

September 25, 2013

Northwest Territories Water Board P.O. Box 2531 #302, 125 Mackenzie Road Inuvik, NT X0E 0T0

Mr. Ron Wallace Executive Director

Dear Mr. Wallace:

Unipkat I-22 2013 Monitoring and Sampling Program Report For Type B Water License N7L1-1831

IEG Consultants Ltd. (IEG) is pleased to submit the 2013 Site Monitoring and Sampling Program Report to the Northwest Territories Water Board in accordance with the requirements of the current water licence N7L1-1831.

If you have any questions, please call the undersigned at (403) 730-6809.

Yours truly, IEG CONSULTANTS LTD.

Nicole Wills

Nicole Wills, P. AG.

NW

c.c. Randall Warren - Shell Canada Energy

c.c. Veronique D'Amours-Gauthier – Fisheries and Oceans Canada



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2013 Monitoring and Sampling Program Report

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1 BACKGROUND

The Unipkat I-22 wellsite (site) was an exploration natural gas well drilled by Shell Canada Ltd. (Shell) in 1972 and 1973. The well was originally spudded on September 8, 1972 and the drilling rig was released on March 6, 1973. Drilling was completed at the site under Indian and Northern Affairs Canada land use license N72A088. The drilling sump was constructed on July 29, 1972, enlarged during drilling operations, and capped April 3, 1972.

Shell conducted a drilling sump remediation program at the site between February and April 2011. The site is located within the Inuvialuit Settlement Region, along the eastern bank of Arvoknar Channel, southwest of the Kendall Island Bird Sanctuary. The closest community is Tuktoyaktuk, Northewest Territories (NT).

As part of the remedial program a Type "B" water licence was granted by the Northwest Territories Water Board (NWTWB). Licence N7L1-1831 requires that a site monitoring and sampling program, approved by the NWTWB, be conducted in 2012 and 2013. The site monitoring and sampling plan (IEG, 2011) was submitted in June 2011 to the NWTWB for review, and approval was granted in February 2012. This report summarizes the activities conducted by IEG Consultants Ltd. (IEG) at the site in 2013.

2 OBJECTIVE AND SCOPE OF WORK

The objective of the 2013 Site Monitoring and Sampling Program was to monitor the remediated drilling sump and site conditions. The scope of work included the following:

- mobilization to site;
- conduct a visual inspection of the site;
- collect groundwater samples from the existing monitoring wells for chemical analyses;
- collect thermal data from the existing thermistor installations for interpretation;
- promote slope stabilization of the eroding river bank with the placement of timber debris and willow staking;
- install fluorescent markers at 5 meter intervals from the riverbank to the well centre for erosion monitoring;
- collect six surface soil samples in the area north of the remediated drilling sump and submit for laboratory analysis;
- demobilization from site; and,
- preparation and submission of a report summarizing the 2013 site activities.

3 METHODOLOGY

The 2013 Site Monitoring and Sampling Program included five aspects: visual inspection of the site, collection and analysis of groundwater samples from existing monitoring wells on-site, collection and



analysis of data from existing thermistors on-site, site maintenance, and surface soil sample collection and analysis.

3.1 Visual Inspection and Site Maintenance

IEG personnel conducted a visual inspection of the site on August 17 and September 2, 2013. Data collected included:

- date, monitoring event number, weather conditions (temperature, precipitation, cloud cover, and wind direction) at the time of inspection;
- name of inspector;
- observations of: subsidence, erosion or frost action, potential seepage, areas of water pooling or discharge, resurgence, shoreline stability, soil staining, vegetation stress, odours and/or hydrocarbon sheen;
- condition of monitoring well/thermistors; and,
- photographic evidence of the inspection.

During the visual inspection, global positioning system data of the current shoreline of the Arvoknar Channel adjacent to the site was collected (Figure 1).

Site maintenance activities conducted on August 17, 2013 involved the placement of timber debris and willow staking to promote slope stabilization and installation of fluorescent markers to monitor erosion.

3.2 Groundwater Monitoring and Sampling

There are currently 10 groundwater monitoring wells installed at the site. The monitoring program included monitoring and sampling the existing (and functioning) monitoring wells. Locations of the current monitoring wells are shown on Figure 1.

The following protocol applied at each monitoring well location:

- measurement of the groundwater/product level with an interface probe; and,
- measurement of combustible vapours in the monitoring well head spaces (using an RKI Instruments Eagle hydrocarbon surveyor)

Following monitoring groundwater conditions, approximately one well volume of groundwater was purged and disposed on-site to allow for recharging of fresh groundwater into the well screen in preparation for sampling.

Subsequent to purging, groundwater samples were collected using new waterra tubing and footvalves to reduce the risk of contamination. Samples were collected in laboratory supplied sterile bottles and stored in a cooler with ice to preserve sample integrity. The samples were transported to AGAT in Edmonton, Alberta under standard chain-of-custody protocol for laboratory analysis of:



- petroleum hydrocarbon (PHC) parameters including benzene, toluene, ethylbenzene, xylenes (BTEX) and fractions F1 to F4;
- polyaromatic hydrocarbons (PAHs);
- total and dissolved metals; and,
- routine potability.

3.3 Thermal Data Collection

There are currently two thermistors installed at the site. The thermistors are used to monitor the ground thermal profile within the backfilled former drilling sump compared to a control point on the site. The thermistor locations are shown on Figure 1. Thermistor data was downloaded onto a field laptop on September 2, 2013.

3.4 Soil Sampling

Surface soil samples were collected on August 17, 2013, north of the sump remediated in 2011 to characterize surface soil where residual exceedances were identified. Test holes were advanced using a shovel and samples were collected at 0.0 m to 0.15 m, 0.15 m to 0.3 m, and 0.3 m to 0.6 m depth intervals.

Soil samples were collected in laboratory supplied sterile jars and kept cool prior to transport off site. Samples were submitted under standard chain of custody protocol to AGAT in Edmonton, Alberta for analysis of:

- PHC parameters including BTEX and fractions F1 to F4;
- PAHs
- regulated metals including barium by fusion; and,
- detailed salinity.

3.5 Quality Assurance and Quality Control

One soil replicate sample was collected as per Canadian Council of Ministers of the Environment (CCME) Guidance, as part of the quality assurance/quality control (QA/QC) program for the site. The replicate sample was submitted to the laboratory under a blind sample designation (Dup A) and analyzed in order to evaluate analytical precision and sampling procedures. The data was evaluated using Zeiner's (1994) relative percent difference method.

Field sampling QA/QC measures included implementation of IEG's site investigation manual for guidelines and protocols regarding field instrument calibration, sampling techniques, and personal protection equipment. To prevent cross contamination, new/or cleaned (as appropriate) sampling equipment was used during sample collection. Nitrile gloves were worn when handling samples and were changed between sampling locations.



3.6 Soil and Groundwater Quality Assessment Guidelines

The dominant soil texture at the site was determined during previous assessments to be fine-grained. Based on the land use of the site and the surrounding properties, BTEX and inorganic parameters (salinity and metals) in soil were compared to the fine-textured soil guidelines found in the CCME Canadian Environmental Quality Guidelines (CEQG), (Update 7.0, September 2007) for residential/parkland land use, where applicable. True total barium results were compared to the Alberta Environment (AENV) Soil Remediation Guidelines for Barite: Environmental Health and Human Health guidelines (AENV, 2009). Groundwater was also compared to the CCME CEQG, 1999 (Update 7.0, September 2007) for residential/parkland land use, where applicable.

4 RESULTS AND DISCUSSION

4.1 Visual Inspection and Site Maintenance

Based on the 2013 visual inspection, the backfilled former drilling sump area and shoreline exhibited signs of erosion where sloughing has resulted in soil loss. At the section of shoreline observed to have the greatest degree of erosion, the shoreline has eroded approximately 9 m since June 2012 and approximately 13 m since June 2011. The rate of erosion is expected to stabilize over time and will continue to be monitored. Signs of staining, vegetative stress or cap failure were not observed. Two of the monitoring wells (MW1 and MW3) were observed to be damaged (Appendix I, Photograph 1) and one monitoring well (MW4) could not be located.

Site maintenance involved the relocation of timber debris from the site to the eroding river bank (Appendix I, Photographs 2 and 3) and the placement of fluorescent markers at 5 m intervals from the riverbank to the well center to monitor erosion (Appendix I, Photograph 4). Site maintenance also included planting two rows of approximately ten willow stakes along the east corner and southern extent of the eroding riverbank to assist with slope stabilization (Appendix I, Photograph 2).

4.2 Groundwater Monitoring and Sampling

In September 2013, monitoring wells MW1 and MW3 were observed to be damaged and monitoring well MW4 could not be located. The remaining monitoring wells were monitored for depth to groundwater and total well depth. The headspace of each well was monitored for organic vapours using an RKI Instruments Eagle hydrocarbon surveyor. Each monitoring well, with the exception of monitoring well MW11-03, was found to be dry. Groundwater monitoring well details and groundwater monitoring results are included in Table 1.

Following monitoring groundwater conditions, at monitoring well MW11-03, approximately one well volume of groundwater was purged and disposed on-site to allow for recharging of fresh groundwater into the well screen in preparation for sampling (Appendix I, Photograph 5).

Laboratory analytical results indicated concentrations of routine potability parameters chloride (723 mg/L) and iron (3.3 mg/L) at monitoring well MW11-03 exceeded the applicable guidelines (120 mg/L and 0.3 mg/L).



Laboratory analytical results for dissolved metals were compared to the CCME CEQG guidelines for dissolved metals in groundwater and indicated concentrations of cadmium (0.000660 mg/L), copper (0.008 mg/L), iron (3.3 mg/L), selenium (0.005 mg/L), silver (0.000310 mg/L), and zinc (0.046 mg/L) at monitoring well MW11-03 exceeded the applicable guidelines (0.00002 mg/L, 0.004 mg/L, 0.3 mg/L, 0.001 mg/L, 0.0001 mg/L, and 0.03 mg/L, respectively). Laboratory analytical results for total metals were also compared to CCME CEQG guidelines for dissolved metals in groundwater as there is not a guideline for total metals in groundwater. Total metals parameters aluminum, cadmium, copper, iron, selenium, silver, and zinc exceeded the applicable dissolved metals guidelines. Laboratory analytical results for dissolved and totals metals are included in Table 2.

Laboratory analytical results indicated concentrations of PHC and PAH parameters at monitoring well MW11-03 were below the applicable guidelines (Table 3).

Laboratory analytical reports are included in Appendix II. Monitoring well logs are included in Appendix III.

4.3 Thermal Data Analysis

Thermistor T3 is located to the north of the excavation towards the lease boundary, while thermistor T4 is within the backfilled former drilling sump. Thermal records were downloaded from the T3 and T4 dataloggers in September 2013. The downloaded data spanned from September 2012 to August 2013. The data for thermistor T3 was corrupted and could not be analyzed. A graph showing average monthly temperatures for each bead depth at thermistor T4 is provided in Appendix IV. Previously reported thermal data were presented in the Stage 1 – 2011 Site Remediation Report (IEG, 2012a) and the Unipkat I-22 2012 Monitoring and Sampling Program (IEG, 2012b) submitted by IEG in March 2012 and September 2012. The graphs from those submissions (with data spanning from March 2011 to August 2011 for T3 and April 2011 to August 2012 for T4) are also included in Appendix IV.

The graphs depict average changes in temperature with depth for each month that data was recorded. On the 2011 graph of the T3 data, at depths of between 1.5 m below ground surface (bgs) and 5.0 m bgs, the temperature of the ground was less than zero degrees Celcius, which is consistent with historical values at this location and at other previously installed locations.

Similar to the 2011 and 2012 graphs, the 2013 graph of the T4 data indicates the temperature of the ground was less than zero degrees Celcius below approximately 1.0 m bgs. The 2012 graph shows the variation decreased between the sampling months from what was shown on the 2011 graph, indicating the ground was returning to equilibrium with the general thermal regime at the site. The results from 2013 support this further as the temperature variation between sampling months from 2012 to 2013 was minimal.

4.4 Soil Sampling

Six samples were collected north of the sump remediated in 2011 to characterize surface soil where residual exceedances were identified (Appendix I, Photograph 6). Surface soil samples were collected at 0.0 m to 0.15 m, 0.15 m to 0.3 m, and 0.3 m to 0.6 m depth intervals. The sample locations are



shown on Figure 1. The soil analytical results are summarized in Table 4 and Table 5, and laboratory analytical reports are included in Appendix II.

Laboratory results reported indicate that soil exceeded the applicable EC guideline (2 dS/m) in nine of the 12 soil samples collected. The EC values in 2013 ranged from 1.01 dS/m at sample location TH13-05 (0.3-0.6m) to 8.89 dS/m at sample location TH13-02 (0.0-0.15m). The SAR value (5.47 dS/m) at sample location TH13-02 (0.0-0.15m) was slightly above the SAR guideline. The Arvoknar Channel is presumed to have elevated salinity due to mixing water from the Beaufort Sea.

Reported metals parameters were less than applicable guidelines for the samples submitted with the exception of total barium. Exceedances of the CCME guideline for total barium were reported in each sample collected with the exception of samples TH13-04 (0.0-0.15 m), TH13-05 (0.0-0.15 m), and TH13-05 (0.3-0.6 m). The samples were analyzed for barium by fusion and the results were less than the applicable guideline.

The PHC results for each of the 12 soil samples reported concentrations less than the applicable guidelines. Soil samples TH13-01 (0.0-0.15) and TH13-02 (0.0-0.15) were analyzed for PAHs and reported concentrations less than the detection limit and applicable guideline for each PAH parameter.

4.5 Quality Assurance/Quality Control Results

Quality assurance and quality control for analytical data was assessed by collecting a field replicate sample. A blind replicate was obtained with a frequency of 10% of the samples collected. A replicate soil sample was collected from sample location TH13-02 (0.0-0.15 m) and labeled Dup A. Replicate sample laboratory analytical results are included in Table 6.

Zeiner's *Environmental Standard's Field Duplicate Criteria* has been applied in order to evaluate the precision of the analytical results (Zeiner, 1994). Precision in analytical results may be evaluated by calculating the relative percent difference (RPD) or absolute difference (AD) of duplicate samples using the following formulae:

$$RPD = \frac{(S-D)}{(S+D)/2} \times 100$$
 $AD = (S-D)$

where: RPD and AD are absolute values

S is the original sample result (mg/kg)

D is the duplicate sample result (mg/kg)

If both the original and replicate soil sample concentrations are greater than or equal to five times the laboratory detection limit for a given parameter, the RPD must be less than or equal to 40%. If the results lie outside of the range, they should be considered estimates only (Zeiner, 1994).

If at least one of the sample concentrations is less than or equal to five times the laboratory detection limit for a given parameter, the AD should be less than or equal to twice the detection limit. If the AD

is greater than twice the detection limit, the results should be considered estimates only (Zeiner, 1994).

If one of the sample concentrations is above the detection limit and its replicate sample concentration is less than the detection limit, the difference between the reported concentration and one-half the detection limit should be less than or equal to twice the detection limit. If the difference is greater than twice the detection limit, the results should be considered estimates only (Zeiner, 1994).

Analyzed parameters from 2013 were assessed using the Zeiner criteria. The replicate sample submitted did not meet the Zeiner criteria for Total Barium. Based on the results of the replicate analysis, analytical results for Total Barium should be considered estimates.

Additionally, AGAT conducts quality assurance and quality control procedures during analysis, including the regular use of calibration checks, surrogate matrix spikes, blanks, and laboratory duplicates. Laboratory quality assurance reports and analytical methods are included in Appendix II.

5 CONCLUSIONS AND RECOMMENDATIONS

IEG personnel conducted the 2013 Site Monitoring and Sampling Program, which included a visual inspection, groundwater monitoring, soil sampling and thermal monitoring, at the site in September 2013. Based on the 2013 visual inspection, the backfilled former drilling sump area and shoreline exhibited signs of erosion where sloughing has resulted in soil loss. At the section of shoreline observed to have the greatest degree of erosion, the shoreline has eroded approximately 9 m since June 2012 and approximately 13 m since June 2011. The rate of erosion is expected to stabilize over time and will continue to be monitored. There were no observed signs of staining, vegetative stress or cap failure observed.

Monitoring wells MW1 and MW3 were found to be damaged during the site visit and monitoring well MW4 could not be located. Each of the remaining monitoring wells, with the exception of monitoring well MW11-03, were found to be dry.

Laboratory analytical results indicated concentrations of routine potability parameters chloride and iron, and dissolved metals parameters cadmium, copper, iron, selenium, silver, and zinc exceeded the applicable guidelines at monitoring well MW11-03.

Based on the thermal monitoring data, the ground is frozen from approximately 1.0 m bgs to the maximum depth of investigation of 5.5 m bgs. Minimal variation in temperature between the same sampling month at T4 indicates the ground has returned to equilibrium with the general thermal regime at the site.

Soil analytical data reported EC and SAR results greater than the applicable guideline values of 2 dS/m and 5 dS/m. These results are expected to be elevated based on proximity of the source area (Arvoknar Channel) and the Beaufort Sea.



IEG recommends continuing site visits on an annual basis to conduct maintenance activities and monitor erosion.

6 CLARIFICATIONS OF THIS REPORT

This report was prepared by IEG for the account of Shell Canada Energy. The material in it reflects IEG's best judgment in light of the information available to it at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. IEG accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The interpretations and conclusions contained herein are based on data derived from a sampling program, where a limited number of soil samples were collected at widely spaced intervals. The sampling method determines surface and subsurface conditions at specific locations where samples were taken and where in-situ tests were conducted, only at the time they were obtained and to the depths penetrated.

The samples and tests cannot be relied upon to accurately reflect the nature and extent of variations that usually exist between sampling or testing locations. The recommendations included herein are based in part on assumptions about variations between sampling or testing locations.

7 CLOSING

We trust this report meets your approval and satisfies your current needs. Should you have any questions or comments, please contact the undersigned at (403) 730-6809.

IEG CONSULTANTS LTD.

Nicole Wills, P. Ag. (Alberta)

REFERENCES

- Alberta Environment (AENV), 2009. Soil Remediation Guidelines for Barite: Environmental Health and Human Health. February, 2009. Publication No. T/738.
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- Zeiner, S.T., 1994. Realistic Criteria for the Evaluation of Field Duplicate Sample Results. Reported from the Proceeding of Superfund XV November 29-December 1, 1994 Sheraton Washington Hotel, Washington D.C.



TABLES

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GENERAL	Location		DELINES	CEQG - Freshwater Aquatic Life	VALYTICAL	MW11-01	MW11-02	MW11-03	MW11-04	MW1	MW2	MW3	MW6	0
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Table 2: Summary of Groundwater Analytical Results for Total and Dissolved Metals Parameters

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Table 3: Summary of Groundwater Analytical Results for Petroleum Hydrocarbon and Polyaromatic Hydrocarbon Parameters

GENERAL			GUIDELINES	CEQG - Freshwater Aquatic Life	ANALYTICAL	MW11-003 2
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sbirdf. wnjpo unisəugei unisse Table 4: Summary of Surface Soil Analytical Results for Salinity, Physical, and Trace Metal Parameters RAZ , citeR notqrozbA mult 7.41 3.66 7.39 3.17 7.43 8.89 7.34 2.19 7.35 6.28 7.39 4.16 6.81 2.25 7.24 1.82 7.00 1.01 7.10 1.01 7.24 1.25 7.24 1.25 7.24 1.25 7.24 1.25 7.24 1.25 7.24 1.25 7.24 1.25 7.24 1.25 7.24 1.25 7.24 1.25 7.24 1.25 7.24 1.25 7.24 1.25 ctrical Conductivity, EC (dS/m) Sample Date (yyyy-mm-dd) Sample Depth (m bgs)								

Shell Canada Energy Unipkat I-22 2013 Monitoring and Sampling Report

g Pytene (mg/kg) 0.02 . 8 0.022 0.035 0.01 <0.05 <0.05 <0,05 <0.05 <0.05 . 500 <0.03 **ca.03** . Q Q <0.005 <0.005 spylbenzene euenjo. Table 5: Summary of Surface Soil Analtyical Results for Petroleum Hydrocarbon Sample Date (yyyy-mm-dd) 2013-06-17 2013-06-17 2013-08-17 2013-08-17 2013-08-17 2013-08-17 2013-08-17 2013-08-17 2013-08-17 2013-08-17 2013-08-17 Sample Depth {m bgs} Sample Designation

Shell Canada Energy Unipkat 1-22 2013 Monitoring and Sampling Report

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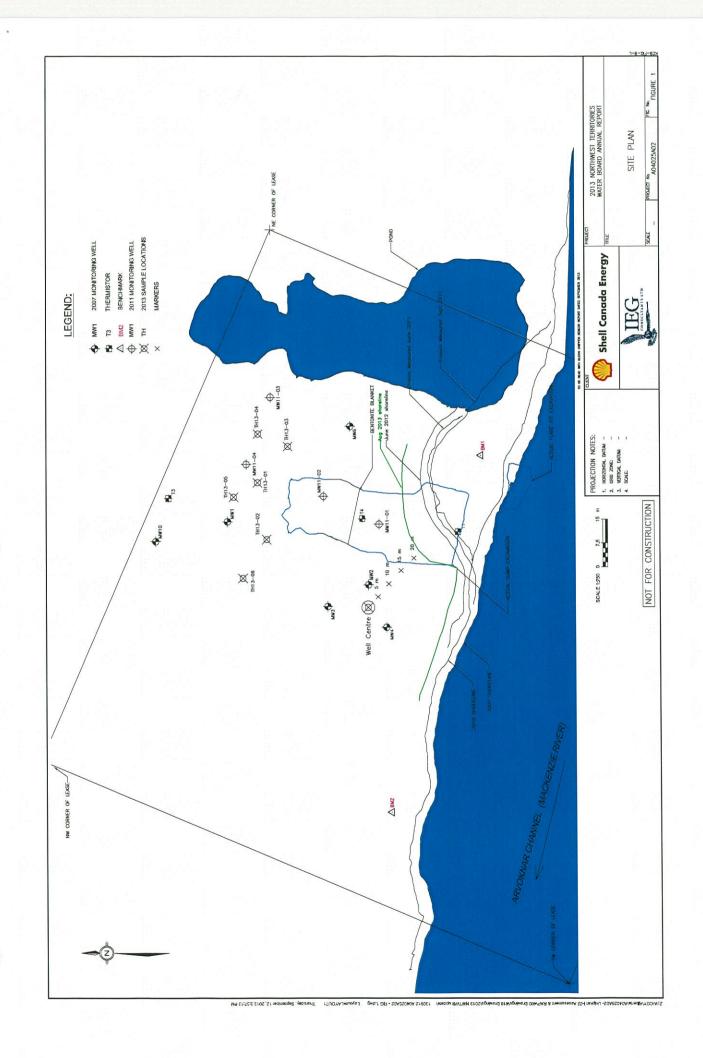
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APPENDIX I

Site Photographs



Photograph 1: View of damaged monitoring well MW 1 (September 2, 2013).



Photograph 2: View northeast of eroded river bank, markers, and willow stakes (August 17, 2013).





Photograph 3: View southwest of timber debris placed on eroded riverbank (August 17, 2013).



Photograph 4: View southeast of Unipkat I-22 well center sign and markers (August 17, 2013).





Photograph 5: View east of groundwater sampling at monitoring well MW11-003 (September 2, 2013).



Photograph 6: View of surface soil sample locations (August 17, 2013).



APPENDIX II

Laboratory Analytical Reports



6310 ROPER ROAD EDMONTON, ALBERTA CANADA T6B 3P9 TEL (780)395-2525 FAX (780)462-2490 http://www.agatlabs.com

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)
PO BOX 3178
INUVIK, NT X0E0T0
(403) 262-5505

ATTENTION TO: Nicole Wills

PROJECT NO: A04025A02/Unipkat I-22

AGAT WORK ORDER: 13E754530

TRACE ORGANICS REVIEWED BY: Jarrod Roberts, Operations Manager WATER ANALYSIS REVIEWED BY: Jarrod Roberts, Operations Manager

DATE REPORTED: Sep 10, 2013

PAGES (INCLUDING COVER): 16

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (780) 395-2525

*NOTES			
E 45 404			

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

Page 1 of 16

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA)

Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA) AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

ATTENTION TO: Nicole Wills

			Petro	oleum Hy	Petroleum Hydrocarbons (BTEX/F1-F4) in Water	3TEX/F	-1-F4) i	n Wate	L .					
DATE RECEIVED: 2013-09-04										DAT	DATE REPORTED: 2013-09-10	ED: 2013-	09-10	
		SAMPLE DESCRIPTION:	CRIPTION:	MW11-003										
		SAM	SAMPLE TYPE:	Water										
		DATE	DATE SAMPLED:	9/2/2013										
Parameter	Unit	8/9	RDL	4708770										
Benzene	mg/L		0.0005	<0.0005										
Toluene	mg/L		0.0005	<0.0005										
Ethylbenzene	mg/L		0.0005	<0.0005										
Xylenes	mg/L		0.0005	<0.0005										
C6 - C10 (F1)	mg/L		0.1	<0.1										
C6 - C10 (F1 minus BTEX)	mg/L		0.1	<0.1										
C>10 - C16	mg/L		0.1	6.1										
C>16 - C34	mg/L		0.1	0.1										
C>34 - C50	mg/L		0.1	0.2										
Surrogate	Unit	Acceptal	Acceptable Limits				11.75							
Toluene-d8 (BTEX)	%	-09	50-150	103										
o-Terphenyl (F2-F4)	%	-09	50-150	121										

Comments: 4708770

RDL - Reported Detection Limit; G / S - Guideline / Standard
The C>6 - C10 fraction is calculated using the tolluene response factor.
The C10 - C16 fraction is calculated using the average response factor for nC10, nC16 and nC34.
BTEX has NOT been subtracted from Fraction 1.
Sample is blank corrected.

Certified By:

sted and to all the items tested

6310 ROPER ROAD

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

ATTENTION TO: Nicole Wills

DATE REPORTED: 2013-09-10 Polyaromatic Hydrocarbon Analysis - Water FWAL <0.00001 <0.00005 <0.00005 9/2/2013 <0.00001 <0.00001 <0.00001 <0.00001 <0.00001 <0.00001 4708770 <0.00001 <0.00001 <0.00001 <0.00001 <0.00001 <0.00001 <0.00001 <0.00001 <0.00001 <0.00001 94 SAMPLE DESCRIPTION: DATE SAMPLED: SAMPLE TYPE: 0.00001 0.00001 0.00001 0.00001 0.00001 0.00005 0.00001 0.00001 0.00001 0.00001 0.00005 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.0000 Acceptable Limits G/S mg/L **DATE RECEIVED: 2013-09-04** Parameter Surrogate Indeno(1,2,3-cd)pyrene Dibenzo(ah)anthracene Benzo(b)fluoranthene Benzo(k)fluoranthene 2-Methylnaphthalene Benzo(a)anthracene Benzo(ghi)perylene Benzo(a)pyrene 2-Fluorobiphenyl Acenaphthylene Acenaphthene Phenanthrene Fluoranthene Vaphthalene Anthracene Chrysene Quinoline Fluorene Acridine Pyrene

G / S - Guideline / Standard RDL - Reported Detection Limit; Comments:

p-Terphenyl-d14

50-150

Based on GC/MS target ion analysis. Isomoranthene have the same GC retention time and are reported as the sum based on the Benzo(b)fluoranthene response. Sample arrived at laboratory with air included in sample container.

Certified By:

ファル		Labo	Laboratories	S	AGAT WORK ORDER: 13E754530 PROJECT NO: A04025A02/Unipkat I-22 FAX (780)462-2490	30)395-2529 30)462-2490 patlabs con
CLIENT NAME: IEG ENVIRONMENTAL (NORTH)	MENTAL	(NORTH)			ON TO: Nicole Wills	
			CCME / /	Alberta 7	/ Alberta Tier 1 Metals (Dissolved) (Full Package)	
DATE RECEIVED: 2013-09-04					DATE REPORTED: 2013-09-10	
		SAMPLE DESCRIPTION	CRIPTION:	MW11-003	និ	
		SAME	SAMPLE TYPE:	Water		
		DATE	DATE SAMPLED:	9/2/2013		
Parameter	Unit	S/S	RDL	4708770		
Dissolved Aluminum	mg/L	0.005	0.002	0.072		
Dissolved Antimony	mg/L	900'0	0.001	<0.001		
Dissolved Arsenic	mg/L	0.005	0.001	0.003		
Dissolved Barium	mg/L	-	0.05	0.16		
Dissolved Boron	mg/L	9.0	0.01	0.04		
Dissolved Cadmium	mg/L	0.000017	0.000016	0.000660		
Dissolved Calcium	mg/L		0.3	431		
Dissolved Chromium	mg/L		0.001	9000		
Dissolved Copper	mg/L	0.002	0.002	0.008		
Dissolved Iron	mg/L	0.3	0.1	3.3		
Dissolved Lead	mg/L	0.001	0.001	0.001		
Dissolved Lithium	mg/L		0.001	0.050		
Dissolved Magnesium	mg/L		0.2	67.3		
Dissolved Manganese	mg/L	0.05	0.005	2.52		
Dissolved Mercury (Low Level)	mg/L	0.000026	0.000025	<0.000025	2	
Dissolved Molybdenum	mg/L		0.003	<0.003		
Dissolved Nickel	mg/L	0.025	0.003	0.029		
Dissolved Phosphorus	mg/L		0.08	<0.08		
Dissolved Potassium	mg/L		9.0	8.7		
Dissolved Selenium	mg/L	0.001	0.001	0.005		
Dissolved Silver	mg/L	0.0001	0.00001	0.00031		
Dissolved Silicon	mg/L		0.032	3.05		
Dissolved Sodium	mg/L	200	9.0	175		
Dissolved Strontium	mg/L		0.001	1.39		
Dissolved Sulphur	mg/L		0.3	51.3		
Dissolved Thallium	mg/L		0.0001	0.0001		
Dissolved Tin	mg/L		0.00025	0.00200		
Dissolved Uranium	mg/L	0.01	0.001	0.011		
Dissolved Vanadium	mg/L		0.001	0.002		
Dissolved Zinc	mg/L	0.03	0.001	0.046		
Dissolved Zirconium	mg/L		90.0	>0.06		

Certified By:

6310 ROPER ROAD EDMONTON, ALBERTA CANADA TGB 3P9 TEL (780)395-2525 FAX (780)462-2490 http://www.agatlabs.com

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

ATTENTION TO: Nicole Wills

CCME / Alberta Tier 1 Metals (Dissolved) (Full Package)

DATE REPORTED: 2013-09-10

DATE RECEIVED: 2013-09-04

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ABTier1 GW (Ag, F) < - Values refer to Method Detection Limit. Comments: 4708770

Certified By:

Results relate only to the items tested and to all the items tested

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

ATTENTION TO: Nicole Wills

				CCME	-	Alberta Tier 1 Metals (Total) (Full Package)	etals (To	tal) (Full	Package)					
DATE RECEIVED: 2013-09-04	4(DATE	DATE REPORTED: 2013-09-10	: 2013-09	-10	
		SA	SAMPLE DESCRIPTION:	CRIPTION:	MW11-003									
			SAME	SAMPLE TYPE:	Water									
			DATES	DATE SAMPLED:	9/2/2013									
Parameter	Unit	Ħ	G/S	RDL	4708770									1
Total Aluminum	/mg/L	/L	0.005	0.002	0.499									
Total Antimony	mg/L	٦	9000	0.001	<0.001									
Total Arsenic	mg/L	٦	0.005	0.001	0.003									
Total Barium	mg/L	٦	-	0.05	0.17									
Total Boron	mg/L	7	9.0	0.0011	0.0415									
Total Cadmium	mg/L	٦,	0.000017	0.000016	0.000578									
Total Calcium	mg/L	٦		0.3	408									
Total Chromium	mg/L	7		0.00012	0.00415									
Total Copper	mg/L	٦,	0.002	0.002	0.013									-
Total Iron	mg/L	٦	0.3	0.1	4.6									
Total Lead	mg/L	7	0.001	0.001	0.001									
Total Lithium	mg/L	L		0.001	0.054									
Total Magnesium	mg/L	_		0.2	64.4									
Total Manganese	mg/L	/L	0.05	0.005	2.50									
Total Mercury (Low Level)	mg/L	/L	0.000026	0.000025	<0.000025									
Total Molybdenum	mg/L	٦,		0.003	<0.003									
Total Nickel	mg/L	/L	0.025	0.003	0.033									-
Total Phosphorus	mg/L	/L		0.08	<0.08									
Total Potassium	mg/L	/L		9.0	0.6									
Total Selenium	mg/L	٦	0.001	0.001	0.008									
Total Silicon	mg/L	7		0.032	3.80									
Total Silver	mg/L	٦	0.0001	0.000005	0.000277									
Total Sodium	mg/L	/r	200	9.0	166									
Total Strontium	mg/L	/L		0.001	1.39									
Total Sulphur	mg/L	L		0.3	49.5									
Total Thallium	mg/L	L		900000	0.00011									37
Total Tin	mg/L	L		0.000025	0.00279									
Total Uranium	mg/L	/L	0.01	0.00007	0.0122									
Total Vanadium	mg/L	/L		0.001	0.003									
Total Zinc	mg/L	/L	0.03	0.001	0.043									
Total Zirconium	mg/L	٦,		0.01	<0.01									1

Certified By:

Results relate only to the it

DATE REPORTED: 2013-09-10

ATTENTION TO: Nicole Wills

DATE RECEIVED: 2013-09-04

CCME / Alberta Tier 1 Metals (Total) (Full Package)

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ABTier1 GW (Ag, F) < - Values refer to Report Detection Limits. Comments: 4708770 Certified By:

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

PROJECT NO: A04025A02/Unipkat I-22 **AGAT WORK ORDER: 13E754530**

ATTENTION TO: Nicole Wills

6310 ROPER ROAD EDMONTON, ALBERTA CANADA 16B 3P9 TEL (780)365-2525 FAX (780)462-2490 http://www.agatlabs.com

				Routin	Routine Chemistry Water Analysis	y Water	Analysis					
DATE RECEIVED: 2013-09-04								٥	DATE REPORTED: 2013-09-10	RTED: 20	13-09-10	
	"	SAMPLE DESCRIPTION:	CRIPTION:	MW11-003								
		SAMI	SAMPLE TYPE:	Water								
		DATE	DATE SAMPLED:	9/2/2013								
Parameter	Unit	8/9	RDL	4708770								
Hd	pH Units	6.5-8.5	NA	7.66								
p - Alkalinity (as CaCO3)	mg/L		5	<5								
T - Alkalinity (as CaCO3)	mg/L		5	543								
Bicarbonate	mg/L		2	662								
Carbonate	mg/L		2	~ 2								
Hydroxide	mg/L		2	\$								
Electrical Conductivity	uS/cm		-	3200								
Fluoride	mg/L	1.5	90.0	<0.05								(=)
Chloride	mg/L	250	-	723								
Nitrite	mg/L	3.2	0.05	<0.05								
Nitrate	mg/L	45	0.5	<0.5								
Sulfate	mg/L	200		157								
Dissolved Calcium	mg/L		0.3	431								
Dissolved Magnesium	mg/L		0.2	67.3								
Dissolved Sodium	mg/L	200	9.0	175								
Dissolved Potassium	mg/L		9.0	8.7								
Dissolved Iron	mg/L	0.3	0.1	3.3								
Dissolved Manganese	mg/L	90.0	0.005	2.52								
Calculated TDS	mg/L		1	1890								
Hardness	mg CaCO3/L		-	1350								
Ion Balance	%		0.1	102								
Nitrate + Nitrite-N	mg/L		0.01	<0.01								
Nitrate-N	mg/L		0.113	<0.113								
Nitrite-N	mg/L		0.015	<0.015								

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to CCME (D Water) < - Values refer to Report Detection Limits. Comments: 4708770

Certified By:

Results relate only to the if sted and to all the items tested



Quality Assurance

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

AGAT WORK ORDER: 13E754530 ATTENTION TO: Nicole Wills

PROJECT NO: A04025A02/Unipkat I-22

Trace Organics Analysis DUPLICATE RPT Date: Sep 10, 2013 REFERENCE MATERIAL METHOD BLANK SPIKE MATRIX SPIKE Acceptable Acceptable Method Acceptable Sample Blank Measure Limits Limits Limits PARAMETER Batch **Dup #1 Dup #2** RPD Recove Value Lower Upper Lower Upper Lower Upper Petroleum Hydrocarbons (BTEX/F1-F4) in Water Benzene 438 TW < 0.0005 < 0.0005 0.0% < 0.0005 95% 80% 120% 97% 80% 120% 111% 70% 130% Toluene 438 TW < 0.0005 < 0.0005 0.0% < 0.0005 98% 80% 120% 98% 80% 120% 111% 70% 130% 130% Ethylbenzene 438 TW < 0.0005 < 0.0005 0.0% < 0.0005 100% 80% 120% 99% 80% 120% 109% 70% **Xylenes** 438 TW < 0.0005 < 0.0005 0.0% < 0.0005 100% 80% 120% 104% 80% 120% 117% 70% 130% C6 - C10 (F1) 96% 80% 80% 94% 70% 130% 438 TW 0.0% 120% 101% 120% < 0.1 < 0.1 < 0.1 C>10 - C16 460 4705740 < 0.1 < 0.1 0.0% < 0.1 97% 80% 120% 115% 80% 120% 127% 70% 130% C>16 - C34 460 4705740 < 01 0.0% < 0.1 105% 80% 120% 105% 80% 120% 95% 70% 130% < 01 C>34 - C50 460 4705740 < 0.1 < 0.1 0.0% < 0.1 102% 80% 120% Polyaromatic Hydrocarbon Analysis - Water FWAL 0.00014 15.4% < 0.00001 70% 130% 70% 130% Naphthalene 240 TW 0.00012 70% 130% 99% 95% 2-Methylnaphthalene 240 TW 0.00001 0.00001 0.0% < 0.00001 94% 70% 130% 89% 70% 130% 70% 130% TW < 0.00005 < 0.00005 0.0% < 0.00005 96% 70% 130% 93% Quinoline 240 99% 70% 130% Acenaphthylene 240 TW < 0.00001 < 0.00001 0.0% < 0.00001 104% 70% 130% 101% 70% 130% 97% 70% 130% Acenaphthene 240 TW < 0.00001 < 0.00001 0.0% < 0.00001 97% 70% 130% 98% 70% 130% 94% 70% 130% 240 TW 0.00002 0.00002 0.0% < 0.00001 92% 70% 130% 94% 70% 130% 89% 70% 130% Fluorene 96% 240 TW 0.00006 0.00006 0.0% < 0.00001 70% 130% 101% 70% 130% 97% 70% 130% Phenanthrene 70% 130% Anthracene 240 TW < 0.00001 < 0.00001 0.0% < 0.00001 100% 70% 130% 93% 70% 130% 93% Acridine 240 TW < 0.00005 < 0.00005 0.0% < 0.00005 111% 70% 130% 103% 70% 130% 104% 70% 130% 70% 130% Fluoranthene 240 TW 0.00001 0.0% < 0.00001 103% 70% 130% 102% 130% 95% 70% < 0.00001 < 0.00001 99% 94% 130% Pyrene 240 TW 0.0% < 0.00001 101% 70% 130% 70% 130% 70% Benzo(a)anthracene 240 TW < 0.00001 < 0.00001 0.0% < 0.00001 70% 130% 89% 70% 130% 79% 70% 130% Chrysene 240 TW < 0.00001 < 0.00001 0.0% < 0.00001 109% 70% 130% 104% 70% 130% 91% 70% 130% 130% Benzo(b)fluoranthene 240 TW < 0.00001 < 0.00001 0.0% < 0.00001 118% 70% 130% 113% 70% 130% 87% 70% Benzo(k)fluoranthene 240 TW < 0.00001 < 0.00001 0.0% < 0.00001 112% 70% 130% 111% 70% 130% 84% 70% 130% 79% 130% Benzo(a)pyrene 240 < 0.00001 < 0.00001 0.0% < 0.00001 122% 70% 130% 110% 70% 130% 70% TW Indeno(1,2,3-cd)pyrene 240 TW < 0.00001 < 0.00001 0.0% < 0.00001 109% 70% 130% 100% 70% 130% 78% 70% 130% Dibenzo(ah)anthracene 240 TW < 0.00001 < 0.00001 0.0% < 0.00001 103% 70% 130% 96% 70% 130% 75% 70% 130% < 0.00001 < 0.00001 0.0%

Certified By:

AGAT QUALITY ASSURANCE REPORT (V1)

240

TW

Benzo(ghi)perylene

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130%

70%

81%

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

< 0.00001 110%

70%

130%

104%

70%

130%



Quality Assurance

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

PROJECT NO: A04025A02/Unipkat I-22

AGAT WORK ORDER: 13E754530
ATTENTION TO: Nicole Wills

				Wate	r Ar	nalysi	S								
RPT Date: Sep 10, 2013		es 198	D	UPLICATE		1 100	REFERE	NCE MA	TERIAL	METHOD	BLAN	SPIKE	MAT	RIX SPI	KE
	A 11/4/2 CO	Sample				Method Blank	Measured		ptable nits		Acceptable Limits				ptable nits
PARAMETER	Batch	Id	Dup #1	Dup #2	RPD	Diank	Value	Lower	Upper	Recovery	Lower		Recovery	Lower	
Routine Chemistry Water Anal	ysis									1 71					1.7
pH	407	4705739	6.57	6.57	0.0%		100%	80%	120%						
T - Alkalinity (as CaCO3)	407	4705739	97	97	0.0%	< 5	101%	80%	120%						
Bicarbonate	407	4705739	118	118	0.0%	< 5									
Electrical Conductivity	407	4705739	5220	5230	0.2%	< 1	104%	80%	120%						
Fluoride	432	4708001	< 0.05	< 0.05	0.0%	< 0.05	96%	80%	120%	100%	80%	120%	100%	80%	1209
Chloride	432	4708001	7	7	0.0%	< 1	105%	80%	120%	107%	80%	120%	105%	80%	1209
Nitrite	432	4708001	< 0.05	< 0.05	0.0%	< 0.05	102%	80%	120%	107%	80%	120%	101%	80%	1209
Nitrate	432	4708001	< 0.5	< 0.5	0.0%	< 0.5	100%	80%	120%	100%	80%	120%	100%	80%	1209
Sulfate	432	4708001	< 1	< 1	0.0%	< 1	102%	80%	120%	110%	80%	120%	104%	80%	1209
	102				0.070		.0270	0070			0070				
Comments: N/A - Not Available.															
CCME / Alberta Tier 1 Metals (Dissolved) (Full Packa	ge)												
Dissolved Aluminum	653	4708001	0.010	0.010	0.0%	< 0.002	103%	80%	120%				97%	80%	120
Dissolved Antimony	653	4708001	0.001	0.001	0.0%	< 0.001	109%	80%	120%				92%	80%	120
Dissolved Arsenic	653	4708001	0.004	0.004	0.0%	< 0.001	98%	80%	120%				98%	80%	120
Dissolved Barium	653	4708001	0.14	0.14	0.0%	< 0.05	119%	80%	120%				110%	80%	120
Dissolved Boron	653	4708001	0.72	0.75	4.1%	< 0.01	104%	80%	120%				104%	80%	120
Dissolved Cadmium	653	4708001	0.000124	0.000101	20.4%	< 0.000016	98%	80%	120%				94%	80%	120
Dissolved Calcium	430	4710228	312	313	0.3%	< 0.3	100%	80%	120%				101%	80%	120
Dissolved Chromium	653	4708001	0.007	0.007	0.0%	< 0.001	102%	80%	120%				97%	80%	120
Dissolved Copper	653	4708001	0.014	0.014	0.0%	< 0.002	98%	80%	120%				90%	80%	120
Dissolved Iron	430	4710228	<0.1	<0.1	0.0%	< 0.1	94%	80%	120%				93%	80%	120
Dissolved Lead	653	4708001	< 0.001	< 0.001	0.0%	< 0.001	101%	80%	120%				94%	80%	120
Dissolved Lithium	653	4708001	0.038	0.039	2.6%	< 0.001	96%	80%	120%				109%	80%	120
Dissolved Magnesium	430	4710228	97.5	91.4	6.4%	< 0.2	94%	80%	120%				106%	80%	120
Dissolved Manganese	430	4710228	0.467	0.465	0.3%	< 0.005	97%	80%	120%				94%	80%	120
Dissolved Mercury (Low Level)	113	4708001	<0.	<0.	0.0%	< 0.000025	5 105%	80%	120%				87%	80%	120
Dissolved Molybdenum	653	4708001	0.018	0.018	0.0%	< 0.003	100%	80%	120%				98%	80%	120
Dissolved Nickel	653	4708001	0.016	0.017	6.1%	< 0.003	97%	80%	120%				92%	80%	120
Dissolved Phosphorus	430	4710228	<0.08	<0.08	0.0%	< 0.08	85%	80%	120%				103%	80%	120
Dissolved Potassium	430	4710228	12.8	12.8	0.8%	< 0.6	89%	80%	120%				96%	80%	120
Dissolved Selenium	653	4708001	0.007	0.007	0.0%	< 0.001	101%	80%	120%				98%	80%	120
Dissolved Silver	653	4708001	< 0.00001	0.00001	NA	< 0.0000	1 90%	80%	120%				82%	80%	120
Dissolved Silicon	430	4710228		7.62	1.0%	< 0.032		80%					104%	80%	
Dissolved Sodium	430	4710228		526	0.4%	< 0.6	90%	80%					100%	80%	
Dissolved Strontium	430	4710228		1.25	0.5%	< 0.001	95%		120%				95%	80%	
Dissolved Sulphur	430	4710228		323	1.3%	< 0.3	95%		120%				103%	80%	
Dissolved Thallium	653	4708001	< 0.0001	< 0.0001	0.0%	< 0.0001	99%	80%	120%				94%	80%	120
Dissolved Triallian	653		< 0.0001			< 0.0001			120%				94%		120
DISSOIVED TIII	000	47 00001	- 0.00025	- 0.00020	0.070	- 0.0002	100/0	00 /0	120/0				J-70	00 /0	120

AGAT QUALITY ASSURANCE REPORT (V1)

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Quality Assurance

CLIENT NAME: IEG ENVIRONMENTAL (NORTH) PROJECT NO: A04025A02/Unipkat I-22

AGAT WORK ORDER: 13E754530 **ATTENTION TO: Nicole Wills**

RPT Date: Sep 10, 2013		ii	D	UPLICATE		14, 119	REFEREN	ICE MA	TERIAL	METHOD	BLANK SPIKE	MAT	RIX SPI	KE
	Sample				Method Blank	Measured	Acceptable Limits		_	Acceptable Limits	Recovery		eptable mits	
	ld	Dup #1	Dup #2	RPD		Value	Lower	Upper	Recovery	Lower Upper	Recovery	Lower	Upper	
Dissolved Uranium	653	4708001	0.045	0.046	2.2%	< 0.001	100%	80%	120%			106%	80%	120%
Dissolved Vanadium	653	4708001	0.004	0.005	0.0%	< 0.001	102%	80%	120%			101%	80%	120%
Dissolved Zinc	653	4708001	0.030	0.030	0.0%	< 0.001	101%	80%	120%			95%	80%	120%
Dissolved Zirconium	430	4710228	<0.06	<0.06	0.0%	< 0.06	101%	80%	120%			98%	80%	120%
CCME / Alberta Tier 1 Metals (Total	al) (Full P	ackage)												
Total Aluminum	654	4710228	0.163	0.173	6.0%	< 0.002	105%	80%	120%			108%	80%	120%
Total Antimony	654	4710228	0.001	0.001	0.0%	< 0.001	105%	80%	120%			93%	80%	120%
Total Arsenic	654	4710228	0.004	0.004	0.0%	< 0.001	97%	80%	120%			100%	80%	120%
Total Barium	654	4710228	0.13	0.13	0.0%	< 0.05	103%	80%	120%			99%	80%	120%
Total Boron	654	4710228	0.818	0.830	1.5%	< 0.0011	105%	80%	120%			98%	80%	120%
Total Cadmium	654	4710228	0.000103	0.000107	3.8%	< 0.000016	101%	80%	120%			97%	80%	120%
Total Calcium	431	4710228	328	322	1.8%	< 0.3	105%	80%	120%			102%	80%	120%
Total Chromium	654	4710228	0.0051	0.0050	2.0%	< 0.00012	98%	80%	120%			100%	80%	120%
Total Copper	654	4710228	0.016	0.016	0.0%	< 0.002	97%	80%	120%			97%	80%	120%
Total Iron	431	4710228	0.6	0.6	0.0%	< 0.1	105%	80%	120%			96%	80%	120%
Total Lead	654	4710228	< 0.001	< 0.001	0.0%	< 0.001	96%	80%	120%			94%	80%	120%
Total Lithium	654	4710228	0.040	0.040	0.0%	< 0.001	99%	80%	120%			106%	80%	
Total Magnesium	431	4710228	105	105	0.5%	< 0.2	101%	80%	120%			100%	80%	120%
Total Manganese	431	4710228	0.533	0.532	0.2%	< 0.005	104%	80%	120%			95%	80%	120%
Total Mercury (Low Level)	133	4710228	< 0.000025	< 0.000025	0.0%	< 0.000025	102%	80%	120%			102%	80%	120%
Total Molybdenum	654	4710228	0.019	0.019	0.0%	< 0.003	98%	80%	120%			106%	80%	120%
Total Nickel	654	4710228	0.018	0.018	0.0%	< 0.003	97%	80%	120%			98%	80%	120%
Total Phosphorus	431	4710228	0.14	0.13	7.4%	< 0.08	105%	80%	120%			101%	80%	120%
Total Potassium	431	4710228	13.8	13.7	0.7%	< 0.6	95%	80%	120%			96%	80%	120%
Total Selenium	654	4710228	0.007	0.007	0.0%	< 0.001	97%	80%	120%			97%	80%	120%
Total Silicon	431	4710228	8.5	8.4	1.2%	< 0.032	NA	80%	120%			103%	80%	120%
Total Silver	654	4710228	0.000056	0.000042	0.0%	< 0.000008	5 89%	80%	120%			88%	80%	120%
Total Sodium	431	4710228	561	533	5.1%	< 0.6	96%	80%	120%			102%	80%	120%
Total Strontium	654	4710228	1.26	1.25	0.8%	< 0.001	95%	80%	120%			100%	80%	120%
Total Sulphur	431	4710228	345	345	0.0%	< 0.3	112%	80%	120%			106%	80%	120%
Total Thallium	654	4710228	0.00008	0.00008	0.0%	< 0.00006	95%	80%	120%			95%	80%	
Total Tin	654	4710228	0.000092	0.000133	NA	< 0.00002	5 103%	80%	120%			97%	80%	120%
Total Uranium	654	4710228	0.0477	0.0474	0.6%	< 0.00007	7 98%	80%	120%			101%	80%	120%
Total Vanadium	654	4710228	0.0045	0.0044	2.2%	< 0.001	98%	80%	120%			106%	80%	120%
Total Zinc	654	4710228	0.018	0.012	40.0%	< 0.001	101%	80%	120%			89%	80%	120%

AGAT QUALITY ASSURANCE REPORT (V1)

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Quality Assurance

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

AGAT WORK ORDER: 13E754530

PROJECT NO: A04025A02/Unipkat I-22

ATTENTION TO: Nicole Wills

		V	Vater	Ana	lysis	(Co	ntinu	ed)				
RPT Date: Sep 10, 2013	31 15 25 1551	a Nag J		UPLICAT	Έ		REFEREN	NCE MATERIAL	METHOD	BLANK SPIKE	MAT	RIX SPIKE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured	Acceptable Limits	Recovery	Acceptable Limits	Recovery	Acceptable Limits
		ld					Value	Lower Upper		Lower Upper		Lower Uppe

Certified By:

Jarthe

AGAT QUALITY ASSURANCE REPORT (V1)

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Method Summary

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

PROJECT NO: A04025A02/Unipkat I-22

AGAT WORK ORDER: 13E754530 ATTENTION TO: Nicole Wills

PROJECT NO: A04025A02/Unipkat	1-22	ATTENTION TO: Nicole Wills					
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE				
Trace Organics Analysis							
Benzene	ORG-170- 5110/5140/5430/5440	EPA SW846 8260	GC/MS				
Toluene	ORG-170- 5110/5140/5430/5440	EPA SW846 8260	GC/MS				
Ethylbenzene	ORG-170- 5110/5140/5430/5440	EPA SW846 8260	GC/MS				
Xylenes	ORG-170- 5110/5140/5430/5440	EPA SW846 8260	GC/MS				
C6 - C10 (F1)	ORG-170- 5110/5140/5430/5440	CCME Tier 1 Method	GC/FID				
C6 - C10 (F1 minus BTEX)	ORG-170- 5110/5140/5430/5440	CCME Tier 1 Method	GC/FID				
C>10 - C16	ORG-170-5120/5300	CCME Tier 1 Method	GC/FID				
C>16 - C34	ORG-170-5120/5300	CCME Tier 1 Method	GC/FID				
C>34 - C50	ORG-170-5120/5300	CCME Tier 1 Method	GC/FID				
Toluene-d8 (BTEX)	ORG-170- 5110/5140/5430/5440	EPA SW846 8260	GC/FID				
o-Terphenyl (F2-F4)	ORG-170-5120/5300	CCME Tier 1 Method	GC/FID				
Naphthalene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
2-Methylnaphthalene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Quinoline	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Acenaphthylene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Acenaphthene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Fluorene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Phenanthrene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Anthracene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Acridine	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Fluoranthene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Pyrene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Benzo(a)anthracene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Chrysene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Benzo(b)fluoranthene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Benzo(k)fluoranthene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Benzo(a)pyrene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Indeno(1,2,3-cd)pyrene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Dibenzo(ah)anthracene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
Benzo(ghi)perylene	ORG-170-5421	EPA SW-846 3510 & 8270	GC/MS				
2-Fluorobiphenyl	ORG-170-5420/-5421	EPA SW-846 3510 & 8270	GC/MS				
p-Terphenyl-d14	ORG-170-5420/-5421	EPA SW-846 3510 & 8270	GC/MS				



Method Summary

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

AGAT WORK ORDER: 13E754530

PROJECT NO: A04025A02/Unipkat I-22

ATTENTION TO: Nicole Wills

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis		100 100 10 10 10 10 10	
Dissolved Aluminum	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP/MS
Dissolved Antimony	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP-MS
Dissolved Arsenic	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP-MS
Dissolved Barium	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP-MS
Dissolved Boron	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP-MS
Dissolved Cadmium	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP/MS
Dissolved Calcium	INOR-171-6202, INOR-171-6100	SM 3120 B	ICP/OES
Dissolved Chromium	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP/MS
Dissolved Copper	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP-MS
Dissolved Iron	INOR-171-6202, INOR-171-6100	SM 3120 B	ICP/OES
Dissolved Lead	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP/MS
Dissolved Lithium	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP/MS
Dissolved Magnesium	INOR-171-6201, INOR-171-6100	SM 3120 B	ICP/OES
Dissolved Manganese	INOR-171-6202, INOR-171-6100	SM 3120 B	ICP/OES
Dissolved Mercury (Low Level)	INOR-171-6202, INOR-171-6100	SM 3112 B	ICP/MS
Dissolved Molybdenum	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP/MS
Dissolved Nickel	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP/MS
Dissolved Phosphorus	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP/OES
Dissolved Potassium	INOR-171-6201, INOR-171-6100	SM 3120 B	ICP/OES
Dissolved Selenium	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP/MS
Dissolved Silver	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP/MS
Dissolved Silicon	INOR-171-6201, INOR-171-6100	SM 3120 B	ICP/OES
Dissolved Sodium	INOR-171-6201, INOR-171-6100	SM 3120 B	ICP/OES
Dissolved Strontium	INOR-171-6202, INOR-171-6100	SM 3120 B	ICP/OES
Dissolved Sulphur	INOR-171-6201, INOR-171-6100	SM 3120 B	ICP/OES
Dissolved Thallium	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP/MS
Dissolved Tin	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP/MS



Method Summary

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

PROJECT NO: A04025A02/Unipkat I-22

AGAT WORK ORDER: 13E754530
ATTENTION TO: Nicole Wills

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Dissolved Uranium	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP/MS
Dissolved Vanadium	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP/MS
Dissolved Zinc	INOR-171-6202, INOR-171-6100	SM 3125 B	ICP-MS
Dissolved Zirconium	INOR-171-6201, INOR-171-6100	SM 3120 B	ICP/OES
Total Aluminum	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/MS
Total Antimony	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP-MS
Total Arsenic	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP-MS
Total Barium	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/MS
Total Boron	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/MS
Total Cadmium	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/MS
Total Calcium	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3120 B	ICP/OES
Total Chromium	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/MS
Total Copper	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/MS
Total Iron	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3120 B	ICP/OES
Total Lead	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP-MS
Total Lithium	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/MS
Total Magnesium	INOR-171-6201, INOR-171-6100	SM 3030 E; SM 3120 B	ICP/OES
Total Manganese	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3120 B	ICP/OES
Total Mercury (Low Level)	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3112 B	ICP/MS
Total Molybdenum	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/MS
Total Nickel	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/MS
Total Phosphorus	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/OES
Total Potassium	INOR-171-6201, INOR-171-6100	SM 3030 E; SM 3120 B	ICP/OES
Total Selenium	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP-MS
Total Silicon	INOR-171-6201, INOR-171-6100	SM 3030 E; SM 3120 B	ICP/OES
Total Silver	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/MS
Total Sodium	INOR-171-6201, INOR-171-6100	SM 3030 E; SM 3120 B	ICP/OES
Total Strontium	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3120 B	ICP/OES



Method Summary

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

PROJECT NO: A04025A02/Unipkat I-22

AGAT WORK ORDER: 13E754530 ATTENTION TO: Nicole Wills

PARAMETER	PARAMETER AGAT S.O.P		ANALYTICAL TECHNIQUE		
Total Sulphur	INOR-171-6201, INOR-171-6100	SM 3030 E; SM 3120 B	ICP/OES		
Total Thallium	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/MS		
Total Tin	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/MS		
Total Uranium	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/MS		
Total Vanadium	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/MS		
Total Zinc	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3125 B	ICP/MS		
Total Zirconium	INOR-171-6202, INOR-171-6100	SM 3030 E; SM 3120 B	ICP/OES		
pH	INOR-171-6205	SM 4500 H+	PC Titrate		
p - Alkalinity (as CaCO3)	INOR-171-6205	SM 2320 B	PC Titrate		
T - Alkalinity (as CaCO3)	INOR-171-6205	SM 2320 B	PC Titrate		
Bicarbonate	INOR-171-6205	SM 2320 B	PC Titrate		
Carbonate	INOR-171-6205	SM 2320 B	PC Titrate		
Hydroxide	INOR-171-6205	SM 2320 B	PC Titrate		
Electrical Conductivity	INOR-171-6205	SM 2510 B	PC Titrate		
Fluoride	INOR-171-6200	SM 4110 B	ION CHROMATOGRAPH		
Chloride	INOR-171-6200	SM 4110 B	ION CHROMATOGRAPH		
Nitrite	INOR-171-6200	SM 4110 B	ION CHROMATOGRAPH		
Nitrate	INOR-171-6200	SM 4110 B	ION CHROMATOGRAPH		
Sulfate	INOR-171-6200	SM 4110 B	ION CHROMATOGRAPH		
Dissolved Calcium	INOR-171-6201, INOR-171-6100	SM 3120 B	ICP/OES		
Dissolved Magnesium	INOR-171-6201, INOR-171-6100	SM 3120 B	ICP/OES		
Dissolved Sodium	INOR-171-6201, INOR-171-6100	SM 3120 B	ICP/OES		
Dissolved Potassium	INOR-171-6201, INOR-171-6100	SM 3120 B	ICP/OES		
Dissolved Iron	INOR-171-6201, INOR-171-6100	SM 3120 B	ICP/OES		
Dissolved Manganese	INOR-171-6201, INOR-171-6100	SM 3120 B	ICP/OES		



Chain of Custody Record

Company: Tes-

Consultants GTD

Report To:

Laboratories

6310 Roper Road NW Edmonton, Alberta

T6B 3P9

webearth.agatlabs.com

Upon filling out this section, client accepts that surcharges will be attached to this analysis. If NOT **Rush Turnaround Requests** compl

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Ph: 780.395.2525 · Fax: 780.462.2490

Report Format

Laboratory Use Only	Date Required: Please contact laboratory to notify
	notify

Single Sample per page

Multiple Samples per

Date and Time:

page

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Arriva AGAT Job

Excel Format Included

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Client Project #:

A04025A02

Unipkat

Phone:

Address: Contact:

8136 Nicole

Harwell P/ NE

Postal Code: TIY

157

2. Name: _

Email:

Jeollins@ klohn.com

Regulatory Requirements (Check one):

CCME

☐ AB Tier 1

1. Name: Nicole Report Information

Samples Relinquished	Samples Relinquished				OFF	Laboratory Use (Lab ID #)	רט/אורא.	Phone:	1	Address:	Contact:	Company:	Invoice To: Sar	
Samples Relinquished by (print name & sign):	Samples-Relinquished by (print pame & sign): Samples Relinquished by (print name & sign):				MW/1-003	Sample Identification		Fax:	Postal code:				Invoice To: Same (Y / N) - Circle	
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CHARLES CO. L.		
SAMPLE INTEGRITY RECEIP	T FORM - Edmonton	Received by: Jucas Myatt
Date & Time: Sept 4th am/pm Branch received from: NA Client left without count verified: Ye	RECEIVING BASIC Courier: CMG M NYS Relinquished by: CMM No	Prepaid / Collect Waybill# 6836624 On Not Company/Consultant: Leg (() Sw) May Custody Seal Intact: Yes / No NA
*If COC Container count differs from wh	ny: 0 166 9 ottlos/Jars: 10 Bags: 0 nat was received why:	TAT: 24-hr 24-48hr 48-72hr Reg Other Workorder Number 13E-154-530 Other: O COC Container Count:
Earliest Date Sampled: Self 2 Microbiology/Time Sensitive Test*: Hydrocarbon Test: Brex Fl-1 Are samples received more than 5 day *Residual Chlorine, D	ys after sampling: Yes No	Expiry: Soft 9th
Hazardous Samples Why hazardous:	Sample Integrit	Y Precaution taken:
Specialty Issues Legal Samples: Yes / No Internati	onal Samples: Yes / No	Proper tape/labels applied: Ves/No
Damaged: Yes / No If YES why? 1	No Bubble Wrap . Frozen	Courier Other:
Temperature (to be recorded from botte (1) (Bottle far) 1/6 + 1/2 + 6/5 = 8/4 °C (les/jars only) 2) (Bottle/Jar)++	N/A – Only Soil Bags received =°C (3) (Bottle/Jar)+ + _ = _°C
(If more than 6	coolers are received use another	
Coolant used: Icepack (Top / Bottom Correct Sample Requirements for T Bottles: Yes / No Amount: Yes / I *If NO to any of the above explain why:	esting (to be completed by Le	p / Bottom / Side) Free Ice None ogistics staff during login process)
Visible Sediment: Yes No/NA(soil		
Additional integrity issues (Indicate issue Preservet in C	es below and on the CoC next to t	he sample ID):
Account Project Manager: Whom spoken to:	have they been Date and Time:	notified of the above issues: Yes No CPM Initial:



CLIENT NAME: IEG ENVIRONMENTAL (NORTH)
PO BOX 3178
INUVIK, NT X0E0T0
(403) 262-5505

ATTENTION TO: Nicole Wills

PROJECT NO: Unipkat I-22 / A04025A02

AGAT WORK ORDER: 13E750792

SOIL ANALYSIS REVIEWED BY: Joydee Saez, Technical Reviewer

TRACE ORGANICS REVIEWED BY: Jarrod Roberts, Operations Manager

DATE REPORTED: Aug 29, 2013

PAGES (INCLUDING COVER): 14

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (780) 395-2525

*NOTES			
*** 1.5-			
17.34			

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

Page 1 of 14

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA)

Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)

010	92	4025A02	ATTENTION TO: Nicole Wills
oci tilicato ol villaly olo	AGAT WORK ORDER: 13E750792	- PROJECT NO: Unipkat I-22 / A04025A02	A
	Laboratories		(HIAO)

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15日		Labo	Laboratories		AGAT WORK ORDER: 13E750792 PROJECT NO: Unipkat I-22 / A04025A02	ORDER: 13E Unipkat I-2;	:750792 2 / A04025A03	Ο.		#4	TEL (780)395-252 FAX (780)462-249
CLIENT NAME: IEG ENVIRONMENTAL (NORTH)	MENTAL	(NORTH)					ATTENTIC	ATTENTION TO: Nicole Wills	e Wills		
			CCME / /	Alberta Ti	/ Alberta Tier 1 Metals	+ Hg + HWS	3 B + Cr6 (soil)	il)			
DATE RECEIVED: 2013-08-21									DATE REPORTED: 2013-08-29	ED: 2013-08-29	
				TH-13-01	TH-13-01 (0.	TH-13-02	TH-13-02 (0.	TH-13-03	TH-13-03 (0.	TH-13-04	TH-13-04 (0.
		SAMPLE DESCRIPTION	CRIPTION:	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)
		SAM	SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE	DATE SAMPLED:	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013
Parameter	Unit	S/S	RDL	4679798	4679800	4679801	4679803	4679804	4679806	4679807	4679809
Antimony Dry Weight	mg/kg	20	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Arsenic	ma/ka	17	0.5	6.2	6.2	6.3	5.6	7.0	5.4	6.5	6.3
Barium	ma/kg	750	0.5	472	641	1530	726	1120	555	479	929
Bervllium	ma/ka	S	0.5	<0.5	<0.5	<0.5	<0.5	9.0	<0.5	0.5	<0.5
Boron (Hot water extraction)	mg/kg	7	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	mg/kg	1.4	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5
Chromium	mg/kg	64	0.5	15.0	14.4	15.3	13.1	17.0	13.4	15.8	15.1
Chromium, Hexavalent	mg/kg	0.4	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Cobalt	mg/kg	20	0.5	7.4	7.2	7.5	6.8	8.1	6.7	7.5	7.2
Copper	mg/kg	63	0.5	15.6	15.3	15.6	13.0	16.8	12.5	16.0	14.7
Lead	mg/kg	02	0.5	7.8	7.7	8.2	6.8	0.6	6.3	7.5	7.7
Mercury	mg/kg	9.9	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Molybdenum	mg/kg	4	0.5	6.1	4.1	1.5	1.2	1.5	1.2	1.3	1.4
Nickel	mg/kg	20	0.5	22.5	22.3	23.0	20.2	24.6	19.2	23.6	21.8
Selenium	mg/kg	-	0.5	9.0	0.7	0.7	0.5	0.7	9.0	0.7	9.0
Silver	ma/ka	20	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Thallium	mg/kg	-	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
-	ma/kg	5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Uranium	mg/kg	23	0.5	6.0	1.0	6.0	6.0	1.0	6.0	1.0	1.0
Vanadium	mg/kg	130	0.5	29.0	28.8	28.5	27.2	33.3	27.4	31.6	30.9
Zinc	mg/kg	200	-	62	75	7.7	69	82	89	62	74

Certified By:

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

ATTENTION TO: Nicole Wills

CLIENI NAME: IEG ENVIRONMENIAL (NORIH)	MENIAL	(NORIH)					ALIENION A	ALIENTION TO: NICOLE WILLS
			CCME /	Alberta Ti	er 1 Metals -	+ Hg + HW	Alberta Tier 1 Metals + Hg + HWS B + Cr6 (soil)	
DATE RECEIVED: 2013-08-21								DATE REPORTED: 2013-08-29
				TH-13-05	TH-13-05 (0.	TH-13-06	TH-13-06 (0.	
		SAMPLE	SAMPLE DESCRIPTION:	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)	
		S	SAMPLE TYPE:	Soil	Soil	Soil	Soil	
		DA	DATE SAMPLED:	8/17/2013	8/17/2013	8/17/2013	8/17/2013	
Parameter	Unit	G/S	RDL	4679810	4679812	4679813	4679815	
Antimony Dry Weight	mg/kg	20	0.5	<0.5	<0.5	<0.5	<0.5	
Arsenic	mg/kg	17	0.5	9.9	0.9	6.2	0.9	
Barium	mg/kg	750	0.5	447	530	449	797	
Beryllium	mg/kg	5	0.5	0.5	<0.5	<0.5	<0.5	
Boron (Hot water extraction)	mg/kg	2	0.5	<0.5	<0.5	<0.5	<0.5	
Cadmium	mg/kg	4.1	0.5	0.5	<0.5	0.5	<0.5	
Chromium	mg/kg	64	0.5	15.7	14.4	14.8	14.0	
Chromium, Hexavalent	mg/kg	4.0	0.3	<0.3	<0.3	<0.3	<0.3	
Cobalt	mg/kg	20	0.5	7.9	7.1	7.4	7.2	
Copper	mg/kg	63	0.5	16.4	15.0	15.4	14.2	
Lead	mg/kg	70	0.5	8.0	7.4	7.3	7.3	
Mercury	mg/kg	9.9	0.5	<0.5	<0.5	<0.5	<0.5	
Molybdenum	mg/kg	4	0.5	4.1	1.3	1.3	1.3	
Nickel	mg/kg	20	0.5	23.9	21.4	22.6	21.1	
Selenium	mg/kg		0.5	7.0	9.0	9.0	9.0	
Silver	mg/kg	20	0.5	<0.5	<0.5	<0.5	<0.5	
Thallium	mg/kg	-	0.5	<0.5	<0.5	<0.5	<0.5	
Tu	mg/kg	S.	0.5	<0.5	<0.5	<0.5	<0.5	
Uranium	mg/kg	23	0.5	1.0	1.0	6.0	6.0	
Vanadium	mg/kg	130	0.5	31.6	29.8	29.6	29.0	
Zinc	mg/kg	200	-	83	75	78	71	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ABTier1 Soil (Ag, F) 4679798-4679815 Results are based on the dry weight of the sample.

Chapter Mr. La

Certified By:

Results relate only to the items tested and to all the items tested

AGAT Laboratories

Certificate of Analysis

AGAT WORK ORDER: 13E750792

6310 ROPER ROAD EDMONTON, ALBERTA CANADA T6B 3P9 TEL (780)365-255 FAX (780)462-2490 http://www.agatlabs.com

 PROJECT NO: Unipkat I-22 / A04025A02 	ATTENTION TO: Nicole Wills
	CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

			Soil Anal	ysis - Bariu	Soil Analysis - Barium by Fusion ICP	n ICP				
DATE RECEIVED: 2013-08-21	1						1	DATE REPORTED: 2013-08-29	ED: 2013-08-29	
			TH-13-01	TH-13-01 (0.	TH-13-01 (0.	TH-13-02	TH-13-02 (0.	TH-13-02 (0.	TH-13-03	TH-13-03 (0.
		SAMPLE DESCRIPTION:	(0-0.15m)	15-0.3m)	3-0.6m)	(0-0.15m)	15-0.3m)	3-0.6m)	(0-0.15m)	15-0.3m)
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013
Parameter	Unit	0	4679798	4679799	4679800	4679801	4679802	4679803	4679804	4679805
True Barium by Fusion ICP			826	912	931	1460	883	1010	1210	1200
			TH-13-03 (0.	TH-13-04	TH-13-04 (0.	TH-13-04 (0.	TH-13-05	TH-13-05 (0.	TH-13-05 (0.	TH-13-06
		SAMPLE DESCRIPTION:	3-0.6m)	(0-0.15m)	15-0.3m)	3-0.6m)	(0-0.15m)	15-0.3m)	3-0.6m)	(0-0.15m)
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013
Parameter	Unit	U	4679806	4679807	4679808	4679809	4679810	4679811	4679812	4679813
True Barium by Fusion ICP			1070	864	1290	1030	854	863	096	854
			TH-13-06 (0.	TH-13-06 (0.						
		SAMPLE DESCRIPTION:	15-0.3m)	3-0.6m)						
		SAMPLE TYPE:	Soil	Soil						
		DATE SAMPLED:	8/17/2013	8/17/2013						
Parameter	Unit	G/S RDL	4679814	4679815						
True Barium by Fusion ICP			1070	686						
										-

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard 4679798-4679815 Result is based on the dry weight of the sample.

	Laboratories	AGAT WORK ORDER: 13E750792 PROJECT NO: Unipkat I-22 / A04025A02
CLIENT NAME: IEG ENVIRONMENTAL	(NORTH)	ATTENTION TO: Nicole Wills

DATE RECEIVED: 2013-08-21									DATE REPORT	DATE REPORTED: 2013-08-29	
				TH-13-01	TH-13-01 (0.	TH-13-02	TH-13-02 (0.	TH-13-03	TH-13-03 (0.	TH-13-04	TH-13-04 (0.
		SAMPLE DESCRIPTION:	CRIPTION:	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)
		SAMF	SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE	DATE SAMPLED:	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013
Parameter	Unit	8/9	RDL	4679798	4679800	4679801	4679803	4679804	4679806	4679807	4679809
nH (CaCl2 Extraction)	pH Units		N/A	7.41	7.39	7.43	7.34	7.35	7.39	6.81	7.24
Flectrical Conductivity (Sat Paste)	dS/m		0.01	3.66	3.17	8.89	2.19	6.28	4.16	2.25	1.82
Sodium Adsorption Ratio				1.97	1.26	5.47	1.01	3.16	2.10	0.95	1.24
Saturation Percentage	%		N/A	41	47	44	44	90	43	47	44
Chloride Soluble	ma/L		2	233	285	1990	174	1330	657	247	188
Calcium Soluble	ma/L		-	484	532	863	358	816	574	358	250
Potassium. Soluble	mg/L		2	25	19	47	23	32	56	21	40
Magnesium, Soluble	mg/L		-	181	107	318	72	221	142	72	22
Sodium. Soluble	mg/L		2	200	122	740	80	395	217	75	83
Sulfur (as Sulfate), Soluble	mg/L		2	2000	1600	2190	1040	1830	1610	943	269
Calcium. Soluble (mea/L)	meq/L		0.05	24.2	26.5	43.1	17.9	40.7	28.6	17.9	12.5
Calcium Soluble (ma/ka)	ma/ka		-	198	250	380	158	408	247	168	110
Chloride Soluble (med/L)	mea/L		0.06	6.57	8.04	56.1	4.91	37.5	18.5	6.97	5.30
Chloride Soluble (ma/ka)	ma/ka		7	96	134	876	77	999	283	116	83
Magnesium. Soluble (meg/L)	med/L		90.0	14.9	8.80	26.2	5.92	18.2	11.7	5.92	4.53
Magnesium, Soluble (mg/kg)	mg/kg		-	74	20	140	32	111	61	34	24
Potassium Soluble (mea/L)	med/L		0.05	0.64	0.49	1.20	0.59	0.82	99.0	0.54	1.02
Potassium Soluble (mg/kg)	ma/ka		2	10	6	21	10	16	7	10	18
Sodium Soluble (med/L)	med/L		0.09	8.70	5.31	32.2	3.48	17.2	9.44	3.26	3.61
Sodium Soluble (mg/kg)	ma/ka		7	82	22	326	35	198	93	32	37
Suffir (as Sulfate) Soluble (med/L)	mea/L		0.04	41.6	33.3	45.6	21.7	38.1	33.5	19.6	14.5
Sulfur (as Sulfate), Soluble (ma/kg)	mg/kg		2	820	752	964	458	915	692	443	307
(6.6)				c	C	•	0	0	c	0	0

Certified By:

Results relate only to the items tested and to all the items tested

ATTENTION TO: Nicole Wills

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

DATE RECEIVED: 2013-08-21 Characteristic Solution Solution (Control of Solution (Co				Soil Anal	ysis - Sali	inity (AB Tie	r 1 - pH Ca	ysis - Salinity (AB Tier 1 - pH Calcium Chloride)	
TH-13-05 TH-13-05 (O. TH-13-05 SAMPLE DESCRIPTION: G.0-0.15m) 3-0.5m) (O-0.15m) SAMPLE TYPE: Soil Soil Soil Soil Soil SAMPLE TYPE: Soil Soil Soil Soil SAMPLE TYPE: Soil Soil Soil Soil SAMPLED: 8/17/2013 8/1	DATE RECEIVED: 2013-08-21								DATE REPORTED: 2013-08-29
SAMPLE DESCRIPTION: Go.0.15m) 3-0.6m) (0-0.15m) SAMPLE TYPE: Soil Soil Soil DATE SAMPLED: 8/17/2013 8/17/2013 8/17/2013 PH Units NIA 7.39 7.00 7.16 AS/m 0.01 1.99 1.01 2.46 AS/m NIA 7.39 7.00 7.16 Mg/L N/A 62 35 5.4 mg/L 1 308 1.01 2.46 mg/L 1 308 1.00 442 mg/L 2 156 6.1 1.15 mg/L 2 948 3.19 1.440 mg/L 0.05 15.4 7.98 22.1 mg/Kg 1 191 56 239 mg/Kg 0.06 4.40 1.72 3.24 mg/Kg 0.08 6.17 2.63 7.57 mg/Kg 2 9 4 11					TH-13-05	TH-13-05 (0.	TH-13-06	TH-13-06 (0.	
SAMPLE TYPE: Soil Soil Soil DATE SAMPLE TYPE: Soil Soil Soil Soil DATE SAMPLED: 8/17/2013 8/17/2013 8/17/2013 8/17/2013 pH Units N/A 7.39 7.00 7.16 pH Units N/A 7.39 7.00 7.16 % N/A 62 35 5.4 mg/L 5 156 61 115 mg/L 2 15 12 2.1 mg/L 2 64 24 80 mg/L 2 948 319 1440 mg/L 2 948 319 1440 mg/L 0.05 15.4 7.98 22.1 mg/L 0.05 15.4 7.98 22.1 mg/Kg 1 191 56 239 mg/Kg 0.06 0.38 0.31 0.54 mg/Kg 0.09 2.78 4 11 </td <td></td> <td></td> <td>SAMPLE DES</td> <td>SCRIPTION:</td> <td>(0-0.15m)</td> <td>3-0.6m)</td> <td>(0-0.15m)</td> <td>3-0.6m)</td> <td></td>			SAMPLE DES	SCRIPTION:	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)	
DATE SAMPLED: 81/17/2013 81/17/2013 81/17/2013 DH Units RDL 4679810 4679812 4679813 PH Units N/A 7.39 7.00 7.16 SM N/A 7.39 7.00 7.16 % N/A 62 35 5.4 mg/L 5 156 61 115 mg/L 1 75 32 92 mg/L 1 75 32 92 mg/L 1 75 32 92 mg/L 2 15 12 21 mg/L 2 948 349 1440 mg/L 0.05 15.4 7.98 22.1 mg/K 2 948 319 1440 mg/K 2 948 319 1440 mg/K 2 94 1.72 22.1 mg/K 2 9 4 11 mg/K 2 </td <td></td> <td></td> <td>SAN</td> <td>IPLE TYPE:</td> <td>Soil</td> <td>Soil</td> <td>Soil</td> <td>Soil</td> <td></td>			SAN	IPLE TYPE:	Soil	Soil	Soil	Soil	
Unit G/S RDL 4679810 4679812 4679813 pH Units NI/A 7.39 7.00 7.16 dS/m 0.01 1.99 1.01 2.46 % NI/A 62 35 5.4 mg/L 5 156 61 115 mg/L 1 308 160 442 mg/L 1 75 32 92 mg/L 0.05 15.4 7.98 22.1 mg/Kg 1 191 56 23 mg/Kg 1 40 1.72 3.24 mg/Kg 1 47 1.1 50 mg/Kg 2 9 4 1.1 mg/Kg 2 9 4 1.1 mg/Kg			DATE	SAMPLED:	8/17/2013	8/17/2013	8/17/2013	8/17/2013	
pH Units N/A 7.39 7.00 7.16 dS/m 0.01 1.99 1.01 2.46 % N/A 62 35 54 mg/L 5 156 61 115 mg/L 1 308 160 442 mg/L 1 75 32 92 mg/L 2 15 24 80 mg/L 2 64 24 80 mg/L 2 64 24 80 mg/L 2 64 24 80 mg/L 0.05 154 7.98 22.1 mg/L 0.05 154 7.98 22.1 mg/Rg 1 191 56 239 mg/Rg 1 47 1.72 3.24 mg/Rg 1 47 1.1 50 mg/Rg 2 9 4 11 mg/L 0.09 2.78	Parameter	Unit	8/9	RDL	4679810	4679812	4679813	4679815	
dS/m 0.01 1.99 1.01 2.46 % N/A 62 35 54 mg/L 5 156 61 115 mg/L 1 308 160 442 mg/L 1 308 160 442 mg/L 1 75 32 92 mg/L 2 64 24 80 mg/L 2 64 24 80 mg/L 2 948 319 1440 mg/L 0.05 154 7.98 22.1 mg/L 0.05 154 7.98 22.1 mg/L 0.06 4.40 1.72 3.24 mg/L 0.08 6.17 2.63 7.57 mg/L 0.08 6.17 2.63 7.57 mg/L 0.09 2.78 4 11 mg/L 0.09 2.78 4 11 mg/L 0.04	pH (CaCl2 Extraction)	pH Units		N/A	7.39	7.00	7.16	7.24	
% N/A 62 35 64 mg/L 5 156 61 115 mg/L 1 308 160 442 mg/L 2 15 12 21 mg/L 1 75 32 92 mg/L 2 64 24 80 mg/L 0.05 15,4 7.98 22.1 mg/L 0.05 15,4 7.98 22.1 mg/L 0.06 4.40 1.72 3.24 mg/Rg 0.06 4.40 1.72 3.24 mg/Rg 0.08 6.17 2.63 7.57 mg/Rg 1 47 11 50 mg/L 0.05 0.38 0.31 0.54 mg/Rg 2 9 4 11 mg/Rg 2 40 8 43 mg/Rg 2 40 8 43 mg/Rg 2 6	Electrical Conductivity (Sat. Paste)	dS/m		0.01	1.99	1.01	2.46	3.19	
% N/A 62 35 54 mg/L 5 156 61 115 mg/L 1 308 160 442 mg/L 2 15 12 21 mg/L 2 64 24 80 mg/L 2 948 319 1440 mg/L 0.05 15,4 7.98 22.1 mg/L 0.05 15,4 7.98 22.1 mg/Rg 1 191 56 239 meq/L 0.06 4.40 1.72 3.24 mg/kg 2 97 21 62 mg/kg 1 47 11 50 mg/kg 2 9 4 11 mg/kg 2 9 4 11 mg/kg 2 9 4 11 mg/kg 2 40 8 43 mg/kg 2 40 8 </td <td>Sodium Adsorption Ratio</td> <td></td> <td></td> <td></td> <td>0.85</td> <td>0.45</td> <td>06.0</td> <td>0.74</td> <td></td>	Sodium Adsorption Ratio				0.85	0.45	06.0	0.74	
mg/L 5 156 61 115 mg/L 1 308 160 442 mg/L 1 75 32 92 mg/L 2 64 24 80 mg/L 2 64 24 80 mg/L 0.05 15,4 7.98 22.1 mg/L 0.06 4.40 1.72 3.24 mg/Rg 2 97 21 62 mg/Rg 1 47 11 50 mg/Rg 1 47 11 50 mg/Rg 0.05 0.38 0.31 0.54 mg/Rg 2 9 4 11 mg/Rg 2 9 4 11 mg/Rg 2 9 4 11 mg/Rg 2 40 8 43 mg/Rg 2 588 112 778 tomnes/ha 0 0 0	Saturation Percentage	%		N/A	62	35	54	46	
mg/L 1 308 160 442 mg/L 2 15 12 21 mg/L 1 75 32 92 mg/L 2 64 24 80 mg/L 2 948 319 1440 mg/L 0.05 15,4 7.98 22.1 mg/kg 1 191 56 239 mg/kg 2 97 21 62 mg/kg 1 47 11 50 mg/kg 1 47 11 50 mg/kg 2 9 4 11 mg/kg 2 9 4 11 mg/kg 2 9 4 11 mg/kg 2 40 8 43 mg/kg 2 40 8 43 mg/kg 2 588 112 778 tonnes/ha 0 0 0	Chloride, Soluble	mg/L		2	156	61	115	129	
mg/L 2 15 12 21 mg/L 1 75 32 92 mg/L 2 64 24 80 mg/L 2 948 319 1440 mg/L 0.05 15,4 7.98 22.1 mg/Rg 1 191 56 239 meq/L 0.06 4.40 1.72 3.24 mg/kg 2 97 21 62 mg/kg 1 47 11 50 mg/kg 2 97 4 11 mg/kg 2 9 4 11 mg/kg 2 9 4 11 mg/kg 2 40 8 43 meq/L 0.09 2.78 1.04 3.48 meq/L 0.04 19.7 6.64 30.0 meq/L 0.04 19.7 6.64 30.0 mg/kg 2 588 </td <td>Calcium, Soluble</td> <td>mg/L</td> <td></td> <td></td> <td>308</td> <td>160</td> <td>442</td> <td>628</td> <td></td>	Calcium, Soluble	mg/L			308	160	442	628	
mg/L 1 75 32 92 mg/L 2 64 24 80 mg/L 0.05 15.4 7.98 22.1 mg/L 0.05 15.4 7.98 22.1 mg/kg 0.06 4.40 1.72 3.24 mg/kg 2 97 21 62 mg/kg 1 47 11 50 mg/kg 0.05 0.38 0.31 0.54 mg/kg 2 9 4 11 mg/kg 2 40 8 43 tomes/L 0.04 19.7 6.64 30.0 tomes/L 0.04 19.7 6.64 30.0 tomes/L 0 0 0 0	Potassium, Soluble	mg/L		2	15	12	21	26	
mg/L 2 64 24 80 mg/L 2 948 319 1440 med/L 0.05 15.4 7.98 22.1 mg/kg 1 191 56 239 med/L 0.06 4.40 1.72 3.24 med/L 0.08 6.17 2.63 7.57 mg/kg 1 47 11 50 med/L 0.05 0.38 0.31 0.54 mg/kg 2 9 4 11 mg/kg 2 40 8 43 med/L 0.09 2.78 1.04 3.48 mg/kg 2 40 8 43 tomed/L 0.04 19.7 6.64 30.0 tomed/L 0.04 19.7 6.64 30.0 tomed/L 0.04 19.7 6.64 30.0	Magnesium, Soluble	mg/L		-	75	32	92	113	
mg/L 2 948 319 1440 mg/kg 1 191 56 22.1 mg/kg 1 191 56 239 mg/kg 2 97 1.72 3.24 mg/kg 6.17 2.63 7.57 mg/kg 1 47 11 50 mg/kg 2 9 4 11 50 mg/kg 2 9 4 11 50 mg/kg 2 40 8 43 mg/kg 2 40 8 43 mg/kg 2 568 112 778 tonnes/ha 0 0 0 0	Sodium, Soluble	mg/L		2	64	24	80	77	
meq/L 0.05 15.4 7.98 22.1 mg/kg 1 191 56 239 meq/L 0.06 4.40 1.72 3.24 mg/kg 2 97 21 62 mg/kg 1 47 11 62 mg/kg 2 9 4 11 mg/kg 2 9 4 11 mg/kg 2 9 4 11 mg/kg 2 40 8 43 meq/L 0.09 2.78 1.04 3.48 mg/kg 2 40 8 43 mg/kg 2 564 30.0 tomey/L 0.04 19.7 6.64 30.0 tomey/L 0.04 19.7 6.64 30.0 tomey/L 0.09 0 0 0	Sulfur (as Sulfate), Soluble	mg/L		2	948	319	1440	2070	
mg/kg 1 191 56 239 mg/kg 2 97 2.7 3.24 mg/kg 2 97 2.1 62 mg/kg 1 47 11 50 mg/kg 2 9 4 11 mg/kg 2 9 4 11 mg/kg 2 40 8 43 mg/kg 2 40 8 43 mg/kg 2 40 8 43 tomeq/L 0.04 19.7 6.64 30.0 tomeg/L 0.04 19.7 6.64 30.0 tomeg/L 0.04 19.7 6.64 30.0 tomeg/L 0.09 2.78 112 778	Calcium, Soluble (meq/L)	meq/L		0.05	15.4	7.98	22.1	31.3	
meq/L 0.06 4.40 1.72 3.24 mg/kg 2 97 21 62 meq/L 0.08 6.17 2.63 7.57 mg/kg 1 47 11 50 mg/kg 2 9 4 11 mg/kg 2 9 4 11 mg/kg 2 40 8 43 mg/kg 2 40 8 43 tomeq/L 0.04 19.7 6.64 30.0 tomkg 2 588 112 778 tomes/ha 0 0 0 0	Calcium, Soluble (mg/kg)	mg/kg			191	26	239	289	
mg/kg 2 97 21 62 meq/L 0.08 6.17 2.63 7.57 mg/kg 1 47 11 50 mg/kg 2 9 4 11 mg/kg 2 9 4 11 mg/kg 2 40 8 43 mg/kg 2 40 8 43 tonnes/ha 0 0 0 0	Chloride, Soluble (meq/L)	med/L		90.0	4.40	1.72	3.24	3.64	
meq/L 0.08 6.17 2.63 7.57 mg/kg 1 47 11 50 meq/L 0.05 0.38 0.31 0.54 mg/kg 2 9 4 11 mg/kg 2 40 8 43 mg/kg 2 40 8 43 tomnes/ha 0 0 0 0	Chloride, Soluble (mg/kg)	mg/kg		7	26	21	62	29	
mg/kg 1 47 11 50 meq/L 0.05 0.38 0.31 0.54 mg/kg 2 9 4 11 meq/L 0.09 2.78 1.04 3.48 mg/kg 2 40 8 43 mg/kg 2 588 112 778 tonnes/ha 0 0 0 0	Magnesium, Soluble (meq/L)	T/bem		0.08	6.17	2.63	7.57	9.30	
meq/L 0.05 0.38 0.31 0.54 mg/kg 2 9 4 11 meq/L 0.09 2.78 1.04 3.48 mg/kg 2 40 8 43 mg/kg 0.04 19.7 6.64 30.0 tonnes/ha 0 0 0 0	Magnesium, Soluble (mg/kg)	mg/kg		-	47	Ε	20	52	
mg/kg 2 9 4 11 meq/L 0.09 2.78 1.04 3.48 mg/kg 2 40 8 43 meq/L 0.04 19.7 6.64 30.0 tonnes/ha 0 0 0 0	Potassium, Soluble (meq/L)	med/L		90.0	0.38	0.31	0.54	99'0	
meq/L 0.09 2.78 1.04 3.48 mg/kg 2 40 8 43 meq/L 0.04 19.7 6.64 30.0 mg/kg 2 588 112 778 tonnes/ha 0 0 0 0	Potassium, Soluble (mg/kg)	mg/kg		2	6	4	+	12	
mg/kg 2 40 8 43 meq/L 0.04 19.7 6.64 30.0 mg/kg 2 588 112 778 tonnes/ha 0 0 0 0	Sodium, Soluble (meq/L)	meg/L		60.0	2.78	1.04	3.48	3.35	
meq/L 0.04 19.7 6.64 30.0 mg/kg 2 588 112 778 tonnes/ha 0 0 0	Sodium, Soluble (mg/kg)	mg/kg		2	40	80	43	35	
mg/kg 2 588 112 778 tonnes/ha 0 0 0	Sulfur (as Sulfate), Soluble (meq/L)	med/L		0.04	19.7	6.64	30.0	43.1	
tonnes/ha 0 0 0 0	Sulfur (as Sulfate), Soluble (mg/kg)	mg/kg		2	588	112	778	952	
	Theoretical Gypsum Requirement	tonnes/ha	_		0	0	0	0	

G / S - Guideline / Standard: Refers to ABTier1 (Ag,F) RDL - Reported Detection Limit; Comments: Certified By:

ssted and to all the items tested

AGAT WORK ORDER: 13E750792 PROJECT NO: Unipkat I-22 / A04025A02

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CLIENT NAME: IEG ENVIRONMENTAL (NORTH)	MENTAL	(NORTH)				ATTENTI	ATTENTION TO: Nicole Wills	le Wills		
		Petrole	um Hydro	Petroleum Hydrocarbons (BTEX/F1-F4) in Soil (CWS)	EX/F1-F4)	in Soil (CW	(S)			
DATE RECEIVED: 2013-08-21								DATE REPORTED: 2013-08-29	ED: 2013-08-29	
			TH-13-01	TH-13-01 (0.	TH-13-02	TH-13-02 (0.	TH-13-03	TH-13-03 (0.	TH-13-04	TH-13-04 (0.
		SAMPLE DESCRIPTION:	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013
Parameter	Unit	G/S RDL	4679798	4679800	4679801	4679803	4679804	4679806	4679807	4679809
Benzene	ma/ka	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tolliene	ma/ka	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	ma/ka	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Xvlenes	ma/ka	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
C6 - C10 (F1)	ma/ka	10	<10	<10	<10	<10	×10	<10	<10	<10
CG C10 (F1 minus BTEX)	ma/ka	10	×10	<10	<10	<10	×10	<10	<10	<10
C40 C46 (E2)	ma/ka	10	<10	×10	58	<10	<10	<10	<10	<10
C16 - C10 (1.2)	ma/ka	9 2	35	20	111	10	23	۸10	35	25
C34 - C50 (F4)	ma/ka	10	<10	11	71	<10	14	<10	21	16
Gravimetric Heavy Hydrocarbons	mg/kg	1000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Moisture Content	%		25	56	56	23	25	22	59	59
Surrogate	Unit	Acceptable Limits		A STATE OF THE STA						
Toluene-d8 (BTEX)	%	50-150	111	112	112	112	112	112	113	112
Ethylbenzene-d10 (BTEX)	%	50-150	107	112	119	82	78	80	78	86
o-Terphenyl (F2-F4)	%	50-150	93	93	94	91	87	98	112	91
										The second secon

6310 ROPER ROAD

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

		Petrole	um Hydro	Petroleum Hydrocarbons (BTEX/F1-F4) in Soil (CWS)	EX/F1-F4)	in Soil (C	WS)		
DATE RECEIVED: 2013-08-21								DATE REPORTED: 2013-08-29	
			TH-13-05	TH-13-05 (0.	TH-13-06	TH-13-06 (0.			
		SAMPLE DESCRIPTION:	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)			
		SAMPLE TYPE:	Soil	Soil	Soil	Soil			
		DATE SAMPLED:	8/17/2013	8/17/2013	8/17/2013	8/17/2013			
Parameter	Chit	G/S RDL	4679810	4679812	4679813	4679815			
Benzene	mg/kg	0.005	<0.005	<0.005	<0.005	<0.005			
Toluene	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05			
Ethylbenzene	mg/kg	0.01	<0.01	<0.01	<0.01	<0.01			
Xylenes	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05			
C6-C10 (F1)	mg/kg	10	<10	<10	<10	<10			
C6 - C10 (F1 minus BTEX)	mg/kg	10	<10	<10	<10	<10			
C10 - C16 (F2)	mg/kg	10	<10	<10	<10	×10			
C16 - C34 (F3)	mg/kg	10	27	12	17	21			
C34 - C50 (F4)	mg/kg	10	21	<10	<10	13			
Gravimetric Heavy Hydrocarbons	mg/kg	1000	N/A	N/A	N/A	N/A			
Moisture Content	%		29	29	30	21			
Surrogate	Unit	Acceptable Limits							
Toluene-d8 (BTEX)	%	50-150	112	114	112	113			
Ethylbenzene-d10 (BTEX)	%	50-150	80	79	83	82			
o-Terphenyl (F2-F4)	%	50-150	92	86	96	06			
							100		

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ABTier1 (Ag,F)

4679798-4679815 Results are based on the dry weight of the sample.
The C6-C10 (F1) fraction is calculated using toluene response factor.
The C6-C10 (F1) fraction is calculated using toluene response factor.
The C10 - C16 (F2), C16 - C34 (F3), and C34 - C50 (F4) fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons (F4g) are not included in and cannot be added to the Total C6-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that

hydrocarbons ≻C50 are present. Total C6 - C50 results are corrected for BTEX and PAH contributions (if requested)

Quality control data is available upon request. Assistance in the interpretation of data is available upon request.

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. nC6 and nC10 response factors are within 30% of Toluene response factor. nC10, nC16 and nC34 response factors are within 10% of their average. C50 response factor is within 70% of nC10 + nC34 average.

Linearity is within 15%.

The chromatogram returned to baseline by the retention time of nC50. Extraction and holding times were met for this sample. Certified By:

AGGT CERTIFICATE OF ANALYSIS (V1)

ATTENTION TO: Nicole Wills

			п.	olyaroma	tic Hydrocar	Polyaromatic Hydrocarbon Analysis - Soil		
DATE RECEIVED: 2013-08-21							DATE REPORTED: 2013-08-29	
				TH-13-01	TH-13-02			
		SAMPLE	SAMPLE DESCRIPTION:	(0-0.15m)	(0-0.15m)			
			SAMPLE TYPE:	Soil	Soil			
			DATE SAMPLED:	8/17/2013	8/17/2013			1.
Parameter	Unit	8/9	S RDL	4679798	4679801			
Naphthalene	mg/kg	0.018	18 0.005	0.022	0.028			
2-Methylnaphthalene	mg/kg		0.005	0.035	0.046			
Acenaphthylene	mg/kg	0.9	0.005	<0.005	<0.005			
Acenaphthene	mg/kg	0.38	38 0.005	<0.005	<0.005			
Fluorene	mg/kg	0.34	34 0.02	<0.02	<0.02			
Phenanthrene	mg/kg	0.061	61 0.02	90.0	0.05			
Anthracene	mg/kg	0.0056	956 0.004	<0.004	<0.004			
Fluoranthene	mg/kg	0.039	39 0.01	0.01	0.01			
Pyrene	mg/kg	0.040	40 0.01	0.02	0.03			
Benz[a]anthracene	mg/kg	0.083	83 0.03	<0.03	<0.03			
Chrysene	mg/kg	6.2	2 0.05	<0.05	<0.05			
Benzo[b+j]fluoranthene	mg/kg	6.2	2 0.05	<0.05	<0.05			
Benzo[k]fluoranthene	mg/kg	6.2	2 0.05	<0.05	<0.05			
Benzo[a]pyrene	mg/kg		0.03	<0.03	<0.03			
Indeno[1,2,3-cd]pyrene	mg/kg		90.0	<0.05	<0.05			
Dibenz[ah]anthracene	mg/kg	8.4	4 0.005	<0.005	<0.005			2 1
Benzo[ghi]perylene	mg/kg		90.0	<0.05	<0.05			
Surrogate	Unit	Acc	Acceptable Limits					
2-Fluorobiphenyl (PAH)	%		50-150	75	81			
p-Terphenyl-d14 (PAH)	%		50-150	73	71			
								-

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ABTier1 Soil (Ag, C)
4679798-4679801 Results are based on the dry weight of the sample.
Based on GC/MS target ion analysis.
Isomers Benzo(b)fluoranthene and Benzo(j)fluoranthene have the same GC retention time and are reported as the sum based on the Benzo(b)fluoranthene response.

Certified By:

Results relate only to the items tested and to all the items tested



Quality Assurance

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

AGAT WORK ORDER: 13E750792

PROJECT NO: Unipkat I-22 / A04025A02

ATTENTION TO: Nicole Wills

DDT D-1-1 Au- 00 0010	-1-			A CONTRACTOR OF THE PARTY OF TH		alysis		UOE	TERM	METHOD	DI 44"	CDIVE		DIV OF	V.F.
RPT Date: Aug 29, 2013		1		DUPLICATI		Method	REFERE		ptable	METHOD	_	ptable	MAI	RIX SPI	ptable
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Blank	Measured Value	Lir	nits	Recovery	Lin	nits	Recovery	Lin	nits
						- 1111		Lower	Upper		Lower	Upper		Lower	Uppe
Soil Analysis - Salinity (AB Tier 1	***************************************				- 6.333	14.									
pH (CaCl2 Extraction)	686	4679810	7.39	7.37	0.3%	N/A	100%	90%	110%						
Electrical Conductivity (Sat. Paste)	686	4679810	1.99	2.06	3.5%	< 0.01	108%	90%	110%						
Saturation Percentage	665	4679810	62	61	1.6%	N/A	100%	80%	120%						
Chloride, Soluble	689	4679704	< 5	< 5	0.0%	< 5	97%	80%	120%	102%	80%	120%	103%	80%	120%
Calcium, Soluble	421	4679704	27	27	1.7%	< 1	112%	80%	120%				109%	80%	120%
Potassium, Soluble	421	4679704	<2	<2	0.0%	< 2	104%	80%	120%				100%	80%	120%
Magnesium, Soluble	421	4679704	14	15	2.0%	< 1	109%	80%	120%				103%	80%	120%
Sodium, Soluble	421	4679704	25	24	2.3%	< 2	102%	80%	120%				102%	80%	120%
Sulfur (as Sulfate), Soluble	421	4679704	36	36	0.4%	< 2	110%	80%	120%				104%	80%	120%
					0.170		1.070	0070	.2070				10170	0070	
Comments: N/A: Not applicable															
CCME / Alberta Tier 1 Metals + Hg	+ HWS	3 + Cr6 (so	il)												
Antimony Dry Weight	644	4679798	< 0.5	< 0.5	0.0%	< 0.5	98%	80%	120%				94%	80%	120%
Arsenic	644	4679798	6.2	6.3	1.6%	< 0.5	99%	80%	120%				96%	80%	120%
Barium	644	4679798	472	462	2.1%	< 0.5	109%	80%	120%				115%	80%	120%
Beryllium	644	4679798	< 0.5	< 0.5	0.0%	< 0.5	98%	80%	120%				102%	80%	120%
Boron (Hot water extraction)	420	4681227	<0.5	<0.5	0.0%	< 0.5	110%	80%	120%				108%	80%	120%
Cadmium	644	4679798	< 0.5	< 0.5	0.0%	< 0.5	98%	80%	120%				96%	80%	120%
Chromium	644	4679798	15.0	14.8	1.3%	< 0.5	91%	80%	120%				97%	80%	120%
Chromium, Hexavalent	180	4682290	< 0.3	< 0.3	0.0%	< 0.3	97%	80%	120%	95%	80%	120%	96%	80%	120%
Cobalt	644	4679798	7.4	7.5	1.3%	< 0.5	90%	80%	120%	5.3(1.7)	207/4/20		95%	80%	120%
Copper	644	4679798	15.6	16.0	2.5%	< 0.5	94%	80%	120%				92%	80%	120%
Lead	644	4679798	7.8	7.8	0.09/	< 0.5	94%	900/	1200/				92%	80%	120%
Mercury	644	4679798	< 0.5	< 0.5	0.0%	< 0.5	106%	80% 80%	120%				96%	80%	120%
									120%						
Molybdenum Nickel	644	4679798	1.3	1.3	0.0%	< 0.5	96%	80%	120%				97%	80%	120%
Selenium	644 644	4679798	22.5	22.6 0.6	0.4%	< 0.5 < 0.5	92%	80%	120%				95%	80%	120%
Selemani	644	4679798	0.6	0.6	0.0%	< 0.5	105%	80%	120%				93%	80%	1209
Silver	644	4679798	< 0.5	< 0.5	0.0%	< 0.5	93%	80%	120%				97%	80%	120%
Thallium	644	4679798	< 0.5	< 0.5	0.0%	< 0.5	92%	80%	120%				93%	80%	120%
Tin	644	4679798	< 0.5	< 0.5	0.0%	< 0.5	92%	80%	120%				97%	80%	120%
Uranium	644	4679798	0.9	0.9	0.0%	< 0.5	95%	80%	120%				108%	80%	120%
Vanadium	644	4679798	29.0	28.4	2.1%	< 0.5	92%	80%	120%				115%	80%	120%
Zinc	644	4679798	79	78	1.3%	< 1	107%	80%	120%				97%	80%	120%
Soil Analysis - Barium by Fusion	ICP														
Barium by Fusion ICP-OES	436	4679798	860	850	1.2%	< 40	95%	80%	120%				96%	80%	120%
COME / Alborto Tior 4 Motols : Us	TUME	D + C=0/s=	.113												
CCME / Alberta Tier 1 Metals + Ho Chromium, Hexavalent	195	4732666	< 0.3	< 0.3	0.0%	< 0.3	113%	80%	120%	100%	80%	120%	103%	80%	1209
omonium, mozavalent	130	71 02000	- 0.0	- 0.5	0.070	- 0.5	113/0	UU /0	120/0	10070	UU /0	120/0	100/0	UU /0	160

AGAT QUALITY ASSURANCE REPORT (V1)

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Quality Assurance

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

AGAT WORK ORDER: 13E750792

PROJECT NO: Unipkat I-22 / A04025A02

ATTENTION TO: Nicole Wills

			Soil	Analy	/sis	(Con	tinue	d)					
RPT Date: Aug 29, 2013		A see		UPLICAT	E		REFEREN	NCE MATERIA	METHOD	BLANK SI	PIKE	MAT	RIX SPIKE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured	Acceptable Limits	Recovery	Accepta Limits		Recovery	Acceptable Limits
		ld					Value	Lower Uppe	7	Lower U	pper		Lower Uppe

Certified By:

Japen M. forg

AGAT QUALITY ASSURANCE REPORT (V1)

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Quality Assurance

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

AGAT WORK ORDER: 13E750792

PROJECT NO: Unipkat I-22 / A04025A02

ATTENTION TO: Nicole Wills

				e Org	,		,								
RPT Date: Aug 29, 2013				UPLICATE	a. 253	1 100	REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable	Recovery		ptable nits	Recovery		ptable nits
		ld				4,50	Value	Lower	Upper		Lower	Upper	136	Lower	Uppe
Petroleum Hydrocarbons (BTEX/I	F1-F4) in	Soil (CWS)		111111	. 7-61		11-11-1		66 J.	:	0.41				1.4.
Benzene	466	4679798	< 0.005	< 0.005	0.0%	< 0.005	95%	80%	120%	104%	80%	120%	113%	60%	1409
Toluene	466	4679798	< 0.05	< 0.05	0.0%	< 0.05	93%	80%	120%	99%	80%	120%	111%	60%	1409
Ethylbenzene	466	4679798	<0.01	<0.01	0.0%	< 0.01	85%	80%	120%	88%	80%	120%	99%	60%	1409
Xylenes	466	4679798	< 0.05	< 0.05	0.0%	< 0.05	89%	80%	120%	87%	80%	120%	98%	60%	1409
C6 - C10 (F1)	466	4679798	<10	<10	0.0%	< 10	93%	80%	120%	113%	80%	120%	123%	60%	140%
C10 - C16 (F2)	340	4679798	<10	<10	0.0%	< 10	89%	80%	120%	83%	80%	120%	90%	60%	1409
C16 - C34 (F3)	340	4679798	35	<10	NA	< 10	92%	80%	120%	92%	80%	120%	99%	60%	1409
C34 - C50 (F4)	340	4679798	<10	<10	0.0%	< 10	81%	80%	120%	118%	80%	120%	132%	60%	140
Moisture Content	340	4679798	25	27	7.7%	< 1									
Polyaromatic Hydrocarbon Analy	sis - Soil														
Naphthalene	237	4678982	< 0.005	< 0.005	0.0%	< 0.005	95%	70%	130%	90%	70%	130%	86%	70%	130
2-Methylnaphthalene	237	4678982	< 0.005	< 0.005	0.0%	< 0.005				78%	70%	130%	77%	70%	130
Acenaphthylene	237	4678982	< 0.005	< 0.005	0.0%	< 0.005	94%	70%	130%	86%	70%	130%	91%	70%	130
Acenaphthene	237	4678982	< 0.005	< 0.005	0.0%	< 0.005	84%	70%	130%	78%	70%	130%	79%	70%	130
Fluorene	237	4678982	< 0.02	< 0.02	0.0%	< 0.02	83%	70%	130%	83%	70%	130%	76%	70%	130
Phenanthrene	237	4678982	< 0.02	< 0.02	0.0%	< 0.02	94%	70%	130%	92%	70%	130%	85%	70%	130
Anthracene	237	4678982	< 0.004	< 0.004	0.0%	< 0.004	96%	70%	130%	97%	70%	130%	91%	70%	130
Fluoranthene	237	4678982	< 0.01	< 0.01	0.0%	< 0.01	114%	70%	130%	103%	70%	130%	100%	70%	130
Pyrene	237	4678982	< 0.01	< 0.01	0.0%	< 0.01	117%	70%	130%	106%	70%	130%	90%	70%	130
Benz[a]anthracene	237	4678982	< 0.03	< 0.03	0.0%	< 0.03	92%	70%	130%	80%	70%	130%	74%	70%	130
Chrysene	237	4678982	< 0.05	< 0.05	0.0%	< 0.05	97%	70%	130%	79%	70%	130%	74%	70%	130
Benzo[b+j]fluoranthene	237	4678982	< 0.05	< 0.05	0.0%	< 0.05	92%	70%	130%	84%	70%	130%	75%	70%	130
Benzo[k]fluoranthene	237	4678982	< 0.05	< 0.05	0.0%	< 0.05	90%	70%	130%	71%	70%	130%	71%	70%	130
Benzo[a]pyrene	237	4678982	< 0.03	< 0.03	0.0%	< 0.03	111%	70%	130%	78%	70%	130%	75%	70%	130
Indeno[1,2,3-cd]pyrene	237	4678982	< 0.05	< 0.05	0.0%	< 0.05	100%	70%	130%	75%	70%	130%	76%	70%	130
Dibenz[ah]anthracene	237	4678982	< 0.005	< 0.005	0.0%	< 0.005	94%	70%	130%	73%	70%	130%	74%	70%	130
Benzo[ghi]perylene	237	4678982	< 0.05	< 0.05	0.0%	< 0.05	87%	70%	130%	72%	70%	130%	74%	70%	130

Certified By:

Jarothad

AGAT QUALITY ASSURANCE REPORT (V1)

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Method Summary

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

PROJECT NO: Unipkat I-22 / A04025A02

AGAT WORK ORDER: 13E750792 ATTENTION TO: Nicole Wills

1100LC1 110. Onipkat 1-227 A04020	.02	ATTENTION TO. IN	10010 111110
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony Dry Weight	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Antimony	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Arsenic	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Barium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Beryllium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Boron (Hot water extraction)	INOR-171-6201 & INOR-171-6005	Carter 12.2.4/ EPA 6010; SHEPPARD	ICP/OES
Cadmium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Chromium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Chromium, Hexavalent	INOR-171-6215	ASA 20-4.3; REISENAUER 1982	SPECTROPHOTOMETER
Cobalt	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Copper	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Lead	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Mercury	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Molybdenum	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Nickel	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Selenium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Silver	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Thallium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Tin	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Uranium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Vanadium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Zinc	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
pH (CaCl2 Extraction)	INOR-171-6207	SHEPPARD 2007; HENDERSHOT 2008	PH METER
Electrical Conductivity (Sat. Paste)	INOR-171-6208	SHEPPARD 2007; MILLER 2007	CONDUCTIVITY METER
Sodium Adsorption Ratio	INOR-171-6201 & INOR-171-6002	McKeague 3.26	CALCULATION
Saturation Percentage	INOR-171-6002	MILLER 2007; SHEPPARD 2007	GRAVIMETRIC
Chloride, Soluble	INOR-171-6200 & INOR-171-6002	SHEPPARD 2007, EATON 2005	CONTINUOUS FLOW ANALYZER
Calcium, Soluble	INOR-171-6201 & INOR-171-6002	SHEPPARD 2007; EATON 2005; MILLER 2007, SM 3120B	ICP/OES
Potassium, Soluble	INOR-171-6201 & INOR-171-6002	SHEPPARD 2007; EATON 2005; MILLER 2007, SM 3120B	ICP/OES



Method Summary

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

AGAT WORK ORDER: 13E750792

PROJECT NO: Unipkat I-22 / A04025A02

ATTENTION TO: Nicole Wills

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Magnesium, Soluble	INOR-171-6201 & INOR-171-6002	SHEPPARD 2007; EATON 2005; MILLER 2007, SM 3120B	ICP/OES
Sodium, Soluble	INOR-171-6201 & INOR-171-6002	SHEPPARD 2007; EATON 2005; MILLER 2007, SM 3120B	ICP/OES
Sulfur (as Sulfate), Soluble	INOR-171-6201 & INOR-171-6002	SHEPPARD 2007; EATON 2005; MILLER 2007, SM 3120B	ICP/OES
Trace Organics Analysis			
Benzene	ORG-170- 5110/5140/5430/5440	EPA SW-846 8260	GC/MS
Toluene	ORG-170- 5110/5140/5430/5440	EPA SW-846 8260	GC/MS
Ethylbenzene	ORG-170- 5110/5140/5430/5440	EPA SW-846 8260	GC/MS
Xylenes	ORG-170- 5110/5140/5430/5440	EPA SW-846 8260	GC/MS
C6 - C10 (F1)	ORG-170- 5110/5140/5430/5440	CCME Tier 1 Method	GC/FID
C6 - C10 (F1 minus BTEX)	ORG-170- 5110/5140/5430/5440	CCME Tier 1 Method	GC/FID
C10 - C16 (F2)	ORG-170-5120/5300	CCME Tier 1 Method	GC/FID
C16 - C34 (F3)	ORG-170-5120/5300	CCME Tier 1 Method	GC/FID
C34 - C50 (F4)	ORG-170-5120/5300	CCME Tier 1 Method	GC/FID
Gravimetric Heavy Hydrocarbons	ORG-170-5120/5300	CCME Tier 1 Method	GC/FID
Moisture Content	LAB-175-4002	CCME Tier 1 Method	GRAVIMETRIC
Toluene-d8 (BTEX)	ORG-170- 5110/5140/5430/5440	EPA SW-846 8260	GC/MS
Ethylbenzene-d10 (BTEX)	ORG-170- 5110/5140/5430/5440	EPA SW-846 8260	GC/MS
o-Terphenyl (F2-F4)	ORG-170-5120/5300	CCME Tier 1 Method	GC/FID
Naphthalene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
2-Methylnaphthalene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Acenaphthylene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Acenaphthene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Fluorene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Phenanthrene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Anthracene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Fluoranthene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Pyrene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Benz[a]anthracene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Chrysene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Benzo[b+j]fluoranthene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Benzo[k]fluoranthene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Benzo[a]pyrene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Indeno[1,2,3-cd]pyrene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Dibenz[ah]anthracene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Benzo[ghi]perylene			
2-Fluorobiphenyl (PAH)	TO 0500	EPA SW846 8270 D/3540 C/3570	GC/MS
p-Terphenyl-d14 (PAH)	TO 0500	EPA SW846 8270 D/3540 C/3570	GC/MS

(N/A) snopiezeH/pereuiweiuo3 052647AGAT Job Number 35 STOTA 24 to 48 thours (200) 24 to 48 thours (160%) 3 48 to 72 hours (50%) 73 NUG 21 =9 ·53 Rush Turnaround Reque Laboratory Use Only Arrival Temperature. DSO: Detailed Soil Salinity (As received) Microtox llibone J.S. easilo: BA 9H □ JetoT □ aeld □ alsteM Validatog tately entino? Single.
Sample per
page - BH & 910 B-SWH X alefeM Report Format webearth.agatlabs.com Ph. 789:395:2525 Fax 780:462:249(Detailed Soll Salinity (Sat: Raste). Natural
Natural
Resident
Comme Dalling). 🔲 SPI Regulatory Requirements Report Information ☐ C**CME** ☐ Agricultura Residentia
Commerci
Tridustrial
Difficility 🔲 other Report to TES (Casa lasts and Chain of Gustody Record

Epris that all silvins: If North	ار الانداز (المنظمية) المناه المنطقة (المنظمية) المنطقة المنطقة المنطقة المنطقة المنطقة المنطقة المنطقة المنطقة	Property Manage Speed Proper Proper Boards Speed Bases	<u> </u>
rnaround Requests Tharound Requests The outful section client accepts the seswill be attached to his analysis: If desided a regular TAT will be definite. Less than 24 hours (200%) 24 to 48 hours (100%) 48 to 72 hours (50%) Illed: Order-laboratory to notify.	(bovigoer ak) Virilles, lies belisted (C		Cilem: Page 7
Rush Turns Uponfilling Surchalges combleted > Comblete	Tals Mr. HWS-B: Cre. & Hg Class 2. Landfill Tals Mr. Potability Tals Mr. Potability	9W	C ZZZZZ PINK CODY
Egmonton Aberta Egmonton Aberta Tele 399 Webearth agatabs com 25. Fax 730 462 2490 Tele 399 Report Format Report Format Report Format Remote Perepagnite Perepagn	NE BTEX/F4:F4	JOO X X X X	Date Time
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oode.	Postal code.	Sample Identification (0.10.15m) (0.15-0.3m) (0.15-0.3m) (0.15-0.2m) (0.15-0.2m)	
Company Address Shore Address Clientry neet #	nvoice To: Samiff Mile Cirole Contacts Contacts didiess didiess No. A. C.	Sample Sam	P. Wat name & series
Chain of Contact Contact Address Phone LSE Collegit Frole of #1	Invoice To: Sain Company Contact Address Phone Phone Laboratoin use		Simple Fein aushed by John Bernbies Pelintered by John Ber



ACAT Laboratories

SAMPLE INTEGRITY RECEIPT FORM - Edmonton	Received by: Second
Pate & Time: 2//2 am/pm Courier: 2/8 //2 //2 Am/pm Relinquished by: 258 //2 Client left without count verified Yes / No	S Prepaid / Collect Waybill# S 18 VEV (83) ///////////////////////////////////
COC INFORMATION COC received: Yes / No Emailed to CPM COC Complete Yes / No *If NO why: COC Numbers: 250/49 155047 Sample Quantities: Coolers: 2 Bottles/(ard: 50 Bags: 18) *If COC Container count differs from what was received why	TAT: 24hr 24-48hr 48-72hr Reg Other Workorder Number 13-7570772
Microbiology/Time Sensitive Test*:	AEREADY EXCEEDED? Yes (No Expiry): 1/2/2012 Expiry: 1/4/2/2012
SAMPLE INTEGRITY Hazardous: Samples Why hazardous:	Precautionitaken: 2/9
Specialty Issues Legal Samples: Yes/No/ International Samples: Yes/No/T	roper-tape/labels-applied: Yes:/No
Damaged: Yes / No lif YES why? No Bubble Wrap Frozen	
Temperature (to be recorded from bottles/ars only) (1) (Bottleffait) (1) + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 +	N/A = Only Soil Bags received = = <u>D(</u> +C(3) (Bottle/Jan) ++ + = °C :
(4) (Bottle/Jar) + + = °C (5) (Bottle/Jar) + + + + (If more than 6 coolers are received use anothers. Coolant used: / Icepack(Top / Bottom / Nide) Bagged Ice (Top	heet of paper and attach)
Correct Sample Requirements for Testing (to be completed by Lo Bottles: Yes / No Amount: Yes / No Labels: Yes / No *If NO to any of the above explain why:	gistics slaff during login process)
Visible Sediment: Yes/No/NA(soil)	
Additional integrity issues (indicate issues below and on the CoC next to the	e sample ID): Q. J. C.
Account Project Manager: have they been a Date and Time:	notified of the above issues: Yes No GPM Initial:

SR-170-9500:004 August 14: 2013 - 2



CLIENT NAME: IEG ENVIRONMENTAL (NORTH)
PO BOX 3178
INUVIK, NT X0E0T0
(403) 262-5505

ATTENTION TO: Nicole Wills

PROJECT NO: Unipkat I-22 / A04025A02

AGAT WORK ORDER: 13E750792

SOIL ANALYSIS REVIEWED BY: Jarrod Roberts, Operations Manager TRACE ORGANICS REVIEWED BY: Jarrod Roberts, Operations Manager

DATE REPORTED: Aug 29, 2013

PAGES (INCLUDING COVER): 12

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (780) 395-2525

*NOTES			
7 4144			in the company of the

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

Page 1 of 12

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA)

of Alberta (APEGGA)
Western Enviro-Agricultural Laboratory Association (WEALA)
Environmental Services Association of Alberta (ESAA)

6310 ROPER ROAD EDMONTON, ALBERTA CANADA TGB 3P9 TEL (780)395-2525 FAX (780)462-2490 http://www.agatlabs.com

AGAT WORK ORDER: 13E750792

ATTENTION TO: Nicole Wills

Parameter Para	DATE RECEIVED: 2013-08-21	38-21									DATE REPORT	DATE REPORTED: 2013-08-29	
Annual Parameter Los of the control of th						TH-13-01	TH-13-01 (0.	TH-13-02	TH-13-02 (0.	TH-13-03	TH-13-03 (0.	TH-13-04	TH-13-04 (0.
Parameter Unit G7.R Solit Parameter Unit G7.R RDL 4677968 4772043 81772013 8				SAMPLE DE	ESCRIPTION:	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)
Parameter Unit OATE SAMPLED: 81/12013				SA	AMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Parameter Unit G/S RDL 4679800 46798001<				DAT	TE SAMPLED:	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013
v Dry Weight mg/kg 20 6.5 <	Parameter		Chit	S/S		4679798	4679800	4679801	4679803	4679804	4679806	4679807	4679809
mg/kg 17 6.5 6.2 6.3 5.6 7.0 5.4 6.5 mg/kg 750 0.5 472 641 1530 726 1120 55.4 479 old walter extraction) mg/kg 7.0 6.5 40.5 40.5 40.5 6.6 40.5 6.6 40.5 6.6 40.5 6.6 <td< td=""><td>Antimony Dry Weight</td><td></td><td>mg/kg</td><td>20</td><td>0.5</td><td><0.5</td><td><0.5</td><td><0.5</td><td><0.5</td><td><0.5</td><td><0.5</td><td><0.5</td><td><0.5</td></td<>	Antimony Dry Weight		mg/kg	20	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
mg/kg 750 6.5 472 641 1530 726 1120 555 479 numble mg/kg 5 6.5 6.05	Arsenic		mg/kg	17	0.5	6.2	6.2	6.3	5.6	7.0	5.4	6.5	6.3
mg/kg 5 6.5 6.05 6.	Sarium		mg/kg	750	0.5	472	641	1530	726	1120	555	479	929
Hot water extraction) mg/kg 2 6.5 6.05 <td>Servilium</td> <td></td> <td>mg/kg</td> <td>5</td> <td>0.5</td> <td><0.5</td> <td><0.5</td> <td><0.5</td> <td><0.5</td> <td>9.0</td> <td><0.5</td> <td>0.5</td> <td><0.5</td>	Servilium		mg/kg	5	0.5	<0.5	<0.5	<0.5	<0.5	9.0	<0.5	0.5	<0.5
mm mg/kg 14 6.5 6.0.5 7.0	Soron (Hot water extraction)		mg/kg	7	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
imm mg/kg 64 0.5 15.0 14.4 15.3 13.1 17.0 13.4 15.8 imi, Hexavalent mg/kg 0.4 0.3 <0.3	Cadmium		mg/kg	4.1	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5
mg/kg 0.4 0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3 <0.3	Chromium		mg/kg	64	0.5	15.0	14.4	15.3	13.1	17.0	13.4	15.8	15.1
mg/kg 20 6.5 7.4 7.2 7.5 6.8 8.1 6.7 7.5 mg/kg 6.3 6.5 15.6 15.3 15.6 13.0 16.8 12.5 16.0 mg/kg 70 6.5 7.8 7.7 8.2 6.8 9.0 6.3 7.5 num mg/kg 6.6 0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <td>Chromium. Hexavalent</td> <td></td> <td>mg/kg</td> <td>0.4</td> <td>0.3</td> <td><0.3</td> <td><0.3</td> <td><0.3</td> <td><0.3</td> <td><0.3</td> <td><0.3</td> <td><0.3</td> <td><0.3</td>	Chromium. Hexavalent		mg/kg	0.4	0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
mg/kg 63 15.6 15.3 15.6 13.0 16.8 12.5 16.0 mg/kg 70 0.5 7.8 7.7 8.2 6.8 9.0 6.3 7.5 num mg/kg 6.6 0.5 4.05	Cobalt		mg/kg	20	0.5	7.4	7.2	7.5	6.8	8.1	6.7	7.5	7.2
mg/kg 70 6.5 7.8 7.7 8.2 6.8 9.0 6.3 7.5 num mg/kg 6.6 0.5 40.5	Copper		mg/kg	63	0.5	15.6	15.3	15.6	13.0	16.8	12.5	16.0	14.7
y mg/kg 6.6 0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.7 <0.	Lead		mg/kg	70	0.5	7.8	7.7	8.2	6.8	9.0	6.3	7.5	7.7
Jenum mg/kg 4 0.5 1.3 1.4 1.5 1.2 1.5 1.2 1.3 um mg/kg 50 0.5 22.5 22.3 23.0 20.2 24.6 19.2 23.6 um mg/kg 1 0.5 6.0 6.7 0.7 0.5 6.0 0.7 0.6 0.7 0.6 0.7 0.7 0.6 0.7 0.7 0.6 0.7 0.7 0.6 0.7 0.7 0.6 0.7 0.7 0.6 0.7 0.7 0.6 0.7 0.7 0.6 0.7 0.7 0.6 0.7 0.7 0.6 0.7 0.7 0.6 0.7 0.6 0.7 0.6	Mercury		mg/kg	9.9	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
um mg/kg 50 0.5 22.5 22.3 23.0 20.2 24.6 19.2 23.6 um mg/kg 1 0.5 0.6 0.7 0.7 0.5 0.7 0.6 0.7 m mg/kg 20 0.5 <0.5	Molybdenum		mg/kg	4	0.5	6.1	4.1	1.5	1.2	1.5	1.2	د ن	1.4
um mg/kg 1 0.5 0.6 0.7 0.7 0.5 0.7 0.6 0.7 m mg/kg 20 0.5 <0.5	Nickel		mg/kg	20	0.5	22.5	22.3	23.0	20.2	24.6	19.2	23.6	21.8
mg/kg 20 0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <	Selenium		mg/kg	-	0.5	9.0	0.7	0.7	0.5	0.7	9.0	0.7	9.0
m mg/kg 1 0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5	Silver		mg/kg	20	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
ium mg/kg 5 0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.5 <0.	Thallium		mg/kg	-	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
ium mg/kg 23 0.5 0.9 1.0 0.9 0.9 1.0 0.9 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0	Ę		mg/kg	S	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
ldium mg/kg 130 0.5 29.0 28.8 28.5 27.2 33.3 27.4 31.6 mg/kg 200 1 79 75 77 69 82 68 79	Uranium		mg/kg	23	0.5	6.0	1.0	6.0	6.0	1.0	6.0	1.0	1.0
mg/kg 200 1 79 75 77 69 82 68 79	Vanadium		mg/kg	130	0.5	29.0	28.8	28.5	27.2	33.3	27.4	31.6	30.9
	Zinc		mg/kg	200		62	75	77	69	82	89	62	74

Certified By:

PROJECT NO: Unipkat I-22 / A04025A02 AGAT WORK ORDER: 13E750792

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)	NMENTAL	(NORTH)					ATTENTION TO: Nicole Wills	Nicole Wills
			CCME /	Alberta Ti	er 1 Metals +	Hg + HWS	CCME / Alberta Tier 1 Metals + Hg + HWS B + Cr6 (soil)	
DATE RECEIVED: 2013-08-21								DATE REPORTED: 2013-08-29
				TH-13-05	TH-13-05 (0.	TH-13-06	TH-13-06 (0.	
		SAMPLE DI	SAMPLE DESCRIPTION:	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)	
		SA	SAMPLE TYPE:	Soil	Soil	Soil	Soil	
		DAT	DATE SAMPLED:	8/17/2013	8/17/2013	8/17/2013	8/17/2013	
Parameter	Unit	8/9	RDL	4679810	4679812	4679813	4679815	The state of the s
Antimony Dry Weight	mg/kg	20	0.5	<0.5	<0.5	<0.5	<0.5	
Arsenic	mg/kg	17	0.5	9.9	0.9	6.2	0.9	
Barium	mg/kg	750	0.5	447	530	449	797	
Beryllium	mg/kg	5	0.5	0.5	<0.5	<0.5	<0.5	
Boron (Hot water extraction)	mg/kg	2	0.5	<0.5	<0.5	<0.5	<0.5	
Cadmium	mg/kg	4.1	9.0	9.0	<0.5	0.5	<0.5	
Chromium	mg/kg	64	9.0	15.7	14.4	14.8	14.0	
Chromium, Hexavalent	mg/kg	0.4	0.3	<0.3	<0.3	<0.3	<0.3	
Cobalt	mg/kg	20	0.5	7.9	7.1	7.4	7.2	
Copper	mg/kg	63	0.5	16.4	15.0	15.4	14.2	
Lead	mg/kg	02	0.5	8.0	7.4	7.3	7.3	
Mercury	mg/kg	9.9	0.5	<0.5	<0.5	<0.5	<0.5	
Molybdenum	mg/kg	4	0.5	4.1	1.3	6.	1.3	
Nickel	mg/kg	90	0.5	23.9	21.4	22.6	21.1	
Selenium	mg/kg	-	9.0	0.7	9.0	9.0	9.0	
Silver	mg/kg	20	0.5	<0.5	<0.5	<0.5	<0.5	
Thallium	mg/kg	-	9.0	<0.5	<0.5	<0.5	<0.5	
Tin	mg/kg	5	0.5	<0.5	<0.5	<0.5	<0.5	
Uranium	mg/kg	23	0.5	1.0	1.0	6.0	6.0	
Vanadium	mg/kg	130	0.5	31.6	29.8	29.6	29.0	
Zinc	mg/kg	200	-	83	75	78	71	

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ABTier1 Soil (Ag, F) 4679798-4679815 Results are based on the dry weight of the sample.

Certified By:

ATTENTION TO: Nicole Wills	

								DATE REPORTED: 2013-08-29	D: 2013-08-29	
			TH-13-01	TH-13-01 (0.	TH-13-02	TH-13-02 (0.	TH-13-03	TH-13-03 (0.	TH-13-04	TH-13-04 (0.
		SAMPLE DESCRIPTION:	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013
Parameter	Unit	G/S RDL	4679798	4679800	4679801	4679803	4679804	4679806	4679807	4679809
PH (CaCl2 Extraction)	pH Units	A/N	7.41	7.39	7.43	7.34	7.35	7.39	6.81	7.24
Flactrical Conductivity (Sat Paste)	dS/m	0.01	3.66	3.17	8.89	2.19	6.28	4.16	2.25	1.82
Sodium Adsorption Ratio			1.97	1.26	5.47	1.01	3.16	2.10	0.95	1.24
Saturation Percentage	%	A/X	41	47	44	44	50	43	47	44
Chloride Soluble	ma/L	S.	233	285	1990	174	1330	657	247	188
Calcium Soluble	mg/L	_	484	532	863	358	816	574	358	250
Potassium Soluble	mg/L	2	25	19	47	23	32	26	21	40
Magnesium Soluble	mg/L	_	181	107	318	72	221	142	72	22
Sodium Soluble	mg/L	2	200	122	740	80	395	217	75	83
Sulfur (as Sulfate) Soluble	ma/L	2	2000	1600	2190	1040	1830	1610	943	269
Calcium Soluble (med/1)	mea/L	0.05	24.2	26.5	43.1	17.9	40.7	28.6	17.9	12.5
Calcium Soluble (mg/kg)	ma/ka		198	250	380	158	408	247	168	110
Calcium, Colubia (mg/ng)	men/l	90.0	6.57	8.04	56.1	4.91	37.5	18.5	6.97	5.30
Chloride Soluble (mg/kg)	ma/ka	2	96	134	876	22	999	283	116	83
Magnesium Soluble (meg/L)	med/L	0.08	14.9	8.80	26.2	5.92	18.2	11.7	5.92	4.53
Magnesium, Soluble (mg/kg)	mg/kg	-	74	20	140	32	111	61	34	24
Potassium Soluble (med/L)	med/L	0.05	0.64	0.49	1.20	0.59	0.82	99.0	0.54	1.02
Potassium Soluble (ma/ka)	ma/ka	2	10	6	21	10	16	7	10	18
Sodium. Soluble (mea/L)	med/L	60'0	8.70	5.31	32.2	3.48	17.2	9.44	3.26	3.61
Sodium, Soluble (mg/kg)	mg/kg	2	82	25	326	35	198	93	32	37
Sulfur (as Sulfate), Soluble (meq/L)	med/L	0.04	41.6	33.3	45.6	21.7	38.1	33.5	19.6	14.5
Sulfur (as Sulfate), Soluble (mg/kg)	mg/kg	2	820	752	964	458	915	692	443	307
Theoretical Gynsum Requirement	tonnot/ha		c	c	C	C	0	0	0	0

Certified By:

Results relate only to the items tested and to all the items tested

PROJECT NO: Unipkat I-22 / A04025A02

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)	MENTAL	(NORTH)				ATTENTION TO: Nicole Wills	Nicole Wills	
		Soil An	alysis - Sal	inity (AB Tier	1 - pH Ca	alysis - Salinity (AB Tier 1 - pH Calcium Chloride)		
DATE RECEIVED: 2013-08-21							DATE REPORTED: 2013-08-29	
			TH-13-05	TH-13-05 (0.	TH-13-06	TH-13-06 (0.		, and
		SAMPLE DESCRIPTION	: (0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)		
		SAMPLE TYPE	: Soil	Soil	Soil	Soil		
		DATE SAMPLED	: 8/17/2013	8/17/2013	8/17/2013	8/17/2013		
Parameter	Unit	G/S RDL	4679810	4679812	4679813	4679815	100 miles (100 miles (
pH (CaCl2 Extraction)	pH Units	N/A	7.39	7.00	7.16	7.24		
Electrical Conductivity (Sat. Paste)	dS/m	0.01	1.99	1.01	2.46	3.19		
Sodium Adsorption Ratio			0.85	0.45	06.0	0.74		
Saturation Percentage	%	A/A	62	35	54	46		
Chloride, Soluble	mg/L	2	156	61	115	129		
Calcium, Soluble	mg/L	÷	308	160	442	628		
Potassium, Soluble	mg/L	2	15	12	21	26		
Magnesium, Soluble	mg/L	-	75	32	92	113		
Sodium, Soluble	mg/L	2	64	24	80	77		
Sulfur (as Sulfate), Soluble	mg/L	2	948	319	1440	2070		
Calcium, Soluble (meq/L)	med/L	90.02	15.4	7.98	22.1	31.3		
Calcium, Soluble (mg/kg)	mg/kg	•	191	56	239	289		
Chloride, Soluble (meq/L)	med/L	90.0	4.40	1.72	3.24	3.64		
Chloride, Soluble (mg/kg)	mg/kg	2	26	21	62	29		
Magnesium, Soluble (meq/L)	med/L	80.0	6.17	2.63	7.57	9.30		
Magnesium, Soluble (mg/kg)	mg/kg	-	47	7	20	52		
Potassium, Soluble (meq/L)	J/bem	90.02	0.38	0.31	0.54	99.0		
Potassium, Soluble (mg/kg)	mg/kg	2	6	4	7	12		
Sodium, Soluble (meq/L)	med/L	60:0	2.78	1.04	3.48	3.35		
Sodium, Soluble (mg/kg)	mg/kg	2	40	80	43	35		
Sulfur (as Sulfate), Soluble (meq/L)	med/L	0.04	19.7	6.64	30.0	43.1		
Sulfur (as Sulfate), Soluble (mg/kg)	mg/kg	2	588	112	778	952		
Theoretical Gypsum Requirement	tonnes/ha		0	0	0	0		

G / S - Guideline / Standard: Refers to ABTier1 (Ag,F) RDL - Reported Detection Limit; Comments: Certified By:

AGG CERTIFICATE OF ANALYSIS (V1)

ssted and to all the items tested Results relate only to the i

6310 ROPER ROAD EDMONTON, ALBERTA CANADA TGB 3P9 TEL (780)395-2525 FAX (780)462-2490 http://www.agatiabs.com

ATTENTION TO: Nicole Wills

		Petrole	um Hydro	Petroleum Hydrocarbons (BTEX/F1-F4) in Soil (CWS)	EX/F1-F4)	in Soil (CW	3)			A 100 PM
DATE RECEIVED: 2013-08-21								DATE REPORTED: 2013-08-29	:D: 2013-08-29	
			TH-13-01	TH-13-01 (0.	TH-13-02	TH-13-02 (0.	TH-13-03	TH-13-03 (0.	TH-13-04	TH-13-04 (0.
		SAMPLE DESCRIPTION:	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)
		SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013	8/17/2013
Parameter	Chit	0	4679798	4679800	4679801	4679803	4679804	4679806	4679807	4679809
Benzene	mg/kg	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Tolliene	ma/ka		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	ma/ka		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Xvlenes	ma/ka	1 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
C6 - C10 (F1)	mg/kg	10	<10	<10	<10	<10	<10	<10	<10	<10
C6 - C10 (F1 minus BTEX)	mg/kg	10	۷10	<10	<10	<10	<10	<10	<10	<10
C10 - C16 (F2)	mg/kg	10	<10	<10	58	<10	<10	<10	<10	<10
C16 - C34 (F3)	mg/kg	10	35	20	111	10	23	<10	35	25
C34 - C50 (F4)	mg/kg	10	<10	11	71	<10	14	<10	21	16
Gravimetric Heavy Hydrocarbons	mg/kg	1000	N/A	N/A	N/A	N/A	N/A	N/A	N/A	NA
Moisture Content	%	T	25	26	26	23	25	22	59	59
Surrogate	Unit	Acceptable Limits								
Toluene-d8 (BTEX)	%	50-150	111	112	112	112	112	112	113	112
Ethylbenzene-d10 (BTEX)	%	50-150	107	112	119	82	78	80	78	98
o-Terphenyl (F2-F4)	%	50-150	93	93	94	91	87	98	112	91

Certified By:

6310 ROPER ROAD

ATTENTION TO: Nicole Wills

PROJECT NO: Unipkat I-22 / A04025A02 AGAT WORK ORDER: 13E750792

		Petrole	um Hydro	Petroleum Hydrocarbons (BTEX/F1-F4) in Soil (CWS)	EX/F1-F4)	In Soil (CW	2)		
DATE RECEIVED: 2013-08-21								DATE REPORTED: 2013-08-29	
			TH-13-05	TH-13-05 (0.	TH-13-06	TH-13-06 (0.			
		SAMPLE DESCRIPTION:	(0-0.15m)	3-0.6m)	(0-0.15m)	3-0.6m)			
		SAMPLE TYPE:	Soil	Soil	Soil	Soil			
		DATE SAMPLED:	8/17/2013	8/17/2013	8/17/2013	8/17/2013			
Parameter	Unit	G/S RDL	4679810	4679812	4679813	4679815			
Benzene	mg/kg	0.005	<0.005	<0.005	<0.005	<0.005			1_1
Toluene	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05			
Ethylbenzene	mg/kg	0.01	<0.01	<0.01	<0.01	<0.01			
Xylenes	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05			
C6 - C10 (F1)	mg/kg	10	<10	<10	<10	<10			
C6 - C10 (F1 minus BTEX)	mg/kg	10	<10	<10	<10	×10			
C10 - C16 (F2)	mg/kg	10	<10	<10	<10	<10			
C16 - C34 (F3)	mg/kg	10	27	12	17	21			
C34 - C50 (F4)	mg/kg	10	21	×10	<10	13			
Gravimetric Heavy Hydrocarbons	mg/kg	1000	N/A	N/A	N/A	N/A			
Moisture Content	%	-	29	29	30	21			
Surrogate	Unit	Acceptable Limits					. W		
Toluene-d8 (BTEX)	%	50-150	112	114	112	113			
Ethylbenzene-d10 (BTEX)	%	50-150	80	79	83	78			
o-Terphenyl (F2-F4)	%	50-150	96	98	96	06			

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ABTier1 (Ag,F) Comments:

4679798-4679815 Results are based on the dry weight of the sample.

The C6-C10 (F1) fraction is calculated using toluene response factor.

The C6-C10 (F1) fraction is calculated using toluene response factor.

The C10 - C16 (F2), C16 - C34 (F3), and C34 - C50 (F4) fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.

Gravimetric Heavy Hydrocarbons (F4g) are not included in and cannot be added to the Total C6-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons > C50 are present.

rotal C6 - C50 results are corrected for BTEX and PAH contributions (if requested)

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. Quality control data is available upon request. Assistance in the interpretation of data is available upon request.

nC6 and nC10 response factors are within 30% of Toluene response factor. nC10, nC16 and nC34 response factors are within 10% of their average. C50 response factor is within 70% of nC10 + nC16 + nC34 average.

Linearity is within 15%.

The chromatogram returned to baseline by the retention time of nC50. Extraction and holding times were met for this sample.

Certified By:

ATTENTION TO: Nicole Wills

DATE RECEIVED: 2013-08-21 Parameter Unit Naphthalene mg/kg 2-Methylnaphthalene mg/kg Acenaphthylene mg/kg Fluorene mg/kg Phenanthrene mg/kg Anthracene mg/kg Anthracene mg/kg Phoranthene mg/kg Anthracene mg/kg Phoranthene mg/kg Cluoranthene mg/kg Pyrene mg/kg Chrysene mg/kg				1 1111				00 00 0000	
Parameter ne aphthalene ylene nene ene ene trinacene							DATE REPORTED: 2013-08-29	7. 2013-00-29	
Parameter ne aphthalene ylene nene ee et thracene			TH-13-01		TH-13-02				
Parameter ne aphthalene ylene nene ene ene trinacene	SA	SAMPLE DESCRIPTION:	ON: (0-0.15m)		(0-0.15m)				
Parameter nne aphthalene ylene nene ene ene trinacene		SAMPLE TYPE:			Soil				
Parameter ne aphthalene ylene nene ene ene trinacene		DATE SAMPLED:	8		8/17/2013				
nne aphthalene vylene nene rene e e sne thracene	nit	G/S RDL	4679798		4679801				
aphthalene ylene nene ene ene the sine thracene	/kg	0.018 0.005			0.028				
ylene hene rene ee sne thracene	/kg	0.005			0.046				
rene rene sne sne thracene	/kg	6.0 0.005			<0.005				
rene ne ane thracene	/kg	0.38 0.005	5 <0.005	10	<0.005				
rene re sne thracene	/kg	0.34 0.02			<0.02				
ne ane ithracene	/kg	0.061 0.02			90.0				
one thracene	/kg	0.0056 0.004		-	<0.004				
thracene	/kg	0.039 0.01			0.01				
thracene	/kg	0.040 0.01			0.03				
	/kg	0.083 0.03			<0.03				
	/kg	6.2 0.05			<0.05				
Benzo[b+j]fluoranthene mg/kg	/kg	6.2 0.05			<0.05				
	/kg	6.2 0.05			<0.05				
	/kg	0.03			<0.03				
pyrene	/kg	0.05			<0.05				
	/kg	8.4 0.005			<0.005				
	/kg	90.0			<0.05				
Surrogate Unit	nit	Acceptable Limits	S						
2-Fluorobiphenyl (PAH) %	%	50-150	75		81				
p-Terphenyl-d14 (PAH) %	%	50-150	73		71				

G / S - Guideline / Standard: Refers to ABTier1 Soil (Ag, C) Comments: RDL - Reported Detection Limit; G / S - Guideline 4679798-4679801 Results are based on the dry weight of the sample. Based on GC/MS target ion analysis.

Isomers Benzo(b)fluoranthene and Benzo(j)fluoranthene have the same GC retention time and are reported as the sum based on the Benzo(b)fluoranthene response.

Certified By:

Results relate only to the items tested and to all the items tested



Quality Assurance

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

AGAT WORK ORDER: 13E750792 ATTENTION TO: Nicole Wills

PROJECT NO: Unipkat I-22 / A04025A02

Soli Analysis - Salinity (AB Tier 1 - pH Calculum Chloride) pH (Caci) Extraction					Soi	I Ana	alysis	5								
PARAMETER Batch Sample Dup #1 Dup #2 RPD Blank Measured Limits Lower Upwer Dup #2 United Lower Upwer U	RPT Date: Aug 29, 2013		10.127		UPLICATE	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	'RIX SPI	KE
Soli Analysis - Salinity (AB Tier 1 - pH Calcium Chloride)	PARAMETER	Batch		Dup #1	Dup #2	RPD					Recovery			Recovery		
pH (Cac) Extraction)			la la	193441	10 (9)		-11-	Value	Lower	Upper		Lower	Upper		Lower	Uppe
Electrical Conductivity (Sat. Paste) 686 4679810 1.99 2.06 3.5% < 0.01 108% 90% 110% 80% 120% 80% 120% 103% 80% 103% 80% 10	Soil Analysis - Salinity (AB Tier 1 -	- pH Cal	cium Chlori	de)												
Saturation Percentage 665 4679810 62 61 1.6% N/A 100% 80% 120% 102% 80% 120% 103% 80% 103% 80% 80% 103% 80% 80% 80% 80% 80% 80% 80% 80% 80% 80	pH (CaCl2 Extraction)	686	4679810	7.39	7.37	0.3%	N/A	100%	90%	110%						
Chloride, Soluble 689 4679704 < 5 < 5 0.0% < 5 97% 80% 120% 102% 80% 120% 103% 80% 12 alcium, Soluble 421 4679704 27 27 1.7% < 1 112% 80% 120% 102% 80% 120% 109% 80% 12 alcium, Soluble 421 4679704 < 2 < 2 0.0% < 2 104% 80% 120% 120% 100% 80% 12 alcium, Soluble 421 4679704 14 15 2.0% < 1 109% 80% 120% 100% 80% 12 alcium, Soluble 421 4679704 25 24 2.3% < 2 102% 80% 120% 100% 80% 12 alcium, Soluble 421 4679704 36 36 0.4% < 2 102% 80% 120% 102% 80% 102%	Electrical Conductivity (Sat. Paste)	686	4679810	1.99	2.06	3.5%	< 0.01	108%	90%	110%						
Calcium, Soluble 421 4679704 27 27 1.7% <1 112% 80% 120% 109% 80% 12 Potassium, Soluble 421 4679704 <2 <2 0.0% <2 104% 80% 120% 100% 80% 12 Magnesium, Soluble 421 4679704 14 15 2.0% <1 109% 80% 120% 103% 80% 15 Sodium, Soluble 421 4679704 25 24 2.3% <2 102% 80% 120% 103% 80% 15 Sodium, Soluble 421 4679704 36 36 0.4% <2 110% 80% 120% 102% 80% 104% 80% 12 Magnesium, Soluble 421 4679704 36 36 0.4% <2 110% 80% 120% 104% 80% 104% 80% 100% 80% 10	Saturation Percentage	665	4679810	62	61	1.6%	N/A	100%	80%	120%						
Potassium, Soluble 421 4679704 <2 <2 0.0% <2 104% 80% 120% 100% 80% 120% 103% 80% 12 Sodium, Soluble 421 4679704 14 15 2.0% <1 109% 80% 120% 103% 80% 12 Sodium, Soluble 421 4679704 25 24 2.3% <2 102% 80% 120% 102% 80% 12 Sulfur (as Sulfate), Soluble 421 4679704 36 36 0.4% <2 110% 80% 120% 102% 80% 12 Sulfur (as Sulfate), Soluble 421 4679704 36 36 0.4% <2 110% 80% 120% 102% 80% 12 Sulfur (as Sulfate), Soluble 421 4679704 36 36 0.4% <2 110% 80% 120% 102% 80% 12 Sulfur (as Sulfate), Soluble 421 4679704 36 36 0.4% <2 110% 80% 120% 102% 80% 12 Sulfur (as Sulfate), Soluble 421 4679704 36 36 0.4% <2 110% 80% 120% 80% 120% 80% 12 Sulfur (as Sulfate), Soluble 421 4679798 <0.5 <0.5 0.0% <0.5 98% 80% 120% 96% 80% 12 Sulfur (as Sulfate), Soluble 421 4679798 6.2 6.3 1.6% <0.5 99% 80% 120% 96% 80% 12 Sulfur (as Sulfate), Soluble 421 4679798 472 462 2.1% <0.5 109% 80% 12 Sulfur (as Sulfate), Soluble 421 4679798 <0.5 <0.5 0.0% <0.5 98% 80% 120% 115% 80% 10 Sulfur (as Sulfate), Soluble 44 4679798 <0.5 <0.5 0.0% <0.5 110% 80% 12 Sulfur (as Sulfate), Soluble 44 4679798 80.5 <0.5 0.0% <0.5 110% 80% 10 Sulfur (as Sulfate), Soluble 44 4679798 15.0 14.8 1.3% <0.5 91% 80% 120% 96% 80% 12 Sulfur (as Sulfate), Soluble 421 4679798 15.0 14.8 1.3% <0.5 91% 80% 120% 95% 80% 12 Sulfur (as Sulfate), Soluble 44 4679798 15.0 14.8 1.3% <0.5 91% 80% 12 Sulfur (as Sulfate), Soluble 44 4679798 15.0 14.8 1.3% <0.5 91% 80% 12 Sulfur (as Sulfate), Soluble 44 4679798 15.0 14.8 1.3% <0.5 91% 80% 12 Sulfur (as Sulfate), Soluble 44 4679798 15.0 14.8 1.3% <0.5 91% 80% 12 Sulfur (as Sulfate), Soluble 42 4679798 15.0 14.8 1.3% <0.5 91% 80% 12 Sulfur (as Sulfate), Soluble 42 4679798 15.0 14.8 1.3% <0.5 91% 80% 12 Sulfur (as Sulfate), Soluble 42 4679798 15.0 14.8 1.3% <0.5 91% 80% 12 Sulfur (as Sulfate), Soluble 42 4679798 15.0 14.8 1.3% <0.5 91% 80% 12 Sulfur (as Sulfate), Soluble 42 4679798 15.0 14.8 1.3% <0.5 91% 80% 12 Sulfur (as Sulfate), Soluble 42 4679798 15.0 14.8 1.3% <0.5 91% 80% 12 Sulfur (as Sulfate), Soluble 42 4679798 15.0 14.8 11.3 11.3 11.3 11.	Chloride, Soluble	689	4679704	< 5	< 5	0.0%	< 5	97%	80%	120%	102%	80%	120%	103%	80%	120
Magnesium, Soluble 421 4679704 14 15 2.0% <1 109% 80% 120% 103% 80% 1 Sodium, Soluble 421 4679704 25 24 2.3% <2	Calcium, Soluble	421	4679704	27	27	1.7%	< 1	112%	80%	120%				109%	80%	1209
Sodium, Soluble 421 4679704 25 24 2.3% <2 102% 80% 120% 102% 80% 1 Solution (as Sulfate), Soluble 421 4679704 36 36 0.4% <2 100% 80% 120% 100% 80% 1 Comments: N/A: Not applicable CCME / Alberta Tier 1 Metals + Hg + HWS B + Cr6 (soill) Antimory Dry Weight 644 4679798 <0.5 <0.5 0.0% <0.5 98% 80% 120% 96% 80% 1 Arsenic 644 4679798 472 462 2.1% <0.5 109% 80% 120% 115% 80% 1 Beryllium 644 4679798 <0.5 <0.5 0.0% <0.5 98% 80% 120% 100% 100% 80% 1 Cadmium 644 4679798 <0.5 <0.5 0.0% <0.5 98% 80% 120% 100% 100% 80% 1 Cadmium 644 4679798 <0.5 <0.5 0.0% <0.5 98% 80% 120% 100% 80% 100% 100% 80% 1 Cadmium 644 4679798 <0.5 <0.5 0.0% <0.5 110% 80% 120% 100% 80% 1 Cadmium 644 4679798 <0.5 <0.5 0.0% <0.5 98% 80% 120% 100% 80% 1 Cadmium 644 4679798 <0.5 <0.5 0.0% <0.5 98% 80% 120% 100% 96% 80% 1 Cadmium 644 4679798 15.0 14.8 1.3% <0.5 91% 80% 120% 95% 80% 120% 96% 80% 1 Cobalt 644 4679798 15.0 14.8 1.3% <0.5 91% 80% 120% 95% 80% 120% 96% 80% 1 Cobalt 644 4679798 15.0 16.0 2.5% <0.5 94% 80% 120% 95% 80% 120% 96% 80% 1 Cobalt 644 4679798 7.8 7.8 7.8 0.0% <0.5 94% 80% 120% 95% 80% 1 Mercury 644 4679798 1.3 1.3 0.0% <0.5 94% 80% 120% 96% 80% 1 Mercury 644 4679798 0.5 <0.5 0.0% <0.5 94% 80% 120% 95% 80% 1 Mercury 644 4679798 1.3 1.3 0.0% <0.5 94% 80% 120% 96% 80% 1 Melcular 644 4679798 0.5 <0.5 0.0% <0.5 94% 80% 120% 96% 80% 1 Selenium 644 4679798 0.5 <0.5 0.0% <0.5 96% 80% 120% 96% 80% 1 Thallium 644 4679798 0.5 <0.5 0.0% <0.5 96% 80% 120% 97% 80% 1 Thallium 644 4679798 0.5 <0.5 0.0% <0.5 92% 80% 120% 97% 80% 1 Thallium 644 4679798 0.5 <0.5 0.0% <0.5 92% 80% 120% 97% 80% 1 Thallium 644 4679798 0.5 <0.5 0.0% <0.5 92% 80% 120% 97% 80% 1 Thallium 644 4679798 0.5 <0.5 0.0% <0.5 92% 80% 120% 97% 80% 1 Thallium 644 4679798 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9 0.9	Potassium, Soluble	421	4679704	<2	<2	0.0%	< 2	104%	80%	120%				100%	80%	1209
Sulfur (as Sulfate), Soluble 421 4679704 36 36 0.4% <2 110% 80% 120% 120% 104% 80% 1 Comments: N/A: Not applicable CCME / Alberta Tier 1 Metals + Hg + HWS B + Cr6 (soil) Antimony Dry Weight 644 4679798 <0.5 <0.5 0.0% <0.5 98% 80% 120% 96% 80% 120% Arsenic 644 4679798 4.72 462 2.1% <0.5 109% 80% 120% 115% 80% 120% Beryllium 644 4679798 <0.5 <0.5 0.0% <0.5 98% 80% 120% 96% 80% 120% Beryllium 644 4679798 <0.5 <0.5 0.0% <0.5 110% 80% 120% 102% 96% 80% 102%	Magnesium, Soluble	421	4679704	14	15	2.0%	< 1	109%	80%	120%				103%	80%	1209
Comments: N/A: Not applicable CCME / Alberta Tier 1 Metals + Hg + HWS B + Cr6 (soil) Antimony Dry Weight 644 4679798 < 0.5	Sodium, Soluble	421	4679704	25	24	2.3%	< 2	102%	80%	120%				102%	80%	120%
CCME / Alberta Tier 1 Metals + Hg + HWS B + Cr6 (soil) Antimony Dry Weight 644 4679798 < 0.5 < 0.5 0.0% < 0.5 98% 80% 120% 96% 80% 120% Barium 644 4679798 472 462 2.1% < 0.5 109% 80% 120% 115% 80% 1 Beryllium 644 4679798 < 0.5 < 0.5 0.0% < 0.5 98% 80% 120% 115% 80% 1 Beryllium 644 4679798 < 0.5 < 0.5 0.0% < 0.5 98% 80% 120% 110% 80% 1 Boron (Hot water extraction) 420 4681227 < 0.5 < 0.5 0.0% < 0.5 100% 80% 120% 102% 80% 1 Cadmium 644 4679798 < 0.5 < 0.5 0.0% < 0.5 110% 80% 120% 102% 96% 80% 1 Chromium 644 4679798 15.0 14.8 1.3% < 0.5 91% 80% 120% 96% 80% 120% 96% 80% 1 Chromium, Hexavalent 180 4682290 < 0.3 < 0.3 0.0% < 0.3 97% 80% 120% 95% 80% 120% 97% 80% 1 Copper 644 4679798 15.6 16.0 2.5% < 0.5 90% 80% 120% 95% 80% 120% 95% 80% 1 Lead 644 4679798 7.8 7.8 7.8 0.0% < 0.5 94% 80% 120% 95% 80% 120% 92% 80% 1 Mercury 644 4679798 1.3 1.3 0.0% < 0.5 94% 80% 120% 95% 80% 96% 80% 1 Mercury 644 4679798 1.3 1.3 0.0% < 0.5 94% 80% 120% 95% 80% 96% 80% 1 Mercury 644 4679798 2.5 2.6 0.5 0.5 0.0% < 0.5 94% 80% 120% 95% 80% 96% 80% 1 Molybdenum 644 4679798 2.5 2.6 0.5 0.5 0.0% < 0.5 96% 80% 120% 95% 80% 96% 80% 1 Silver 644 4679798 < 0.5 < 0.5 0.0% < 0.5 92% 80% 120% 97% 80% 1 Thallium 644 4679798 < 0.5 < 0.5 0.0% < 0.5 92% 80% 120% 97% 80% 1 Tin 644 4679798 < 0.5 < 0.5 0.0% < 0.5 92% 80% 120% 97% 80% 1 Uranium 644 4679798 < 0.5 < 0.5 0.0% < 0.5 92% 80% 120% 97% 80% 1 Uranium 644 4679798 < 0.5 < 0.5 0.0% < 0.5 92% 80% 120% 97% 80% 1 Uranium 644 4679798 < 0.5 < 0.5 0.0% < 0.5 92% 80% 120% 97% 80% 1 Uranium 644 4679798 0.9 0.9 0.9 0.0% < 0.5 92% 80% 120% 100% 100% 80% 1	Sulfur (as Sulfate), Soluble	421	4679704	36	36	0.4%	< 2	110%	80%	120%				104%	80%	120%
Antimony Dry Weight 644 4679798 < 0.5	Comments: N/A: Not applicable															
Arsenic 644 4679798 6.2 6.3 1.6% < 0.5 99% 80% 120% 96% 80% 1 15% 80% 1 2 3 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	CCME / Alberta Tier 1 Metals + Hg	+ HWS	B + Cr6 (so	il)												
Barium 644 4679798 472 462 2.1% < 0.5 109% 80% 120% 115% 80% 1 15% 80% 1 Beryllium 644 4679798 < 0.5 < 0.5 < 0.5 0.0% < 0.5 98% 80% 120% 102% 80% 1 102% 80% 1 102% 80% 1 102% 80% 1 102% 80% 1 108% 8	Antimony Dry Weight	644	4679798	< 0.5	< 0.5	0.0%	< 0.5	98%	80%	120%				94%	80%	120
Beryllium 644 4679798 < 0.5 < 0.5 0.0% < 0.5 98% 80% 120% 102% 80% 1 Boron (Hot water extraction) 420 4681227 < 0.5	Arsenic	644	4679798	6.2	6.3	1.6%	< 0.5	99%	80%	120%				96%	80%	120
Boron (Hot water extraction) 420 4681227 <0.5 <0.5 0.0% <0.5 110% 80% 120% 108% 80% 1 Cadmium 644 4679798 <0.5 <0.5 0.0% <0.5 98% 80% 120% 96% 80% 1 Chromium 644 4679798 15.0 14.8 1.3% <0.5 91% 80% 120% 97% 80% 1 Chromium, Hexavalent 180 4682290 <0.3 <0.3 0.0% <0.3 97% 80% 120% 95% 80% 120% 95% 80% 120% 96% 80% 1 Cobalt Copper 644 4679798 7.4 7.5 1.3% <0.5 90% 80% 120% 95% 80% 120% 95% 80% 1 Copper 644 4679798 15.6 16.0 2.5% <0.5 94% 80% 120% 92% 80% 1 Copper 444 4679798 7.8 7.8 0.0% <0.5 94% 80% 120% 92% 80% 1 Nercury 444 4679798 0.5 <0.5 0.0% <0.5 94% 80% 120% 96% 80% 1 Nickel 644 4679798 22.5 22.6 0.4% <0.5 92% 80% 120% 95% 80% 1 Selenium 644 4679798 0.6 0.6 0.0% <0.5 92% 80% 120% 95% 80% 1 Silver 644 4679798 <0.5 <0.5 0.0% <0.5 92% 80% 120% 93% 80% 1 Thaillium 644 4679798 <0.5 <0.5 0.0% <0.5 92% 80% 120% 97% 80% 1 Thin 644 4679798 0.9 0.9 0.0% <0.5 95% 80% 120% 97% 80% 1 Uranium 644 4679798 0.9 0.9 0.0% <0.5 95% 80% 120% 115% 80% 1	Barium	644	4679798	472	462	2.1%	< 0.5	109%	80%	120%				115%	80%	120
Cadmium 644 4679798 < 0.5	Beryllium	644	4679798	< 0.5	< 0.5	0.0%	< 0.5	98%	80%	120%				102%	80%	120
Chromium 644 4679798 15.0 14.8 1.3% < 0.5 91% 80% 120% 97% 80% 1 Chromium, Hexavalent 180 4682290 < 0.3 < 0.3 0.0% < 0.3 97% 80% 120% 95% 80% 120% 96% 80% 1 Cobalt 644 4679798 7.4 7.5 1.3% < 0.5 90% 80% 120% 95% 80% 120% 95% 80% 1 Copper 644 4679798 15.6 16.0 2.5% < 0.5 94% 80% 120% 92% 80% 1 Copper 644 4679798 7.8 7.8 0.0% < 0.5 94% 80% 120% 92% 80% 1 Mercury 644 4679798 < 0.5 < 0.5 0.0% < 0.5 106% 80% 120% 96% 80% 1 Molybdenum 644 4679798 1.3 1.3 0.0% < 0.5 96% 80% 120% 96% 80% 1 Nickel 644 4679798 22.5 22.6 0.4% < 0.5 92% 80% 120% 95% 80% 1 Selenium 644 4679798 < 0.5 < 0.5 0.0% < 0.5 105% 80% 120% 95% 80% 1 Silver 644 4679798 < 0.5 < 0.5 0.0% < 0.5 105% 80% 120% 95% 80% 1 Thallium 644 4679798 < 0.5 < 0.5 0.0% < 0.5 92% 80% 120% 97% 80% 1 Tin 644 4679798 < 0.5 < 0.5 0.0% < 0.5 92% 80% 120% 97% 80% 1 Uranium 644 4679798 < 0.5 < 0.5 0.0% < 0.5 92% 80% 120% 97% 80% 1 Uranium 644 4679798 0.9 0.9 0.0% < 0.5 95% 80% 120% 97% 80% 1	Boron (Hot water extraction)	420	4681227	<0.5	<0.5	0.0%	< 0.5	110%	80%	120%				108%	80%	120
Chromium, Hexavalent 180 4682290 < 0.3	Cadmium	644	4679798	< 0.5	< 0.5	0.0%	< 0.5	98%	80%	120%				96%	80%	120
Cobalt 644 4679798 7.4 7.5 1.3% < 0.5	Chromium	644	4679798	15.0	14.8	1.3%	< 0.5	91%	80%	120%				97%	80%	120
Copper 644 4679798 15.6 16.0 2.5% < 0.5	Chromium, Hexavalent	180	4682290	< 0.3	< 0.3	0.0%	< 0.3	97%	80%	120%	95%	80%	120%	96%	80%	120
Lead 644 4679798 7.8 7.8 0.0% < 0.5 94% 80% 120% 92% 80% 1 Mercury 644 4679798 < 0.5 < 0.5 0.0% < 0.5 106% 80% 120% 96% 80% 1 Molybdenum 644 4679798 1.3 1.3 0.0% < 0.5 96% 80% 120% 97% 80% 1 Nickel 644 4679798 22.5 22.6 0.4% < 0.5 92% 80% 120% 95% 80% 1 Molybdenum 644 4679798 0.6 0.6 0.0% < 0.5 105% 80% 120% 95% 80% 1 Molybdenum 644 4679798 < 0.5 < 0.5 0.0% < 0.5 92% 80% 120% 95% 80% 1 Molybdenum 644 4679798 < 0.5 < 0.5 0.0% < 0.5 105% 80% 120% 93% 80% 1 Molybdenum 644 4679798 < 0.5 < 0.5 0.0% < 0.5 93% 80% 120% 93% 80% 1 Molybdenum 644 4679798 < 0.5 < 0.5 0.0% < 0.5 92% 80% 120% 97% 80% 1 Molybdenum 644 4679798 < 0.5 < 0.5 0.0% < 0.5 92% 80% 120% 97% 80% 1 Molybdenum 644 4679798 < 0.5 < 0.5 0.0% < 0.5 92% 80% 120% 97% 80% 1 Molybdenum 644 4679798 0.9 0.9 0.0% < 0.5 92% 80% 120% 97% 80% 1 Molybdenum 644 4679798 0.9 0.9 0.0% < 0.5 95% 80% 120% 120% 108% 80% 1 Molybdenum 644 4679798 0.9 0.9 0.0% < 0.5 95% 80% 120% 120% 108% 80% 1 Molybdenum 644 4679798 0.9 0.9 0.0% < 0.5 95% 80% 120% 115% 80% 1 Molybdenum 644 4679798 0.9 0.9 0.0% < 0.5 95% 80% 120% 115% 80% 1 Molybdenum 644 4679798 0.9 0.9 0.0% < 0.5 95% 80% 120% 115% 80% 1	Cobalt	644	4679798	7.4	7.5	1.3%	< 0.5	90%	80%	120%				95%	80%	120
Mercury 644 4679798 < 0.5	Copper	644	4679798	15.6	16.0	2.5%	< 0.5	94%	80%	120%				92%	80%	120
Molybdenum 644 4679798 1.3 1.3 0.0% < 0.5	Lead	644	4679798	7.8	7.8	0.0%	< 0.5	94%	80%	120%				92%	80%	120
Nickel 644 4679798 22.5 22.6 0.4% <0.5 92% 80% 120% 95% 80% 1 Selenium 644 4679798 0.6 0.6 0.0% <0.5 105% 80% 120% 93% 80% 1 Selenium 644 4679798 <0.5 <0.5 0.0% <0.5 93% 80% 120% 97% 80% 1 Thallium 644 4679798 <0.5 <0.5 0.0% <0.5 92% 80% 120% 97% 80% 1 Thallium 644 4679798 <0.5 <0.5 0.0% <0.5 92% 80% 120% 93% 80% 1 Thallium 644 4679798 <0.5 <0.5 0.0% <0.5 92% 80% 120% 93% 80% 1 Thallium 644 4679798 <0.5 <0.5 0.0% <0.5 92% 80% 120% 97% 80% 1 Thallium 644 4679798 0.9 0.9 0.0% <0.5 92% 80% 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Mercury	644	4679798	< 0.5	< 0.5	0.0%	< 0.5	106%	80%	120%				96%	80%	120
Selenium 644 4679798 0.6 0.6 0.0% < 0.5	Molybdenum	644	4679798	1.3	1.3	0.0%	< 0.5	96%	80%	120%				97%	80%	120
Silver 644 4679798 < 0.5	Nickel	644	4679798	22.5	22.6	0.4%	< 0.5	92%	80%	120%				95%	80%	120
Thallium 644 4679798 < 0.5	Selenium	644	4679798	0.6	0.6	0.0%	< 0.5	105%	80%	120%				93%	80%	120
Thallium 644 4679798 < 0.5	Silver	644	4679798	< 0.5	< 0.5	0.0%	< 0.5	93%	80%	120%				97%	80%	120
Tin 644 4679798 < 0.5 < 0.5 0.0% < 0.5 92% 80% 120% 97% 80% 1 Uranium 644 4679798 0.9 0.9 0.0% < 0.5 95% 80% 120% 108% 80% 1 Vanadium 644 4679798 29.0 28.4 2.1% < 0.5 92% 80% 120% 115% 80% 1	Thallium				< 0.5									93%		
Uranium 644 4679798 0.9 0.9 0.0% < 0.5	Tin	644	4679798	< 0.5	< 0.5	0.0%	< 0.5	92%						97%	80%	120
Vanadium 644 4679798 29.0 28.4 2.1% < 0.5 92% 80% 120% 115% 80% 1		0.200,000		0.755	0.7.000	0.000.000.00	1000000		100000					100000000000000000000000000000000000000	WE'S 12.00	
Zinc 644 4679798 79 78 1.3% <1 107% 80% 120% 97% 80% 1						1000 200000			00000000000	COLUMN TOWNS						
211 1010100 10 10/0 1 101/0 00/0 120/0	Zinc	644	4679798	79	78	1.3%	< 1	107%	80%	120%				97%	80%	120

Certified By:

Jarohan

AGAT QUALITY ASSURANCE REPORT (V1)

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6310 ROPER ROAD EDMONTON, ALBERTA CANADA T6B 3P9 TEL (780)395-2525 FAX (780)462-2490 http://www.agatlabs.com

Quality Assurance

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

PROJECT NO: Unipkat I-22 / A04025A02

AGAT WORK ORDER: 13E750792

ATTENTION TO: Nicole Wills

			Trac	e Org	janio	s An	alysi	S							
RPT Date: Aug 29, 2013				UPLICATE			REFERE	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	IKE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recovery		ptable nits	Recovery		eptable mits
		ld	13731		111 5		Value	Lower	Upper		Lower	Upper		Lower	Uppe
Petroleum Hydrocarbons (BTE	X/F1-F4) in	Soil (CWS)		1 11											
Benzene	466	4679798	< 0.005	< 0.005	0.0%	< 0.005	95%	80%	120%	104%	80%	120%	113%	60%	140%
Toluene	466	4679798	< 0.05	< 0.05	0.0%	< 0.05	93%	80%	120%	99%	80%	120%	111%	60%	140%
Ethylbenzene	466	4679798	< 0.01	< 0.01	0.0%	< 0.01	85%	80%	120%	88%	80%	120%	99%	60%	140%
Xylenes	466	4679798	< 0.05	< 0.05	0.0%	< 0.05	89%	80%	120%	87%	80%	120%	98%	60%	140%
C6 - C10 (F1)	466	4679798	<10	<10	0.0%	< 10	93%	80%	120%	113%	80%	120%	123%	60%	140%
C10 - C16 (F2)	340	4679798	<10	<10	0.0%	< 10	89%	80%	120%	83%	80%	120%	90%	60%	140%
C16 - C34 (F3)	340	4679798	35	<10	NA	< 10	92%	80%	120%	92%	80%	120%	99%	60%	140%
C34 - C50 (F4)	340	4679798	<10	<10	0.0%	< 10	81%	80%	120%	118%	80%	120%	132%	60%	140%
Moisture Content	340	4679798	25	27	7.7%	< 1									
Polyaromatic Hydrocarbon An	alvsis - Soil														
Naphthalene	237	4678982	< 0.005	< 0.005	0.0%	< 0.005	95%	70%	130%	90%	70%	130%	86%	70%	130%
2-Methylnaphthalene	237	4678982	< 0.005	< 0.005	0.0%	< 0.005	0070	. 0 / 0	10070	78%	70%	130%	77%	70%	130%
Acenaphthylene	237	4678982	< 0.005	< 0.005	0.0%	< 0.005	94%	70%	130%	86%	70%	130%	91%	70%	130%
Acenaphthene	237	4678982	< 0.005	< 0.005	0.0%	< 0.005	84%	70%	130%	78%	70%	130%	79%	70%	130%
Fluorene	237	4678982	< 0.02	< 0.02	0.0%	< 0.02	83%	70%	130%	83%	70%	130%	76%	70%	
Phenanthrene	237	4678982	< 0.02	< 0.02	0.0%	< 0.02	94%	70%	130%	92%	70%	130%	85%	70%	130%
Anthracene	237	4678982	< 0.004	< 0.004	0.0%	< 0.004	96%	70%	130%	97%	70%	130%	91%	70%	
Fluoranthene	237	4678982	< 0.01	< 0.01	0.0%	< 0.01	114%	70%	130%	103%	70%	130%	100%	70%	
Pyrene	237	4678982	< 0.01	< 0.01	0.0%	< 0.01	117%	70%	130%	106%	70%	130%	90%	70%	
Benz[a]anthracene	237	4678982	< 0.03	< 0.03	0.0%	< 0.03	92%	70%	130%	80%	70%	130%	74%	70%	130%
Chrysene	237	4678982	< 0.05	< 0.05	0.0%	< 0.05	97%	70%	130%	79%	70%	130%	74%	70%	130%
Benzo[b+j]fluoranthene	237	4678982	< 0.05	< 0.05	0.0%	< 0.05	92%	70%	130%	84%	70%	130%	75%	70%	
Benzo[k]fluoranthene	237	4678982	< 0.05	< 0.05	0.0%	< 0.05	90%	70%	130%	71%	70%	130%	71%	70%	
Benzo[a]pyrene	237	4678982	< 0.03	< 0.03	0.0%	< 0.03	111%	70%	130%	78%	70%	130%	75%	70%	
Indeno[1,2,3-cd]pyrene	237	4678982	< 0.05	< 0.05	0.0%	< 0.05	100%	70%	130%	75%	70%	130%	76%	70%	
Dibenz[ah]anthracene	237	4678982	< 0.005	< 0.005	0.0%	< 0.005	94%	70%	130%	73%	70%	130%	74%	70%	1309
Benzo[ghi]perylene	237	4678982	< 0.05	< 0.05	0.0%	< 0.05	87%	70%	10.000.000	72%	70%	NATE VENERAL	74%	70%	

Certified By:

Joshh

AGAT QUALITY ASSURANCE REPORT (V1)

Page 10 of 12

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.



6310 ROPER ROAD EDMONTON, ALBERTA CANADA T6B 3P9 TEL (780)395-2525 FAX (780)462-2490 http://www.agatlabs.com

Method Summary

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

PROJECT NO: Unipkat I-22 / A04025A02

AGAT WORK ORDER: 13E750792 ATTENTION TO: Nicole Wills

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis	i danierini	- 25-14-14 1 (11-15-1	
Antimony Dry Weight	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Arsenic	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Barium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Beryllium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Boron (Hot water extraction)	INOR-171-6201 & INOR-171-6005	Carter 12.2.4/ EPA 6010; SHEPPARD	ICP/OES
Cadmium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Chromium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Chromium, Hexavalent	INOR-171-6215	ASA 20-4.3; REISENAUER 1982	SPECTROPHOTOMETER
Cobalt	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Copper	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Lead	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Mercury	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Molybdenum	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Nickel	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Selenium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Silver	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Thallium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Tin	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Uranium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Vanadium	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
Zinc	INOR-171-6202 & INOR-171-6006	EPA SW 846-3050/6010; SHEPPARD	ICP/MS
pH (CaCl2 Extraction)	INOR-171-6207	SHEPPARD 2007; HENDERSHOT 2008	PH METER
Electrical Conductivity (Sat. Paste)	INOR-171-6208	SHEPPARD 2007; MILLER 2007	CONDUCTIVITY METER
Sodium Adsorption Ratio	INOR-171-6201 & INOR-171-6002	McKeague 3.26	CALCULATION
Saturation Percentage	INOR-171-6002	MILLER 2007; SHEPPARD 2007	GRAVIMETRIC
Chloride, Soluble	INOR-171-6200 & INOR-171-6002	SHEPPARD 2007, EATON 2005	CONTINUOUS FLOW ANALYZER
Calcium, Soluble	INOR-171-6201 & INOR-171-6002	SHEPPARD 2007; EATON 2005; MILLER 2007, SM 3120B	ICP/OES
Potassium, Soluble	INOR-171-6201 & INOR-171-6002	SHEPPARD 2007; EATON 2005; MILLER 2007, SM 3120B	ICP/OES
Magnesium, Soluble	INOR-171-6201 & INOR-171-6002	SHEPPARD 2007; EATON 2005; MILLER 2007, SM 3120B	ICP/OES



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Method Summary

CLIENT NAME: IEG ENVIRONMENTAL (NORTH)

PROJECT NO: Unipkat I-22 / A04025A02

AGAT WORK ORDER: 13E750792 ATTENTION TO: Nicole Wills

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Sodium, Soluble	INOR-171-6201 & INOR-171-6002	SHEPPARD 2007; EATON 2005; MILLER 2007, SM 3120B	ICP/OES
Sulfur (as Sulfate), Soluble	INOR-171-6201 & INOR-171-6002	SHEPPARD 2007; EATON 2005; MILLER 2007, SM 3120B	ICP/OES
Trace Organics Analysis			
Benzene	ORG-170- 5110/5140/5430/5440	EPA SW-846 8260	GC/MS
Toluene	ORG-170- 5110/5140/5430/5440	EPA SW-846 8260	GC/MS
Ethylbenzene	ORG-170- 5110/5140/5430/5440	EPA SW-846 8260	GC/MS
Xylenes	ORG-170- 5110/5140/5430/5440	EPA SW-846 8260	GC/MS
C6 - C10 (F1)	ORG-170- 5110/5140/5430/5440	CCME Tier 1 Method	GC/FID
C6 - C10 (F1 minus BTEX)	ORG-170- 5110/5140/5430/5440	CCME Tier 1 Method	GC/FID
C10 - C16 (F2)	ORG-170-5120/5300	CCME Tier 1 Method	GC/FID
C16 - C34 (F3)	ORG-170-5120/5300	CCME Tier 1 Method	GC/FID
C34 - C50 (F4)	ORG-170-5120/5300	CCME Tier 1 Method	GC/FID
Gravimetric Heavy Hydrocarbons	ORG-170-5120/5300	CCME Tier 1 Method	GC/FID
Moisture Content	LAB-175-4002	CCME Tier 1 Method	GRAVIMETRIC
Toluene-d8 (BTEX)	ORG-170- 5110/5140/5430/5440	EPA SW-846 8260	GC/MS
Ethylbenzene-d10 (BTEX)	ORG-170- 5110/5140/5430/5440	EPA SW-846 8260	GC/MS
o-Terphenyl (F2-F4)	ORG-170-5120/5300	CCME Tier 1 Method	GC/FID
Naphthalene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
2-Methylnaphthalene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Acenaphthylene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Acenaphthene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Fluorene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Phenanthrene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Anthracene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Fluoranthene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Pyrene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Benz[a]anthracene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Chrysene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Benzo[b+j]fluoranthene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Benzo[k]fluoranthene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Benzo[a]pyrene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Indeno[1,2,3-cd]pyrene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Dibenz[ah]anthracene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
Benzo[ghi]perylene	ORG-170-5420	EPA SW846 8270 D/3540 C/3570	GC/MS
2-Fluorobiphenyl (PAH)	TO 0500	EPA SW846 8270 D/3540 C/3570	GC/MS
p-Terphenyl-d14 (PAH)	TO 0500	EPA SW846 8270 D/3540 C/3570	GC/MS

Rush Turnaround Requests Uponfilling out this section, client accepts that, such arges will be attached to this analysis. If NOT completed regular TAT will be default Less than 24 hours: (200%) Late Section (100%) As to 72 hours: (50%) Date Rooured: Please collect taboratory to morth Laboratory Use Only Date and Time Tay All 19 21: -9 53	Deviages (As (September 1957)	Tasid Tasiew Nonether Adjoin Mark Adjoin		22 Pink Copy AcAT NO. 052-647
6310 Rober Road NW Edworton Aberta 16S Webearth against com Phr 780395255. Fax 780462 2490 Tradion Phr 780395255. Fax 780462 2490 Phr 780310 Fax 780462 2490 Phr 780415 Fax 780462 2490 Phr 780415 Fax 7804	Requirements Check ont). AB Tiert1 Included Included	Dutling) SPIGEC. Date/Time Comments Stef/Sample Sampled Info Sample Containment 5/08/17		1930 Samilies Per
Hain of Custody Record Report 10: 工匠 (公文) 化 (公文) (公文) (公文) (公文) (公文) (公文) (公文) (公文)	Reg	Pack	174-13-02 174-13-02 174-13-03 174-13-03	114.15 174.13 1879. mm

equests ction, cilient accepts that chief in bedefault frous (200%) s (100%) s (50%)	54	(N/X) snopiezeH					No. 052649
Turnaround Rulling Serges will be attained attai	Laboratory Use Only Laboratory Use Only Date and Time. 113 AUG 21 -9 Arrival Temperature: Acar John Colonial	Villdistog	ABJC[aes]2.[Lan. XojololiMi				Port Copy Client Fellow Copy AGIT Fellow Copy A
Mebcar Mebcar 395.2525 (Fa)	Sample per page page page page page page page page	(57269: 162) VIIIIIE 49:	COMERLEXALT		X X Y M	95t & (ame & sign) Date/In
es es matton	ny Requirements (GPE)		7 1	500/1 (5/603/1/7 1/2	3 (a)	2 e 3 g	Samples Received by Partition Date Time Samples Received by Partition Samples Received by Partition Samples Received by Partition
		Postal code:	Sample toertuication	3-05 (0-0.15m) 3-05 (015-0.3m) 3-05 (03-0.04) 3-06 (0-0.5m)			ame & sign) ame & sign) ame & sign) ame & sign)
Chain of Custody Record	4 2 1		BO/AHE #: Abbracov/Lise *(LabilD#)、	\$(V)			The Self visted by printing minimum self of the self o



CCCAT Laboratories

# Company of the Comp	
SAMPLE INTEGRITY RECEIPT FORM - Edmonton Rec	eived by: 💯 🗀
Prepaid / College Receiving Basics Date & Time: 1/1/2/2 am/ pm Courier: 1/2/2 / 1/2/2 Prepaid / College Relinquished by: 1/2/2 / 1/2/2 Compar Client left without count verified 1/2/2 / No Custody Seal	eet Waybill# <u>\$18 YEV (\$3</u> py/Consultant: <u>TEO</u> infact: Yes/No/NA
COC INFORMATION COC received: Yes No Emailed to CPM TAT. 24hr. 24 COC Complete Yes No *If NO why: Workorder N COC Numbers: 53/49 (55)/45 Sample Quantities: Coolers 2 Bottles/fars: 36 Bags: 18 Other: X *If COC Container count differs from what was received why	148hr 48:72hr Reg Other Number 15 750172 COC Container Count: 54
TIME SENSITIVE ISSUES Earliest Date Sampled: 7/42/2/2 AEREADY E Microbiology/Time Sensitive Test*: Expiry: 2/2/ Hydrocarbon Test: 8 1 2 Are samples received more than \$ days after sampling. Yes 80 *Residual Chlorine, Dissolved Oxygen, Turbidity, BOD, Nitrate/P	-14/4/4/16
SAMPLE INTEGRITY Hazardous Samples Why hazardous: Precaution take	n: <u>//</u>
Specialty Issues Legal Samples: Yes/No/ International Samples: Yes/No/ Proper tape/labe	els applied. Yes / No
Damaged: Yes / No / If YES why? No Bubble Wrap Frozen Courier:	Other section and the section of the
Temperature (to be recorded from bottles/jars only) N(1) (Bottle/far) $(2+\frac{1}{2}+1$	/A - Only Soil Bags received sittle/Jan)/2 + 2 = 2° € 5
(4) (Bottle/Jar) + + = °C (5) (Bottle/Jar) + + = °C (6) (Bottle/Jar) (If more than 6 coolers are received use another sheet of paper and Goolant used: Icepack(Top/Bottom/Side) Bagged Ice (Top/Bottom/Side)	
Correct Sample Requirements for Testing (10) be completed by Logistics staff during Bottles; Yes / No. Amount: Yes / No. Labels: Yes / No. *If: NO/to any of the above explain why.	
Visible Sediment: Yes / No / NA(soil)	
Additional integrity issues (Indicate issues below and on the CoCinext to the sample ID):	626
Account Project Manager: Whom spoken to: Date and Time:	bove issues: Yes No CPM/Initial:

SR-170-9500:004 August 14; 2013

APPENDIX III

Monitoring Well Logs

) Kloh	n Crippen Berger	BORE HOL	E LOG - ENVIR	ONME	ITAL	MW1	1-01	
CLIE		Shell Canada Energy	PROJECT: Unipkat I-2						
		· · · · · · · · · · · · · · · · · · ·			DATE: 14				
		ATES: Not Measured	GROUND ELEVATION:	Not Measured	CASING I				
	EDIA.:		CASING DIA.: N/A		TOTAL D	EPTH OF	HOLE: 4	n	
		METHOD: Solid Stem Auger	DRILLING CONTRACT	OR:	I.				
LOGO	GED B	Y: RL	CHECKED BY: JW	··	Page 1 c)† 1			
DEPTH (m)	SYMBOL	MATERIAL DESCRIPT	NOI.	COMMENTS	SAMPLE TYPE	100 × EC	◆ OVA	500 70	
DEF	l ₹		WELL CON		SAN	1	3	5 7	9
-1 -2 -3		Silty sand (SM) Fill Loose, brown, moist. End of Hole at: 4.00 m							
— 4		End of Hole at: 4.00 m							
<u>.</u>									

JEI	NT:	Shell Canada Energy	PROJECT: Unipkat I-22 R	lemediation Program						
		Unipkat I-22	PROJECT NO.: A04025A02 DATE: 15/04/2011							
D-C	RDINA	TES: Not Measured	GROUND ELEVATION: No	t Measured	CASING E	ELEVAT	ION: N	4		
OLE	EDIA.:	0.15	CASING DIA.: N/A		TOTAL DI	EPTH O	F HOLE:	4 m		
RILI	LING M	ETHOD: Solid Stem Auger	DRILLING CONTRACTOR	:						
OGO	GED BY	: RL	CHECKED BY: JW		Page 1 o	f 1		_		
DEPTH (m)	7		NOI.		SAMPLE TYPE	100	♦ C	VA (pp 500	m) 700	90
_	<u>ĕ</u>	MATERIAL DESCRIPT	.ION ⊐Ř	COMMENTS	를 교	× EC	MEASU	JREME	NTS (d	dS/m)
֝֞֞֜֞֜֝֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֜֜֜֓֓֓֓֓֡֓֜֓֓֓֓֡֓֜֡֓֡֓֡֓֜֡֓֡֓֡֓֡֓֡֡֡	SYMBOL		Ö.₩		SAI	i	3	5	7	9
1 2		Silty sand (SM) Fill Loose, brown, moist.								
		End of Hole at: 4.00 m								
5										

1) Klol	nn Crippen Berger	BORE HOLE	LOG - ENVIR	 NMEN	NTAL.	MW11-0	03	
CLIE	NT:	Shell Canada Energy	PROJECT: Unipkat I-22	Remediation Program					
LOC	ATION	: Unipkat I-22	PROJECT NO.: A04025A		DATE: 15	5/04/2011			
		ATES: Not Measured	GROUND ELEVATION: N	lot Measured	CASING I		N: N/A		
		0.15	CASING DIA.: N/A		TOTAL DI	EPTH OF	HOLE: 4.3 m	1	
		METHOD: Solid Stem Auger	DRILLING CONTRACTOR	₹;					
LOG	GED B	Y: RL	CHECKED BY: JW		Page 1 o	of 1			
			ZO ZO WELL CONSTRUCTION		밀		OVA (p	nm)	
OEPTH (m)			22		SAMPLE TYPE	100	300 500		00
프	SYMBOL	MATERIAL DESCRIPT	ION] till	COMMENTS	H			ENTS (dS/m)	
ద	<u>₹</u>				NA.	1	3 5	7 9))
- - - - -		Silt (ML) Trace fine sand, soft, dark brown, odour							
- - 1 - - -		Silt (ML) Dark brown, odour.							
- - - - - - 2		Silt (ML + VS) Dark brown, odourless, frozen.			9				
- - - - - - - -									
									:
	 	End of Hole at: 4.30 m							\vdash
_									
•									
− 5									T
-									
_									
-									
-									
-									
		· · · · · · · · · · · · · · · · · · ·	 -		1				_

IJ	Kloni	n Crippen Berger	BORE HOLE	LOG - ENVIR	ONMEN	ITAL	_ M	W11-	.04		
IEN	IT:	Shell Canada Energy	PROJECT: Unipkat I-22	Remediation Program				•			
CA	TION:	Unipkat I-22	PROJECT NO.: A04025	402	DATE: 15	/04/20	111				
)-0	RDINA	TES: Not Measured	GROUND ELEVATION: N	lot Measured	CASING E	LEVA	TION: N	VA.			
LE	DIA.:	0.15	CASING DIA.: N/A		TOTAL DEPTH OF HOLE: 3.9 m						
ILL	ING M	ETHOD: Solid Stem Auger	DRILLING CONTRACTO	R:	,						
GG	ED BY	: RL	CHECKED BY: JW		Page 1 o	f 1					
(m)	SYMBOL	MATERIAL DESCRIPT	NOI:	COMMENTS	SAMPLE TYPE	100 × E		OVA (0 7	700 5 (dS/	90 (m)
		Silt and Clay (ML + Cl) Brown, odourless, moist, trace peat.			Jar/Bag	1.5					
		Organic Silt and Clay (OL) Peatey, brown, odourless, moist.			Jar/Baç	6.9					
		Silt and Clay (ML + Cl) Brown, odourless. 2.7 - 3.9 Frozen			Jar/Baç	42.9					
					Jar/Bag	2.4					
!					Jar/Baç	1.1					
				·	Jar/Bag	2.3				:	
3					Jar/Ba	1.1					
					Jar/Ba	2.3					
5		End of Hole at: 3.90 m									
						į					

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APPENDIX IV

Thermal Data

