / LFN Site Location: SA DENA HES - MONTHLY MONITORING / WATSON LAKE, YUKON Your P.O. #: 8470

Sampler Initials: JC

# CSR DISSOLVED METALS IN WATER (WATER)

Maxxam ID		KS6046		KS6048	KS6050	KS6051		
Sampling Date		2014/09/26		2014/09/26	2014/09/26	2014/09/26		
		15:55		10:55	12:50	13:15		
COC Number		08397233		08397233	08397232	08397232		
	UNITS	MH-30	QC Batch	MH-15	MH-12	MH-12D	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	40.9	7667446	57.2	59.7	58.1	0.050	7658769
Dissolved Magnesium (Mg)	mg/L	14.1	7667446	13.0	6.01	5.99	0.050	7658769
Dissolved Potassium (K)	mg/L	0.314 (1)	7658769	0.406	0.481	0.476	0.050	7658769
Dissolved Sodium (Na)	mg/L	0.741	7658769	0.992	1.10	1.10	0.050	7658769
Dissolved Sulphur (S)	mg/L	<3.0	7667446	<3.0	3.6	4.1	3.0	7658769

RDL = Reportable Detection Limit

(1) Dissolved greater than total. Reanalysis yields similar results.



Sampler Initials: JC

# CSR TOTAL METALS IN WATER (WATER)

Maxxam ID		KS6046	KS6048	KS6050	KS6051		
Sampling Date		2014/09/26	2014/09/26	2014/09/26	2014/09/26		
200 N		15:55	10:55	12:50	13:15	_	
COC Number	UNITS	08397233 MH-30	08397233 MH-15	08397232 MH-12	08397232 MH-12D	RDL	QC Batch
	UNITS	MIT-30	MI-15	WITI-12			NC Daton
Calculated Parameters							
Total Hardness (CaCO3)	mg/L	164	194	175	179	0.50	7658766
Total Metals by ICPMS							
Total Aluminum (Al)	ug/L	7.2	18.2	60.4	56.1	3.0	7659655
Total Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7659655
Total Arsenic (As)	ug/L	0.24	0.41	0.90	0.87	0.10	7659655
Total Barium (Ba)	ug/L	194	158	80.6	80.2	1.0	7659655
Total Beryllium (Be)	ug/L	<0.10	<0.10	<0.10	<0.10	0.10	7659655
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7659655
Total Boron (B)	ug/L	<50	<50	<50	<50	50	7659655
Total Cadmium (Cd)	ug/L	0.020	0.014	0.057	0.047	0.010	7659655
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7659655
Total Cobalt (Co)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7659655
Total Copper (Cu)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7659655
Total Iron (Fe)	ug/L	394	220	90	73	10	7659655
Total Lead (Pb)	ug/L	<0.20	<0.20	2.21	1.76	0.20	7659655
Total Lithium (Li)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	7659655
Total Manganese (Mn)	ug/L	12.9	11.1	5.1	3.4	1.0	7659655
Total Mercury (Hg)	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	7659655
Total Molybdenum (Mo)	ug/L	1.3	1.6	1.2	1.2	1.0	7659655
Total Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	7659655
Total Selenium (Se)	ug/L	0.42	0.32	0.54	0.53	0.10	7659655
Total Silicon (Si)	ug/L	2590	3500	4130	4210	100	7659655
Total Silver (Ag)	ug/L	<0.020	<0.020	<0.020	<0.020	0.020	7659655
Total Strontium (Sr)	ug/L	116	186	222	227	1.0	7659655
Total Thallium (TI)	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	7659655
Total Tin (Sn)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	7659655
Total Titanium (Ti)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	7659655
Total Uranium (U)	ug/L	1.37	0.72	0.93	0.95	0.10	7659655
Total Vanadium (V)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	7659655
Total Zinc (Zn)	ug/L	<5.0	<5.0	5.9	<5.0	5.0	7659655
Total Zirconium (Zr)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	7659655



Sampler Initials: JC

# CSR TOTAL METALS IN WATER (WATER)

Maxxam ID		KS6046	KS6048	KS6050	KS6051		
Sampling Date		2014/09/26	2014/09/26	2014/09/26	2014/09/26		
		15:55	10:55	12:50	13:15		
COC Number		08397233	08397233	08397232	08397232		
	UNITS	MH-30	MH-15	MH-12	MH-12D	RDL	QC Batch
Total Calcium (Ca)	mg/L	41.1	55.5	59.7	61.0	0.050	7658770
Total Magnesium (Mg)	mg/L	14.8	13.5	6.24	6.43	0.050	7658770
Total Potassium (K)	mg/L	0.244	0.373	0.430	0.436	0.050	7658770
Total Sodium (Na)	mg/L	0.701	1.03	1.10	1.09	0.050	7658770
Total Sulphur (S)	mg/L	3.9	<3.0	<3.0	<3.0	3.0	7658770
			•	•	•		
RDL = Reportable Detec	tion Limit						



Sampler Initials: JC

# NITRITE & NITRATE IN WATER (WATER)

Maxxam ID		KS6046	KS6048	KS6050	KS6051		
Sampling Date		2014/09/26	2014/09/26	2014/09/26	2014/09/26		
		15:55	10:55	12:50	13:15		
COC Number		08397233	08397233	08397232	08397232		
	UNITS	MH-30	MH-15	MH-12	MH-12D	RDL	QC Batch

ANIONS							
Nitrite (N)	mg/L	<0.0050 (1)	<0.0050 (1)	<0.0050 (1)	<0.0050 (1)	0.0050	7659771
Calculated Parameters							
Nitrate (N)	mg/L	<0.020	<0.020	0.022	0.022	0.020	7658771
Nutrients							
Nitrate plus Nitrite (N)	mg/L	<0.020 (1)	<0.020 (1)	0.022 (1)	0.022 (1)	0.020	7659763

RDL = Reportable Detection Limit

(1) Sample analysed past hold time: sample was received on the hold time expiry date which did not allow sufficient time for preparation and analysis.



Maxxam Job #: B487137 Report Date: 2014/10/17 SRK CONSULTING Client Project #: SRK 1CT008.043 / LFN Site Location: SA DENA HES - MONTHLY MONITORING / WATSON LAKE, YUKON Your P.O. #: 8470 Sampler Initials: JC

#### **General Comments**

Revised Report (Version: 2,3,4): Results have been split onto separate reports as per client request.

Sample KS6046, Na, K, Ca, Mg, S by CRC ICPMS (diss.): Test repeated.

Results relate only to the items tested.



# Quality Assurance Report

Maxxam Job Number: VB487137

QA/QC Batch			Date Analyzed				
Num Init	QC Type	Parameter	yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7658912 JSQ	Spiked Blank	Total Suspended Solids	2014/10/01	Value	103	%	80 - 120
1000012000	Method Blank	Total Suspended Solids	2014/10/01	<1.0	100	mg/L	00 120
7659427 NS6	Spiked Blank	Turbidity	2014/09/30	\$1.0	100	%	80 - 120
1000421 1100	Method Blank	Turbidity	2014/09/30	<0.10	100	NTU	00 120
	RPD	Turbidity	2014/09/30	NC		%	20
7659512 MM3	Matrix Spike	Alkalinity (Total as CaCO3)	2014/10/01	NO	NC	%	80 - 120
1003012 101010	Spiked Blank	Alkalinity (Total as CaCO3)	2014/10/01		99	%	80 - 120
	Method Blank	Alkalinity (Total as CaCO3)	2014/10/01	0.02 5	SDL=0.50		00 - 120
	Method Dialik	,		<0.50 ×	DL=0.50	mg/L	
		Alkalinity (PP as CaCO3) Bicarbonate (HCO3)	2014/10/01 2014/10/01		RDL=0.50	mg/L	
		Carbonate (CO3)	2014/10/01	<0.50	DL=0.50	mg/L	
						mg/L	
	000	Hydroxide (OH)	2014/10/01	<0.50		mg/L	
	RPD	Alkalinity (Total as CaCO3)	2014/10/01	0.9		%	20
		Alkalinity (PP as CaCO3)	2014/10/01	NC		%	20
		Bicarbonate (HCO3)	2014/10/01	0.9		%	20
		Carbonate (CO3)	2014/10/01	NC		%	20
		Hydroxide (OH)	2014/10/01	NC		%	20
7659514 MM3	Spiked Blank	Conductivity	2014/10/01		99	%	80 - 120
	Method Blank	Conductivity	2014/10/01	<1.0		uS/cm	
	RPD	Conductivity	2014/10/01	0.2		%	20
7659515 MM3	Spiked Blank	рН	2014/10/01		101	%	97 - 103
	RPD	рН	2014/10/01	0		%	N/A
7659655 AD5	Matrix Spike						
	[KS6038-04]	Total Aluminum (Al)	2014/10/01		105	%	80 - 120
		Total Antimony (Sb)	2014/10/01		NC	%	80 - 120
		Total Arsenic (As)	2014/10/01		105	%	80 - 120
		Total Barium (Ba)	2014/10/01		NC	%	80 - 120
		Total Beryllium (Be)	2014/10/01		99	%	80 - 120
		Total Bismuth (Bi)	2014/10/01		102	%	80 - 120
		Total Cadmium (Cd)	2014/10/01		99	%	80 - 120
		Total Chromium (Cr)	2014/10/01		104	%	80 - 120
		Total Cobalt (Co)	2014/10/01		103	%	80 - 120
		Total Copper (Cu)	2014/10/01		103	%	80 - 120
		Total Iron (Fe)	2014/10/01		120	%	80 - 120
		Total Lead (Pb)	2014/10/01		104	%	80 - 120
		Total Lithium (Li)	2014/10/01		NC	%	80 - 120
		Total Manganese (Mn)	2014/10/01		104	%	80 - 120
		Total Mercury (Hg)	2014/10/01		104	%	80 - 120
		Total Molybdenum (Mo)	2014/10/01		NC	%	80 - 120
		Total Nickel (Ni)	2014/10/01		103	%	80 - 120
		Total Selenium (Se)	2014/10/01		NC	%	80 - 120
						%	
		Total Silver (Ag)	2014/10/01		90		80 - 120
		Total Strontium (Sr)	2014/10/01		NC	%	80 - 120
		Total Thallium (TI)	2014/10/01		103	%	80 - 120
		Total Tin (Sn)	2014/10/01		106	%	80 - 120
		Total Titanium (Ti)	2014/10/01		108	%	80 - 120
		Total Uranium (U)	2014/10/01		104	%	80 - 120
		Total Vanadium (V)	2014/10/01		105	%	80 - 120
		Total Zinc (Zn)	2014/10/01		NC	%	80 - 12
	Spiked Blank	Total Aluminum (Al)	2014/10/01		106	%	80 - 12
		Total Antimony (Sb)	2014/10/01		105	%	80 - 120
		Total Arsenic (As)	2014/10/01		101	%	80 - 120
		Total Barium (Ba)	2014/10/01		102	%	80 - 120
		Total Danum (Da)	2014/10/01		102	70	00 - 120



## Quality Assurance Report (Continued)

Maxxam Job Number: VB487137

QA/QC			Date				
Batch			Analyzed				
Num Init	QC Type	Parameter	yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7659655 AD5	Spiked Blank	Total Bismuth (Bi)	2014/10/01		100	%	80 - 120
		Total Cadmium (Cd)	2014/10/01		100	%	80 - 120
		Total Chromium (Cr)	2014/10/01		101	%	80 - 120
		Total Cobalt (Co)	2014/10/01		102	%	80 - 120
		Total Copper (Cu)	2014/10/01		104	%	80 - 120
		Total Iron (Fe)	2014/10/01		103	%	80 - 120
		Total Lead (Pb)	2014/10/01		100	%	80 - 120
		Total Lithium (Li)	2014/10/01		98	%	80 - 120
		Total Manganese (Mn)	2014/10/01		100	%	80 - 120
		Total Mercury (Hg)	2014/10/01		105	%	80 - 120
		Total Molybdenum (Mo)	2014/10/01		108	%	80 - 120
		Total Nickel (Ni)	2014/10/01		102	%	80 - 120
		Total Selenium (Se)	2014/10/01		99	%	80 - 120
		Total Silver (Ag)	2014/10/01		105	%	80 - 120
		Total Strontium (Sr)	2014/10/01		102	%	80 - 120
		Total Thallium (TI)	2014/10/01		100	%	80 - 120
		Total Tin (Sn)	2014/10/01		104	%	80 - 120
		Total Titanium (Ti)	2014/10/01		107	%	80 - 120
		Total Uranium (U)	2014/10/01		107	%	80 - 120
		Total Vanadium (V)	2014/10/01		96	%	80 - 120
		Total Zinc (Zn)	2014/10/01		90 99	%	80 - 120
	Method Blank			<3.0	33		00 - 120
	Method Diank	Total Aluminum (Al) Total Antimony (Sb)	2014/10/01	<0.50		ug/L	
			2014/10/01			ug/L	
		Total Arsenic (As)	2014/10/01	<0.10		ug/L	
		Total Barium (Ba)	2014/10/01	<1.0		ug/L	
		Total Beryllium (Be)	2014/10/01	<0.10		ug/L	
		Total Bismuth (Bi)	2014/10/01	<1.0		ug/L	
		Total Boron (B)	2014/10/01	<50		ug/L	
		Total Cadmium (Cd)	2014/10/01	<0.010		ug/L	
		Total Chromium (Cr)	2014/10/01	<1.0		ug/L	
		Total Cobalt (Co)	2014/10/01	<0.50		ug/L	
		Total Copper (Cu)	2014/10/01	<0.50		ug/L	
		Total Iron (Fe)	2014/10/01	<10		ug/L	
		Total Lead (Pb)	2014/10/01	<0.20		ug/L	
		Total Lithium (Li)	2014/10/01	<5.0		ug/L	
		Total Manganese (Mn)	2014/10/01	<1.0		ug/L	
		Total Mercury (Hg)	2014/10/01	<0.050		ug/L	
		Total Molybdenum (Mo)	2014/10/01	<1.0		ug/L	
		Total Nickel (Ni)	2014/10/01	<1.0		ug/L	
		Total Selenium (Se)	2014/10/01	<0.10		ug/L	
		Total Silicon (Si)	2014/10/01	<100		ug/L	
		Total Silver (Ag)	2014/10/01	0.024, RE	DL=0.020	ug/L	
		Total Strontium (Sr)	2014/10/01	<1.0		ug/L	
		Total Thallium (TI)	2014/10/01	<0.050		ug/L	
		Total Tin (Sn)	2014/10/01	<5.0		ug/L	
		Total Titanium (Ti)	2014/10/01	<5.0		ug/L	
		Total Uranium (U)	2014/10/01	<0.10		ug/L	
		Total Vanadium (V)	2014/10/01	<5.0		ug/L	
		Total Zinc (Zn)	2014/10/01	<5.0		ug/L	
		Total Zirconium (Zr)	2014/10/01	<0.50		ug/L	
7659726 EPE	Method Blank	True Colour	2014/10/01	<5.0		Col. Unit	
1000120 LI L	RPD	True Colour	2014/10/01	×3.0 NC (1)		%	20
7659763 SF1	Matrix Spike		2014/10/01			70	20
1009100 001	[KS6049-02]	Nitrate plus Nitrite (N)	2014/09/30		99	%	80 - 120



# Quality Assurance Report (Continued)

Maxxam Job Number: VB487137

QA/QC			Date				
Batch	00 T		Analyzed		5		001.5
Num Init	QC Type	Parameter	yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7659763 SF1	Spiked Blank	Nitrate plus Nitrite (N)	2014/09/30		100	%	80 - 120
	Method Blank	Nitrate plus Nitrite (N)	2014/09/30	<0.020		mg/L	
7659771 SF1	Matrix Spike						
	[KS6049-02]	Nitrite (N)	2014/09/30		97	%	80 - 120
	Spiked Blank	Nitrite (N)	2014/09/30		100	%	80 - 120
	Method Blank	Nitrite (N)	2014/09/30	<0.0050		mg/L	
7659972 WAY		Alkalinity (Total as CaCO3)	2014/09/30		NC	%	80 - 120
	Spiked Blank	Alkalinity (Total as CaCO3)	2014/09/30		91	%	80 - 120
	Method Blank	Alkalinity (Total as CaCO3)	2014/09/30	<0.50		mg/L	
		Alkalinity (PP as CaCO3)	2014/09/30	<0.50		mg/L	
		Bicarbonate (HCO3)	2014/09/30	<0.50		mg/L	
		Carbonate (CO3)	2014/09/30	<0.50		mg/L	
		Hydroxide (OH)	2014/09/30	<0.50		mg/L	
	RPD	Alkalinity (Total as CaCO3)	2014/09/30	5.7		%	20
		Alkalinity (PP as CaCO3)	2014/09/30	NC		%	20
		Bicarbonate (HCO3)	2014/09/30	5.7		%	20
		Carbonate (CO3)	2014/09/30	NC		%	20
		Hydroxide (OH)	2014/09/30	NC		%	20
7660002 WAY	Spiked Blank	pH	2014/09/30	110	101	%	97 - 103
1000002 WAT	RPD	На	2014/09/30	0.5	101	%	N/A
7660003 WAY		Conductivity	2014/09/30	0.5	98	%	80 - 120
7000003 WAT	•	Conductivity		.1.0	90		00 - 120
	Method Blank	5	2014/09/30	<1.0		uS/cm	00
7000440 000	RPD	Conductivity	2014/09/30	0.6		%	20
7660146 DC6	Matrix Spike				07		00 100
	[KS6048-02]	Dissolved Chloride (CI)	2014/09/30		97	%	80 - 120
	Spiked Blank	Dissolved Chloride (Cl)	2014/09/30		99	%	80 - 120
	Method Blank	Dissolved Chloride (CI)	2014/09/30	<0.50		mg/L	
	RPD [KS6048-02]	Dissolved Chloride (Cl)	2014/09/30	NC		%	20
7660147 DC6	Matrix Spike						
	[KS6048-02]	Dissolved Sulphate (SO4)	2014/09/30		97	%	80 - 120
	Spiked Blank	Dissolved Sulphate (SO4)	2014/09/30		92	%	80 - 120
	Method Blank	Dissolved Sulphate (SO4)	2014/09/30	<0.50		mg/L	
	RPD [KS6048-02]	Dissolved Sulphate (SO4)	2014/09/30	NC		%	20
7660148 DC6	Matrix Spike	Dissolved Chloride (Cl)	2014/09/30		89	%	80 - 120
	Spiked Blank	Dissolved Chloride (Cl)	2014/09/30		100	%	80 - 120
	Method Blank	Dissolved Chloride (Cl)	2014/09/30	<0.50		mg/L	
	RPD [KS6051-02]	Dissolved Chloride (CI)	2014/09/30	NC		%	20
7660150 DC6	Matrix Spike	Dissolved Sulphate (SO4)	2014/09/30		NC	%	80 - 120
1000100 200	Spiked Blank	Dissolved Sulphate (SO4)	2014/09/30		89	%	80 - 120
	Method Blank	Dissolved Sulphate (SO4)	2014/09/30	<0.50	00	mg/L	00 120
	RPD [KS6051-02]	Dissolved Sulphate (SO4)	2014/09/30	6.3		%	20
				0.5	NC		80 - 120
7660880 PSA	Matrix Spike	Total Dissolved Solids	2014/10/02		NC	%	
	Spiked Blank	Total Dissolved Solids	2014/10/02	10	82	%	80 - 120
	Method Blank	Total Dissolved Solids	2014/10/02	<10		mg/L	
	RPD	Total Dissolved Solids	2014/10/02	5.3		%	20
7661729 VT1	Matrix Spike	Dissolved Organic Carbon (C)	2014/10/01		NC	%	80 - 120
	Spiked Blank	Dissolved Organic Carbon (C)	2014/10/01		109	%	80 - 120
	Method Blank	Dissolved Organic Carbon (C)	2014/10/01	<0.50		mg/L	
	RPD	Dissolved Organic Carbon (C)	2014/10/01	3.2		%	20
7661733 VT1	Matrix Spike	Total Organic Carbon (C)	2014/10/01		103	%	80 - 120
	Spiked Blank	Total Organic Carbon (C)	2014/10/01		104	%	80 - 120
	Method Blank	Total Organic Carbon (C)	2014/10/01	<0.50		mg/L	
	RPD	Total Organic Carbon (C)	2014/10/01	NC		%	20
7662233 IW1		Total Ammonia (N)	2014/10/01	-	NC	%	80 - 120
7662233 IW1	RPD Matrix Spike			INC	NC		80 -



# Quality Assurance Report (Continued)

Maxxam Job Number: VB487137

C Type iked Blank ethod Blank PD atrix Spike S6043-05]	Parameter Total Ammonia (N) Total Ammonia (N) Total Ammonia (N) Dissolved Aluminum (Al)	Analyzed yyyy/mm/dd 2014/10/01 2014/10/01 2014/10/01	Value <0.0050 6.5	Recovery 97	UNITS % mg/L %	QC Limits 80 - 120
iked Blank ethod Blank PD atrix Spike	Total Ammonia (N) Total Ammonia (N) Total Ammonia (N) Dissolved Aluminum (Al)	2014/10/01 2014/10/01 2014/10/01	<0.0050		% mg/L	80 - 120
ethod Blank PD atrix Spike	Total Ammonia (Ň) Total Ammonia (Ň) Dissolved Aluminum (Al)	2014/10/01 2014/10/01		97	mg/L	
PD atrix Spike	Total Ammonia (N) Dissolved Aluminum (Al)	2014/10/01				
atrix Spike	Dissolved Aluminum (Al)		6.5		0/	
		004 444 6466			/0	20
S6043-05]		004 4/40/00				
	Dissolved Antimony (Ch)	2014/10/02		105	%	80 - 120
	Dissolved Antimony (Sb)	2014/10/02		97	%	80 - 120
	Dissolved Arsenic (As)	2014/10/02		106	%	80 - 120
	Dissolved Barium (Ba)	2014/10/02		100	%	80 - 120
	Dissolved Beryllium (Be)	2014/10/02		99	%	80 - 120
	Dissolved Bismuth (Bi)	2014/10/02		101	%	80 - 120
	Dissolved Cadmium (Cd)	2014/10/02		100	%	80 - 120
	Dissolved Chromium (Cr)	2014/10/02		106	%	80 - 120
	Dissolved Cobalt (Co)	2014/10/02		103	%	80 - 120
	Dissolved Copper (Cu)	2014/10/02		103	%	80 - 120
	Dissolved Iron (Fe)	2014/10/02		109	%	80 - 120
	Dissolved Lead (Pb)	2014/10/02		98	%	80 - 120
	Dissolved Lithium (Li)	2014/10/02		97	%	80 - 120
	Dissolved Manganese (Mn)	2014/10/02		104	%	80 - 120
	Dissolved Mercury (Hg)	2014/10/02		97	%	80 - 120
	Dissolved Molybdenum (Mo)	2014/10/02		99	%	80 - 120
	Dissolved Nickel (Ni)	2014/10/02		106	%	80 - 120
	Dissolved Selenium (Se)	2014/10/02		100	%	80 - 120
	Dissolved Selenium (Se)	2014/10/02		104	%	80 - 120
	Dissolved Strontium (Sr)			103	%	80 - 120
	Dissolved Thallium (TI)	2014/10/02 2014/10/02		100	%	80 - 12
	Dissolved Tin (Sn)	2014/10/02		98	%	80 - 12
					%	
	Dissolved Titanium (Ti)	2014/10/02		97		80 - 120
	Dissolved Uranium (U)	2014/10/02		99	%	80 - 12
						80 - 12
la d Dia d						80 - 12
iked Blank						80 - 12
	,					80 - 12
	( ),					80 - 12
						80 - 12
	,					80 - 12
						80 - 12
	· · ·					80 - 12
	Dissolved Chromium (Cr)	2014/10/02			%	80 - 12
						80 - 12
	Dissolved Copper (Cu)	2014/10/02		101	%	80 - 12
	Dissolved Iron (Fe)	2014/10/02		109	%	80 - 12
	Dissolved Lead (Pb)	2014/10/02		99	%	80 - 12
	Dissolved Lithium (Li)	2014/10/02		93	%	80 - 12
	Dissolved Manganese (Mn)	2014/10/02		97	%	80 - 12
	Dissolved Mercury (Hg)	2014/10/02		101	%	80 - 12
	Dissolved Molybdenum (Mo)	2014/10/02		91	%	80 - 12
	Dissolved Nickel (Ni)	2014/10/02		103	%	80 - 12
	Dissolved Selenium (Se)	2014/10/02		103		80 - 12
						80 - 12
	Dissolved Strontium (Sr)					80 - 12
						80 - 12
	Dissolved Thallium (TI)	2014/10/02		101		
	Dissolved Thallium (TI) Dissolved Tin (Sn)	2014/10/02 2014/10/02				
	Dissolved Thallium (TI) Dissolved Tin (Sn) Dissolved Titanium (Ti)	2014/10/02 2014/10/02 2014/10/02		101 100 95	% %	80 - 12 80 - 12
il	ked Blank	Dissolved Vanadium (V) Dissolved Zinc (Zn) ked Blank Dissolved Aluminum (Al) Dissolved Antimony (Sb) Dissolved Arsenic (As) Dissolved Barium (Ba) Dissolved Beryllium (Be) Dissolved Beryllium (Be) Dissolved Bismuth (Bi) Dissolved Cadmium (Cd) Dissolved Cadmium (Cd) Dissolved Cobalt (Co) Dissolved Cobalt (Co) Dissolved Copper (Cu) Dissolved Copper (Cu) Dissolved Lead (Pb) Dissolved Lead (Pb) Dissolved Lithium (Li) Dissolved Manganese (Mn) Dissolved Manganese (Mn) Dissolved Molybdenum (Mo) Dissolved Selenium (Se) Dissolved Silver (Ag) Dissolved Strontium (Sr)	Dissolved Vanadium (V)         2014/10/02           Dissolved Zinc (Zn)         2014/10/02           Dissolved Zinc (Zn)         2014/10/02           Dissolved Aluminum (Al)         2014/10/02           Dissolved Antimony (Sb)         2014/10/02           Dissolved Arsenic (As)         2014/10/02           Dissolved Barium (Ba)         2014/10/02           Dissolved Beryllium (Be)         2014/10/02           Dissolved Bismuth (Bi)         2014/10/02           Dissolved Cadmium (Cd)         2014/10/02           Dissolved Cobalt (Co)         2014/10/02           Dissolved Copper (Cu)         2014/10/02           Dissolved Copper (Cu)         2014/10/02           Dissolved Iron (Fe)         2014/10/02           Dissolved Lead (Pb)         2014/10/02           Dissolved Manganese (Mn)         2014/10/02           Dissolved Mercury (Hg)         2014/10/02           Dissolved Nickel (Ni)         2014/10/02           Dissolved Selenium (Se)         2014/10/02           Dissolved Silver (Ag)	Dissolved Vanadium (V)2014/10/02Dissolved Zinc (Zn)2014/10/02Dissolved Aluminum (Al)2014/10/02Dissolved Antimony (Sb)2014/10/02Dissolved Arsenic (As)2014/10/02Dissolved Barium (Ba)2014/10/02Dissolved Beryllium (Be)2014/10/02Dissolved Bismuth (Bi)2014/10/02Dissolved Cadmium (Cd)2014/10/02Dissolved Cobalt (Co)2014/10/02Dissolved Cobalt (Co)2014/10/02Dissolved Lead (Pb)2014/10/02Dissolved Lithium (Li)2014/10/02Dissolved Manganese (Mn)2014/10/02Dissolved Manganese (Mn)2014/10/02Dissolved Selenium (Mo)2014/10/02Dissolved Selenium (Se)2014/10/02Dissolved Silver (Ag)2014/10/02Dissolved Strontium (Sr)2014/10/02	Dissolved Vanadium (V)         2014/10/02         101           Dissolved Zinc (Zn)         2014/10/02         105           ked Blank         Dissolved Aluminum (Al)         2014/10/02         104           Dissolved Antimony (Sb)         2014/10/02         102           Dissolved Arsenic (As)         2014/10/02         102           Dissolved Barium (Ba)         2014/10/02         101           Dissolved Beryllium (Be)         2014/10/02         99           Dissolved Cadmium (Cd)         2014/10/02         98           Dissolved Chromium (Cr)         2014/10/02         98           Dissolved Cobalt (Co)         2014/10/02         102           Dissolved Copper (Cu)         2014/10/02         102           Dissolved Copper (Cu)         2014/10/02         102           Dissolved Iron (Fe)         2014/10/02         102           Dissolved Iron (Fe)         2014/10/02         101           Dissolved Lead (Pb)         2014/10/02         103           Dissolved Marganese (Mn)         2014/10/02         97           Dissolved Molybdenum (Mo)         2014/10/02         101           Dissolved Molybdenum (Mo)         2014/10/02         103           Dissolved Nickel (Ni)         2014/10/02	Dissolved Vanadium (V)         2014/10/02         101         %           Dissolved Zinc (Zn)         2014/10/02         105         %           Dissolved Aluminum (Al)         2014/10/02         104         %           Dissolved Antimony (Sb)         2014/10/02         104         %           Dissolved Arsenic (As)         2014/10/02         98         %           Dissolved Baryllium (Ba)         2014/10/02         101         %           Dissolved Beryllium (Be)         2014/10/02         94         %           Dissolved Beryllium (Cd)         2014/10/02         99         %           Dissolved Cadmium (Cd)         2014/10/02         98         %           Dissolved Copper (Cu)         2014/10/02         102         %           Dissolved Copper (Cu)         2014/10/02         102         %           Dissolved Iron (Fe)         2014/10/02         102         %           Dissolved Lead (Pb)         2014/10/02         109         %           Dissolved Manganese (Mn)         2014/10/02         99         %           Dissolved Manganese (Mn)         2014/10/02         101         %           Dissolved Molybdenum (Mo)         2014/10/02         103         %



### Quality Assurance Report (Continued)

Maxxam Job Number: VB487137

QA/QC			Date				
Batch			Analyzed				
Num Init	QC Type	Parameter	yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7662499 AD5	Spiked Blank	Dissolved Vanadium (V)	2014/10/02		98	%	80 - 120
		Dissolved Zinc (Zn)	2014/10/02		100	%	80 - 120
	Method Blank	Dissolved Aluminum (Al)	2014/10/02	<3.0		ug/L	
		Dissolved Antimony (Sb)	2014/10/02	<0.50		ug/L	
		Dissolved Arsenic (As)	2014/10/02	<0.10		ug/L	
		Dissolved Barium (Ba)	2014/10/02	<1.0		ug/L	
		Dissolved Beryllium (Be)	2014/10/02	<0.10		ug/L	
		Dissolved Bismuth (Bi)	2014/10/02	<1.0		ug/L	
		Dissolved Boron (B)	2014/10/02	<50		ug/L	
		Dissolved Cadmium (Cd)	2014/10/02	<0.010		ug/L	
		Dissolved Chromium (Cr)	2014/10/02	<1.0		ug/L	
		Dissolved Cobalt (Co)	2014/10/02	<0.50		ug/L	
		Dissolved Copper (Cu)	2014/10/02	<0.20		ug/L	
		Dissolved Iron (Fe)	2014/10/02	<5.0		ug/L	
		Dissolved Lead (Pb)	2014/10/02	<0.20		ug/L	
		Dissolved Lithium (Li)	2014/10/02	<5.0		ug/L	
		Dissolved Manganese (Mn)	2014/10/02	<1.0		ug/L	
		Dissolved Mercury (Hg)	2014/10/02	<0.050		ug/L	
		Dissolved Molybdenum (Mo)	2014/10/02	<1.0		ug/L	
		Dissolved Nickel (Ni)	2014/10/02	<1.0		ug/L	
		Dissolved Selenium (Se)	2014/10/02	<0.10		ug/L	
		Dissolved Silicon (Si)	2014/10/02	<100		ug/L	
		Dissolved Silver (Ag)	2014/10/02	<0.020		ug/L	
		Dissolved Strontium (Sr)	2014/10/02	<1.0		ug/L	
		Dissolved Thallium (TI)	2014/10/02	<0.050		ug/L	
		Dissolved Tin (Sn)	2014/10/02	<5.0		ug/L	
		Dissolved Titanium (Ti)	2014/10/02	<5.0		ug/L	
		Dissolved Uranium (U)	2014/10/02	<0.10		ug/L	
		Dissolved Vanadium (V)	2014/10/02	<5.0		ug/L	
		Dissolved Zinc (Zn)	2014/10/02	<5.0		ug/L	
		Dissolved Zirconium (Zr)	2014/10/02	<0.50		ug/L	
7662751 PSA	Matrix Spike	Total Dissolved Solids	2014/10/03		98	%	80 - 12
	Spiked Blank	Total Dissolved Solids	2014/10/03		104	%	80 - 12
	Method Blank	Total Dissolved Solids	2014/10/03	<10		mg/L	
	RPD	Total Dissolved Solids	2014/10/03	15.4		%	2
'663719 VT1	Matrix Spike						
	[KS6050-08]	Dissolved Organic Carbon (C)	2014/10/02		108	%	80 - 12
	Spiked Blank	Dissolved Organic Carbon (C)	2014/10/02		110	%	80 - 120
	Method Blank	Dissolved Organic Carbon (C)	2014/10/02	<0.50		mg/L	
	RPD [KS6050-08]	Dissolved Organic Carbon (C)	2014/10/02	NC		%	20
7663723 VT1	Matrix Spike						
	[KS6051-07]	Total Organic Carbon (C)	2014/10/02		106	%	80 - 120
	Spiked Blank	Total Organic Carbon (C)	2014/10/02		108	%	80 - 120
	Method Blank	Total Organic Carbon (C)	2014/10/02	<0.50		mg/L	
	RPD [KS6051-07]	Total Organic Carbon (C)	2014/10/02	NC		%	20
7663724 VT1	Matrix Spike	Total Organic Carbon (C)	2014/10/02		NC	%	80 - 12
	Spiked Blank	Total Organic Carbon (C)	2014/10/02		110	%	80 - 12
	Method Blank	Total Organic Carbon (C)	2014/10/02	<0.50		mg/L	
	RPD	Total Organic Carbon (C)	2014/10/02	5.7		%	2
7663980 IW1	Matrix Spike						
	[KS6051-06]	Total Ammonia (N)	2014/10/02		90	%	80 - 12
	Spiked Blank	Total Ammonia (N)	2014/10/02		108	%	80 - 12
	Method Blank	Total Ammonia (N)	2014/10/02		DL=0.0050	mg/L	
	RPD [KS6051-06]	Total Ammonia (N)	2014/10/02	6.8		%	20



## Quality Assurance Report (Continued)

Maxxam Job Number: VB487137

QA/QC			Date				
Batch			Analyzed				
Num Init	QC Type	Parameter	yyyy/mm/dd	Value	Recovery	UNITS	QC Limits
7663981 IW1	Matrix Spike	Total Ammonia (N)	2014/10/02		86	%	80 - 120
	Spiked Blank	Total Ammonia (N)	2014/10/02		99	%	80 - 120
	Method Blank	Total Ammonia (N)	2014/10/02	<0.0050		mg/L	
	RPD	Total Ammonia (N)	2014/10/02	NC		%	20
7665656 TS1	Matrix Spike						
	[KS6051-09]	Strong Acid Dissoc. Cyanide (CN)	2014/10/03		96	%	80 - 120
	Spiked Blank	Strong Acid Dissoc. Cyanide (CN)	2014/10/03		102	%	80 - 120
	Method Blank	Strong Acid Dissoc. Cyanide (CN)	2014/10/03	0.00053, R	DL=0.00050	mg/L	
	RPD [KS6051-09]	Strong Acid Dissoc. Cyanide (CN)	2014/10/03	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. 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.

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) Sample analysed past recommended hold time.



# Validation Signature Page

### Maxxam Job #: B487137

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

Brelften

Andy Lu, Data Validation Coordinator

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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Phone / Fax#: Ph: 250-427-	and the second se	427-8451	- Phone / Fa:	x#:			604-62	THE OWNER WATER OF THE OWNER OF T	All and a second se	_	Fax:					ł		ation		Wat			_							
E-mail michelle.u	nger@teck.com	m	E-mail		1	che	erian@	2)srk	.con	n; Ib	araz	zzu	01@8	srk.	cor	I	Sam	pled	by:	JC	neria	n/T	Jim	my /	SC	aes	ar			
REGULATORY REQUIREMEN	S: SERVICE RE	EQUESTED:												_																
CSR		Turn Around	10 E					-	1-1		-	_	- 1	AN/	ALY	SIS	R	And in case of the		TE	D	_	_		_	170		_	_	-
		or most tests		2		ſ			$\square$					zľ	z	1	e l	≥ sat	Alkalinity							acid				
BC Water Quality		Please contac	Day 3 Day			_	IS		Ŷ		SCM	0	Y.	N N N	N V	onie	Sulphate	1.1	alinit		Fecal					red,				
DRINKING WATER	Date Require			MTBE		-	S BT	24)	BTEX)		s by C	SMOG				Ammonia	Sul		Alk		Ē					filte				192.0 (3-10)
SPECIAL INSTRUCTIONS:				Σ		Ξ	EPH/HEPH	us 2	Ē	Bioassay	Phenols by GCMS	\$	Field Filtered?	Field Acidified?	Field Acidified?	244		Solids (TSS)		1	1		fied)			Mercury (field filtered,			ers	$\Box$
	Sample Bottles	(please spe	cify)				12	actio	ion 1	sioas			HL P	d Ac	d Ac	Nitrite <	Fluoride	lids (		8	E.coli		acidified)			IIV (			Containers	0
nclude results of MH-01B, MH-0	4 and DUP from (	COC EB1035	5014		$\square$		ractic	(Fre	ract	C50 E	4AAP	MOG	Ē	_	_	Nit	E	ad So	uctiv	-	Total &		(field a	SAD		erct			Col	NO
n results reporting	Lat Use Only	8		H	Ŧ	-1	L S	PHC	Ŷ	의	by 4A	2	p	ŝ	etals	7	4	pued	Conductivity					1		Np			of	
	Lab	Sample	Date/Time(24hr	BTEX/VPH	VOC/VPH	- l'		ME-F	AE-P	님		0	Dissolved	n) sis	Total Metals	ate	Chloride	Total Susp			Coliform:	Bromide	Mercury	Cyanide	our	Dissolved	turbidity	9	Number	S
Sample Identification	Identification	Туре	Sampled	BTE	Š	EPH	PAH come-	CCME	CCME-	Trout	Phenols	100	Dise	NIEGIS	Tota	Nitrate	CPT	Tota	⊳Hq	DOC	Coli	Bro	Mer	Cya	Colour	Diss	turb	НОГР	Nur	YES
1 MH-22	KS6038	Surface W	14/09/23 10:34										x	x	x	x	x	x	x					x	x		x		7	ce?
2 MH-11	K\$6039	Surface W	14/09/24 11:00	130						No.			x	x	x	x	x	x	x	「神		x	100	x	x	循	x	198	7	Source
3 MH-08	KS6040	2	14/09/23 11:15							1			x	x	x	x	x	x	x					×	x		x		7	S'S
4 MH-02	K\$6041	Seepage	14/09/23 12:50					_					x	x	x	x	x	x	x				x	x	x	×	x		9	Nati
5 MH-13	KS6042		14/09/26 14:28		Γ								x	x	x	x	x	x	x					x	x		x		7	- Bu
6 MH-FB	K\$6043	In the second second	14/09/26 8:35		10		3	1		No.			x	x	x	x	x	x	x			10	x	x	x	1016	x		7	Drinking
7 Trip Blank (Batch# 090814 A-09	to a control	an an an area and an	0.0000000000000000000000000000000000000	1	F .		2						x		x	x	x	x	x			x	x	x	x	×	×		9	D
8 MH-14		Surface W	14/09/26 10:00	120	100							200	x	x	x	×	x	x	U.S.		10			x	×		×	12	7	m
9 MH-30	K\$6046	The second se	14/09/26 15:55										×	x	x	x	x	×	x	x			-	x	x	x	x		9	E
10 MH-06A*	K56047	A COLUMN TWO IS NOT THE	14/09/27 13:55	151	123						2.6	2	×	x	Ĵ	1.9		x	î	1010	201	x	188	x	x	Ê	Ê	133	7	are
	Contraction of the second second	1		121212210	21		2		31	x	12525	525		-	~	x	-	-	×		PEASE	341	22131	-		2006010		-	0	ples
11 MH-15	<ul> <li>International Contract Contract Contract</li> </ul>		14/09/26 10:55	0 5250	10				1782	1025	6000	1313	x	â		*	-	x	×		0.030	(1.9)	R.S.	x	×	12539	x	123	7	- 6
12 MH-16 Print name and sign	K\$6049	A REAL PROPERTY AND A REAL PROPERTY.	14/09/26 8:55 ne and sign	No. of	124	and an	No. in case		th 44			1	<u>^  </u>	X	~	~		^	•		TO La	borat	tory L	Jse Or	nly					0
	nm/dd): Time (24	hr):	Received by :		Date	(yy/r	mm/dd	I);	Tir	ne ()	24 hr	);	Т	ime	10.0	Tem	pera	ture	on F	Rece	ipt (°	(C)		Сця	stody	y Se	al	Yes		No
Relinquished By: Date (yy/	6:00	Maler	THE AMBOS	UTA	A 20	214	1091	29		14.	20		Ser	nsitiv	e	A)	8	B)	8		C)	9		Pres	sent	?			制制	Z
Relinquished By: Date (yy/ Gherian 14/09/29	0.00												1.	1	100		ARCHE THE		CLEVIND.	b'ae	CONTRACTOR OF CONTRACTOR	And in case of the local division of the loc	题				And in case of the local division of the loc	40.000	And in case of the	V

Maxia Address: Company Name: Contact Name: Address: Phone / Fax#: E-mail REGULATORY REQUIREMENTS: SE CSR	PC: Fax: 250-4: Dteck.com	2 No Scientist 27-8451 QUESTED: urn Around	Company N Contact Nar Address: Phone / Fax E-mail	lame me:		Rep SRI Lisa	713 Nort K Col Bar	To: nsul	ting		coc	#:		np #			_				Page		2	of .	2				
ompany Name: ontact Name: ddress: hone / Fax#: -mail EGULATORY REQUIREMENTS: SE	PC: Fax: 250-4: Deck.com RVICE REC Regular Tr (5 days for RUSH (Plo	Scientist 27-8451 L QUESTED: urn Around	Contact Nar Address: Phone / Fax E-mail	me:	¢	SRI	K Co	nsul								-													
ontact Name: Michelle Unger, Envi ddress: hone / Fax#: Ph: 250-427-8422 michelle.unger@ EGULATORY REQUIREMENTS: SE	PC: Fax: 250-4: Deck.com RVICE REC Regular Ti (5 days fo RUSH (Plo	27-8451 QUESTED: urn Around	Contact Nar Address: Phone / Fax E-mail	me:	¢	Lisa																			_				
ddress: hone / Fax#: Ph: 250-427-8422 mail <u>michelle.unger@</u> EGULATORY REQUIREMENTS: SE	PC: Fax: 250-4: Deck.com RVICE REC Regular Ti (5 days fo RUSH (Plo	27-8451 QUESTED: urn Around	Address: Phone / Fax E-mail				a Bar	razu	IOI / J			_	_	_			0#:			ck PC		_		-					
mone / Fax#: Ph: 250-427-8422 mail <u>michelle.unger@</u> EGULATORY REQUIREMENTS: SE	Fax: 250-4 2teck.com RVICE REC Regular To (5 days for RUSH (Plo	QUESTED: urn Around	- Phone / Fax E-mail	d#:		(86)				lay C	heriar	1			_		_		#: B1:						-	_		_	_
-mail <u>michelle.unger@</u> EGULATORY REQUIREMENTS: SE	Fax: 250-4 2teck.com RVICE REC Regular To (5 days for RUSH (Plo	QUESTED: urn Around	E-mail	d#:		(86)	-						_	_		_		xt # :		_	_		3/LF	-		-			
mail <u>michelle.unger@</u> EGULATORY REQUIREMENTS: SE	teck.com RVICE REC Regular T (5 days for RUSH (Plo	QUESTED: urn Around	E-mail	G#1		and the second second		_	112 (J	_	P	14 h		-	-		-		: Sa					Ionite	oring	Prog	Iram		
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CSR	(5 days for RUSH (Pla											_																	
	RUSH (Ple	210.100.000 AND SHOT	Time (TAT)								-			AN	ALY	SIS	RE	QUE	STE	D			_					_	
CCME														$\Box$		1		TDS \	]						acid			1110	ST-
BC Water Quality	1 Day				1			8	$\Box$	0			N	γN	γN	nia	nate	UL Hu		a					p,	(pa		1	
Other		and the second s	Day 🗌 3 Day	E			E.	BTE	0	E		SMOG	Ń	×	Y	Ammonia	Supnate	Alkalinity S		Fecal					tere	lidifi		100	
DRINKING WATER Da	te Required	4		MTBE		TEH	<b>LEPH/HEPH</b>	(Fractions 1-4 Plus BTEX)	(Fractions 2-4)	CCME-PHC (Fraction 1 Plus BTEX)			cpa	Field Acidified?	Field Acidified?	≪   Γ			1			R			Dissolved Mercury (field filtered, acid	DOC (field filtered, field acidified)			-
PECIAL INSTRUCTIONS:			(2) = IN	2		Ē	E P	4	ous	1 PI			Filtered?	cidit	cidit	고난	0	otal Suspended Solids (TSS) 어머스 Conductivity (이		To		(field acidified)			(fie	field		Containers	2
eturn Cooler 📃 Ship Sample		the second s	and the second se				5	SUO	acti	tion	L f		명	Y PI	A bi	a i	DIG	Vit-	TOC	ш		scid		1 1	ŝ	g,	1	IT IT	Q
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LAD	Use Only	Country	Della CTI and Alla	Ś	1 P			HA	맓	H			[ pay	ē	Me		Ge	dan C	_	Ē	de	A,	ge	-	Ne	(fie		ie ie	-
	Lab entification	i and in the	Date/Time(24hr) Sampled	BTEX/VPH	VOC/VPH	EPH	PAH	CCME-PHC	CCME-PHC	CME	Other		Dissolved	Vietals (DM)	Total Metals	Nitrate 🗠	Culonde	Total Su		Coliform: Total & E.coli	Bromide	Mercury	Cyanide	Colour	isso	8	HOLD	VEC	3
	10.1110.001.120.002.0001	Туре		-	>	ш	0.	ö	0	0	0 1	F	-			-	-	-	1	0	<u> </u>	2				-	-	-	
The second se	the barrier of the second	Surface W	Statistic Landston and	107514	1.00	Ur=int)	22707	1100	5.022	1250	Netters Co	CT 100.0	X	x	x	100	12 19	x x	de litere	100.0	1	9124	x	x	1000	10000	10000 100	9	les are from a Drinking Water Source
	the second s	and the second se	14/09/26 13:15	124	민만	1	500		2.44	1033	633	1912	×	x	x	x	()	x x	X			2	x	x			_	9	
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4		S. 55	and a strange	200	1001				12751							10					S.	影司							Water
			BARLAND COMPANY		1			CA MARK		-	10000	-	1			2000 0		100 100	1	-	- CONTRACT	1000			Comments of			-17	5
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		1110			1											ust s	amp	ed &	rec'd	or the Lore	Contraction of the		Intac	ct?				U	TA
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d.

Your Project #: 12-1021-0006 Site Location: PHASE 11000 Your C.O.C. #: 22807

#### Attention:Andrew Bruemmer

GOLDER ASSOCIATES LTD 4260 STILL CREEK DRIVE Suite 500 BURNABY, BC Canada V5C 6C6

> Report Date: 2014/10/08 Report #: R1659113 Version: 1 - Final

### **CERTIFICATE OF ANALYSIS**

## MAXXAM JOB #: B488182

#### Received: 2014/10/01, 13:55

Sample Matrix: Water # Samples Received: 7

		Date	Date		
Analyses	Quantity	Extracted	Analyzed	Laboratory Method	Analytical Method
Chloride by Automated Colourimetry	7	N/A	2014/10/02	BBY6SOP-00011	SM 22 4500-Cl- G m
Fluoride	7	N/A	2014/10/06	BBY6SOP-00048	SM 22 4500-F C m
Hardness (calculated as CaCO3)	7	N/A	2014/10/07	BBY7SOP-00002	EPA 6020a R1 m
Mercury (Dissolved) by CVAF	7	N/A	2014/10/08	BBY7SOP-00015	BCMOE BCLM Oct2013 m
Extrac. Pet HC when LEPH/HEPH required	7	2014/10/06	2014/10/07	BBY8SOP-00029	BCMOE EPH w 07/99
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	7	N/A	2014/10/07	BBY7SOP-00002	EPA 6020A R1 m
					EPA 6020A R1 m





#### **RESULTS OF CHEMICAL ANALYSES OF WATER**

	1												
Maxxam ID		KT2492	KT2493	KT2494	KT2495	KT2496	KT2497	KT2498					
Sampling Date		2014/09/27	2014/09/27	2014/09/27	2014/09/27	2014/09/27	2014/09/27	2014/09/27					
COC Number		22807	22807	22807	22807	22807	22807	22807					
	Units	22807-01	22807-02	22807-03	22807-04	22807-05	22807-06	22807-07	RDL	QC Batch			
Misc. Inorganics													
Fluoride (F)	mg/L	0.063	0.088	0.220	0.069	0.046	0.044	0.140	0.010	7668584			
Anions													
Dissolved Sulphate (SO4)	mg/L	<0.50	0.50	20.2	19.4	1.05	1.05	21.7	0.50	7663854			
Dissolved Chloride (Cl)	mg/L	0.71	0.55	0.62	1.2	0.97	0.87	1.0	0.50	7663850			
RDL = Reportable Detection	RDL = Reportable Detection Limit												



# LEPH & HEPH WITH CSR/CCME PAH IN WATER (WATER)

		KT2402	KT2402	KT2404	KT2405	KT240C	KT2407		
Maxxam ID		KT2492	KT2493	KT2494	KT2495	KT2496	KT2497		
Sampling Date		2014/09/27	2014/09/27	2014/09/27	2014/09/27	2014/09/27	2014/09/27		
COC Number		22807	22807	22807	22807	22807	22807		
	Units	22807-01	22807-02	22807-03	22807-04	22807-05	22807-06	RDL	QC Batc
Polycyclic Aromatics									
Low Molecular Weight PAH`s	ug/L	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	0.24	7660618
High Molecular Weight PAH`s	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7660618
Total PAH	ug/L	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	0.24	7660618
Naphthalene	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7668614
2-Methylnaphthalene	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7668614
Quinoline	ug/L	<0.24	<0.24	<0.24	<0.24	<0.24	<0.24	0.24	7668614
Acenaphthylene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7668614
Acenaphthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7668614
Fluorene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7668614
Phenanthrene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7668614
Anthracene	ug/L	<0.010	<0.010	<0.010	< 0.010	<0.010	<0.010	0.010	7668614
Acridine	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7668614
Fluoranthene	ug/L	<0.020	<0.020	<0.020	0.021	<0.020	<0.020	0.020	7668614
Pyrene	ug/L	<0.020	<0.020	0.023	0.026	<0.020	<0.020	0.020	7668614
Benzo(a)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7668614
Chrysene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7668614
Benzo(b&j)fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7668614
Benzo(k)fluoranthene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7668614
Benzo(a)pyrene	ug/L	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090	0.0090	7668614
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7668614
Dibenz(a,h)anthracene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7668614
Benzo(g,h,i)perylene	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7668614
Calculated Parameters		1	1	1			1		
LEPH (C10-C19 less PAH)	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7661269
HEPH (C19-C32 less PAH)	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7661269
Ext. Pet. Hydrocarbon		I	1	I			I	1	
EPH (C10-C19)	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7668617
EPH (C19-C32)	mg/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7668617
Surrogate Recovery (%)									
O-TERPHENYL (sur.)	%	100	99	99	99	99	99		7668617
D10-ANTHRACENE (sur.)	%	95	119	96	113	119	111		7668614
D8-ACENAPHTHYLENE (sur.)	%	74	105	92	99	101	100		7668614
D8-NAPHTHALENE (sur.)	%	69	98	89	92	96	95		7668614
D9-Acridine	%	77	97	73	83	95	85		7668614
RDL = Reportable Detection Lin	nit	1	1	1			1		



GOLDER ASSOCIATES LTD Client Project #: 12-1021-0006 Site Location: PHASE 11000

Sampler Initials: AM

# LEPH & HEPH WITH CSR/CCME PAH IN WATER (WATER)

Maxxam ID		KT2492	KT2493	KT2494	KT2495	KT2496	KT2497					
Sampling Date		2014/09/27	2014/09/27	2014/09/27	2014/09/27	2014/09/27	2014/09/27					
COC Number		22807	22807	22807	22807	22807	22807					
	Units	22807-01	22807-02	22807-03	22807-04	22807-05	22807-06	RDL	QC Batch			
TERPHENYL-D14 (sur.)	%	82	89	56 (1)	77	89	74		7668614			
RDL = Reportable Detection Limit												
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.												



# LEPH & HEPH WITH CSR/CCME PAH IN WATER (WATER)

Maxxam ID		KT2498		
Sampling Date		2014/09/27		
COC Number		22807		
	Units	22807-07	RDL	QC Batcl
Polycyclic Aromatics				
Low Molecular Weight PAH's	ug/L	<0.24	0.24	7660618
High Molecular Weight PAH's	ug/L	<0.050	0.050	7660618
Total PAH	ug/L	<0.24	0.24	7660618
Naphthalene	ug/L	<0.10	0.10	7668614
2-Methylnaphthalene	ug/L	<0.10	0.10	7668614
Quinoline	ug/L	<0.24	0.24	7668614
Acenaphthylene	ug/L	<0.050	0.050	7668614
Acenaphthene	ug/L	<0.050	0.050	7668614
Fluorene	ug/L	<0.050	0.050	7668614
Phenanthrene	ug/L	<0.050	0.050	7668614
Anthracene	ug/L	<0.010	0.010	7668614
Acridine	ug/L	<0.050	0.050	7668614
Fluoranthene	ug/L	<0.020	0.020	7668614
Pyrene	ug/L	<0.020	0.020	7668614
Benzo(a)anthracene	ug/L	<0.010	0.010	7668614
Chrysene	ug/L	<0.050	0.050	7668614
Benzo(b&j)fluoranthene	ug/L	<0.050	0.050	7668614
Benzo(k)fluoranthene	ug/L	<0.050	0.050	7668614
Benzo(a)pyrene	ug/L	<0.0090	0.0090	7668614
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	0.050	7668614
Dibenz(a,h)anthracene	ug/L	<0.050	0.050	7668614
Benzo(g,h,i)perylene	ug/L	<0.050	0.050	7668614
Calculated Parameters				1
LEPH (C10-C19 less PAH)	mg/L	<0.20	0.20	7661269
HEPH (C19-C32 less PAH)	mg/L	<0.20	0.20	7661269
Ext. Pet. Hydrocarbon	1 0.			1
EPH (C10-C19)	mg/L	<0.20	0.20	7668617
EPH (C19-C32)	mg/L	<0.20	0.20	7668617
Surrogate Recovery (%)	•	-		•
O-TERPHENYL (sur.)	%	99		7668617
D10-ANTHRACENE (sur.)	%	85		7668614
D8-ACENAPHTHYLENE (sur.)	%	90		7668614
D8-NAPHTHALENE (sur.)	%	86	İ	7668614
D9-Acridine	%	60	İ	7668614
RDL = Reportable Detection Li	mit		•	



### LEPH & HEPH WITH CSR/CCME PAH IN WATER (WATER)

TERPHENYL-D14 (sur.)	%	44 (1)		7668614
	Units	22807-07	RDL	QC Batch
COC Number		22807		
Sampling Date		2014/09/27		
Maxxam ID		KT2498		

RDL = Reportable Detection Limit

(1) Surrogate recovery exceeds acceptance criteria due to matrix interference.



Maxxam ID		KT2492	KT2493	KT2494	KT2495		
Sampling Date		2014/09/27	2014/09/27	2014/09/27	2014/09/27		
COC Number		22807	22807	22807	22807		
	Units	22807-01	22807-02	22807-03	22807-04	RDL	QC Batch
Misc. Inorganics							
Dissolved Hardness (CaCO3)	mg/L	80.7	95.4	176	200	0.50	7662095
Elements			ı	ı	ı	1	1
Dissolved Mercury (Hg)	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	7670828
Dissolved Metals by ICPMS	_		ľ	ľ	ľ	1	1
Dissolved Aluminum (Al)	mg/L	<0.0030	0.0072	0.0089	0.0050	0.0030	7667768
Dissolved Antimony (Sb)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	7667768
Dissolved Arsenic (As)	mg/L	<0.00010	<0.00010	0.00033	0.00031	0.00010	7667768
Dissolved Barium (Ba)	mg/L	0.0192	0.0240	0.0571	0.0446	0.0010	7667768
Dissolved Beryllium (Be)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	7667768
Dissolved Bismuth (Bi)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7667768
Dissolved Boron (B)	mg/L	<0.050	<0.050	< 0.050	<0.050	0.050	7667768
Dissolved Cadmium (Cd)	mg/L	0.000014	0.000011	0.000090	0.00265	0.000010	7667768
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7667768
Dissolved Cobalt (Co)	mg/L	<0.00050	<0.00050	0.00075	0.00058	0.00050	7667768
Dissolved Copper (Cu)	mg/L	0.00084	0.00031	0.00056	0.00534	0.00020	7667768
Dissolved Iron (Fe)	mg/L	2.63	0.320	0.0090	<0.0050	0.0050	7667768
Dissolved Lead (Pb)	mg/L	<0.00020	<0.00020	<0.00020	0.00058	0.00020	7667768
Dissolved Lithium (Li)	mg/L	<0.0050	<0.0050	<0.0050	< 0.0050	0.0050	7667768
Dissolved Manganese (Mn)	mg/L	0.135	0.0673	0.216	0.0544	0.0010	7667768
Dissolved Molybdenum (Mo)	mg/L	<0.0010	<0.0010	0.0019	0.0019	0.0010	7667768
Dissolved Nickel (Ni)	mg/L	<0.0010	<0.0010	0.0031	0.0018	0.0010	7667768
Dissolved Selenium (Se)	mg/L	<0.00010	0.00012	0.00027	0.00026	0.00010	7667768
Dissolved Silicon (Si)	mg/L	0.56	0.92	3.56	3.13	0.10	7667768
Dissolved Silver (Ag)	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	7667768
Dissolved Strontium (Sr)	mg/L	0.102	0.130	0.206	0.259	0.0010	7667768
Dissolved Thallium (TI)	mg/L	<0.000050	<0.000050	<0.000050	<0.000050	0.000050	7667768
Dissolved Tin (Sn)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7667768
Dissolved Titanium (Ti)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7667768
Dissolved Uranium (U)	mg/L	<0.00010	0.00021	0.00098	0.00120	0.00010	7667768
Dissolved Vanadium (V)	mg/L	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	7667768
Dissolved Zinc (Zn)	mg/L	0.0066	<0.0050	<0.0050	0.0228	0.0050	7667768
Dissolved Zirconium (Zr)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	7667768
Dissolved Calcium (Ca)	mg/L	24.6	30.3	58.6	69.4	0.050	7661375
Dissolved Magnesium (Mg)	mg/L	4.70	4.75	7.13	6.52	0.050	7661375
Dissolved Potassium (K)	mg/L	0.631	0.371	1.14	0.915	0.050	7661375



Maxxam ID		KT2492	KT2493	KT2494	KT2495						
Sampling Date		2014/09/27	2014/09/27	2014/09/27	2014/09/27						
COC Number		22807	22807	22807	22807						
	Units	22807-01	22807-02	22807-03	22807-04	RDL	QC Batch				
Dissolved Sodium (Na)	mg/L	1.14	0.954	3.42	3.08	0.050	7661375				
Dissolved Sulphur (S)	mg/L	<3.0	<3.0	6.7	6.3	3.0	7661375				
RDL = Reportable Detection Limit											



Maxxam ID		KT2496	KT2497	KT2498		
Sampling Date		2014/09/27	2014/09/27	2014/09/27		
COC Number		22807	22807	22807		
	Units	22807-05	22807-06	22807-07	RDL	QC Batch
Misc. Inorganics						
Dissolved Hardness (CaCO3)	mg/L	205	207	227	0.50	7662095
Elements			I	ľ	1	1
Dissolved Mercury (Hg)	ug/L	<0.010	<0.010	<0.010	0.010	7670786
Dissolved Metals by ICPMS	<u> </u>		l .	•		1
Dissolved Aluminum (Al)	mg/L	0.0110	0.0098	0.0236	0.0030	7667768
Dissolved Antimony (Sb)	mg/L	<0.00050	<0.00050	<0.00050	0.00050	7667768
Dissolved Arsenic (As)	mg/L	0.00042	0.00042	0.00028	0.00010	7667768
Dissolved Barium (Ba)	mg/L	0.317	0.312	0.0866	0.0010	7667768
Dissolved Beryllium (Be)	mg/L	<0.00010	<0.00010	<0.00010	0.00010	7667768
Dissolved Bismuth (Bi)	mg/L	<0.0010	<0.0010	<0.0010	0.0010	7667768
Dissolved Boron (B)	mg/L	<0.050	<0.050	<0.050	0.050	7667768
Dissolved Cadmium (Cd)	mg/L	0.000039	0.000036	0.000168	0.000010	7667768
Dissolved Chromium (Cr)	mg/L	<0.0010	<0.0010	<0.0010	0.0010	7667768
Dissolved Cobalt (Co)	mg/L	<0.00050	<0.00050	0.00067	0.00050	7667768
Dissolved Copper (Cu)	mg/L	0.00032	0.00022	0.00059	0.00020	7667768
Dissolved Iron (Fe)	mg/L	0.0083	0.0081	0.0397	0.0050	7667768
Dissolved Lead (Pb)	mg/L	<0.00020	<0.00020	0.00049	0.00020	7667768
Dissolved Lithium (Li)	mg/L	<0.0050	<0.0050	<0.0050	0.0050	7667768
Dissolved Manganese (Mn)	mg/L	0.0102	0.0104	0.283	0.0010	7667768
Dissolved Molybdenum (Mo)	mg/L	<0.0010	<0.0010	0.0022	0.0010	7667768
Dissolved Nickel (Ni)	mg/L	<0.0010	<0.0010	0.0031	0.0010	7667768
Dissolved Selenium (Se)	mg/L	<0.00010	<0.00010	0.00101	0.00010	7667768
Dissolved Silicon (Si)	mg/L	3.79	3.83	3.50	0.10	7667768
Dissolved Silver (Ag)	mg/L	<0.000020	<0.000020	<0.000020	0.000020	7667768
Dissolved Strontium (Sr)	mg/L	0.225	0.222	0.204	0.0010	7667768
Dissolved Thallium (Tl)	mg/L	<0.000050	<0.000050	<0.000050	0.000050	7667768
Dissolved Tin (Sn)	mg/L	<0.0050	<0.0050	<0.0050	0.0050	7667768
Dissolved Titanium (Ti)	mg/L	<0.0050	<0.0050	<0.0050	0.0050	7667768
Dissolved Uranium (U)	mg/L	0.00073	0.00075	0.00050	0.00010	7667768
Dissolved Vanadium (V)	mg/L	<0.0050	<0.0050	<0.0050	0.0050	7667768
Dissolved Zinc (Zn)	mg/L	0.0330	0.0125	<0.0050	0.0050	7667768
Dissolved Zirconium (Zr)	mg/L	<0.00050	<0.00050	<0.00050	0.00050	7667768
Dissolved Calcium (Ca)	mg/L	65.1	66.2	73.3	0.050	7661375
Dissolved Magnesium (Mg)	mg/L	10.3	10.1	10.6	0.050	7661375
Dissolved Potassium (K)	mg/L	0.675	0.641	1.13	0.050	7661375
RDL = Reportable Detection Li	mit					



Maxxam ID		KT2496	KT2497	KT2498		
Sampling Date		2014/09/27	2014/09/27	2014/09/27		
COC Number		22807	22807	22807		
	Units	22807-05	22807-06	22807-07	RDL	QC Batch
Dissolved Sodium (Na)	mg/L	1.10	1.05	3.19	0.050	7661375
Dissolved Sulphur (S)	mg/L	<3.0	<3.0	7.9	3.0	7661375
RDL = Reportable Detection	Limit					



#### NITRITE & NITRATE IN WATER (WATER)

Maxxam ID		KT2492	KT2493	KT2494	KT2495	KT2496	KT2497		
Sampling Date		2014/09/27	2014/09/27	2014/09/27	2014/09/27	2014/09/27	2014/09/27		
COC Number		22807	22807	22807	22807	22807	22807		
	Units	22807-01	22807-02	22807-03	22807-04	22807-05	22807-06	RDL	QC Batch
ANIONS									
Nitrite (N)	mg/L	0.0237 (1)	<0.0050 (1)	<0.0050 (1)	<0.0050 (1)	<0.0050 (1)	<0.0050 (1)	0.0050	7663596
Calculated Parameters	•								
Nitrate (N)	mg/L	<0.020	<0.020	0.262	0.182	0.131	0.123	0.020	7660681
Nutrients									
Nitrate plus Nitrite (N)	mg/L	0.039 (1)	<0.020 (1)	0.262 (1)	0.182 (1)	0.131 (1)	0.123 (1)	0.020	7663592
RDL = Reportable Detection Limit									

(1) Sample arrived to laboratory past recommended hold time.

Maxxam ID		KT2498							
Sampling Date		2014/09/27							
COC Number		22807							
	Units	22807-07	RDL	QC Batch					
ANIONS									
Nitrite (N)	mg/L	<0.0050 (1)	0.0050	7663596					
Calculated Parameters									
Nitrate (N)	mg/L	0.187	0.020	7660681					
Nutrients									
Nitrate plus Nitrite (N) mg/L 0.187 (1) 0.020 7663592									
RDL = Reportable Detection Limit (1) Sample arrived to laboratory past recommended hold time.									



### CSR VOC + VPH IN WATER (WATER)

09/27 07 7-01 RD 0 30 .0 1.1 50 0.5 .0 1.1 .0 4.1	00 766061		RDL	QC Batch	2014/09/27 22807		2014/09/27 22807		
7-01         RD           0         30           .0         1.1           50         0.5           .0         1.1	00 766061	h 22807-02	RDL	QC Batch			22807		
0 30 .0 1.0 50 0.5 .0 1.0	00 766061		RDL	QC Batch	0000-00				1
.0 1.0 50 0.5 .0 1.0		) <300			22807-03	RDL	22807-04	RDL	QC Batch
.0 1.0 50 0.5 .0 1.0		) <300							
50 0.5 .0 1.0	.0 766878		300	7660619	<300	300	<300	300	7660619
.0 1.		5 <1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
	50 766878	5 <0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
0 4.	.0 766878	5 <1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
	.0 766878	5 <4.0	4.0	7665601	<4.0	4.0	<4.0	4.0	7668785
50 0.5	50 766878	5 <0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
2 (1) 6.3	.2 766878	5 <2.0	2.0	7665601	<6.1 (1)	6.1	<6.6 (1)	6.6	7668785
.0 1.0	.0 766878	5 <1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
50 0.5	50 766878	5 <0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
.0 1.0	.0 766878	5 <1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
.0 1.0	.0 766878	5 <1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
50 0.5	50 766878	5 <0.50	0.50	7665601	<0.50	0.50	1.9	0.50	7668785
50 0.5	50 766878	5 <0.50	0.50	7665601	<0.87 (1)	0.87	<0.50	0.50	7668785
50 0.5	50 766878	5 <0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
40 0.4	40 766878	5 <0.40	0.40	7665601	<0.40	0.40	<0.40	0.40	7668785
.0 4.0	.0 766878	5 <4.0	4.0	7665601	<4.0	4.0	<4.0	4.0	7668785
50 0.5	50 766878	5 <0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
.0 1.0	.0 766878	5 <1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
.0 1.0	.0 766878	5 <1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
.0 1.0	.0 766878	5 <1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
50 0.5	50 766878	5 <0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
50 0.5	50 766878	5 <0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
.0 1.0	.0 766878	5 <1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
20 0.2	20 766878	5 <0.20	0.20	7665601	<0.20	0.20	<0.20	0.20	7668785
50 0.5	50 766878	5 <0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
.0 1.0	.0 766878	5 <1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
69 0.4	40 766878	5 <0.40	0.40	7665601	<0.40	0.40	0.42	0.40	7668785
40 0.4	40 766878	5 <0.40	0.40	7665601	<0.40	0.40	<0.40	0.40	7668785
40 0.4	40 766878	5 <0.40	0.40	7665601	<0.40	0.40	<0.40	0.40	7668785
.0 1.	.0 766878	5 <1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
50 0.5	50 766878	5 <0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
40 0.4		-	0.40	7665601	<0.40	0.40	<0.40	0.40	7668785
	40 766878	5 <0.40	0.40	7665601	<0.40	0.40	<0.40	0.40	7668785
40 0.4	50 766878	5 <0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
1.	1.0         1           .50         0.           .40         0.           .40         0.	1.0         1.0         7668785           .50         0.50         7668785           .40         0.40         7668785           .40         0.40         7668785	1.0         1.0         7668785         <1.0           .50         0.50         7668785         <0.50	1.0         1.0         7668785         <1.0         1.0           .50         0.50         7668785         <0.50	1.01.07668785<1.01.07665601.500.507668785<0.50	1.0         1.0         7668785         <1.0         1.0         7665601         <1.0           .50         0.50         7668785         <0.50	1.0         1.0         7668785         <1.0         1.0         7665601         <1.0         1.0           .50         0.50         7668785         <0.50	1.0         1.0         7668785         <1.0         1.0         7665601         <1.0         1.0         <1.0           .50         0.50         7668785         <0.50	1.0         1.0         7668785         <1.0         1.0         7665601         <1.0         1.0         <1.0         1.0           .50         0.50         7668785         <0.50

(1) RDL raised due to sample matrix interference.



# CSR VOC + VPH IN WATER (WATER)

Maxxam ID		KT2492			KT2493			KT2494		KT2495		
		-						-				
Sampling Date		2014/09/27			2014/09/27			2014/09/27		2014/09/27		
COC Number		22807			22807			22807		22807		
	Units	22807-01	RDL	QC Batch	22807-02	RDL	QC Batch	22807-03	RDL	22807-04	RDL	QC Batch
1,1,2,2-tetrachloroethane	ug/L	<0.50	0.50	7668785	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
1,2-dichlorobenzene	ug/L	<0.50	0.50	7668785	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
1,3-dichlorobenzene	ug/L	<0.50	0.50	7668785	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
1,4-dichlorobenzene	ug/L	<0.50	0.50	7668785	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
Chlorobenzene	ug/L	<0.50	0.50	7668785	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
VH C6-C10	ug/L	370	300	7668785	<300	300	7665601	<300	300	<300	300	7668785
Surrogate Recovery (%)												
1,4-Difluorobenzene (sur.)	%	105		7668785	122		7665601	104		109		7668785
4-Bromofluorobenzene (sur.)	%	98		7668785	106		7665601	100		92		7668785
D4-1,2-Dichloroethane (sur.)	%	110		7668785	106		7665601	109		108		7668785
RDL = Reportable Detection Lim	it											



### CSR VOC + VPH IN WATER (WATER)

Maxxam ID		KT2496			KT2497		KT2498		
Sampling Date		2014/09/27			2014/09/27		2014/09/27		
COC Number		22807			22807		22807		
	Units	22807-05	RDL	QC Batch	22807-06	RDL	22807-07	RDL	QC Batch
Volatiles									
VPH (VHW6 to 10 - BTEX)	ug/L	<300	300	7660619	<300	300	<300	300	7660619
Chloromethane	ug/L	<1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
Vinyl chloride	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
Chloroethane	ug/L	<1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
Trichlorofluoromethane	ug/L	<4.0	4.0	7665601	<4.0	4.0	<4.0	4.0	7668785
1,1-dichloroethene	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
Dichloromethane	ug/L	<2.0	2.0	7665601	<4.1 (1)	4.1	<4.5 (1)	4.5	7668785
trans-1,2-dichloroethene	ug/L	<1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
1,1-dichloroethane	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
cis-1,2-dichloroethene	ug/L	<1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
Chloroform	ug/L	<1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
1,1,1-trichloroethane	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
1,2-dichloroethane	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
Carbon tetrachloride	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
Benzene	ug/L	<0.40	0.40	7665601	<0.40	0.40	<0.40	0.40	7668785
Methyl-tert-butylether (MTBE)	ug/L	<4.0	4.0	7665601	<4.0	4.0	<4.0	4.0	7668785
1,2-dichloropropane	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
cis-1,3-dichloropropene	ug/L	<1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
trans-1,3-dichloropropene	ug/L	<1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
Bromomethane	ug/L	<1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
1,1,2-trichloroethane	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
Trichloroethene	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
Chlorodibromomethane	ug/L	<1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
1,2-dibromoethane	ug/L	<0.20	0.20	7665601	<0.20	0.20	<0.20	0.20	7668785
Tetrachloroethene	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
Bromodichloromethane	ug/L	<1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
Toluene	ug/L	<0.40	0.40	7665601	<0.40	0.40	<0.40	0.40	7668785
Ethylbenzene	ug/L	<0.40	0.40	7665601	<0.40	0.40	<0.40	0.40	7668785
m & p-Xylene	ug/L	<0.40	0.40	7665601	<0.40	0.40	<0.40	0.40	7668785
Bromoform	ug/L	<1.0	1.0	7665601	<1.0	1.0	<1.0	1.0	7668785
Styrene	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
o-Xylene	ug/L	<0.40	0.40	7665601	<0.40	0.40	<0.40	0.40	7668785
Xylenes (Total)	ug/L	<0.40	0.40	7665601	<0.40	0.40	<0.40	0.40	7668785
1,1,1,2-tetrachloroethane	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
RDL = Reportable Detection Lim	it								

(1) RDL raised due to sample matrix interference.



# CSR VOC + VPH IN WATER (WATER)

Maxxam ID		KT2496			KT2497		KT2498		
Sampling Date		2014/09/27			2014/09/27		2014/09/27		
COC Number		22807			22807		22807		
	Units	22807-05	RDL	QC Batch	22807-06	RDL	22807-07	RDL	QC Batch
1,1,2,2-tetrachloroethane	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
1,2-dichlorobenzene	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
1,3-dichlorobenzene	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
1,4-dichlorobenzene	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
Chlorobenzene	ug/L	<0.50	0.50	7665601	<0.50	0.50	<0.50	0.50	7668785
VH C6-C10	ug/L	<300	300	7665601	<300	300	<300	300	7668785
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	91		7665601	85		85		7668785
4-Bromofluorobenzene (sur.)	%	101		7665601	90		90		7668785
D4-1,2-Dichloroethane (sur.)	%	104		7665601	106		106		7668785
RDL = Reportable Detection Limi	t								



Success Through Science®

Maxxam Job #: B488182 Report Date: 2014/10/08

GOLDER ASSOCIATES LTD Client Project #: 12-1021-0006 Site Location: PHASE 11000 Sampler Initials: AM

### **GENERAL COMMENTS**

Results relate only to the items tested.



Maxxam Job #: B488182 Report Date: 2014/10/08

### QUALITY ASSURANCE REPORT

GOLDER ASSOCIATES LTD

Client Project #: 12-1021-0006

Site Location: PHASE 11000 Sampler Initials: AM

			Matrix	Spike	Spiked	Blank	Method	Blank	RP	D
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7665601	1,4-Difluorobenzene (sur.)	2014/10/04	116	70 - 130	115	70 - 130	120	%		
7665601	4-Bromofluorobenzene (sur.)	2014/10/04	105	70 - 130	101	70 - 130	105	%		
7665601	D4-1,2-Dichloroethane (sur.)	2014/10/04	106	70 - 130	99	70 - 130	106	%		
7668614	D10-ANTHRACENE (sur.)	2014/10/07	94	60 - 130	130	60 - 130	111	%		
7668614	D8-ACENAPHTHYLENE (sur.)	2014/10/07	92	50 - 130	103	50 - 130	91	%		
7668614	D8-NAPHTHALENE (sur.)	2014/10/07	87	50 - 130	96	50 - 130	91	%		
7668614	D9-Acridine	2014/10/07	76	50 - 130	100	50 - 130	83	%		
7668614	TERPHENYL-D14 (sur.)	2014/10/07	62	60 - 130	118	60 - 130	100	%		
7668617	O-TERPHENYL (sur.)	2014/10/07	99	50 - 130	100	50 - 130	98	%		
7668785	1,4-Difluorobenzene (sur.)	2014/10/06	111	70 - 130	84	70 - 130	105	%		
7668785	4-Bromofluorobenzene (sur.)	2014/10/06	102	70 - 130	106	70 - 130	101	%		
7668785	D4-1,2-Dichloroethane (sur.)	2014/10/06	114	70 - 130	116	70 - 130	110	%		
7663592	Nitrate plus Nitrite (N)	2014/10/02	101	80 - 120	103	80 - 120	<0.020	mg/L	1.6	25
7663596	Nitrite (N)	2014/10/02	95	80 - 120	101	80 - 120	<0.0050	mg/L	NC	20
7663850	Dissolved Chloride (Cl)	2014/10/02	106	80 - 120	97	80 - 120	<0.50	mg/L	NC	20
7663854	Dissolved Sulphate (SO4)	2014/10/02	105	80 - 120	92	80 - 120	<0.50	mg/L	3.6	20
7665601	1,1,1,2-tetrachloroethane	2014/10/04	107	70 - 130	91	70 - 130	<0.50	ug/L	NC	30
7665601	1,1,1-trichloroethane	2014/10/04	108	70 - 130	94	70 - 130	<0.50	ug/L	NC	30
7665601	1,1,2,2-tetrachloroethane	2014/10/04	111	70 - 130	110	70 - 130	<0.50	ug/L	NC	30
7665601	1,1,2-trichloroethane	2014/10/04	108	70 - 130	92	70 - 130	<0.50	ug/L	NC	30
7665601	1,1-dichloroethane	2014/10/04	104	70 - 130	91	70 - 130	<0.50	ug/L	NC	30
7665601	1,1-dichloroethene	2014/10/04	106	70 - 130	93	70 - 130	<0.50	ug/L	NC	30
7665601	1,2-dibromoethane	2014/10/04	103	70 - 130	89	70 - 130	<0.20	ug/L	NC	30
7665601	1,2-dichlorobenzene	2014/10/04	116	70 - 130	104	70 - 130	<0.50	ug/L	NC	30
7665601	1,2-dichloroethane	2014/10/04	115	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
7665601	1,2-dichloropropane	2014/10/04	105	70 - 130	114	70 - 130	<0.50	ug/L	NC	30
7665601	1,3-dichlorobenzene	2014/10/04	113	70 - 130	99	70 - 130	<0.50	ug/L	NC	30
7665601	1,4-dichlorobenzene	2014/10/04	112	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
7665601	Benzene	2014/10/04	119	70 - 130	103	70 - 130	<0.40	ug/L	NC	30
7665601	Bromodichloromethane	2014/10/04	102	70 - 130	87	70 - 130	<1.0	ug/L	NC	30
7665601	Bromoform	2014/10/04	107	70 - 130	97	70 - 130	<1.0	ug/L	NC	30
7665601	Bromomethane	2014/10/04	119	60 - 140	104	60 - 140	<1.0	ug/L	NC	30



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## QUALITY ASSURANCE REPORT(CONT'D)

GOLDER ASSOCIATES LTD

Client Project #: 12-1021-0006

Site Location: PHASE 11000 Sampler Initials: AM

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			Matrix	Spike	Spiked	Blank	Method	Blank	RP	D
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7665601	Carbon tetrachloride	2014/10/04	108	70 - 130	93	70 - 130	<0.50	ug/L	NC	30
7665601	Chlorobenzene	2014/10/04	116	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
7665601	Chlorodibromomethane	2014/10/04	107	70 - 130	93	70 - 130	<1.0	ug/L	NC	30
7665601	Chloroethane	2014/10/04	121	60 - 140	80	60 - 140	<1.0	ug/L	NC	30
7665601	Chloroform	2014/10/04	106	70 - 130	92	70 - 130	<1.0	ug/L	NC	30
7665601	Chloromethane	2014/10/04	132	60 - 140	122	60 - 140	<1.0	ug/L	NC	30
7665601	cis-1,2-dichloroethene	2014/10/04	111	70 - 130	97	70 - 130	<1.0	ug/L	NC	30
7665601	cis-1,3-dichloropropene	2014/10/04	96	70 - 130	85	70 - 130	<1.0	ug/L	NC	30
7665601	Dichloromethane	2014/10/04	120	70 - 130	100	70 - 130	<2.0	ug/L	NC	30
7665601	Ethylbenzene	2014/10/04	112	70 - 130	97	70 - 130	<0.40	ug/L	NC	30
7665601	m & p-Xylene	2014/10/04	112	70 - 130	97	70 - 130	<0.40	ug/L	NC	30
7665601	Methyl-tert-butylether (MTBE)	2014/10/04	115	70 - 130	99	70 - 130	<4.0	ug/L	NC	30
7665601	o-Xylene	2014/10/04	117	70 - 130	93	70 - 130	<0.40	ug/L	NC	30
7665601	Styrene	2014/10/04	123	70 - 130	109	70 - 130	<0.50	ug/L	NC	30
7665601	Tetrachloroethene	2014/10/04	110	70 - 130	96	70 - 130	<0.50	ug/L	NC	30
7665601	Toluene	2014/10/04	109	70 - 130	94	70 - 130	<0.40	ug/L	NC	30
7665601	trans-1,2-dichloroethene	2014/10/04	108	70 - 130	90	70 - 130	<1.0	ug/L	NC	30
7665601	trans-1,3-dichloropropene	2014/10/04	105	70 - 130	92	70 - 130	<1.0	ug/L	NC	30
7665601	Trichloroethene	2014/10/04	108	70 - 130	94	70 - 130	<0.50	ug/L	NC	30
7665601	Trichlorofluoromethane	2014/10/04	147 (1)	60 - 140	133	60 - 140	<4.0	ug/L	NC	30
7665601	VH C6-C10	2014/10/04			87	70 - 130	<300	ug/L	NC	30
7665601	Vinyl chloride	2014/10/04	129	60 - 140	112	60 - 140	<0.50	ug/L	NC	30
7665601	Xylenes (Total)	2014/10/04					<0.40	ug/L	NC	30
7667768	Dissolved Aluminum (Al)	2014/10/07	98	80 - 120	105	80 - 120	<0.0030	mg/L	NC	20
7667768	Dissolved Antimony (Sb)	2014/10/07	101	80 - 120	102	80 - 120	<0.00050	mg/L	NC	20
7667768	Dissolved Arsenic (As)	2014/10/07	106	80 - 120	105	80 - 120	<0.00010	mg/L	NC	20
7667768	Dissolved Barium (Ba)	2014/10/07	NC	80 - 120	103	80 - 120	<0.0010	mg/L	2.9	20
7667768	Dissolved Beryllium (Be)	2014/10/07	99	80 - 120	99	80 - 120	<0.00010	mg/L	NC	20
7667768	Dissolved Bismuth (Bi)	2014/10/07	97	80 - 120	97	80 - 120	<0.0010	mg/L	NC	20
7667768	Dissolved Boron (B)	2014/10/07					<0.050	mg/L	NC	20
7667768	Dissolved Cadmium (Cd)	2014/10/07	100	80 - 120	101	80 - 120	<0.000010	mg/L	NC	20
7667768	Dissolved Chromium (Cr)	2014/10/07	100	80 - 120	104	80 - 120	<0.0010	mg/L	NC	20



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# QUALITY ASSURANCE REPORT(CONT'D)

GOLDER ASSOCIATES LTD Client Project #: 12-1021-0006

Site Location: PHASE 11000 Sampler Initials: AM

			Matrix	Spike	Spiked	Blank	Method	Blank	RP	D
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7667768	Dissolved Cobalt (Co)	2014/10/07	99	80 - 120	105	80 - 120	<0.00050	mg/L	NC	20
7667768	Dissolved Copper (Cu)	2014/10/07	96	80 - 120	102	80 - 120	<0.00020	mg/L	NC	20
7667768	Dissolved Iron (Fe)	2014/10/07	105	80 - 120	112	80 - 120	<0.0050	mg/L	NC	20
7667768	Dissolved Lead (Pb)	2014/10/07	95	80 - 120	99	80 - 120	<0.00020	mg/L	NC	20
7667768	Dissolved Lithium (Li)	2014/10/07	101	80 - 120	99	80 - 120	<0.0050	mg/L	NC	20
7667768	Dissolved Manganese (Mn)	2014/10/07	NC	80 - 120	105	80 - 120	<0.0010	mg/L	1.6	20
7667768	Dissolved Molybdenum (Mo)	2014/10/07	NC	80 - 120	101	80 - 120	<0.0010	mg/L	NC	20
7667768	Dissolved Nickel (Ni)	2014/10/07	98	80 - 120	106	80 - 120	<0.0010	mg/L	NC	20
7667768	Dissolved Selenium (Se)	2014/10/07	100	80 - 120	102	80 - 120	<0.00010	mg/L	NC	20
7667768	Dissolved Silicon (Si)	2014/10/07					<0.10	mg/L	4.0	20
7667768	Dissolved Silver (Ag)	2014/10/07	101	80 - 120	89	80 - 120	<0.000020	mg/L	NC	20
7667768	Dissolved Strontium (Sr)	2014/10/07	NC	80 - 120	101	80 - 120	<0.0010	mg/L	2.9	20
7667768	Dissolved Thallium (Tl)	2014/10/07	100	80 - 120	99	80 - 120	<0.000050	mg/L	NC	20
7667768	Dissolved Tin (Sn)	2014/10/07	101	80 - 120	99	80 - 120	<0.0050	mg/L	NC	20
7667768	Dissolved Titanium (Ti)	2014/10/07	110	80 - 120	93	80 - 120	<0.0050	mg/L	NC	20
7667768	Dissolved Uranium (U)	2014/10/07	103	80 - 120	100	80 - 120	<0.00010	mg/L	0.60	20
7667768	Dissolved Vanadium (V)	2014/10/07	106	80 - 120	103	80 - 120	<0.0050	mg/L	NC	20
7667768	Dissolved Zinc (Zn)	2014/10/07	NC	80 - 120	105	80 - 120	<0.0050	mg/L	NC	20
7667768	Dissolved Zirconium (Zr)	2014/10/07					<0.00050	mg/L	NC	20
7668584	Fluoride (F)	2014/10/06	NC	80 - 120	100	80 - 120	<0.010	mg/L	0	20
7668614	2-Methylnaphthalene	2014/10/07	67	50 - 130	100	50 - 130	<0.10	ug/L	NC	40
7668614	Acenaphthene	2014/10/07	84	50 - 130	104	50 - 130	<0.050	ug/L	NC	40
7668614	Acenaphthylene	2014/10/07	85	50 - 130	105	50 - 130	<0.050	ug/L	NC	40



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# QUALITY ASSURANCE REPORT(CONT'D)

GOLDER ASSOCIATES LTD Client Project #: 12-1021-0006

Site Location: PHASE 11000 Sampler Initials: AM

			Matrix	Spike	Spiked	Blank	Method	Blank	RP	D
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7668614	Fluoranthene	2014/10/07	97	60 - 130	108	60 - 130	<0.020	ug/L	NC	40
7668614	Fluorene	2014/10/07	90	50 - 130	105	50 - 130	<0.050	ug/L	NC	40
7668614	Indeno(1,2,3-cd)pyrene	2014/10/07	102	60 - 130	106	60 - 130	<0.050	ug/L	NC	40
7668614	Naphthalene	2014/10/07	76	50 - 130	100	50 - 130	<0.10	ug/L	NC	40
7668614	Phenanthrene	2014/10/07	90	60 - 130	107	60 - 130	<0.050	ug/L	NC	40
7668614	Pyrene	2014/10/07	97	60 - 130	107	60 - 130	<0.020	ug/L	NC	40
7668614	Quinoline	2014/10/07	122	50 - 130	116	50 - 130	<0.24	ug/L	NC	40
7668617	EPH (C10-C19)	2014/10/07	52	50 - 130	83	50 - 130	<0.20	mg/L	NC	30
7668617	EPH (C19-C32)	2014/10/07	77	50 - 130	104	50 - 130	<0.20	mg/L	NC	30
7668785	1,1,1,2-tetrachloroethane	2014/10/06	104	70 - 130	105	70 - 130	<0.50	ug/L		
7668785	1,1,1-trichloroethane	2014/10/06	114	70 - 130	113	70 - 130	<0.50	ug/L		
7668785	1,1,2,2-tetrachloroethane	2014/10/06	91	70 - 130	115	70 - 130	<0.50	ug/L		
7668785	1,1,2-trichloroethane	2014/10/06	112	70 - 130	114	70 - 130	<0.50	ug/L		
7668785	1,1-dichloroethane	2014/10/06	114	70 - 130	111	70 - 130	<0.50	ug/L		
7668785	1,1-dichloroethene	2014/10/06	112	70 - 130	109	70 - 130	<0.50	ug/L		
7668785	1,2-dibromoethane	2014/10/07	107	70 - 130	110	70 - 130	<0.20	ug/L	NC (2)	30
7668785	1,2-dichlorobenzene	2014/10/06	106	70 - 130	115	70 - 130	<0.50	ug/L		
7668785	1,2-dichloroethane	2014/10/07	121	70 - 130	116	70 - 130	<0.50	ug/L	NC	30
7668785	1,2-dichloropropane	2014/10/06	104	70 - 130	101	70 - 130	<0.50	ug/L		
7668785	1,3-dichlorobenzene	2014/10/06	112	70 - 130	114	70 - 130	<0.50	ug/L		
7668785	1,4-dichlorobenzene	2014/10/06	109	70 - 130	113	70 - 130	<0.50	ug/L		
7668785	Benzene	2014/10/06	126	70 - 130	118	70 - 130	<0.40	ug/L		
7668785	Bromodichloromethane	2014/10/06	103	70 - 130	105	70 - 130	<1.0	ug/L		
7668785	Bromoform	2014/10/06	87	70 - 130	97	70 - 130	<1.0	ug/L		
7668785	Bromomethane	2014/10/06	126	60 - 140	103	60 - 140	<1.0	ug/L		
7668785	Carbon tetrachloride	2014/10/06	112	70 - 130	110	70 - 130	<0.50	ug/L		
7668785	Chlorobenzene	2014/10/06	121	70 - 130	120	70 - 130	<0.50	ug/L		
7668785	Chlorodibromomethane	2014/10/06	96	70 - 130	102	70 - 130	<1.0	ug/L		
7668785	Chloroethane	2014/10/06	107	60 - 140	85	60 - 140	<1.0	ug/L		
7668785	Chloroform	2014/10/06	115	70 - 130	112	70 - 130	<1.0	ug/L		
7668785	Chloromethane	2014/10/06			135	60 - 140	<1.0	ug/L		
7668785	cis-1,2-dichloroethene	2014/10/06	117	70 - 130	116	70 - 130	<1.0	ug/L		



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#### QUALITY ASSURANCE REPORT(CONT'D)

GOLDER ASSOCIATES LTD Client Project #: 12-1021-0006

Site Location: PHASE 11000 Sampler Initials: AM

			Matrix	Spike	Spiked	Blank	Method	Blank	RP	D
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7668785	cis-1,3-dichloropropene	2014/10/06	94	70 - 130	103	70 - 130	<1.0	ug/L		
7668785	Dichloromethane	2014/10/06			128	70 - 130	<2.0	ug/L		
7668785	Ethylbenzene	2014/10/06	123	70 - 130	127	70 - 130	<0.40	ug/L		
7668785	m & p-Xylene	2014/10/06	125	70 - 130	123	70 - 130	<0.40	ug/L		
7668785	Methyl-tert-butylether (MTBE)	2014/10/07	116	70 - 130	111	70 - 130	<4.0	ug/L	NC	30
7668785	o-Xylene	2014/10/06	124	70 - 130	122	70 - 130	<0.40	ug/L		
7668785	Styrene	2014/10/06	124	70 - 130	112	70 - 130	<0.50	ug/L		
7668785	Tetrachloroethene	2014/10/06	115	70 - 130	116	70 - 130	<0.50	ug/L		
7668785	Toluene	2014/10/06	119	70 - 130	118	70 - 130	<0.40	ug/L		
7668785	trans-1,2-dichloroethene	2014/10/06	117	70 - 130	110	70 - 130	<1.0	ug/L		
7668785	trans-1,3-dichloropropene	2014/10/06	89	70 - 130	95	70 - 130	<1.0	ug/L		
7668785	Trichloroethene	2014/10/06	116	70 - 130	113	70 - 130	<0.50	ug/L		
7668785	Trichlorofluoromethane	2014/10/06			149 (1)	60 - 140	<4.0	ug/L		
7668785	VH C6-C10	2014/10/06			86	70 - 130	<300	ug/L		
7668785	Vinyl chloride	2014/10/06	140	60 - 140	132	60 - 140	<0.50	ug/L		
7668785	Xylenes (Total)	2014/10/06					<0.40	ug/L		
7670786	Dissolved Mercury (Hg)	2014/10/08	94	80 - 120	90	80 - 120	<0.010	ug/L	NC	20
7670828	Dissolved Mercury (Hg)	2014/10/08	93	80 - 120	93	80 - 120	<0.010	ug/L	NC	20

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.

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.

(2) RDL raised due to sample matrix interference.



GOLDER ASSOCIATES LTD Client Project #: 12-1021-0006 Site Location: PHASE 11000 Sampler Initials: AM

## VALIDATION SIGNATURE PAGE

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

Rob Reinert, Data Validation Coordinator

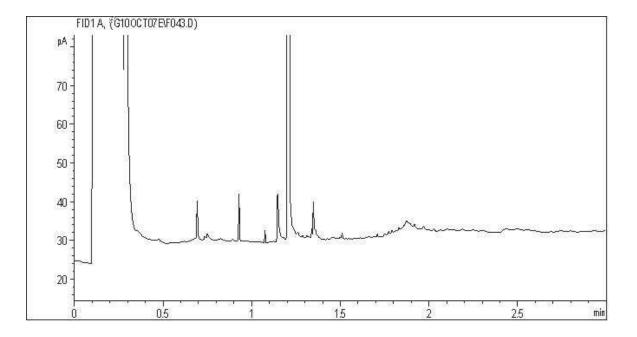
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Golder	Project	Number: 12-10	021-00061	(11000)		Labor	atory Nan	ne: Ma	XXam	Ana	lytics
4260 Still Creek Drive	- A					Addre	55: 46	K Cc.	rector (2)	. R	uytics moby 15
naby, British Columbia, Canada V5C phone: 604-298-6623 Fax: 604-298-5		Contact: Ivew Bruen	golder Andr	E-mail Address: Britemmur@	golder.c	Tel/Fa	1639	7 26	14 Long	tact:	. Sahni
ffjøe the final reports should be sent to:		P to 1 to			No.	*=	Analys	es Require	d	-	1
Burnaby, BC V5C 6C6	202–2790 Gladwin Road Abbotsford, BC V2T 4S8 Fel: 604-850-8786 Fax: 604-850-8756 Sample Matrix (over)	Victoria Tel: 250	buglas Street 1 1 1 a, BC V8T 4M1 0-881-7372 0-881-7470	Number of Containers-	CONTREPUTING PAH)	Brex Net at 00		Huens 🐝 Voce		RUSH	Remarks (over)
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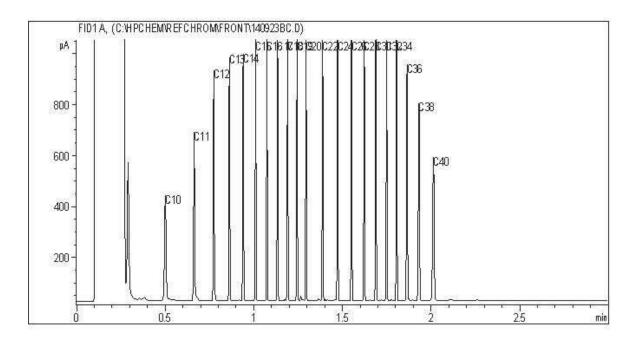
11

GOLDER ASSOCIATES LTD Client Project #: 12-1021-0006 Site Reference: PHASE 11000 Client ID: 22807-01

#### Extrac. Pet HC when LEPH/HEPH required Chromatogram



Carbon Range Distribution - Reference Chromatogram



TYPICAL PRODUCT CARBON NUMBER RANGES

Gasoline:C4C12Diesel:C8C22Varsol:C8-C12Lubricating Oils:C20C40Note: This information is provided for reference purposes only. Should detailed chemist interpretationor fingerprinting be required, please contact the laboratory.

Extrac. Pet HC when LEPH/HEPH required Chromatogram

Attention:L. Barazzuol

1066 W. HASTINGS ST. VANCOUVER, BC Canada

V6E 3X2

SRK CONSULTING SRKCONSU-VAN **SUITE 2200** 

Your P.O. #: 8470 Your Project #: SRK 1CT008.043 / LFN Site Location: SA DENA HES - LFN MONITORING PROGRAM, WATSON LAKE, YUKON Your C.O.C. #: TEMP#4

> Report Date: 2014/10/22 Report #: R1669504 Version: 1 - Final

## **CERTIFICATE OF ANALYSIS**

#### MAXXAM JOB #: B492574 Received: 2014/10/14, 14:15

Sample Matrix: Water # Samples Received: 3

		Date	Date		
Analyses	Quantity	Extracted	Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water	3	2014/10/15	2014/10/15	BBY6SOP-00026	SM 22 2320 B m
Chloride by Automated Colourimetry	3	N/A	2014/10/15	BBY6SOP-00011	SM 22 4500-Cl- G m
Cyanide SAD (strong acid dissociable)	3	N/A	2014/10/16	BBY6SOP-00004	SM 22 4500-CN O m
Colour (True)	3	N/A	2014/10/15	BBY6SOP-00021	SM 22 2120 B m
Conductance - water	3	N/A	2014/10/15	BBY6SOP-00026	SM 22 2510 B m
Fluoride - Mining Clients	1	N/A	2014/10/15	BBY6SOP-00048	SM 22 4500-F C m
Fluoride - Mining Clients	2	N/A	2014/10/17	BBY6SOP-00048	SM 22 4500-F C m
Hardness Total (calculated as CaCO3)	3	N/A	2014/10/20	BBY7SOP-00002	EPA 6020a R1 m
Hardness (calculated as CaCO3)	3	N/A	2014/10/20	BBY7SOP-00002	EPA 6020a R1 m
Mercury (Dissolved) by CVAF	3	N/A	2014/10/20	BBY7SOP-00015	BCMOE BCLM Oct2013 m
Mercury (Total) by CVAF	3	2014/10/20	2014/10/20	BBY7SOP-00015	BCMOE BCLM Oct2013 m
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	3	N/A	2014/10/20	BBY7SOP-00002	EPA 6020A R1 m
Elements by CRC ICPMS (dissolved)	3	N/A	2014/10/17	BBY7SOP-00002	EPA 6020A R1 m
Na, K, Ca, Mg, S by CRC ICPMS (total)	3	2014/10/14	2014/10/20	BBY7SOP-00002	EPA 6020A R1 m
Elements by CRC ICPMS (total)	3	2014/10/16	2014/10/18	BBY7SOP-00002	EPA 6020A R1 m
Ammonia-N (Preserved)	3	N/A	2014/10/15	BBY6SOP-00009	SM 22 4500-NH3- G m
Nitrate + Nitrite (N)	3	N/A	2014/10/15	BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrite (N) by CFA	3	N/A	2014/10/15	BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrogen - Nitrate (as N)	3	N/A	2014/10/15	BBY6SOP-00010	SM 22 4500-NO3 I m
Filter and HNO3 Preserve for Metals	3	N/A	2014/10/17	BBY7 WI-00004	BCMOE Reqs 08/14
pH Water (1)	3	N/A	2014/10/15	BBY6SOP-00026	SM 22 4500-H+ B m
Sulphate by Automated Colourimetry	3	N/A	2014/10/15	BBY6SOP-00017	SM 22 4500-SO42- E m
Total Dissolved Solids (Filt. Residue)	3	2014/10/15	2014/10/16	BBY6SOP-00033	SM 22 2540 C m
Total Suspended Solids	3	N/A	2014/10/16	BBY6SOP-00034	SM 22 2540 D
Turbidity	3	N/A	2014/10/15	BBY6SOP-00027	SM 22 2130 B m

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

(1) The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.



Your P.O. #: 8470 Your Project #: SRK 1CT008.043 / LFN Site Location: SA DENA HES - LFN MONITORING PROGRAM, WATSON LAKE, YUKON Your C.O.C. #: TEMP#4

#### Attention:L. Barazzuol

SRK CONSULTING SRKCONSU-VAN SUITE 2200 1066 W. HASTINGS ST. VANCOUVER, BC Canada V6E 3X2

> Report Date: 2014/10/22 Report #: R1669504 Version: 1 - Final

# **CERTIFICATE OF ANALYSIS**

MAXXAM JOB #: B492574 Received: 2014/10/14, 14:15

**Encryption Key** 

Please direct all questions regarding this Certificate of Analysis to your Project Manager. Ken Pomeroy, Project Manager Email: KPomeroy@maxxam.ca Phone# (604)638-5020

This report has been generated and distributed using a secure automated process.

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 P.O. #: 8470 Sampler Initials: JC

#### **RESULTS OF CHEMICAL ANALYSES OF WATER**

Maxxam ID		KW1287		KW1288		KW1289		
Sampling Date		2014/10/11		2014/10/11		2014/10/11		
		11:03		12:15		13:39	ļ	
COC Number		TEMP#4		TEMP#4		TEMP#4		
	Units	SW14-01	QC Batch	SW14-02	QC Batch	SW14-03	RDL	QC Batch
Misc. Inorganics								
Fluoride (F)	mg/L	0.120	7683057	0.100	7683057	0.110	0.010	7679354
Calculated Parameters								
Filter and HNO3 Preservation	N/A	FIELD	ONSITE	FIELD	ONSITE	FIELD	N/A	ONSITE
Misc. Inorganics								
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00067	7681271	0.00081	7681271	0.00071	0.00050	7681271
Alkalinity (Total as CaCO3)	mg/L	140	7679801	156	7679801	155	0.50	7679801
Alkalinity (PP as CaCO3)	mg/L	<0.50	7679801	<0.50	7679801	<0.50	0.50	7679801
Bicarbonate (HCO3)	mg/L	171	7679801	190	7679801	189	0.50	7679801
Carbonate (CO3)	mg/L	<0.50	7679801	<0.50	7679801	<0.50	0.50	7679801
Hydroxide (OH)	mg/L	<0.50	7679801	<0.50	7679801	<0.50	0.50	7679801
Anions								
Dissolved Sulphate (SO4)	mg/L	5.95	7679830	10.5	7679830	10.4	0.50	7679830
Dissolved Chloride (Cl)	mg/L	1.3	7679826	<0.50	7679826	0.74	0.50	7679826
MISCELLANEOUS								
True Colour	Col. Unit	<5.0 (1)	7679776	<5.0 (1)	7679776	<5.0 (1)	5.0	7679776
Nutrients								
Total Ammonia (N)	mg/L	0.015	7680028	0.0053	7680024	0.010	0.0050	7680024
Physical Properties								
Conductivity	uS/cm	274	7679824	318	7679824	321	1.0	7679824
рН	рН	7.98	7679823	8.11	7679823	8.09	N/A	7679823
Physical Properties								
Total Suspended Solids	mg/L	<4.0	7678857	<4.0	7678874	<4.0	4.0	7678874
Total Dissolved Solids	mg/L	144	7678876	170	7678876	180	10	7678876
Turbidity	NTU	0.57 (1)	7679144	0.31 (1)	7679144	1.17 (1)	0.10	7679144
RDL = Reportable Detection Limit								

N/A = Not Applicable

(1) Sample analysed past hold time: sample was received on the hold time expiry date which did not allow sufficient time for preparation and analysis.



Your P.O. #: 8470 Sampler Initials: JC

## CSR DISSOLVED METALS IN WATER WITH CV HG (WATER)

Maxxam ID		KW1287	KW1288	KW1289		
Sampling Date		2014/10/11	2014/10/11	2014/10/11		
		11:03	12:15	13:39		
COC Number		TEMP#4	TEMP#4	TEMP#4		
	Units	SW14-01	SW14-02	SW14-03	RDL	QC Batch
Misc. Inorganics						
Dissolved Hardness (CaCO3)	mg/L	144	161	169	0.50	7677512
Elements			1	1	1	
Dissolved Mercury (Hg)	ug/L	<0.010	< 0.010	<0.010	0.010	7682854
Dissolved Metals by ICPMS		L	1	1		L
Dissolved Aluminum (Al)	ug/L	4.2	3.6	<3.0	3.0	7681640
Dissolved Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	0.50	7681640
Dissolved Arsenic (As)	ug/L	1.08	0.79	0.75	0.10	7681640
Dissolved Barium (Ba)	ug/L	57.3	66.6	70.0	1.0	7681640
Dissolved Beryllium (Be)	ug/L	<0.10	<0.10	<0.10	0.10	7681640
Dissolved Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	1.0	7681640
Dissolved Boron (B)	ug/L	<50	<50	<50	50	7681640
Dissolved Cadmium (Cd)	ug/L	0.034	0.044	0.037	0.010	7681640
Dissolved Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	1.0	7681640
Dissolved Cobalt (Co)	ug/L	<0.50	<0.50	<0.50	0.50	7681640
Dissolved Copper (Cu)	ug/L	0.24	0.27	0.22	0.20	7681640
Dissolved Iron (Fe)	ug/L	22.9	7.6	<5.0	5.0	7681640
Dissolved Lead (Pb)	ug/L	<0.20	<0.20	<0.20	0.20	7681640
Dissolved Lithium (Li)	ug/L	<5.0	<5.0	<5.0	5.0	7681640
Dissolved Manganese (Mn)	ug/L	28.7	8.6	3.0	1.0	7681640
Dissolved Molybdenum (Mo)	ug/L	1.3	1.3	1.2	1.0	7681640
Dissolved Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	1.0	7681640
Dissolved Selenium (Se)	ug/L	0.45	0.60	0.61	0.10	7681640
Dissolved Silicon (Si)	ug/L	4100	3780	4010	100	7681640
Dissolved Silver (Ag)	ug/L	<0.020	<0.020	<0.020	0.020	7681640
Dissolved Strontium (Sr)	ug/L	177	213	216	1.0	7681640
Dissolved Thallium (Tl)	ug/L	<0.050	<0.050	<0.050	0.050	7681640
Dissolved Tin (Sn)	ug/L	<5.0	<5.0	<5.0	5.0	7681640
Dissolved Titanium (Ti)	ug/L	<5.0	<5.0	<5.0	5.0	7681640
Dissolved Uranium (U)	ug/L	0.65	0.93	0.89	0.10	7681640
Dissolved Vanadium (V)	ug/L	<5.0	<5.0	<5.0	5.0	7681640
Dissolved Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	5.0	7681640
Dissolved Zirconium (Zr)	ug/L	<0.50	<0.50	<0.50	0.50	7681640
Dissolved Calcium (Ca)	mg/L	48.8	54.4	57.2	0.050	7677946
RDL = Reportable Detection Li	mit		•	•	·	



Your P.O. #: 8470 Sampler Initials: JC

## CSR DISSOLVED METALS IN WATER WITH CV HG (WATER)

Maxxam ID		KW1287	KW1288	KW1289				
Sampling Date		2014/10/11 11:03	2014/10/11 12:15	2014/10/11 13:39				
COC Number		TEMP#4	TEMP#4	TEMP#4				
	Units	SW14-01	SW14-02	SW14-03	RDL	QC Batch		
Dissolved Magnesium (Mg)	mg/L	5.49	6.09	6.23	0.050	7677946		
Dissolved Potassium (K)	mg/L	0.358	0.439	0.461	0.050	7677946		
Dissolved Sodium (Na)	mg/L	0.909	1.07	1.05	0.050	7677946		
Dissolved Sulphur (S)	mg/L	<3.0	3.5	3.7	3.0	7677946		
RDL = Reportable Detection Limit								



Your P.O. #: 8470 Sampler Initials: JC

## CSR TOTAL METALS IN WATER WITH CV HG (WATER)

Maxxam ID		KW1287	KW1288	KW1289						
Sampling Date		2014/10/11	2014/10/11	2014/10/11						
		11:03	12:15	13:39						
COC Number		TEMP#4	TEMP#4	TEMP#4						
	Units	SW14-01	SW14-02	SW14-03	RDL	QC Batch				
Calculated Parameters										
Total Hardness (CaCO3)	mg/L	150	165	166	0.50	7677107				
Elements	•				•					
Total Mercury (Hg)	ug/L	<0.010	<0.010	<0.010	0.010	7685144				
Total Metals by ICPMS		-				·				
Total Aluminum (Al)	ug/L	28.1	15.2	33.5	3.0	7681235				
Total Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	0.50	7681235				
Total Arsenic (As)	ug/L	1.14	0.88	0.82	0.10	7681235				
Total Barium (Ba)	ug/L	62.9	70.1	74.3	1.0	7681235				
Total Beryllium (Be)	ug/L	<0.10	<0.10	<0.10	0.10	7681235				
Total Bismuth (Bi)	ug/L	<1.0	<1.0	<1.0	1.0	7681235				
Total Boron (B)	ug/L	<50	<50	<50	50	7681235				
Total Cadmium (Cd)	ug/L	0.043	0.050	0.044	0.010	7681235				
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	1.0	7681235				
Total Cobalt (Co)	ug/L	<0.50	<0.50	<0.50	0.50	7681235				
Total Copper (Cu)	ug/L	<0.50	<0.50	<0.50	0.50	7681235				
Total Iron (Fe)	ug/L	67	36	57	10	7681235				
Total Lead (Pb)	ug/L	0.84	0.61	1.13	0.20	7681235				
Total Lithium (Li)	ug/L	<5.0	<5.0	<5.0	5.0	7681235				
Total Manganese (Mn)	ug/L	32.2	11.5	6.2	1.0	7681235				
Total Molybdenum (Mo)	ug/L	1.3	1.3	1.3	1.0	7681235				
Total Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	1.0	7681235				
Total Selenium (Se)	ug/L	0.54	0.62	0.59	0.10	7681235				
Total Silicon (Si)	ug/L	4160	3950	3810	100	7681235				
Total Silver (Ag)	ug/L	<0.020	<0.020	<0.020	0.020	7681235				
Total Strontium (Sr)	ug/L	183	214	213	1.0	7681235				
Total Thallium (Tl)	ug/L	<0.050	<0.050	<0.050	0.050	7681235				
Total Tin (Sn)	ug/L	<5.0	<5.0	<5.0	5.0	7681235				
Total Titanium (Ti)	ug/L	<5.0	<5.0	<5.0	5.0	7681235				
Total Uranium (U)	ug/L	0.65	0.89	0.88	0.10	7681235				
Total Vanadium (V)	ug/L	<5.0	<5.0	<5.0	5.0	7681235				
Total Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	5.0	7681235				
Total Zirconium (Zr)	ug/L	<0.50	<0.50	<0.50	0.50	7681235				
Total Calcium (Ca)	mg/L	50.8	56.1	56.3	0.050	7677108				
RDL = Reportable Detection Limit										



Your P.O. #: 8470 Sampler Initials: JC

## CSR TOTAL METALS IN WATER WITH CV HG (WATER)

Maxxam ID		KW1287	KW1288	KW1289					
Sampling Date		2014/10/11 11:03	2014/10/11 12:15	2014/10/11 13:39					
COC Number		TEMP#4	TEMP#4	TEMP#4					
	Units	SW14-01	SW14-02	SW14-03	RDL	QC Batch			
Total Magnesium (Mg)	mg/L	5.52	6.02	6.10	0.050	7677108			
Total Potassium (K)	mg/L	0.312	0.418	0.408	0.050	7677108			
Total Sodium (Na)	mg/L	0.843	0.984	0.975	0.050	7677108			
Total Sulphur (S)	mg/L	<3.0	<3.0	<3.0	3.0	7677108			
RDL = Reportable Detection Limit									



Your P.O. #: 8470 Sampler Initials: JC

## NITRITE & NITRATE IN WATER (WATER)

Maxxam ID		KW1287	KW1288	KW1289							
Sampling Date		2014/10/11	2014/10/11	2014/10/11							
		11:03	12:15	13:39							
COC Number		TEMP#4	TEMP#4	TEMP#4							
	Units	SW14-01	SW14-02	SW14-03	RDL	QC Batch					
ANIONS											
Nitrite (N)	mg/L	<0.0050 (1)	<0.0050 (1)	<0.0050 (1)	0.0050	7679764					
Calculated Parameters	•										
Nitrate (N)	mg/L	0.051	0.062	0.056	0.020	7677848					
Nutrients											
Nitrate plus Nitrite (N)         mg/L         0.051 (1)         0.062 (1)         0.056 (1)         0.020         7675483											
RDL = Reportable Detection Limit											
1) Sample analysed past hold time: sample was received on the hold time expiry date which did											

(1) Sample analysed past hold time: sample was received on the hold time expiry date which did not allow sufficient time for preparation and analysis.



Report Date: 2014/10/22

SRK CONSULTING Client Project #: SRK 1CT008.043 / LFN Site Location: SA DENA HES - LFN MONITORING PROGRAM, WATSON LAKE, YUKON Your P.O. #: 8470

Sampler Initials: JC

#### **GENERAL COMMENTS**

Results relate only to the items tested.



Maxxam Job #: B492574 Report Date: 2014/10/22

# QUALITY ASSURANCE REPORT

SRK CONSULTING Client Project #: SRK 1CT008.043 / LFN

SA DENA HES - LFN MONITORING PROGRAM,

Site Location: WATSON LAKE, YUKON Your P.O. #: 8470 Sampler Initials: JC

			Matrix	Spike	Spiked	Blank	Method	Blank	RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7675483	Nitrate plus Nitrite (N)	2014/10/15	NC	80 - 120	105	80 - 120	<0.020	mg/L	0.52	25
7678857	Total Suspended Solids	2014/10/16	104	80 - 120	99	80 - 120	<4.0	mg/L	NC	20
7678874	Total Suspended Solids	2014/10/16	107	80 - 120	101	80 - 120	<4.0	mg/L	NC	20
7678876	Total Dissolved Solids	2014/10/16	100	80 - 120	90	80 - 120	<10	mg/L		
7679144	Turbidity	2014/10/15			99	80 - 120	<0.10	NTU	NC	20
7679354	Fluoride (F)	2014/10/15	100	80 - 120	98	80 - 120	<0.010	mg/L		
7679764	Nitrite (N)	2014/10/15	98	80 - 120	99	80 - 120	<0.0050	mg/L	NC	20
7679776	True Colour	2014/10/15					<5.0	Col. Unit	NC (1)	20
7679801	Alkalinity (PP as CaCO3)	2014/10/15					<0.50	mg/L	NC	20
7679801	Alkalinity (Total as CaCO3)	2014/10/15	NC	80 - 120	95	80 - 120	<0.50	mg/L	6.5	20
7679801	Bicarbonate (HCO3)	2014/10/15					<0.50	mg/L	6.4	20
7679801	Carbonate (CO3)	2014/10/15					<0.50	mg/L	NC	20
7679801	Hydroxide (OH)	2014/10/15					<0.50	mg/L	NC	20
7679823	рН	2014/10/15			101	97 - 103			0.55	N/A
7679824	Conductivity	2014/10/15			99	80 - 120	<1.0	uS/cm	0.27	20
7679826	Dissolved Chloride (Cl)	2014/10/15	110	80 - 120	106	80 - 120	<0.50	mg/L	NC	20
7679830	Dissolved Sulphate (SO4)	2014/10/15	112	80 - 120	98	80 - 120	<0.50	mg/L	0.69	20
7680024	Total Ammonia (N)	2014/10/15	83	80 - 120	100	80 - 120	<0.0050	mg/L	NC	20
7680028	Total Ammonia (N)	2014/10/15	90	80 - 120	102	80 - 120	<0.0050	mg/L	NC	20
7681235	Total Aluminum (Al)	2014/10/21	99	80 - 120	104	80 - 120	<3.0	ug/L	NC	20
7681235	Total Antimony (Sb)	2014/10/21	90	80 - 120	99	80 - 120	<0.50	ug/L	NC	20
7681235	Total Arsenic (As)	2014/10/21	100	80 - 120	97	80 - 120	<0.10	ug/L	14	20
7681235	Total Barium (Ba)	2014/10/21	NC	80 - 120	100	80 - 120	<1.0	ug/L	1.4	20
7681235	Total Beryllium (Be)	2014/10/21	103	80 - 120	100	80 - 120	<0.10	ug/L	NC	20
7681235	Total Bismuth (Bi)	2014/10/21	100	80 - 120	100	80 - 120	<1.0	ug/L	NC	20
7681235	Total Boron (B)	2014/10/21					<50	ug/L	NC	20
7681235	Total Cadmium (Cd)	2014/10/21	100	80 - 120	98	80 - 120	<0.010	ug/L	1.7	20
7681235	Total Chromium (Cr)	2014/10/21	104	80 - 120	100	80 - 120	<1.0	ug/L	NC	20
7681235	Total Cobalt (Co)	2014/10/21	104	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
7681235	Total Copper (Cu)	2014/10/21	101	80 - 120	99	80 - 120	<0.50	ug/L	NC	20



Maxxam Job #: B492574 Report Date: 2014/10/22

# QUALITY ASSURANCE REPORT(CONT'D)

SRK CONSULTING Client Project #: SRK 1CT008.043 / LFN

SA DENA HES - LFN MONITORING PROGRAM,

Site Location: WATSON LAKE, YUKON Your P.O. #: 8470 Sampler Initials: JC

			Matrix	Spike	Spiked	Blank	Method	Blank	RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7681235	Total Iron (Fe)	2014/10/21	102	80 - 120	104	80 - 120	<10	ug/L	NC	20
7681235	Total Lead (Pb)	2014/10/21	103	80 - 120	99	80 - 120	<0.20	ug/L	NC	20
7681235	Total Lithium (Li)	2014/10/21	107	80 - 120	107	80 - 120	<5.0	ug/L	NC	20
7681235	Total Manganese (Mn)	2014/10/21	105	80 - 120	96	80 - 120	<1.0	ug/L	NC	20
7681235	Total Molybdenum (Mo)	2014/10/21	NC	80 - 120	98	80 - 120	<1.0	ug/L	NC	20
7681235	Total Nickel (Ni)	2014/10/21	106	80 - 120	105	80 - 120	1.4 ,RDL=1.0	ug/L	NC	20
7681235	Total Selenium (Se)	2014/10/21	98	80 - 120	103	80 - 120	<0.10	ug/L	11	20
7681235	Total Silicon (Si)	2014/10/21					<100	ug/L	2.6	20
7681235	Total Silver (Ag)	2014/10/21	104	80 - 120	103	80 - 120	<0.020	ug/L	NC	20
7681235	Total Strontium (Sr)	2014/10/21	NC	80 - 120	94	80 - 120	<1.0	ug/L	1.5	20
7681235	Total Thallium (Tl)	2014/10/21	104	80 - 120	98	80 - 120	<0.050	ug/L	NC	20
7681235	Total Tin (Sn)	2014/10/21	104	80 - 120	107	80 - 120	<5.0	ug/L	NC	20
7681235	Total Titanium (Ti)	2014/10/21	91	80 - 120	104	80 - 120	<5.0	ug/L	NC	20
7681235	Total Uranium (U)	2014/10/21	103	80 - 120	98	80 - 120	<0.10	ug/L	0.86	20
7681235	Total Vanadium (V)	2014/10/21	98	80 - 120	101	80 - 120	<5.0	ug/L	NC	20
7681235	Total Zinc (Zn)	2014/10/21	NC	80 - 120	102	80 - 120	<5.0	ug/L	NC	20
7681235	Total Zirconium (Zr)	2014/10/21					<0.50	ug/L	NC	20
7681271	Strong Acid Dissoc. Cyanide (CN)	2014/10/16	102	80 - 120	103	80 - 120	0.00052 ,RDL=0.00050	mg/L	NC	20
7681640	Dissolved Aluminum (Al)	2014/10/17	107	80 - 120	103	80 - 120	<3.0	ug/L	NC	20
7681640	Dissolved Antimony (Sb)	2014/10/17	99	80 - 120	101	80 - 120	<0.50	ug/L	NC	20
7681640	Dissolved Arsenic (As)	2014/10/17	104	80 - 120	103	80 - 120	<0.10	ug/L	5.5	20
7681640	Dissolved Barium (Ba)	2014/10/17	NC	80 - 120	98	80 - 120	<1.0	ug/L	2.3	20
7681640	Dissolved Beryllium (Be)	2014/10/17	102	80 - 120	101	80 - 120	<0.10	ug/L	NC	20
7681640	Dissolved Bismuth (Bi)	2014/10/17	96	80 - 120	98	80 - 120	<1.0	ug/L	NC	20
7681640	Dissolved Boron (B)	2014/10/17					<50	ug/L	NC	20
7681640	Dissolved Cadmium (Cd)	2014/10/17	100	80 - 120	98	80 - 120	<0.010	ug/L	NC	20
7681640	Dissolved Chromium (Cr)	2014/10/17	101	80 - 120	99	80 - 120	<1.0	ug/L	NC	20
7681640	Dissolved Cobalt (Co)	2014/10/17	98	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
7681640	Dissolved Copper (Cu)	2014/10/17	95	80 - 120	98	80 - 120	<0.20	ug/L	NC	20



Success Through Science®

Maxxam Job #: B492574 Report Date: 2014/10/22

# QUALITY ASSURANCE REPORT(CONT'D)

SRK CONSULTING Client Project #: SRK 1CT008.043 / LFN

SA DENA HES - LFN MONITORING PROGRAM,

Site Location: WATSON LAKE, YUKON Your P.O. #: 8470 Sampler Initials: JC

			Matrix	Spike	Spiked	Blank	Method	Blank	RP	D
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits
7681640	Dissolved Iron (Fe)	2014/10/17	102	80 - 120	101	80 - 120	<5.0	ug/L	NC	20
7681640	Dissolved Lead (Pb)	2014/10/17	97	80 - 120	100	80 - 120	<0.20	ug/L	NC	20
7681640	Dissolved Lithium (Li)	2014/10/17	105	80 - 120	104	80 - 120	<5.0	ug/L	NC	20
7681640	Dissolved Manganese (Mn)	2014/10/17	100	80 - 120	99	80 - 120	<1.0	ug/L	NC	20
7681640	Dissolved Molybdenum (Mo)	2014/10/17	NC	80 - 120	96	80 - 120	<1.0	ug/L	NC	20
7681640	Dissolved Nickel (Ni)	2014/10/17	96	80 - 120	99	80 - 120	<1.0	ug/L	NC	20
7681640	Dissolved Selenium (Se)	2014/10/17	96	80 - 120	92	80 - 120	<0.10	ug/L	2.2	20
7681640	Dissolved Silicon (Si)	2014/10/17					<100	ug/L	2.2	20
7681640	Dissolved Silver (Ag)	2014/10/17	98	80 - 120	85	80 - 120	<0.020	ug/L	NC	20
7681640	Dissolved Strontium (Sr)	2014/10/17	NC	80 - 120	102	80 - 120	<1.0	ug/L	0.099	20
7681640	Dissolved Thallium (Tl)	2014/10/17	97	80 - 120	103	80 - 120	<0.050	ug/L	NC	20
7681640	Dissolved Tin (Sn)	2014/10/17	100	80 - 120	99	80 - 120	<5.0	ug/L	NC	20
7681640	Dissolved Titanium (Ti)	2014/10/17	102	80 - 120	100	80 - 120	<5.0	ug/L	NC	20
7681640	Dissolved Uranium (U)	2014/10/17	100	80 - 120	97	80 - 120	<0.10	ug/L	1.4	20
7681640	Dissolved Vanadium (V)	2014/10/17	101	80 - 120	98	80 - 120	<5.0	ug/L	NC	20
7681640	Dissolved Zinc (Zn)	2014/10/17	98	80 - 120	100	80 - 120	<5.0	ug/L	NC	20
7681640	Dissolved Zirconium (Zr)	2014/10/17					<0.50	ug/L	NC	20
7682854	Dissolved Mercury (Hg)	2014/10/20	114	80 - 120	105	80 - 120	<0.010	ug/L	NC	20
7683057	Fluoride (F)	2014/10/17	99	80 - 120	94	80 - 120	<0.010	mg/L	6.1	20
7685144	Total Mercury (Hg)	2014/10/20	84	80 - 120	106	80 - 120	<0.010	ug/L	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.

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.

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) Sample arrived to laboratory past recommended hold time.



Your P.O. #: 8470 Sampler Initials: JC

#### VALIDATION SIGNATURE PAGE

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

July

Andy Lu, Data Validation Coordinator

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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1 SW14-01		KW1287	Surface W	14/10/11 11:03										x	x	x	x	x	x	x			x	x	x	x	x		9
Sample	Identification	Lab Identificatio	Sample Type	Date/Time(24hr) Sampled	<b>BTEX/VPH</b>	VOC/VPH	EPH	PAH	CCME-PHC (Fractions 1-4 Plus BTEX)	CCME-PHC (Fractions	CCME-PHC (Fraction 1 Plus BTEX)	Other	Phenols by 4AAP	Diecohrad	Metals (DM)	Total Metals	Nitrate	Chloride	Total Su			Bromide	Mercury	Cyanide	Colour	Dissolved Mercury (field filtered,	turbidity	НОГР	Number of Containers
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Sample Control Number (SCN)	Sample Location	Sa. #	Sample Depth (m)	Sample Matrix (over)	Date Sampled (D/M/Y)	Time Sampled (HH:MM)	Sample Type (over)	QAQC Code (over)	Related SCN (over)	Number of Containers	COPH/HEPH Linc.	BREX/UPH	Dis. Netals	Dis New	Anions	Vocs			RUSH	Remarks (over)		
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Sample Control Number (SCN)			ample ocation	Sa. #	Sample Depth	Sample Matrix	Date Sampled	Time Sampled	Sample Type	QAQC Code	Related SCN	Number of Containers	ССРН ГНЕРНСіл.	BREXVIPH	_	-	Arians				_	Remarks	
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