

**THE COLLECTION OF LANDFILL
MONITORING DATA AT THE FORMER
FOX-3 DISTANT EARLY WARNING LINE SITE**

Dewar Lakes, Nunavut

FINAL REPORT – 2013

(O/Ref.: CD2655) (Y/Ref.: DLCMON (QIKIQ12))

DEFENCE CONSTRUCTION CANADA

January 2014





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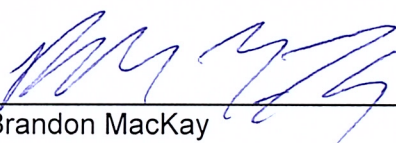
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DEFENCE CONSTRUCTION CANADA

January 2014

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A circular blue ink seal for a Registered Professional Engineer. The outer ring contains the text "REGISTERED PROFESSIONAL ENGINEER" at the top and "NT/NU" at the bottom. The center contains the name "A. LECLAIR" and the word "LICENSEE". A handwritten date "2014-01-28" is written across the seal.

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1 OUTLINE

1.1 OBJECTIVE AND SCOPE OF WORK

The objective of the Defence Construction Canada (DCC) Landfill Monitoring Program is to collect sufficient information to assess the performance of landfills at former DEW line sites that have been remediated, from a geotechnical and environmental perspective. DCC has specified the requirements for the Landfill Monitoring Program in the document: Terms of Reference (TOR) – Services for the Collection of Landfill Monitoring Data CAM-5 Mackar Inlet, FOX-M Hall Beach, FOX-2 Longstaff Bluff, FOX-3 Dewar Lakes DEW Line Sites Nunavut Territory Qikiqtaaluk Region DCC Project #: DLCMON(QIKIQ12), March 20, 2012. This report contains a summary of the findings from the 2013 inspection of the FOX-3 Dewar Lakes site.

During the 2013 monitoring program, a visual inspection was completed at all site landfills to identify erosional features. Soil and groundwater sampling, as well as thermal monitoring, were conducted at the Tier II Facility. Table I summarizes the monitoring requirements of the 2013 season. No deviations from the TOR were experienced while completing the 2013 monitoring.

Table I: 2013 Monitoring Requirements for FOX-3 Landfills

Landfill	Visual Inspection	Soil Sampling	Groundwater Sampling	Thermal Monitoring
Station West Landfill	✓			
West Landfill	✓			
Non-Hazardous Waste Landfill	✓			
Tier II Disposal Facility	✓	✓	✓	✓

1.2 FIELD PROGRAM STAFF AND TIMING

The 2013 on-site field program at FOX-3 Dewar Lakes took place from August 23 to 25, 2013. Biogénie sub-contracted Sila Remediation Inc. (Sila), from Igloolik, Nunavut to perform the fieldwork. The Sila field program was to be executed by Mr. Brandon MacKay with the assistance of four local representatives however, due to weather issues

in Hall Beach, the local staff was unable to arrive at the FOX-3 site. The local staff remained in Hall Beach on stand-by in the event weather improved to allow for their arrival by charter plane.

The team was made up of the following individuals:

- Brandon MacKay, Site Technician;
- Caleb Qanatsiaq, Field Assistant (on stand-by);
- Lamiki Irqittuq, Field Assistant (on stand-by);
- Glen Nangmalik, Wildlife Monitor (on stand-by); and
- Jonah Arnardjuaq, Camp Attendant (on stand-by).

The team was also accompanied by Nasittuq representative, Jolly Davidee.

1.3 2013 WEATHER CONDITIONS

Weather conditions at FOX-3 Dewar Lakes were seasonably average, with temperatures ranging from 3 - 8°C, high winds and precipitation ranging from heavy rains to light snow. A detailed breakdown of the weather conditions during the visual inspections of each landfill is detailed in Table II below:

Table II: Weather During Landfill Visual Inspections

Date/Time	Landfill	Weather Conditions
August 23, 2013/14:39	Station West Landfill	8°C, overcast, 30 knot gusts from the east, no precipitation.
August 23, 2013/18:12	West Landfill	6°C, overcast, 45 knot gusts from the north, steady rain.
August 23, 2013/18:50	Non-Hazardous Waste Landfill	6°C, overcast, 40 knot gusts from the south, steady rain.
August 24, 2013/17:51	Tier II Disposal Facility	3°C, partly cloudy, 25 knot wind from the west, light snow.

1.4 REPORT FORMAT

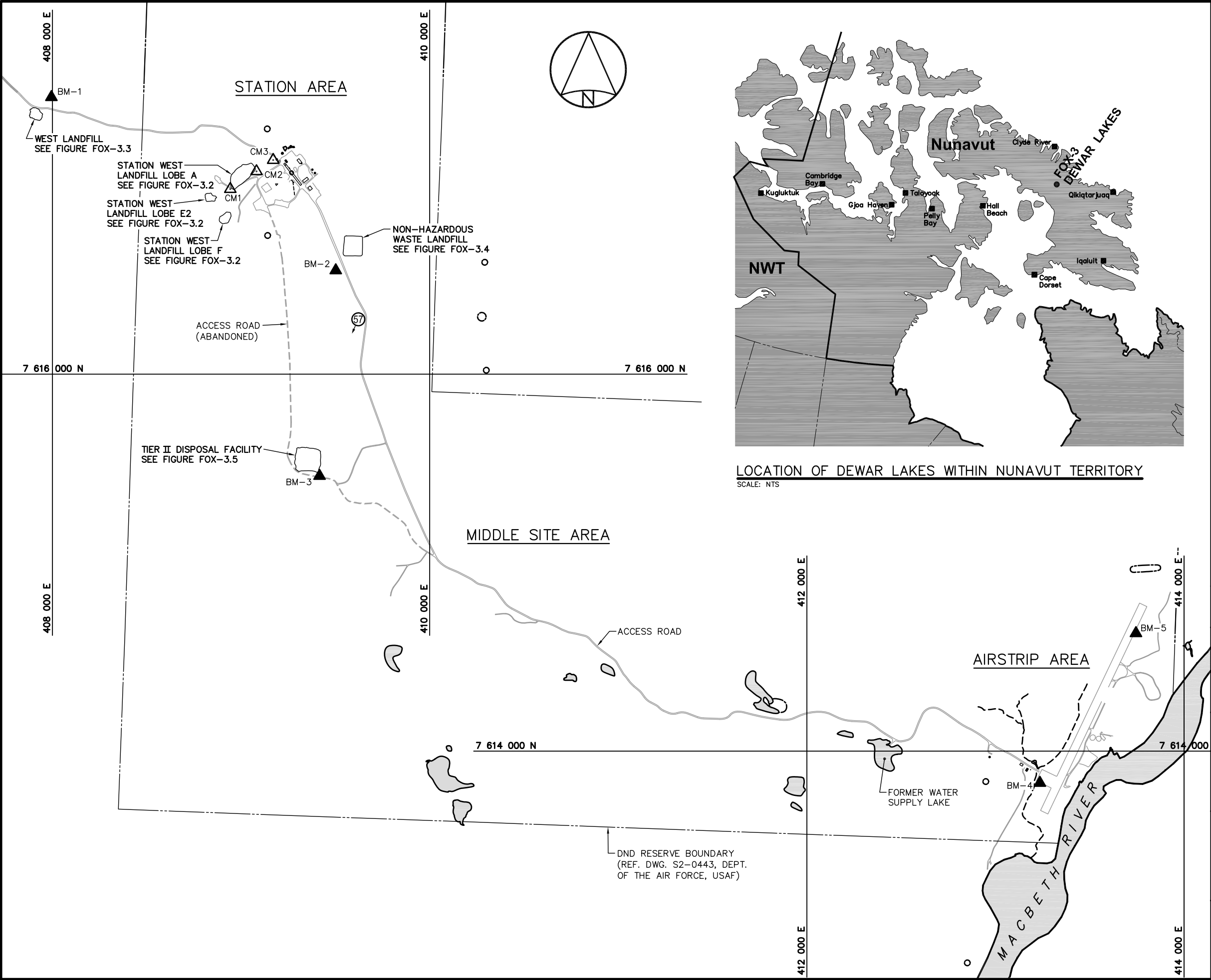
This report describes the work carried out in August, 2013 at the four landfill sites at FOX-3 Dewar Lakes. Results from soil and groundwater sampling, thermal monitoring and visual inspection of the sites are also presented in the formats described in the TOR (Reference A). An electronic version of the report and its component tables, figures and data files are included in an Addendum DVD-ROM, which is appended to this report.

The report is organized with a separate section for each of the landfill areas. Each section contains all relevant information for that landfill area, for the 2013 Landfill Monitoring Program. The following information is provided in each landfill section:

- Visual inspection checklist.
- Visual inspection drawing mark-up.
- A selection of visual inspection photos.
- Thermal monitoring inspection reports (where applicable).
- Summary of 2013 soil analytical data (where applicable).
- Summary of 2013 groundwater analytical data (where applicable).
- Monitoring well development/sampling reports (where applicable).

For the photographic record, the printed copy of the report includes an index image of photos for each of the landfill areas. The full resolution photos are included in electronic format in the Addendum DVD-ROM to this report. Certificates of Analysis, QA/QC analytical results and field notes are attached in the Appendices.

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LEGEND

- APPROXIMATE LOCATION OF PROPERTY BOUNDARY
- △ SURVEY CONTROL MONUMENT
- ▲ PERMANENT BENCHMARK LOCATION
- BODY OF WATER
- ⑤7 PHOTOGRAPH VIEWPOINT LOCATION

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NO.	VERSION	DATE	BY	VERIF.	APPR.



Construction de Défense Canada
Défence Construction Canada

COLLECTION OF
LANDFILL MONITORING DATA
FOX-3, DEWAR LAKES, NUNAVUT

OVERALL SITE PLAN

SITE REMEDIATION SOLUTIONS

Biogenie, a division of EnGlobe Corp.
4495 Wilfrid-Hamel blvd, Suite 200
Quebec, (Quebec) CANADA G1P 2J7
Phone : 418-653-4422 www.biogenie-env.com



MEASUREMENT UNIT Meter	SCALE: 1 : 15,000	DATE (month-year): JANUARY 2014
DRAWN BY: P. LÉGARÉ	VERIFIED BY: B. MACKAY	APPROVED BY: A. LECLAIR P. Eng.
PROJECT NO: CD2655_320_323	DRAWING NO: CD2655_320_323_101-FOX-3_A	PAGE LS

FIGURE FOX-3-1

2 METHODOLOGY

2.1 VISUAL INSPECTION

Data and information collected during the visual inspection of the FOX-3 landfills are included in the visual inspection data sheets. These data sheets include such inspection data as the location of settlement, erosion, frost action, sloughing and cracking, animal burrows, vegetation cover and stress, staining, seepage points, exposed debris, and any other features of note.

Each feature was identified with an alphabetical tag to be used consistently each year in an effort to track changes in conditions for each specific feature.

Digital photos were taken to illustrate the current state of the landfills as well as features of interest. Annotated sketches/diagrams are included in the report for each landfill.

The photos were taken with a Nikon D5100 16.2 megapixel (MP) digital camera. Full resolution digital jpg copies are available on the DVD-ROM appended to this report. The photo log, including the local coordinates from where the photo was taken, orientation (relative to map north), features of note and picture numbers are included with each landfill report.

2.2 SOIL SAMPLING

The soil sampling methodology conformed to guidance provided in the following Canadian Council of Ministers of the Environment (CCME) documents:

- CCME Guidance Document on the *Management of Contaminated Sites in Canada*, April 1997, CCME PN 1279. (CCME catalogue - http://www.ccme.ca/pdfs/cat_eng.pdf).
- CCME EPC-NCS62E Guidance Manual on *Sampling, Analysis, and Data Management for Contaminated Sites* - Volume I: Main Report, Dec 1993 (CCME catalogue - http://www.ccme.ca/pdfs/cat_eng.pdf).
- CCME EPC-NCS66E Guidance Manual on *Sampling, Analysis, and Data Management for Contaminated Sites* - Volume II: Analytical Method Summaries, Dec. 1993 (CCME catalogue - http://www.ccme.ca/pdfs/cat_eng.pdf).

- Reference method for the *Determination of Petroleum Hydrocarbons in Soil – Tier I Method*, 2001.
- CCME *Subsurface Assessment Handbook for Contaminated Sites*, March 1994, EPC-NCSRP-48E (CCME catalogue - "http://www.ccme.ca/pdfs/cat_eng.pdf").

For the 2013 monitoring event, four soil sampling stations were visited. A surface (0-15 cm depth) and subsurface sample (40-50 cm depth below surface) were taken at each sampling station. No frozen ground or frost was encountered at the soil stations during the August, 2013 sampling.

As specified in the TOR (Reference A), the following soil sampling procedures were adhered to:

- Where required, the soil samples were collected from locations between a two to four metre radius of the monitoring wells.
- Blind field duplicates (10%) were collected for quality assurance and quality control purposes.
- Duplicate samples (10%) were also taken and sent to a second laboratory for quality control purposes.
- An additional 10% of soil samples taken were sent to the owner's representative (ESG OPS CENTRE) in Kingston for archiving as specified by DCC.

The soil samples were analyzed for requested parameters (TPH (F1-F3), total metals and PCBs) as specified by DCC. Table II below summarizes the soil sampling at FOX-3 during the August, 2013 field program:

Table III: Summary of Soil Sampling at FOX-3, August 2013

Landfill Site	Soil Sample Locations			
Tier II Disposal Facility	MW-1	MW-2	MW-3	MW-4

Notes:

Soil samples annotated as "MW" were collected as per the TOR (Reference A) between 2-4 m from monitoring wells. All soil samples were collected from two depths (0-15 cm and 40-50 cm). For 2013 sampling, total number of soil samples = 11 samples (four samples x two depths + two QA/QC (Intra + Inter-laboratory comparison) + one for Owner's Representative (ESG Archives)).

2.3 GROUNDWATER SAMPLING

The groundwater sampling methodology conformed to guidance provided in the following Canadian Council of Ministers of the Environment (CCME) documents:

- CCME EPC-NCS62E Guidance Manual on *Sampling, Analysis and Data Management for Contaminated Sites* - Volume I: Main Report, Dec 1993 (CCME catalogue - http://www.ccme.ca/pdfs/cat_eng.pdf).
- CCME EPC-NCS66E Guidance Manual on *Sampling, Analysis and Data Management for Contaminated Sites* - Volume II: Analytical Method Summaries, Dec 1993 (CCME catalogue - "http://www.ccme.ca/pdfs/cat_eng.pdf").

Wells were purged as specified and measurements of *in situ* temperature, conductivity and pH were taken. Sampling took place when these parameters were stabilized. Turbidity readings were also collected at each station. The samples were not acidified and were not filtered (as directed in the TOR).

The 2013 field program included sampling four monitoring wells at FOX-3; a summary of the groundwater sampling undertaken at FOX-3 is summarized in Table IV.

In sampled wells, no signs of free-phase hydrocarbon product were detected. Monitoring Well Development and Sampling Record forms are included in appropriate sections in this report.

Table IV: Summary of Groundwater Sampling at FOX-3, August 2013

Landfill Site	Groundwater Sample Locations			
Tier II Disposal Facility	MW-1	MW-2	MW-3	MW-4

Notes:

All monitoring wells were inspected and found to be in good condition with no significant concerns identified. For 2013 sampling, total number of water samples = 6 samples (4 monitoring well samples + 2 QA/QC (intra and inter-laboratory duplicates)).

2.4 THERMAL MONITORING

The 2013 thermal monitoring program at FOX-3 consisted of an inspection of the thermistors and data loggers, the downloading of all datasets and the manual reading of thermistors. Specific detailed information regarding temperature data is contained in the Tier II Facility section of this report.

2.5 FIELD NOTES AND DATA

Field notes from the 2013 Landfill Monitoring Program, including soil and water sampling, are included in Appendix B for reference. Notes were written in field books, previously prepared logs or entered directly into a field computer. The notes were scanned to an Adobe pdf document for future reference and back up. Locations of all observations and features for the visual inspection were recorded using a Garmin GPSmap 60CSx hand-held GPS, which included a combination of continuous tracks and discrete waypoints. Datasets collected from the individual vertical thermistors were downloaded directly to a field laptop computer.

2.6 QUALITY CONTROL

Sila implemented standard sample collection techniques to decrease the likelihood of compromising collected samples. The methods used for sample collection are summarized in Sections 2.4 and 2.5 of this report. The following measures were taken to minimize sample cross-contamination:

- All samples were placed directly into the appropriate laboratory supplied containers (for the particular analysis).
- Soil samples were collected with the use of decontaminated sampling equipment and/or nitrile gloves that were used only once.
- Water samples were collected through the use of dedicated Waterra foot valves and tubing.

Chain of Custody (COC) forms were completed by the Field Technician after sample collection. The samples were refrigerated prior to off-site shipment in chilled coolers by First Air Cargo directly to Maxxam in Ottawa (via Iqaluit), Exova in Ottawa (via Iqaluit) and ESG in Kingston (via Iqaluit), where they were checked in by laboratory representatives. All analyses were completed as specified on COC forms.

2.7 QA/QC PROCEDURES

Sila used standard QA/QC procedures as specified in the TOR and CCME Guidance Documents for this project. The following is a summary of the analytical QA/QC samples collected:

- 10% Blind Duplicate Samples of soil and water were sent to Maxxam. Results can be found in Appendix C.
- 10% Inter-laboratory Duplicate Samples were sent to Exova (to determine if variation in procedures may cause significant difference in analytical results).
- 10% Archival Samples of soil to ESG.

2.8 PROJECT REFERENCES

The following references are specifically relevant to the 2013 Landfill Monitoring activities:

- A. Invitation to Tender – Contractor Services for the Collection of Landfill Monitoring Data: CAM-5 Mackar Inlet, FOX-M Hall Beach, FOX-2 Longstaff Bluff and FOX-3 Dewar Lakes – DEW Line Sites Nunavut Territory Qikiqtaaluk Region. DCC Project #: DLCMON(QIKIQ12), March 20, 2012.
- B. Terms of Reference – Services for the Collection of Landfill Monitoring Data: CAM-5 Mackar Inlet, FOX-M Hall Beach, FOX-2 Longstaff Bluff and FOX-3 Dewar Lakes – DEW Line Sites Nunavut Territory Qikiqtaaluk Region. DCC Project #: DLCMON(QIKIQ12), March 20, 2012.
- C. Contractor Services for the Collection of Landfill Monitoring Data: CAM-5 Mackar Inlet, FOX-M Hall Beach, FOX-2 Longstaff Bluff and FOX-3 Dewar Lakes – DEW Line Sites Nunavut Territory Qikiqtaaluk Region. Technical Proposal - May 2012.
- D. *Post-Field Progress Report, QIQKITALUK DEW Line Sites 2013, September, 2013.*

3 STATION WEST LANDFILL

3.1 SUMMARY

The visual inspection of the Station West Landfill was completed on August 23, 2013. Soil samples were not collected during the 2013 investigation and there are no monitoring instruments installed at the Station West Landfill. Soil sampling will be performed during the 2014 field season.

As of 2013, no erosion features with “significant” or “unacceptable” severity ratings were identified in the Preliminary Stability Assessment of the Station West Landfill. There are occasional occurrences of settlement, erosion and debris on the three landfill lobes, but all features remain minor at this point. Debris identified in the baseline investigation and 2013 investigation includes survey piping not removed during construction and scattered debris in the general area of the landfill lobes, no exposed debris is present at the lobes.

At this time, the overall performance of the landfill is rated as acceptable. A visual inspection report, including supporting photos and drawings, are presented in the following pages.

3.2 VISUAL INSPECTION CHECKLIST

The Visual Inspection Checklist is included in Table V of this report and has been completed as per the TOR. Please refer to Figure FOX-3.2 for a sketch of the Station West Landfill detailing the location of photographs and erosional features.

Table V: Visual Inspection Checklist – Station West Landfill

**DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING
VISUAL INSPECTION CHECKLIST**

INSPECTION REPORT – PAGE 1 of 2

SITE NAME: FOX-3 Dewar Lakes
LANDFILL DESIGNATION: Station West Landfill
DATE OF INSPECTION: August 23, 2013
DATE OF PREVIOUS INSPECTION: Date of Baseline Investigation is unknown
INSPECTED BY: B. MacKay
REPORT PREPARED BY: B. MacKay
MONITORING EVENT NUMBER: 2
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Checklist Item	Present Yes/No	Location	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records (Refer to the photographic log for more details)	Additional Comments
Settlement	Yes	Feature D - Lobe A - refer to figure FOX-3-2	1.00 m	0.15 m	0.10 m	<1%	Small linear area of settlement.	15 and 16	New Observation: Small linear depression located on the north toe of the landfill.
		Feature E - Lobe A - refer to figure FOX-3-2	0.80 m	0.40 m	0.20 m	<1%	Small area of settlement.	18 and 19	New Observation: Settlement of fines at area associated with large cobble stones.
		Feature F - Lobe A - refer to figure FOX-3-2	3.00 m	0.40 m	0.1 m	<1%	Small linear area of settlement.	20 and 21	New Observation: Located underneath the Nasittuq Fuel tank. Depression is directly below the cross beam of the fuel tank base.
		Feature H - Lobe A - refer to figure FOX-3-2	0.30 m	0.30 m	0.08 m	<1%	Small circular area of settlement.	32 and 33	New Observation: Small circular depression on the southwest landfill surface.
		Feature J - Lobe E2 - refer to figure FOX-3-2	0.20 m	0.20 m	0.10 m	<1%	Small circular area of settlement.	45 and 46	New Observation: Small circular depression located on the west landfill surface.
		Feature K - Lobe F - refer to figure FOX-3-2	0.50 m	0.60 m	0.05 m	<1%	Circular area of settlement.	51 and 52	Previously observed: Little change in size since baseline investigation.
		Feature L - Lobe F - refer to figure FOX-3-2	0.40 m	0.30 m	0.05 m	<1%	Circular area of settlement.	55 and 56	New Observation: Circular depression located southwest surface of the lobe.
Erosion	Yes	Feature M - Lobe F - refer to figure FOX-3-2	12.00 m	0.10 m	0.01 – 0.10 m	<1%	Single erosion channel.	61 and 62	New Observation: Minor erosion channel to the west of Feature P – self-armouring.
		Feature P - Lobe F - refer to figure FOX-3-2	10.00 m	0.20 m	0.05 – 0.10 m	1%	Six erosion channels.	65, 66 and 67	Previously observed: Minor - Self-armouring.
Frost Action	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sloughing and Cracking	Yes	Feature O - Lobe F - refer to figure FOX-3-2	3.00 m	0.002 – 0.005 m	Unknown	<1%	Small tension crack.	63 and 64	New Observation: minor tension crack on the southwest landfill toe.
		Feature Q - Lobe F - refer to figure FOX-3-2	4.00 m	0.002 – 0.005 m	Unknown	<1%	Small desiccation crack.	68 and 69	New Observation: minor desiccation cracking in silt deposited at the base of the landfill by Feature P.

Checklist Item	Present Yes/No	Location	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records (Refer to the photographic log for more details)	Additional Comments
Animal Burrows	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vegetation	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Staining	Yes	Feature A - Lobe A - refer to figure FOX-3-2	0.50 – 0.60 m	0.40 – 0.50 m	N/A	<1%	2 small hydrocarbon stains.	3 and 4	Previously observed: minor staining on the northeast landfill cap.
		Feature B - Lobe A - refer to figure FOX-3-2	18.00 m	6.00 m	N/A	<1%	Iron staining.	6, 7, 8 and 9	Previously observed: large area of iron staining extending from the landfill cap to the toe.
Vegetation Stress	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Seepage Points	Yes	Feature N - Lobe F - refer to figure FOX-3-2	20.00 m	10.00 m	N/A	25% of Lobe F		59 and 60	Previously Observed: Feature has increased in size.
Debris Exposed	Yes	Feature C - Lobe A - refer to figure FOX-3-2	0.04 m	0.04 m	0.20 – 0.25 m	<1%	Two plastic pipes.	13, 14, 28 and 29	Previously Observed: Plastic piping used to indicate lift heights by surveyor during construction.
		Feature G - south of Lobe A - refer to figure FOX-3-2	10.00 m	10.00 m	N/A	<1%	Scattered wood debris.	24 and 25	Previously Observed: Large wood debris during baseline has been removed, small wood fragments remain.
		Feature I - northeast of Lobe E2 - refer to figure FOX-3-2	2.50 m	.50 m	0.02 m	<1%	Geotextile debris.	40	Previously Observed: Northeast of the landfill, debris is lying on the ground surface. Result of construction work, not DEW line operations.
		Feature R - north of Lobe F - refer to figure FOX-3-2	0.30 m	0.30 m	0.15 m	<1%	Partial barrel.	73 and 74	New Observation: Piece of metal barrel partially buried north of Lobe F.
Presence/Condition – Monitoring Instruments	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Features of Note.	Yes	Fuel Tank - Lobe A - refer to figure FOX-3-2	3 m	2 m	N/A	<1%		1, 4 and 5	Previously Observed: JET-A1 fuel tank positioned on the landfill cap.

3.3 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for the Station West Landfill has been completed as per the TOR and is included as Table VI hereafter.

Table VI: Preliminary Stability Assessment – Station West Landfill

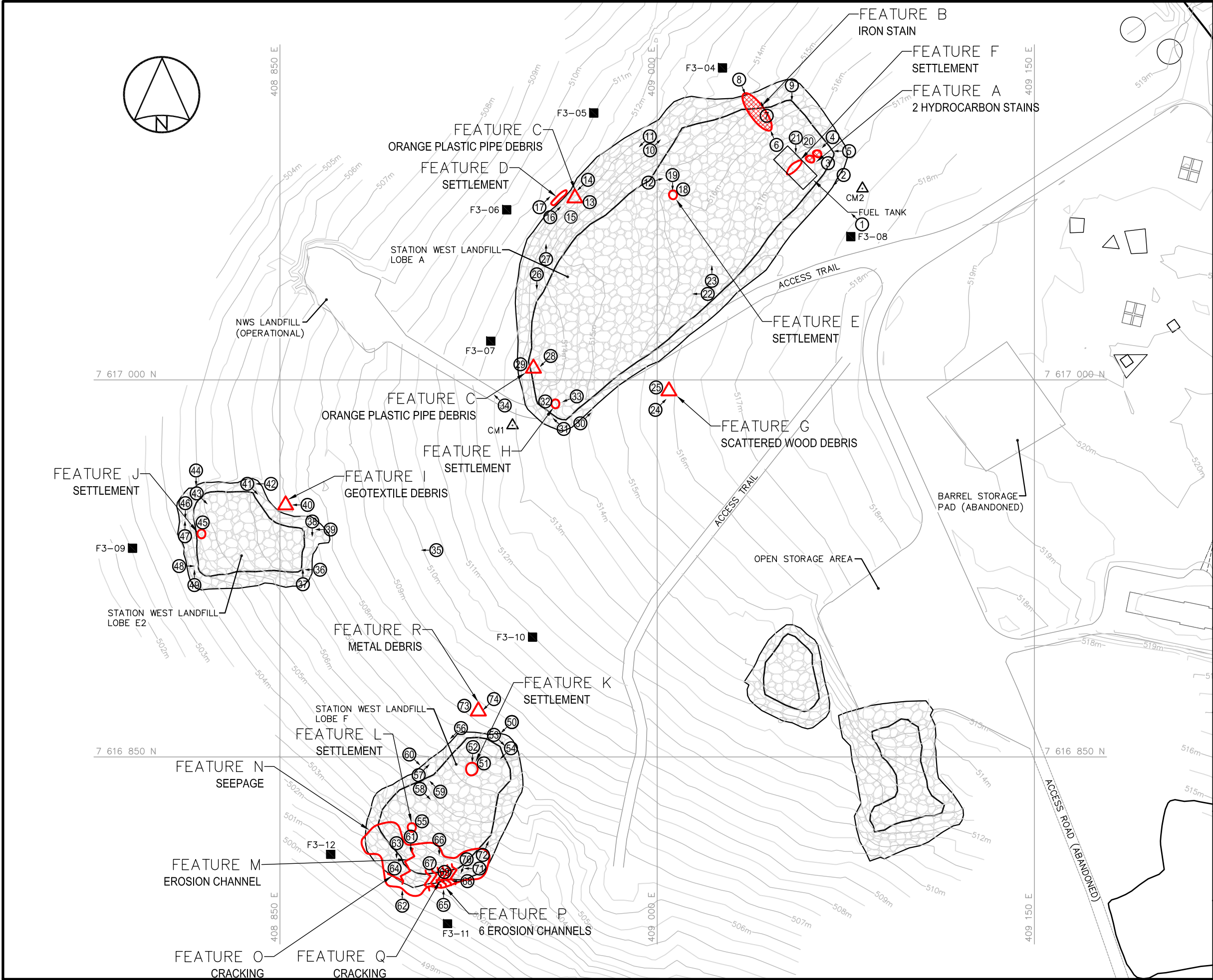
Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Marginal	Occasional
Frost Action	Not observed	None
Staining	Acceptable	Isolated
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Acceptable	Isolated
Debris Exposure	Acceptable	Occasional
Overall Landfill Performance	Acceptable	

Performance/Severity Rating	Description
Acceptable	Noted features are of little consequence. The landfill is performing as designed. Minor deviations in environmental or physical performance may be observed, such as isolated areas of erosion, settlement.
Marginal	Physical/environmental performance appears to be deteriorating with time. Observations may include an increase in size or number of features of note, such as differential settlement, erosion or cracking. No significant impact on landfill stability to-date, but potential for failure is assessed as low or moderate.
Significant	Significant or potentially significant changes affecting landfill stability, such as significant changes in slope geometry, significant erosion or differential settlement; scarp development. The potential for failure is assessed as imminent.
Unacceptable	Stability of the landfill is compromised to the extent that its ability to contain waste materials is compromised. Examples may include: - Debris exposed in erosion channels or areas of differential settlement. - Liner exposed. - Slope failure.
Extent	Description
Isolated	Singular feature.
Occasional	Features of note occurring at irregular intervals/locations.
Numerous	Many features of note, impacting less than 50% of the surface area of the landfill.
Extensive	Impacting greater than 50% of the surface area of the landfill.

3.4 ANNOTATED DRAWING OF THE STATION WEST LANDFILL

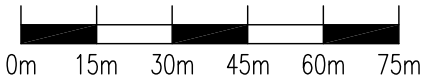
The annotated drawing for the Station West Landfill has been completed as per the TOR and is included in the following page as Figure FOX-3.2 Station West Landfill.

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LEGEND

- △ CM1 SURVEY CONTROL MONUMENT
- SOIL SAMPLING LOCATION
- ① PHOTOGRAPH VIEWPOINT LOCATION
- SETTLEMENT (NTS)
- ~ EROSION (NTS)
- CRACK (NTS)
- △ DEBRIS (NTS)
- ~ SEEPAGE (NTS)
- ⊗ STAINING



A	FINAL	14-01-28	P.L.	B.M.	AL
NO.	VERSION	DATE	BY	VERIF.	APPR.



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COLLECTION OF
LANDFILL MONITORING DATA
FOX-3, DEWAR LAKES, NUNAVUT
STATION WEST LANDFILL

SITE REMEDIATION SOLUTIONS

Biogenie, a division of EnGlobe Corp.
4495 Wilfrid-Hamel Blvd, Suite 200
Quebec, (Quebec) CANADA G1P 2J7
Phone : 418-653-4422 www.biogenie-env.com



MEASUREMENT UNIT Meter	SCALE: 1 : 1,500	DATE (month-year): JANUARY 2014
DRAWN BY: P. LÉGARÉ	VERIFIED BY: B. MACKAY	APPROVED BY: A. LECLAIR P.Eng.
PROJECT NO: CD2655_320_323	DRAWING NO: CD2655_320_323_101-FOX-3_C	PAGE PL

FIGURE FOX-3-2

3.5 PHOTOGRAPHIC RECORDS

The Photographic Record for Station West Landfill has been completed as per the TOR and is included as Table VII hereafter. Full-sized photographs are contained in the Addendum DVD-ROM.

Table VII: Landfill Visual Inspection Photo Log – Station West Landfill

Photo	Filename	Size (MB)	Date	Vantage Point		Focal Length	Caption
				Easting	Northing		
Lobe A							
1	2013-F3-SW-1	5.12	23/08/2013	409085	7617064	24	View NW – of Jet A-1 fuel tank on the eastern landfill cap – taken from the CM2 survey control monument.
2	2013-F3-SW-2	6.34	23/08/2013	409068	7617078	24	View SW – of the south landfill toe.
3	2013-F3-SW-3	8.69	23/08/2013	409061	7617093	18	Feature A – Close-up – of hydrocarbon stain on the east landfill cap.
4	2013-F3-SW-4	6.75	23/08/2013	409061	7617093	11	Feature A – View SW – of hydrocarbon stain on the east landfill cap.
5	2013-F3-SW-5	6.21	23/08/2013	409072	7617091	10	View W – of east landfill cap from the survey point 304.
6	2013-F3-SW-6	7.58	23/08/2013	409049	7617100	10	Feature B – View NNW – of most concentrated section of iron staining, lighter staining visible of the peripheral – from top of stain.
7	2013-F3-SW-7	8.26	23/08/2013	409044	7617105	10	Feature B – View NNW – of iron staining from middle of stain.
8	2013-F3-SW-8	8.20	23/08/2013	409030	7617116	22	Feature B – View SSE – of iron staining from landfill toe and end of staining.
9	2013-F3-SW-9	7.00	23/08/2013	409053	7617116	10	View S – of east landfill cap from survey control point 303 – Feature B visible.
10	2013-F3-SW-10	6.37	23/08/2013	408997	7617091	10	View NE – of north landfill toe.
11	2013-F3-SW-11	7.32	23/08/2013	408997	7617091	10	View SW - of north landfill toe.
12	2013-F3-SW-12	7.29	23/08/2013	408997	7617079	10	View W – of central landfill cap.
13	2013-F3-SW-13	7.89	23/08/2013	408972	7617077	14	Feature C – Close-up – orange plastic pipe in north landfill toe, used to mark material lift heights by surveyors. 1 of 2 plastic pipes on the lobe.
14	2013-F3-SW-14	9.25	23/08/2013	408972	7617077	12	Feature C – View SW – of Feature C, plastic pipe.
15	2013-F3-SW-15	8.71	23/08/2013	408975	7617078	10	Feature D – Close-up – small linear depression on the north landfill toe.
16	2013-F3-SW-16	8.44	23/08/2013	408975	7617077	24	Feature D – View NE – of small linear depression on the north landfill toe.
17	2013-F3-SW-17	7.08	23/08/2013	408963	7617070	14	View NE – of north landfill toe.
18	2013-F3-SW-18	8.67	23/08/2013	409006	7617070	14	Feature E – Close-up – of small depression on the central landfill cap associated with large cobble.
19	2013-F3-SW-19	8.18	23/08/2013	409004	7617072	14	Feature E – View S of small depression on central landfill cap.
20	2013-F3-SW-20	7.63	23/08/2013	409064	7617084	17	Feature F – Close-up – of linear depression under cross beam of fuel tank base.
21	2013-F3-SW-21	6.02	23/08/2013	409064	7617084	24	Feature F – View S – of linear depression under cross beam of fuel tank base.
22	2013-F3-SW-22	6.93	23/08/2013	409022	7617034	10	View W – of central landfill cap from survey point 306.
23	2013-F3-SW-23	6.49	23/08/2013	409022	7617034	10	View N – of central landfill cap from survey point 306.
24	2013-F3-SW-24	7.93	23/08/2013	408994	7616992	18	Feature G – view NE – of scattered wood debris south of the landfill lobe.
25	2013-F3-SW-25	8.95	23/08/2013	408995	7616993	18	Feature G – Close-up – of scattered wood debris south of the landfill lobe.
26	2013-F3-SW-26	7.03	23/08/2013	408952	7617042	19	View S – of north toe of the landfill.
27	2013-F3-SW-27	6.51	23/08/2013	408952	7617042	19	View N – of north toe of the landfill.
28	2013-F3-SW-28	8.31	23/08/2013	408950	7617008	19	Feature C - View SW – of Feature C, plastic pipe. 2 of 2 pipes on the landfill lobe.
29	2013-F3-SW-29	8.28	23/08/2013	408949	7617013	19	Feature C – Close-up – of orange plastic pipe in north landfill toe, used to mark lift heights by surveyors.
30	2013-F3-SW-30	6.83	23/08/2013	408958	7616986	10	View NE – of landfill cap and toe from southern most corner of the lobe.
31	2013-F3-SW-31	6.96	23/08/2013	408960	7616983	10	View NW – of landfill cap and toe from southern most corner of the lobe.
32	2013-F3-SW-32	8.46	23/08/2013	408950	7616993	12	Feature H – Close-up - of small depression on the south landfill cap, adjacent to the toe.
33	2013-F3-SW-33	8.54	23/08/2013	408949	7616994	24	Feature H – View N – of small depression on the south landfill surface.
34	2013-F3-SW-34	5.75	23/08/2013	408939	7616990	24	View NW – of active North Warning Landfill.

Table VII: Landfill Visual Inspection Photo Log – Station West Landfill (continued)

Photo	Filename	Size (MB)	Date	Vantage Point		Focal Length	Caption
				Easting	Northing		
Lobe E2							
35	2013-F3-SW-35	6.03	23/08/2013	408912	7616932	24	View W – of lobe from the tundra.
36	2013-F3-SW-36	8.40	23/08/2013	408859	7616925	10	View W – of south landfill toe from SE corner of lobe.
37	2013-F3-SW-37	8.02	23/08/2013	408859	7616925	10	View N – of east landfill toe from SE corner of lobe.
38	2013-F3-SW-38	7.99	23/08/2013	408863	7616944	10	View S – of east landfill toe from NE corner of lobe.
39	2013-F3-SW-39	7.77	23/08/2013	408863	7616944	10	View W – of north landfill toe from NE corner of lobe.
40	2013-F3-SW-40	7.74	23/08/2013	408861	7616950	10	Feature I – view W - of geotextile debris to the north of the lobe.
41	2013-F3-SW-41	7.84	23/08/2013	408837	7616959	10	View SE – of north landfill toe from centre of north toe.
42	2013-F3-SW-42	7.56	23/08/2013	408837	7616959	10	View W – of north landfill toe from centre of north toe.
43	2013-F3-SW-43	7.97	23/08/2013	408817	7616955	10	View SE – of landfill cap from NW corner of the lobe.
44	2013-F3-SW-44	7.82	23/08/2013	408817	7616955	10	View S – of west landfill toe from NW corner of the lobe.
45	2013-F3-SW-45	8.71	23/08/2013	408810	7616946	20	Feature F – Close-up of small depression on the western cap of the lobe, adjacent to the toe.
46	2013-F3-SW-46	8.75	23/08/2013	408815	7616934	16	Feature F – View S of small depression on the western cap of the lobe, adjacent to the toe.
47	2013-F3-SW-47	7.77	23/08/2013	408814	7616933	10	View N – of west landfill toe from the SW corner of the lobe.
48	2013-F3-SW-48	7.53	23/08/2013	408814	7616933	10	View E - of south landfill toe from the SW corner of the lobe.
49	2013-F3-SW-49	7.84	23/08/2013	408814	7616920	10	View N – of central landfill cap from survey point 337.
Photo	Filename	Size (MB)	Date	Vantage Point		Focal Length	Caption
				Easting	Northing		
Lobe F							
50	2013-F3-SW-50	7.63	23/08/2013	408843	7616924	13	View SW – of the lobe from the access road.
51	2013-F3-SW-51	8.94	23/08/2013	408945	7616867	13	Feature K – Close-up – of small depression on the northeast landfill cap.
52	2013-F3-SW-52	8.86	23/08/2013	408945	7616867	13	Feature K – View SW of small depression on the northeast landfill cap.
53	2013-F3-SW-53	7.02	23/08/2013	408931	7616852	13	View SE – of the northeast landfill toe from survey point 210.
54	2013-F3-SW-54	7.32	23/08/2013	408931	7616852	11	View SW – of the north landfill toe from survey point 210.
55	2013-F3-SW-55	8.84	23/08/2013	408932	7616852	16	Feature L – Close-up – of small depression on the south landfill cap.
56	2013-F3-SW-56	7.81	23/08/2013	408920	7616860	13	Feature L – view SW – of small depression on the south landfill cap.
57	2013-F3-SW-57	6.93	23/08/2013	408905	7616843	10	View NE – of landfill surface from survey point 217.
58	2013-F3-SW-58	6.88	23/08/2013	408905	7616843	10	View SE – of landfill surface from survey point 217.
59	2013-F3-SW-59	7.25	23/08/2013	408905	7616843	10	Feature N – view NW - Seepage/damp area on the southwestern ¼ of the landfill cap.
60	2013-F3-SW-60	8.17	23/08/2013	408905	7616843	10	Feature N – view SE - Seepage/damp area on the southwestern ¼ of the landfill cap.
61	2013-F3-SW-61	7.76	23/08/2013	408886	7616833	10	Feature M – view S – of erosion channel extending from the landfill surface to the southwestern toe of the lobe – from top of channel.
62	2013-F3-SW-62	6.21	23/08/2013	408907	7616824	10	Feature M – view N – of erosion channel extending from the landfill surface to the southwestern toe of the lobe – from bottom top of channel.
63	2013-F3-SW-63	8.77	23/08/2013	408903	7616812	24	Feature O – View S – of discontinuous crack running parallel to the southwestern toe of the landfill.
64	2013-F3-SW-64	8.47	23/08/2013	408896	7616804	24	Feature O – close-up – of discontinuous crack running parallel to the southwestern toe of the landfill.
65	2013-F3-SW-65	7.97	23/08/2013	408897	7616804	10	Feature P – view N – of six erosion channels extending from the southwestern landfill surface to the toe – from bottom of channels.
66	2013-F3-SW-66	8.69	23/08/2013	408918	7616801	11	Feature P – view S – of six erosion channels extending from the southwestern landfill surface to the toe – from top of channels.
67	2013-F3-SW-67	8.55	23/08/2013	408918	7616810	13	Feature P – close-up – of 1 of 6 erosion channels extending from the southwestern landfill surface to the toe – from bottom of channels.
68	2013-F3-SW-68	8.73	23/08/2013	408920	7616805	14	Feature Q – view W – of discontinuous crack running parallel to the southwestern toe of the landfill.
69	2013-F3-SW-69	8.65	23/08/2013	408924	7616804	24	Feature Q – close-up - of discontinuous crack running parallel to the southwestern toe of the landfill.
70	2013-F3-SW-70	8.69	23/08/2013	408922	7616806	15	View SSW – of landfill cap from survey point 214.
71	2013-F3-SW-71	7.93	23/08/2013	408922	7616806	15	View W – of landfill cap from survey point 214.
72	2013-F3-SW-72	7.97	23/08/2013	408922	7616806	15	View NNE – of landfill cap from survey point 214.
73	2013-F3-SW-73	8.79	23/08/2013	408936	7616830	12	Feature R – Close-up – of metal debris to the north of the lobe.
74	2013-F3-SW-74	8.80	23/08/2013	408935	7616873	10	Feature R – view SW - of metal debris to the north of the lobe.

3.6 SELECTED PHOTOGRAPHS



Figure 1: Photo - 2013-F3-SW-20 - Feature F - Close-up of linear depression under cross beam of fuel tankbase located on Lobe A - (new observation).



Figure 2: Photo - 2013-F3-SW-13 - Feature C - Close-up - orange plastic pipe in north landfill toe, used to mark material lift heights by surveyors; 1 of 2 plastic pipes present on the Lobe A - (previously observed).



Figure 3: Photo - Feature M - view S of erosion channel extending from the landfill surface to the southwestern toe of the lobe, taken from the top of the channel on Lobe F - (new observation).



Figure 4: Photo - 2013-F3-SW-65 - Feature P - view N - of six erosion channels extending from the southwestern landfill surface to the toe taken from the bottom of channels, located on Lobe F - (previously observed).

4 WEST LANDFILL

4.1 SUMMARY

The visual inspection of the West Landfill was completed on August 23, 2013. Soil samples were not collected during the 2013 investigation and there are no monitoring instruments installed at the Station West Landfill. Soil sampling will be performed during the 2014 field season.

As of the 2013 monitoring event, no features were identified with “significant” or “unacceptable” severity ratings. Occasional areas of minor settlement were observed on the landfill surface as well as one occurrence of exposed debris north of the toe of the landfill. Water was observed draining west from the previously identified low lying area along the toe of the landfill. All observed features are acceptable as of 2013.

Based on the results of the Preliminary Stability Assessment, the West Landfill has an acceptable severity rating.

4.2 VISUAL INSPECTION CHECKLIST

The Visual Inspection Checklist has been completed as per the TOR and is included as Table VIII of this report. Please refer to Figure FOX-3.3 for a sketch of West Landfill detailing the location of photographs and erosional features.

Table VIII: Visual Inspection Checklist - West Landfill

**DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING
VISUAL INSPECTION CHECKLIST**

INSPECTION REPORT – PAGE 1 of 2

SITE NAME: FOX-3 Dewar Lakes
LANDFILL DESIGNATION: West Landfill
DATE OF INSPECTION: August 23, 2013
DATE OF PREVIOUS INSPECTION: Date of Baseline Investigation is unknown
INSPECTED BY: B. MacKay
REPORT PREPARED BY: B. MacKay
MONITORING EVENT: 2
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Checklist Item	Present Yes/No	Location	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records (Refer to the photographic log for more details)	Additional Comments
Settlement	Yes	Feature A - refer to figure FOX-3-3	0.15 m	0.15 m	0.10 m	<1%	4 circular areas of settlement.	3, 4, 5, 6, 7, 8, and 9	New Observation: Four minor areas of settlement on the northeast surface of the landfill.
		Feature B - refer to figure FOX-3-3	0.20 m	0.20 m	0.20 m	<1%	Small circular area of settlement.	15 and 16	New Observation: Minor area of settlement on the southeast surface of the landfill.
Erosion	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Frost Action	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sloughing and Cracking	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Animal Burrows	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vegetation	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Staining	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vegetation Stress	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Seepage Points	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Debris Exposed	Yes	Feature C - refer to figure FOX-3-3	0.10m	0.02 m	Unknown	<1%	Two small black cables.	1 and 2	New Observation: Small black cable protruding from the north of the landfill.
Presence/Condition – Monitoring Instruments	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Features of Note.	Yes	Feature D - refer to figure FOX-3-3	50.00 m	0.50 – 10.00 m	N/A	>1%	Low lying area and drainage channel.	1, 10, 22, 23 and 24	Previously observed: Low lying area to the north of the landfill, in contact with toe, water draining on north landfill lobe. No significant erosion to note at this time.

4.3 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for the West Landfill has been completed as per the TOR and is included as Table IX hereafter.

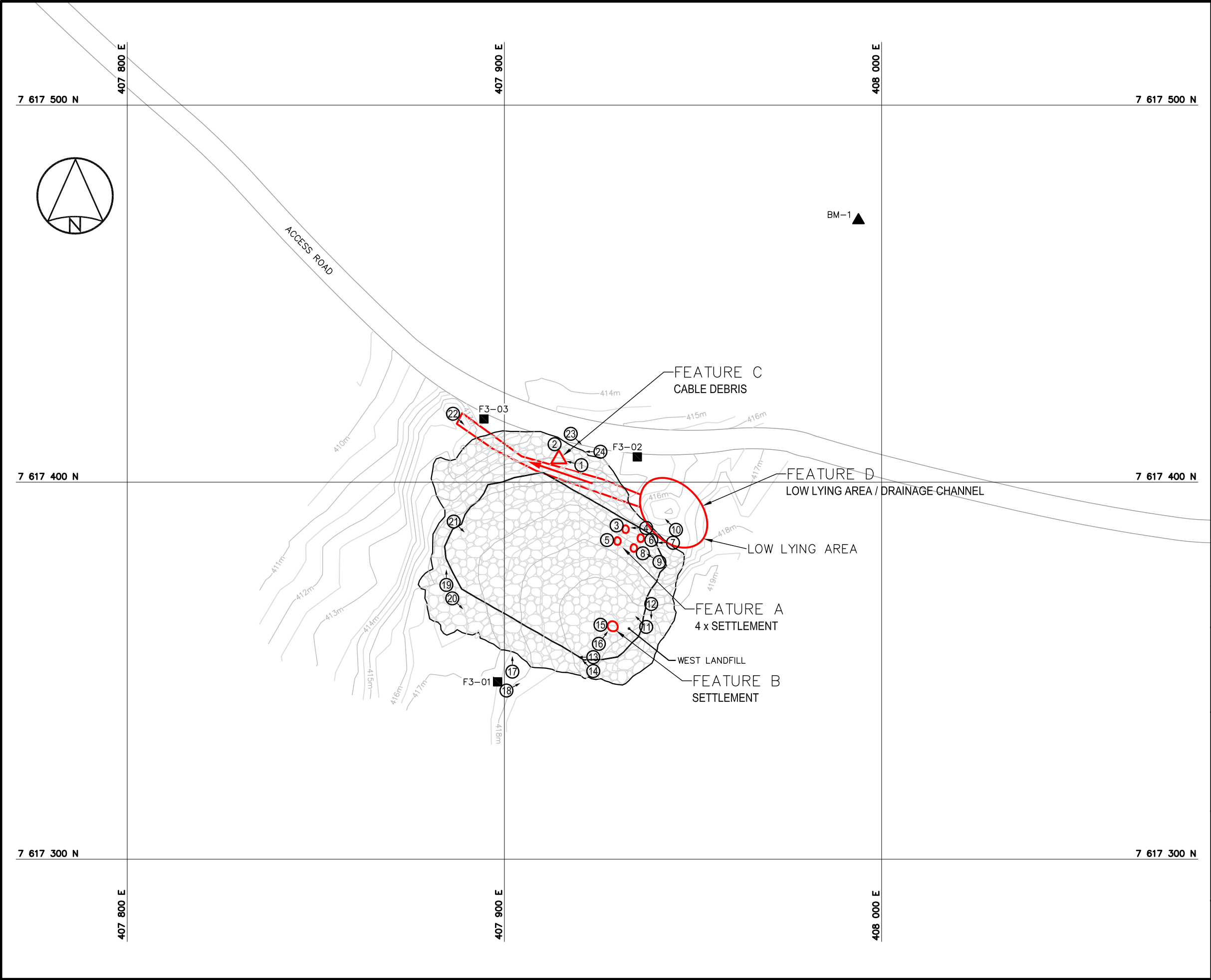
Table IX: Preliminary Stability Assessment – West Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Not observed	None
Frost Action	Not observed	None
Staining	Not observed	Isolated
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Acceptable	Isolated
Debris Exposure	Acceptable	Isolated
Overall Landfill Performance	Acceptable	

4.4 ANNOTATED DRAWING OF THE WEST LANDFILL

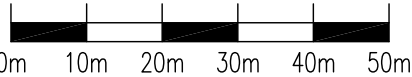
The annotated drawing for the West Landfill has been completed as per the TOR and is included in the following page as Figure FOX-3.3 Dewar Lakes – West Landfill.

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LEGEND

- ▲ PERMANENT BENCHMARK LOCATION
- SOIL SAMPLING LOCATION
- ① PHOTOGRAPH VIEWPOINT LOCATION
- △ DEBRIS (NTS)
- SETTLEMENT (NTS)
- DRAINAGE CHANNEL



A	FINAL	14-01-23	P.L.	B.M.	A.L.
NO.	VERSION	DATE	BY	VERIF.	APPR.



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COLLECTION OF
LANDFILL MONITORING DATA
FOX-3, DEWAR LAKES, NUNAVUT

WEST LANDFILL

SITE REMEDIATION SOLUTIONS

Biogenie, a division of EnGlobe Corp.
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Quebec, (Quebec) CANADA G1P 2J7
Phone : 418-653-4422 www.biogenie-env.com



MEASUREMENT UNIT Meter	SCALE: 1 : 1,000	DATE (month-year): JANUARY 2014
DRAWN BY: P. LÉGARÉ	VERIFIED BY: B. MACKAY	APPROVED BY: A. LECLAIR P. Eng.
PROJECT NO: CD2655_320_323	DRAWING NO: CD2655_320_323_101-FOX-3_B	PAGE PL

FIGURE FOX-3-3

4.5 PHOTOGRAPHIC RECORDS

The Photographic Record for the West Landfill has been completed as per the TOR and is included in the following pages as Table X. Full-sized photographs are contained in the Addendum DVD-ROM.

Table X: Landfill Visual Inspection Photo Log – West Landfill

Photo	Filename	Size (MB)	Date	Waypoint	Vantage Point		Caption
					Easting	Northing	
1	2013-F3-W-1	7.47	23/08/2013	212	408936	7616872	Feature C – View NW – of cable debris at the north landfill toe. Water is visible running along the toe of the landfill.
2	2013-F3-W-2	8.16	23/08/2013	213	407921	7617412	Feature C – Close-up – of cable debris identified at the north landfill toe.
3	2013-F3-W-3	8.74	23/08/2013	214	407922	7617412	Feature A – Close-up – of 1 of 4 small depressions identified on the north landfill cap.
4	2013-F3-W-4	7.52	23/08/2013	215	407934	7617389	Feature A – View W – of 2 of 4 small depressions identified on the north landfill cap – western 2 depressions.
5	2013-F3-W-5	8.75	23/08/2013	216	407934	7617389	Feature A – Close-up – of 1 of 4 small depression identified on the northern landfill cap.
6	2013-F3-W-6	8.36	23/08/2013	217	407930	7617389	Feature A – Close-up – of 1 of 4 small depressions identified on the northern landfill cap – eastern most depression.
7	2013-F3-W-7	7.93	23/08/2013	218	407937	7617384	Feature A – View W – of 1 of 4 small depressions identified on the northern landfill cap – 1 of 2 eastern depressions.
8	2013-F3-W-8	8.68	23/08/2013	219	407937	7617384	Feature A – Close-up – of 1 of 4 small depressions identified on the north landfill cap – 2 of 2 eastern depressions.
9	2013-F3-W-9	8.04	23/08/2013	220	407938	7617383	Feature A – View W – of 1 of 4 small depressions identified on the north landfill cap.
10	2013-F3-W-10	6.75	23/08/2013	221	407946	7617386	View NW – of previously identified low lying area.
11	2013-F3-W-11	7.49	23/08/2013	222	407938	7617362	View NW – of north landfill cap.
12	2013-F3-W-12	7.23	23/08/2013	222	407938	7617362	View S – of the east landfill cap.
13	2013-F3-W-13	6.84	23/08/2013	223	407924	7617354	View W – of south landfill cap.
14	2013-F3-W-14	6.65	23/08/2013	223	407924	7617354	View NW – of central landfill cap.
15	2013-F3-W-15	9.06	23/08/2013	224	407923	7617355	Feature B – Close-up – of small depression identified on the east landfill cap.
16	2013-F3-W-16	6.50	23/08/2013	225	407924	7617357	Feature B – View NW – of small depression identified on the east landfill cap.
17	2013-F3-W-17	6.06	23/08/2013	226	407924	7617356	View N – of the south section of the West Landfill – taken from the tundra south of the lobe.
18	2013-F3-W-18	7.15	23/08/2013	227	407900	7617346	View SE – of south landfill cap.
19	2013-F3-W-19	7.52	23/08/2013	227	407900	7617346	View N – of west landfill cap.
20	2013-F3-W-20	6.81	23/08/2013	228	407902	7617346	View SE – of central landfill cap.
21	2013-F3-W-21	6.56	23/08/2013	229	407878	7617380	View SE – of north landfill toe.
22	2013-F3-W-22	6.71	23/08/2013	230	407887	7617390	View SE – of drainage along the north toe of the landfill.
23	2013-F3-W-23	6.61	23/08/2013	231	407885	7617418	View SE – of north landfill toe.
24	2013-F3-W-24	6.03	23/08/2013	231	407885	7617418	View W – of north landfill toe.

4.6 SELECTED PHOTOGRAPHS



Figure 5: Photo - 2013-F3-W-9 - Feature A - View W - of 1 of 4 small depressions identified on the northern section of the landfill cap - (New observation).



Figure 6: Photo - 2013-F3-W-16 - Feature B - View NW - of small depression identified on the northeast landfill cap.

5 NON-HAZARDOUS WASTE LANDFILL

5.1 SUMMARY

The visual inspection of the Non-Hazardous Waste Landfill was completed August 23, 2013. Soil and groundwater samples were not collected during the 2013 investigation. Sampling (soil and groundwater) will be performed during the 2014 field season.

As of the 2013 monitoring event, no features were identified with “significant” or “unacceptable” severity ratings. Occasional areas of minor settlement were observed on the landfill surface and side slope as well as isolated tension cracking, ponded water and erosion. Vegetation in the form of arctic mosses has begun to grow on the southern 8% of the landfill cap. Monitoring instruments at the Non-Hazardous Waste Landfill which include four groundwater wells all appear in good condition.

Based on the results of the Preliminary Stability Assessment, the Non-Hazardous Waste Landfill has an acceptable severity rating.

5.2 VISUAL INSPECTION CHECKLIST

The visual inspection of the Non-Hazardous Waste Landfill was conducted on August 23, 2013. The Visual Inspection Checklist has been completed as per the TOR and is included as Table XI of this report. Please refer to Figure FOX-3.4 for a sketch of the Non-Hazardous Waste Landfill detailing the location of photographs and erosional features.

Table XI: Visual Inspection Checklist - Non-Hazardous Waste Landfill

**DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING
VISUAL INSPECTION CHECKLIST**

INSPECTION REPORT – PAGE 1 of 2

SITE NAME: FOX-3 Dewar Lakes
LANDFILL DESIGNATION: Non-Hazardous Waste Landfill
DATE OF INSPECTION: August 23, 2013
DATE OF PREVIOUS INSPECTION: Date of Baseline Investigation is unknown
INSPECTED BY: B. MacKay
REPORT PREPARED BY: B. MacKay
MONITORING EVENT: 2
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Checklist Item	Present Yes/No	Location	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records (Refer to the photographic log for more details)	Additional Comments
Settlement	Yes	Feature A - refer to figure FOX-3-4	0.40 m	0.30 m	0.05 m	<1%	Circular area of settlement.	28 and 29	New Observation: Minor area of settlement on the eastern surface of the landfill cap.
		Feature B - refer to figure FOX-3-4	0.60 m	0.60 m	0.15 m	<1%	Circular area of settlement.	33 and 34	New Observation: Minor area of settlement at the top of the east slope of the landfill.
Erosion	Yes	Feature C- refer to figure FOX-3-4	4.00 m	0.10 m	0.03	<1%	Singular erosion channel.	54 and 55	Previously observed: Minor erosion channel on the north slope of the landfill, barely discernible as of 2013 – self armouring.
Frost Action	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sloughing and Cracking	Yes	Feature D- refer to figure FOX-3-4	20.00 m	0.02 m	Unknown	<1%	Tension crack.	52 and 53	New observation: Discontinuous tension crack running parallel to the south toe on the landfill cap.
Animal Burrows	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vegetation	Yes	Feature E - refer to figure FOX-3-4	70.00 m	2.00 – 3.50 m	N/A	5%	Arctic moss growing on the landfill surface.	50 and 51	New Observation: Sparse moss growth on the southern portion of the landfill cap.
Staining	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vegetation Stress	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Seepage Points	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Debris Exposed	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Presence/Condition – Monitoring Instruments	Yes	MW-05, MW-06, MW-07 and MW-08 - refer to figure FOX-3-4	N/A	N/A	N/A	N/A	Groundwater monitoring wells.	8, 9, 16, 17, 37, 38,	All wells appear in good condition.
Features of Note.	Yes	Feature F - refer to figure FOX-3-4	100.00 m	0.30 – 3.00 m	0.03 – 0.05 m	>1%	Ponded water.	3, 5, 6, 43 and 44	Previously Identified: Ponded water north of the landfill. Water is pooled in shallow ruts caused by truck traffic and other low-lying areas.

5.3 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for the Non-Hazardous Waste Landfill has been completed as per the TOR and is included as Table XII hereafter.

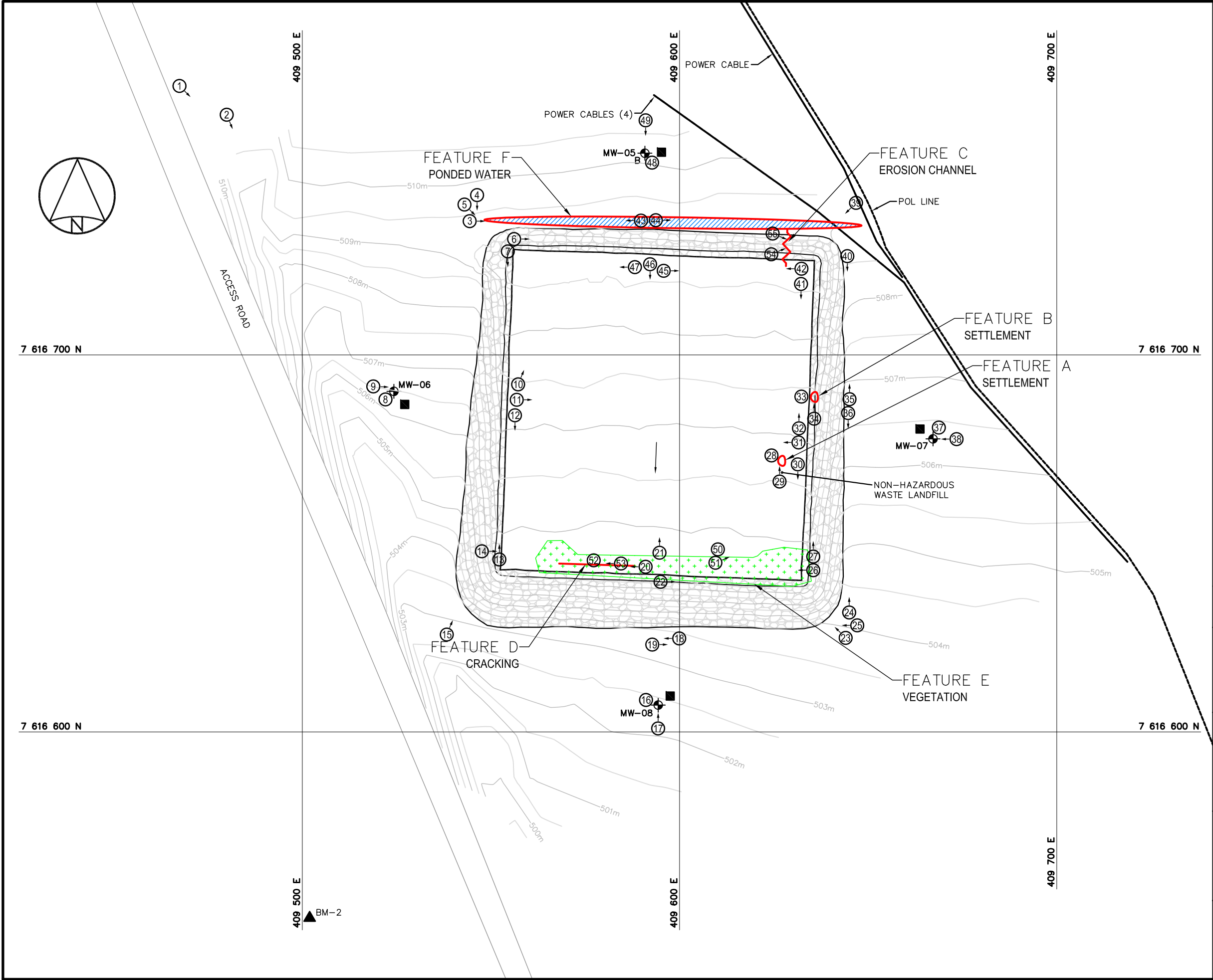
Table XII: Preliminary Stability Assessment – Non-Hazardous Waste Landfill

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Isolated
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Acceptable	Isolated
Debris Exposure	Not observed	None
Overall Landfill Performance	Acceptable	

5.4 ANNOTATED DRAWING OF THE NON-HAZARDOUS WASTE LANDFILL

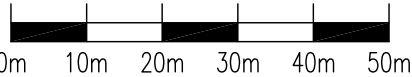
The annotated drawing for the Non-Hazardous Waste Landfill has been completed as per the TOR and is included in the following page as Figure FOX-3.4 Dewar Lakes – Non-Hazardous Waste Landfill.

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LEGEND

- MONITORING WELL LOCATION
- PERMANENT BENCHMARK LOCATION
- SOIL SAMPLING LOCATION
- PHOTOGRAPH VIEWPOINT LOCATION
- SETTLEMENT (NTS)
- PONDED WATER
- EROSION (NTS)
- VEGETATION
- CRACK (NTS)



A	FINAL	14-01-23	P.L.	B.M.	A.L.
NO.	VERSION	DATE	BY	VERIF.	APPR.



COLLECTION OF
LANDFILL MONITORING DATA
FOX-3, DEWAR LAKES, NUNAVUT
NON-HAZARDOUS
WASTE LANDFILL

SITE REMEDIATION SOLUTIONS

Biogenie, a division of EnGlobe Corp.
4495 Wilfrid-Hamel blvd, Suite 200
Quebec, (Quebec) CANADA G1P 2J7
Phone : 418-653-4422 www.biogenie-env.com



MEASUREMENT UNIT Meter	SCALE: 1 : 1,000	DATE (month-year): JANUARY 2014
DRAWN BY: P. LÉGARÉ	VERIFIED BY: B. MACKAY	APPROVED BY: A. LECLAIR P. Eng.
PROJECT NO: CD2655_320_323	DRAWING NO: CD2655_320_323_101-FOX-3_B	PAGE PL

FIGURE FOX-3-4

5.5 PHOTOGRAPHIC RECORDS

The Photographic Record for the Non-Hazardous Waste Landfill has been completed as per the TOR and is included in the following pages as Table XIII. Full-sized photographs are contained in the Addendum DVD-ROM.

Table XIII: Landfill Visual Inspection Photo Log – Non-Hazardous Waste Landfill

Photo	Filename	Size (MB)	Date	Vantage Point		Focal Length	Caption
				Easting	Northing		
1	2013-F3-NHWL-1	6.07	23/08/2013	409467	7616771	20	View SE - of Non-Hazardous Waste landfill from access road.
2	2013-F3-NHWL-2	5.93	23/08/2013	409480	7616764	24	View SSE - of drainage channel.
3	2013-F3-NHWL-3	6.27	23/08/2013	409546	7616739	24	Feature F - ponded water north of the north toe of the landfill.
4	2013-F3-NHWL-4	6.56	23/08/2013	409546	7616739	24	View S - of west toe from the northwest corner of the landfill.
5	2013-F3-NHWL-5	6.52	23/08/2013	409546	7616739	10	View SE - of northwest corner of the landfill.
6	2013-F3-NHWL-6	7.03	23/08/2013	409556	7616731	10	View E - of landfill surface from top of northwest corner.
7	2013-F3-NHWL-7	6.50	23/08/2013	409556	7616731	10	View E - of landfill surface from top of northwest corner.
8	2013-F3-NHWL-8	8.15	23/08/2013	409521	7616691	10	MW-06 - Close-up.
9	2013-F3-NHWL-9	6.41	23/08/2013	409523	7616692	10	MW-06 - view W - of the well.
10	2013-F3-NHWL-10	6.19	23/08/2013	409554	7616688	10	View NNE - of landfill surface taken from the midpoint of the top of the west slope.
11	2013-F3-NHWL-11	6.19	23/08/2013	409554	7616688	10	View E - of landfill surface taken from the midpoint of the top of the west slope.
12	2013-F3-NHWL-12	6.00	23/08/2013	409554	7616688	10	View S - of landfill surface taken from the midpoint of the top of the west slope.
13	2013-F3-NHWL-13	4.79	23/08/2013	409552	7616646	10	View N - of landfill surface from top of southwest corner of the landfill.
14	2013-F3-NHWL-14	6.15	23/08/2013	409552	7616646	10	View E - of landfill surface from top of southwest corner of the landfill.
15	2013-F3-NHWL-15	5.58	23/08/2013	409538	7616626	10	View NNE - of southwest corner of the landfill.
16	2013-F3-NHWL-16	7.25	23/08/2013	409596	7616609	16	MW-08 - Close-up.
17	2013-F3-NHWL-17	5.94	23/08/2013	409597	7616603	10	MW-08 - view N - of the monitoring well.
18	2013-F3-NHWL-18	6.67	23/08/2013	409597	7616603	10	View W - of south landfill slope/toe.
19	2013-F3-NHWL-19	6.60	23/08/2013	409595	7616644	10	View E - of south landfill slope/toe.
20	2013-F3-NHWL-20	6.49	23/08/2013	409595	7616644	10	View W - of landfill surface from south slope, directly north of MW-08.
21	2013-F3-NHWL-21	6.55	23/08/2013	409595	7616644	10	View N - of landfill surface from south slope, directly north of MW-08.
22	2013-F3-NHWL-22	6.06	23/08/2013	409595	7616644	10	View E - of landfill surface from south slope, directly north of MW-08.
23	2013-F3-NHWL-23	5.80	23/08/2013	409644	7616625	10	View NW - of southeast corner of the landfill slope.
24	2013-F3-NHWL-24	6.57	23/08/2013	409644	7616625	17	View N - of east side slope of the landfill, from the bottom of the southeast corner.
25	2013-F3-NHWL-25	5.70	23/08/2013	409644	7616625	17	View W - of the north side slope of the landfill, from the bottom of the southeast corner.
26	2013-F3-NHWL-26	6.05	23/08/2013	409635	7616643	10	View W - of the landfill surface from the top of the southeast corner.
27	2013-F3-NHWL-27	5.71	23/08/2013	409635	7616643	10	View N - of the landfill surface from the top of the southeast corner.
28	2013-F3-NHWL-28	8.54	23/08/2013	409625	7616670	20	Feature A - Close-up - of minor depression on eastern landfill surface.
29	2013-F3-NHWL-29	7.89	23/08/2013	409626	7616670	10	Feature A - view N - of minor depression on the eastern landfill surface.
30	2013-F3-NHWL-30	6.57	23/08/2013	409635	7616679	10	View S - of landfill surface from the midpoint of the east side-slope.
31	2013-F3-NHWL-31	5.67	23/08/2013	409635	7616679	10	View W - of landfill surface from the midpoint of the east side-slope.
32	2013-F3-NHWL-32	5.94	23/08/2013	409635	7616679	10	View N - of landfill surface from the midpoint of the east side-slope.
33	2013-F3-NHWL-33	7.54	23/08/2013	409636	7616686	24	Feature B - Close-up - of minor depression on the crest of the east side-slope.

Table XIII : Landfill Visual Inspection Photo Log – Non-Hazardous Waste Landfill (continued)

Photo	Filename	Size (MB)	Date	Vantage Point		Focal Length	Caption
				Easting	Northing		
34	2013-F3-NHWL-34	7.27	23/08/2013	409636	7616686	10	Feature B - View N - of minor depression on the crest of the east side-slope.
35	2013-F3-NHWL-35	6.12	23/08/2013	409644	7616681	16	View N - of East side slope, from the bottom of the midpoint of the slope.
36	2013-F3-NHWL-36	6.36	23/08/2013	409644	7616681	16	View S - of East side slope, from the bottom of the midpoint of the slope.
37	2013-F3-NHWL-37	6.93	23/08/2013	409667	7616679	16	MW-07 - Close-up.
38	2013-F3-NHWL-38	6.29	23/08/2013	409672	7616680	10	MW-07 - view W - of the monitoring well.
39	2013-F3-NHWL-39	5.59	23/08/2013	409647	7616740	10	View SW - of northeast corner of the landfill.
40	2013-F3-NHWL-40	6.60	23/08/2013	409636	7616727	24	View S - of drainage channel along the east toe of the landfill.
41	2013-F3-NHWL-41	6.39	23/08/2013	409602	7616734	10	View S - of landfill surface from the top of the northeast corner.
42	2013-F3-NHWL-42	6.00	23/08/2013	409602	7616734	10	View W - of landfill surface from the top of the northeast corner.
43	2013-F3-NHWL-43	5.46	23/08/2013	409590	7616732	16	View W - of the north side slope of the landfill, from the midpoint of the slope.
44	2013-F3-NHWL-44	6.41	23/08/2013	409590	7616732	14	View W - of the north side slope of the landfill, from the midpoint of the slope.
45	2013-F3-NHWL-45	6.31	23/08/2013	409590	7616756	10	View E - of landfill surface from the midpoint of the north crest of the landfill.
46	2013-F3-NHWL-46	6.16	23/08/2013	409590	7616756	10	View S - of landfill surface from the midpoint of the north crest of the landfill.
47	2013-F3-NHWL-47	6.00	23/08/2013	409590	7616756	10	View W - of landfill surface from the midpoint of the north crest of the landfill.
48	2013-F3-NHWL-48	7.54	23/08/2013	409591	7616759	20	MW-05 - Close-up.
49	2013-F3-NHWL-49	6.88	23/08/2013	409612	7616646	10	MW-05 - view S - of the monitoring well.
50	2013-F3-NHWL-50	7.55	23/08/2013	409610	7616646	20	Feature E - Close-up - of vegetation growing on the southern portion of the landfill surface.
51	2013-F3-NHWL-51	5.79	23/08/2013	409610	7616645	10	Feature E - ENE - of general area of vegetation growing on the southern portion of the landfill surface.
52	2013-F3-NHWL-52	8.69	23/08/2013	409610	7616645	12	Feature D - Close-up - of discontinuous crack on the southern surface of the landfill.
53	2013-F3-NHWL-53	7.97	23/08/2013	409582	7616647	10	Feature D - view W - of discontinuous crack on the southern surface of the landfill.
54	2013-F3-NHWL-54	8.63	24/08/2013	409627	7616727	24	Feature C - view ENE - of previously identified erosion on the north slope of the landfill, from the landfill surface.
55	2013-F3-NHWL-55	8.12	24/08/2013	409626	7616732	24	Feature C - view ESE - of previously identified erosion on the north slope of the landfill, from the landfill toe.

5.6 SELECTED PHOTOGRAPHS



Figure 7: Photo - 2013-F3-NHWL-34 - Feature B - View N - of minor depression on the crest of the east side-slope - (new observation)



Figure 8: Photo - 2013-F3-NHWL-39 - View SW - of the northeast corner of the landfill.



Figure 9: Photo - 2013-F3-NHWL-50 - Feature E - Close-up - of vegetation growing on the southern portion of the landfill surface - (new observation).



Figure 10: Photo - 2013-F3-NHWL-53 - Feature D - View W - of the discontinuous crack on the southern surface of the landfill - (new observation).

6 TIER II DISPOSAL FACILITY

6.1 SUMMARY

The 2013 monitoring of the Tier II Disposal Facility conducted on August 24 and 25, 2013 consisted of a visual inspection to identify areas of erosion conducted and as per the TOR, soil and groundwater samples were taken as well as thermal monitoring.

TPH was detected at two soil sampling locations; MW-2 a downgradient location and MW-4 an upgradient location. At both sites TPH was detected in the surface sample at relatively low concentrations, 22 mg/kg at MW-2 and 11 mg/kg at MW-4. Detected TPH in both samples was comprised completely of the F3 fraction. PCBs were detected at low concentrations (0.015 mg/kg) in the duplicate of the surface sample of MW-3; a downgradient sample. The samples were rerun and PCBs were not detected, it is believed the initial detection may be due to laboratory error. No relatively high metal concentrations were detected at the collected soil samples.

Water levels were sufficient to allow sampling at all four of the Tier II Disposal Facility groundwater wells. No TPH, PCBs or relatively high metal results were detected in any of the samples.

Thermal monitoring was conducted at the Tier II Disposal Facility, all dataloggers and thermistors were observed to be functioning properly and datasets were successfully retrieved.

As of the 2013 monitoring event, the Tier II Disposal Facility is showing little to no signs of erosion with a total of two minor areas of settlement. There is however occasional occurrences of hydrocarbon stains on the landfill surface as well as the area surrounding Tier II Disposal Facility. Overall performance rating of the Tier II Disposal Facility is acceptable.

6.2 VISUAL INSPECTION CHECKLIST

The visual inspection of the Tier II Disposal Facility was conducted on August 24, 2013. The Visual Inspection Checklist has been completed as per the TOR and is included as

Table XIV of this report. Please refer to Figure FOX-3.5 for a sketch of the Tier II Disposal Facility detailing the location of photographs and erosional features.

Table XIV: Visual Inspection Checklist – Tier II Disposal Facility

**DEW LINE CLEANUP: POST-CONSTRUCTION - LANDFILL MONITORING
VISUAL INSPECTION CHECKLIST**

INSPECTION REPORT – PAGE 1 of 2

SITE NAME: FOX-3 Dewar Lakes
LANDFILL DESIGNATION: Tier II Disposal Facility
DATE OF INSPECTION: August 24, 2013
DATE OF PREVIOUS INSPECTION: Date of Baseline Investigation is unknown
INSPECTED BY: B. MacKay
REPORT PREPARED BY: B. MacKay
MONITORING EVENT NUMBER: 2
The inspector/reporter represents to the best of his/her knowledge that the following statements and observations are true and correct and to the best of the preparer's actual knowledge, no material facts have been suppressed or misstated.

Checklist Item	Present Yes/No	Location	Length	Width	Depth	Extent relative to Area of Landfill (%)	Description	Photographic Records (Refer to the photographic log for more details)	Additional Comments
Settlement	Yes	Feature A - refer to figure FOX-3-5	0.30 m	0.30 m	0.10 m	<1%	Circular area of settlement.	41 and 42	New Observation: Minor area of settlement on the surface of the landfill cap, located at the northeast corner of the facility.
		Feature B - refer to figure FOX-3-5	1.00 m	0.15 m	0.05 m	<1%	Linear area of settlement.	43 and 44	New Observation: Minor area of settlement on the north surface of the landfill.
Erosion	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Frost Action	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sloughing and Cracking	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Animal Burrows	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vegetation	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Staining	Yes	Feature C - refer to figure FOX-3-5	17.00 m	0.30 m	Unknown	1%	Large hydrocarbon stain.	20 and 21	Previously observed: Large hydrocarbon stain extending from the top to the bottom of a slope to the southeast of the landfill.
		Feature D - refer to figure FOX-3-5	6.00 m	0.30 – 1.00 m	Unknown	<1%	Hydrocarbon stain.	38, 39, and 40	Previously observed: Hydrocarbon stain on the south landfill surface.
		Feature E - refer to figure FOX-3-5	0.40 m	0.30 m	Unknown	<1%	Small hydrocarbon stain.	47 and 48	Previously observed: Hydrocarbon stain located on the south landfill cap.
		Feature F - refer to figure FOX-3-5	1.00 m	1.00 m	Unknown	<1%	Small hydrocarbon stain.	49 and 50	Previously observed: Hydrocarbon stain located on the south landfill cap.
		Feature G - refer to figure FOX-3-5	0.20 m	0.20 m	Unknown	<1%	Small hydrocarbon stain.	51 and 52	Previously observed: Hydrocarbon stain located centrally on the landfill cap.
Vegetation Stress	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Seepage Points	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Debris Exposed	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Presence/Condition – Monitoring Instruments	Yes	MW-01, MW-02, MW-03, MW-04, VT-1, VT-2, VT-3 and VT-4 - refer to figure FOX-3-5	N/A	N/A	N/A	N/A	Groundwater monitoring wells and thermistor installations.	1, 2, 5, 6, 10, 11, 14, 15, 17, 18, 58 and 59	Groundwater wells and thermistors are in good condition.
Features of Note	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

6.3 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for the Tier II Disposal Facility has been completed as per the TOR and is included as Table XV hereafter.

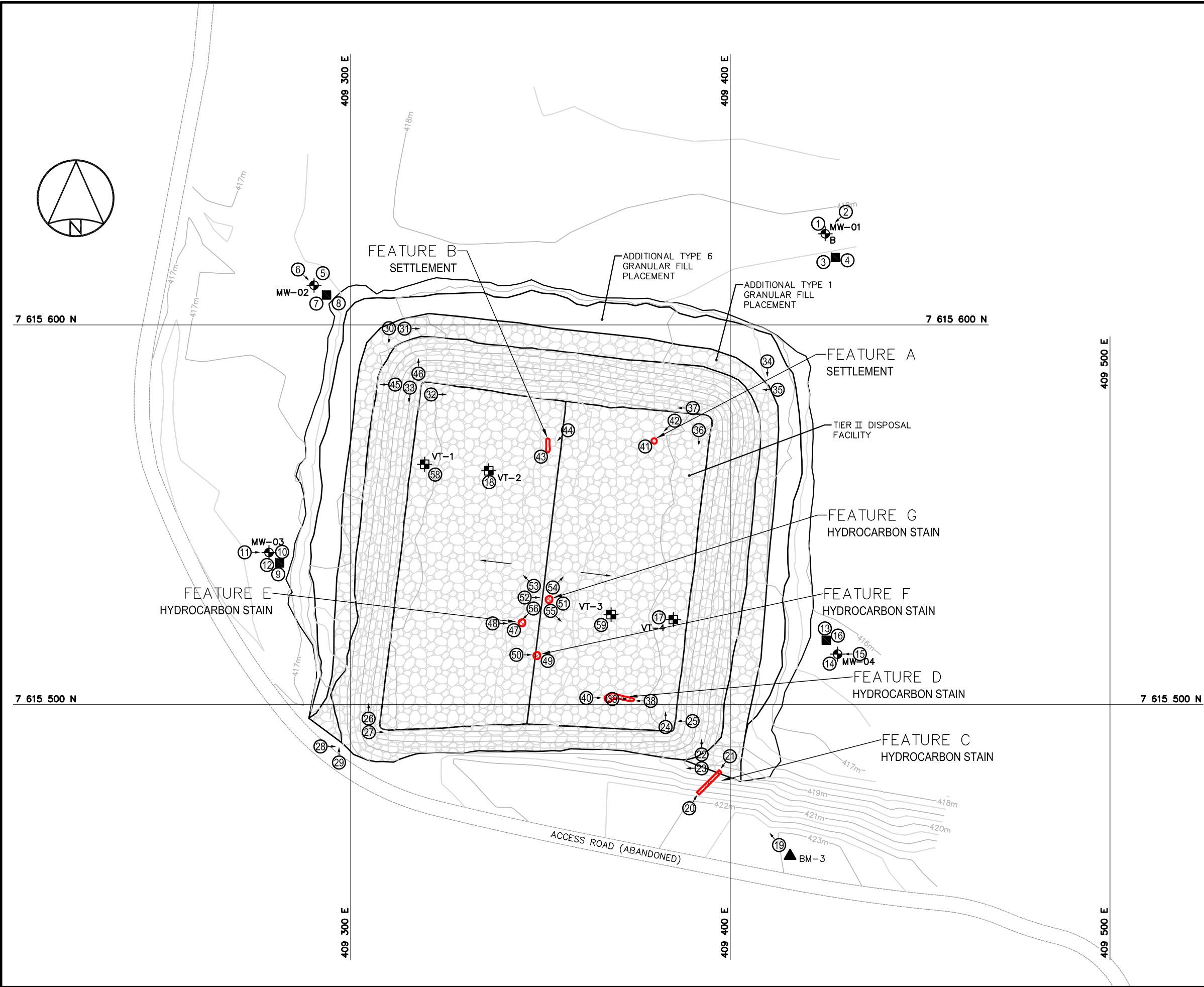
Table XV: Preliminary Stability Assessment – Tier II Disposal Facility

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Not observed	None
Frost Action	Not observed	None
Staining	Acceptable	Occasional
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris Exposure	Not observed	None
Overall Landfill Performance	Acceptable	

6.4 LOCATION PLAN

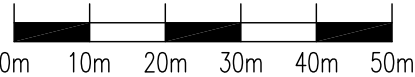
The Location Plan for the Tier II Disposal Facility has been completed as per the TOR and is included in the following page as Figure FOX-3.5 Dewar Lakes – Tier II Disposal Facility.

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LEGEND

- MONITORING WELL LOCATION
- BACKGROUND MONITORING WELL LOCATION
- GROUND TEMPERATURE CABLE LOCATION
- PERMANENT BENCHMARK LOCATION
- SOIL SAMPLING LOCATION
- PHOTOGRAPH VIEWPOINT LOCATION
- SETTLEMENT (NTS)
- STAINING



A	FINAL	14-01-28	P.L.	B.M.	A.L.
NO.	VERSION	DATE	BY	VERIF.	APPR.



Construction de Défense Canada
Défence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA FOX-3, DEWAR LAKES, NUNAVUT

TIER II DISPOSAL FACILITY

SITE REMEDIATION SOLUTIONS

Biogenie, a division of EnGlobe Corp.
4495 Wilfrid-Hamel Blvd, Suite 200
Quebec, (Quebec) CANADA G1P 2J7
Phone : 418-653-4422 www.biogenie-env.com



MEASUREMENT UNIT Meter	SCALE: 1 : 1,000	DATE (month-year): JANUARY 2014
DRAWN BY: P. LÉGARÉ	VERIFIED BY: B. MACKAY	APPROVED BY: A. LECLAIR P. Eng.
PROJECT NO: CD2655_320_323	DRAWING NO: CD2655_320_323_101-FOX-3_E	PAGE PL

FIGURE FOX-3-5

6.5 THERMISTOR ANNUAL MAINTENANCE REPORTS

The thermistor inspection reports VT-1 to VT-4 are presented in this section.

Thermistor Annual Maintenance Report

Contractor Name:	Biogenie/Sila Remediation	Inspection Date:	August-24-13
Prepared By:	Brandon MacKay		

Thermistor Information

Site Name:	FOX-3	Thermistor Location	Tier II	
Thermistor Number:	VT-1	Inclination:	Vertical	
Install Date:	2011-09-07	First Date Event	2012-08-25	Last Date Event 2013-08-24
Coordinates and Elevation	N	7615563	E	409318 Elev 422 m
Length of Cable (m)	9.54	Cable Lead Above Ground (m)	3.71	Nodal Points 14
Datalogger Serial #	9100022	Cable Serial Number	VT-1	

Thermistor Inspection

	Good	Needs Maintenance	
Casing	X	☐	
Cover	X	☐	
Data Logger	X	☐	
Cable	X	☐	
Beads	X	☐	
Battery Installation Date	2011-09-07		
Battery Levels	Main	11.34	Aux 13.26

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	14.520	2.340
2	14.121	2.893
3	13.422	3.904
4	13.903	3.202
5	15.179	1.464
6	16.624	-0.316
7	17.379	-1.179
8	18.006	-1.863

Bead	ohms	Degrees C
9	18.763	-2.656
10	19.340	-3.236
11	20.000	-3.876
12	20.530	-4.373
13	20.990	-4.793
14	21.370	-5.133

Observations and Proposed Maintenance

Reset clock: 00:42:38 behind

Thermistor Annual Maintenance Report

Contractor Name:	Biogenie/Sila Remediation	Inspection Date:	August-24-13
Prepared By:	Brandon MacKay		

Thermistor Information

Thermistor Information					
Site Name:	FOX-3	Thermistor Location		Tier II	
Thermistor Number:	VT-2	Inclination		Vertical	
Install Date:	2011-09-07	First Date Event		2012-08-25	Last Date Event 2013-08-24
Coordinates and Elevation	N	7615562	E	409336	Elev 422.44m
Length of Cable (m)	7.52	Cable Lead Above Ground (m)	3.92	Nodal Points	10
Datalogger Serial #	9100028	Cable Serial Number			VT-2

Thermistor Inspection

	Good	Needs Maintenance
Casing	X	☐
Cover	X	☐
Data Logger	X	☐
Cable	X	☐
Beads	X	☐
Battery Installation Date	2011-09-07	
Battery Levels	Main	11.34
	Aux	13.26

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	15.218	1.414
2	14.682	2.121
3	14.041	3.006
4	13.155	4.306
5	13.889	3.222
6	14.997	1.702
7	16.724	-0.433
8	17.246	-1.030

Bead	ohms	Degrees C
9	18.075	-1.937
10	18.800	-2.693

Observations and Proposed Maintenance

Reset clock: 00:48:42 behind

Thermistor Annual Maintenance Report

Contractor Name: Biogenie/Sila Remediation	Inspection Date: August-24-13
Prepared By:	

Thermistor Information

Site Name: FOX-3	Thermistor Location Tier II	
Thermistor Number: VT-3	Inclination Vertical	
Install Date: 2011-09-07	First Date Event 2012-08-25	Last Date Event 2013-08-24
Coordinates and Elevation N 7615523	E 409367	Elev 422.59 m
Length of Cable (m) 8.05	Cable Lead Above Ground (m) 4.32	Nodal Points 11
Datalogger Serial # 9100048	Cable Serial Number VT-3	

Thermistor Inspection

	Good	Needs Maintenance
Casing	X	☐
Cover	X	☐
Data Logger	X	☐
Cable	X	☐
Beads	X	☐
Battery Installation Date	2011-09-07	
Battery Levels	Main 11.34	Aux 13.02

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	14.840	1.909
2	14.704	2.091
3	14.200	2.782
4	13.227	4.197
5	13.734	3.446
6	14.720	2.070
7	16.568	-0.250
8	16.755	-0.469

Bead	ohms	Degrees C
9	17.976	-1.831
10	18.501	-2.385
11	19.198	-3.095

Observations and Proposed Maintenance

Reset clock: 00:48:58 behind

Thermistor Annual Maintenance Report

Contractor Name:	Biogenie/Sila Remediation	Inspection Date:	August-24-13
Prepared By:	Brandon MacKay		

Thermistor Information

Site Name:	FOX-3	Thermistor Location	Tier II		
Thermistor Number:	VT-4	Inclination	Vertical		
Install Date:	2011-09-07	First Date Event	2012-08-25	Last Date Event	2013-08-24
Coordinates and Elevation	N	7615522	E	409384	Elev 422.56
Length of Cable (m)	10	Cable Lead Above Ground (m)	4.05	Nodal Points	15
Datalogger Serial #	9100049	Cable Serial Number			VT-4

Thermistor Inspection

	Good	Needs Maintenance
Casing	X	☐
Cover	X	☐
Data Logger	X	☐
Cable	X	☐
Beads	X	☐
Battery Installation Date	2011-09-07	
Battery Levels	Main	Aux
	11.34	13.26

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	14.801	1.961
2	14.233	2.736
3	13.295	4.094
4	13.492	3.800
5	14.246	2.718
6	15.886	0.570
7	17.052	-0.810
8	17.806	-1.648

Bead	ohms	Degrees C
9	18.385	-2.265
10	19.204	-3.101
11	19.774	-3.659
12	20.450	-4.299
13	20.700	-4.530
14	21.280	-5.053
15	21.400	-5.159

Observations and Proposed Maintenance

Reset Clock: 00:49:30 behind

6.6 PHOTOGRAPHIC RECORDS

The Photographic Record for the Tier II Disposal Facility has been completed as per the TOR and is included in the following pages as Table XVI. Full-sized photographs are contained in the Addendum DVD-ROM.

Table XVI: Landfill Visual Inspection Photo Log – Tier II Disposal Facility

Photo	Filename	Size (MB)	Date	Vantage Point		Focal Length	Caption
				Easting	Northing		
1	2013-F3-TII-1	8.68	24/08/2013	409425	7615624	12	MW-01 - Close-up - of monitoring well.
2	2013-F3-TII-2	6.14	24/08/2013	409428	7615624	16	MW-01 - View SW - of the monitoring well.
3	2013-F3-TII-3	8.67	24/08/2013	409428	7615620	24	MW-01 - Close-up - open soil sampling test pit.
4	2013-F3-TII-4	8.72	24/08/2013	409428	7615620	24	MW-01 - Close-up - closed soil sampling test pit.
5	2013-F3-TII-5	5.61	24/08/2013	409291	7615609	20	MW-02 - Close-up - of monitoring well.
6	2013-F3-TII-6	6.12	24/08/2013	409291	7615611	10	MW-02 - View SE - of the monitoring well.
7	2013-F3-TII-7	8.44	24/08/2013	409291	7615610	10	MW-02 - Close-up - open soil sampling test pit.
8	2013-F3-TII-8	8.72	24/08/2013	409291	7615610	10	MW-02 - Close-up - closed soil sampling test pit.
9	2013-F3-TII-9	8.76	24/08/2013	409280	7615540	10	MW-03 - Close-up - open soil sampling test pit.
10	2013-F3-TII-10	8.92	24/08/2013	409278	7615542	10	MW-03 - Close-up - of monitoring well.
11	2013-F3-TII-11	7.12	24/08/2013	409278	7615541	10	MW-03 - View E - of the monitoring well.
12	2013-F3-TII-12	8.91	24/08/2013	409280	7615540	10	MW-03 - Close-up - closed soil sampling test pit.
13	2013-F3-TII-13	8.54	24/08/2013	409430	7615513	24	MW-04 - Close-up - open soil sampling test pit.
14	2013-F3-TII-14	6.41	24/08/2013	409430	7615516	18	MW-04 - Close-up - of monitoring well.
15	2013-F3-TII-15	6.64	24/08/2013	409431	7615516	10	MW-04 - View W - of the monitoring well.
16	2013-F3-TII-16	8.97	24/08/2013	409430	7615513	10	MW-04 - Close-up - closed soil sampling test pit.
17	2013-F3-TII-17	7.21	24/08/2013	409382	7615521	10	VT-4 - Close-up - of datalogger.
18	2013-F3-TII-18	6.41	24/08/2013	409335	7615560	10	VT-2 - Close-up - of datalogger.
19	2013-F3-TII-19	6.76	24/08/2013	409393	7615468	10	View SW - of the Tier II from the access road.
20	2013-F3-TII-20	9.17	24/08/2013	409391	7615473	24	Feature C - View N - of hydrocarbon stain on a slope to the south of the Tier II, taken from the top of the hill.
21	2013-F3-TII-21	7.93	24/08/2013	409397	7615487	20	Feature C - View S - of hydrocarbon stain on a slope to the south of the Tier II, taken from the bottom of the hill.
22	2013-F3-TII-22	7.14	24/08/2013	409392	7615487	20	View N - of east side slope of the landfill, from the bottom of the southeast corner.
23	2013-F3-TII-23	6.75	24/08/2013	409392	7615487	20	View W - of south side slope of the landfill, from the bottom of the southeast corner.
24	2013-F3-TII-24	6.90	24/08/2013	409383	7615494	10	View N - of surface of the landfill, from the top of the southeast corner.
25	2013-F3-TII-25	6.78	24/08/2013	409383	7615494	10	View W - of surface of the landfill, from the top of the southeast corner.
26	2013-F3-TII-26	6.79	24/08/2013	409305	7615496	10	View N - of surface of the landfill, from the top of the southwest corner.
27	2013-F3-TII-27	6.73	24/08/2013	409305	7615496	10	View E - of surface of the landfill, from the top of the southwest corner.
28	2013-F3-TII-28	6.87	24/08/2013	409297	7615485	10	View N - of east side slope of the landfill, from the bottom of the southwest corner.
29	2013-F3-TII-29	6.98	24/08/2013	409297	7615485	10	View E - of south side slope of the landfill, from the bottom of the southwest corner.
30	2013-F3-TII-30	6.66	24/08/2013	409310	7615599	10	View S - of east side slope of the landfill, from the bottom of the southwest corner.
31	2013-F3-TII-31	6.85	24/08/2013	409310	7615599	10	View E - of south side slope of the landfill, from the bottom of the southwest corner.
32	2013-F3-TII-32	6.73	24/08/2013	409321	7615582	10	View N - of surface of the landfill, from the top of the northwest corner.
33	2013-F3-TII-33	6.96	24/08/2013	409321	7615582	10	View E - of surface of the landfill, from the top of the northwest corner.
34	2013-F3-TII-34	6.59	24/08/2013	409410	7615585	10	View S - of east side slope of the landfill, from the bottom of the northeast corner.
35	2013-F3-TII-35	6.82	24/08/2013	409410	7615585	10	View W - of south side slope of the landfill, from the bottom of the northeast corner.

Table XVI: Landfill Visual Inspection Photo Log – Tier II Disposal Facility (continued)

Photo	Filename	Size (MB)	Date	Vantage Point		Focal Length	Caption
				Easting	Northing		
36	2013-F3-TII-36	6.64	24/08/2013	409391	7615574	10	View S - of surface of the landfill, from the top of the northeast corner.
37	2013-F3-TII-37	6.40	24/08/2013	409391	7615574	10	View W - of surface of the landfill, from the top of the northeast corner.
38	2013-F3-TII-38	8.74	24/08/2013	409370	7615497	16	Feature D - view W - of large hydrocarbon stain on the southeastern landfill surface, taken at the eastern extent of the stain.
39	2013-F3-TII-39	8.59	24/08/2013	409363	7615501	16	Feature D - view E - of a large hydrocarbon stain on the southeastern landfill surface.
40	2013-F3-TII-40	8.70	24/08/2013	409363	7615501	16	Feature D - view E - of a large hydrocarbon stain on the southeastern landfill surface, taken from the western extent of the stain.
41	2013-F3-TII-41	8.62	24/08/2013	409392	7615575	16	Feature A - Close-up - of minor depression on the landfill surface at the northeast corner.
42	2013-F3-TII-42	8.66	24/08/2013	409392	7615574	16	Feature A - view SW - of minor depression on the landfill surface at the northeast corner.
43	2013-F3-TII-43	8.85	24/08/2013	409350	7615570	16	Feature B - Close-up - of minor linear depression on the northern landfill surface.
44	2013-F3-TII-44	8.32	24/08/2013	409351	7615569	16	Feature B - view SW - of minor linear depression on the northern landfill surface.
45	2013-F3-TII-45	7.36	24/08/2013	409310	7615599	10	View W - of area previously identified to have ponded water - no longer visible.
46	2013-F3-TII-46	7.45	24/08/2013	409310	7615599	10	View N - of area previously identified to have ponded water - no longer visible.
47	2013-F3-TII-47	8.60	24/08/2013	409342	7615518	24	Feature E - Close-up - of minor hydrocarbon stain on the southern landfill surface.
48	2013-F3-TII-48	8.04	24/08/2013	409342	7615517	24	Feature E - view E - of minor hydrocarbon stain on the southern landfill surface.
49	2013-F3-TII-49	8.63	24/08/2013	409346	7615510	18	Feature F - Close-up - of minor hydrocarbon stain on the southern landfill surface.
50	2013-F3-TII-50	8.01	24/08/2013	409346	7615510	10	Feature F - view E - of minor hydrocarbon stain on the southern landfill surface.
51	2013-F3-TII-51	8.73	24/08/2013	409349	7615519	24	Feature G - Close-up - of minor hydrocarbon stain on the southern landfill surface.
52	2013-F3-TII-52	8.45	24/08/2013	409347	7615521	15	Feature G - view E - of minor hydrocarbon stain on the southern landfill surface.
53	2013-F3-TII-53	8.50	24/08/2013	409347	7615521	10	View NW - of landfill surface, taken from the middle of the facility.
54	2013-F3-TII-54	8.13	24/08/2013	409347	7615521	10	View NE - of landfill surface, taken from the middle of the facility.
55	2013-F3-TII-55	7.90	24/08/2013	409347	7615521	10	View SE - of landfill surface, taken from the middle of the facility.
56	2013-F3-TII-56	7.09	24/08/2013	409347	7615521	10	View SW - of landfill surface, taken from the middle of the facility.
57	2013-F3-TII-57	6.27	24/08/2013	409621	7616291	24	View S - of landfill from access road. Note* photo 57 is represented on Figure FOX-3.1 as it was taken from the access road and not in the direct vicinity of the Tier II.
58	2013-F3-TII-58	6.81	24/08/2013	409319	7615565	10	VT-1 - Close-up - of datalogger.
59	2013-F3-TII-59	4.76	24/08/2013	409367	7615528	14	VT-3 - Close-up - of datalogger.

6.7 SELECTED PHOTOGRAPHS



Figure 11: Photo – 2013-F3-TII-40 - Feature D - View E - of a large hydrocarbon stain on the southeastern landfill surface, taken from the western extent of the stain. Previously observed.



Figure 12: Photo – 2013-F3-TII-42 - Feature A - View SW - of minor depression on the landfill surface at the northeast corner. New observation.



Figure 13: Photo – 2013-F3-TII-44 - Feature B - View SW - of minor linear depression on the northern landfill surface. New observation.



Figure 14: Photo – 2013-F3-TII-46 - View N - of area previously identified to have ponded water - no longer visible.

6.8 SOIL SAMPLE ANALYTICAL DATA

The soil chemical analysis results for the 2013 Tier II Disposal Facility samples are presented in Table XVII hereafter. Certificates of analysis and results of field duplicates collected as part of the QA/QC program are presented in Appendix C at the end of this report.

Table XVII: Tier II Summary Table for Soil Analytical Data

Sample #	Location	Depth [cm]	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	F1 C ₆ -C ₁₀	F2 C ₁₀ -C ₁₆	F3 C ₁₆ -C ₃₄	TPH C ₆ -C ₃₄
Upgradient Soil Samples																
2013-F3-MW-01-A	MW1	0 -10	48	39	9.3	<0.1	7	71	79	18	<0.05	<0.010	<10	<10	<10	<10
2013-F3-MW-01-B		40 - 50	33	32	8.7	<0.1	6	61	73	16	<0.05	<0.010	<10	<10	<10	<10
Downgradient Soil Samples																
2013-F3-MW-02-A	MW2	1 -10	31	29	9.3	<0.1	8	60	69	14	<0.05	<0.010	<10	<10	22	22
2013-F3-MW-02-B		40 - 50	30	29	8.9	<0.1	8	63	71	11	<0.05	<0.010	<10	<10	<10	<10
2013-F3-MW-03-A/03-A-D	MW3	0 -10	34	34	10.0	<0.1	7	67	75	14	<0.05	0.015	<10	<10	<10	<10
Rerun for PCBs			-	-	-	-	-	-	-	-	<0.010	-	-	-	-	
2013-F3-MW-03-B		40 - 50	30	33	11.0	<0.1	6	61	74	12	<0.05	<0.010	<10	<10	<10	<10
2013-F3-MW-04-A	MW4	0 -10	35	38	11.0	<0.1	7	63	85	19	<0.05	<0.010	<10	<10	11	11
2013-F3-MW-04-B		40 - 50	39	38	11.0	<0.1	8	70	88	21	<0.05	<0.010	<10	<10	<10	<10

6.9 GROUNDWATER SAMPLE ANALYTICAL DATA

The groundwater chemical analysis results and evaluation for the analytical data for the 2013 Tier II Disposal Facility samples are presented in Table XVII hereafter. Certificates of analysis and results for groundwater samples collected as part of the QA/QC program are presented in Appendix C, at the end of this report.

Table XVIII: Tier II Summary Table for Groundwater Analytical Data

Sample #	Location	Cu [mg/L]	Ni [mg/L]	Co [mg/L]	Cd [mg/L]	Pb [mg/L]	Zn [mg/L]	Cr [mg/L]	As [mg/L]	Hg [mg/L]	PCBs [mg/L]	F1 C ₆ -C ₁₀	F2 C ₁₀ -C ₁₆	F3 C ₁₆ -C ₃₄	TPH C ₈ -C ₃₄
Upgradient Groundwater Samples															
2013-F3-MW-01	MW1	0.3700	0.720	0.1300	0.00280	0.05400	0.5600	0.3900	0.13000	0.00004	<0.00001	<0.025	<0.10	<0.10	<0.025
Downgradient Groundwater Samples															
2013-F3-MW-02	MW2	0.0150	0.043	0.0035	0.00033	0.00086	0.0170	0.0280	0.00220	<0.00001	<0.00001	<0.025	<0.10	<0.10	<0.025
2013-F3-MW-03	MW3	0.0370	0.110	0.0200	0.00120	0.00044	0.3700	0.0200	0.00790	0.00002	<0.00001	<0.025	<0.10	<0.10	<0.025
2013-F3-MW-04/04-D	MW4	0.0155	0.235	0.0785	0.00175	0.00185	0.0955	0.0475	0.00215	<0.00001	<0.00001	<0.025	<0.10	<0.10	<0.025

6.10 MONITORING WELL SAMPLING / INSPECTION LOGS

The monitoring well sampling logs for MW-1 to MW-4 are presented in this section.

Site Name:	FOX-3	Dewar Lakes	
Date of Sampling Event:	2013-08-25	Time:	21:22
Names of Samplers:		Brandon MacKay	
Landfill Name:	Tier II		
Monitoring Well ID:	MW-01		
Sample Number:		2013-F3-MW-01	
Condition of Well:	Good	lock rusty	
Measured Data			
Well pipe height above ground (cm)=	65		
Diameter of well (cm)=	4		
Depth of well installation (cm)= (from ground surface)	440		
Length screened section (cm)=	300		
Depth to top of screen (cm)= (from ground surface)	36		
Depth to water surface (cm)= (from top of pipe)	94	Measurement method: (meter, tape, etc)	Interface meter
Static water level (cm)= (below ground surface)	29		
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	196	Evidence of sludge or siltation:	Evidence of freezing
Thickness of water column (cm)=	102		
Static volume of water in well (mL)=	1282		
Free product thickness (mm)=	0	Measurement method: (meter, paste, etc)	
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra tubing
Volume Purged Water=	1500 mL		Foot Valve
Decontamination required: (Y/N)	N	Dedicated Waterra Tubing	
Number washes:	N/A		
Number rinses:	N/A		
Final pH=	6.09		
Final Conductivity (uS/cm)=	710		
Final Temperature (degC)=	1.1		

Site Name:	FOX-3	Dewar Lakes	
Date of Sampling Event:	2013-08-25	Time:	21:56
Names of Samplers:		Brandon MacKay	
Landfill Name:	Tier II		
Monitoring Well ID:	MW-02		
Sample Number:		2013-F3-MW-02 Interlab Duplicate	
Condition of Well:	Good		
Measured Data			
Well pipe height above ground (cm)=	75	*Top of pipe	
Diameter of well (cm)=	4		
Depth of well installation (cm)= (from ground surface)	440		
Length screened section (cm)=	300		
Depth to top of screen (cm)= (from ground surface)	36		
Depth to water surface (cm)= (from top of pipe)	115	Measurement method: (meter, tape, etc)	Interface meter
Static water level (cm)= (below ground surface)	40		
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	238	Evidence of sludge or siltation:	No
Thickness of water column (cm)=	123		
Static volume of water in well (mL)=	1546		
Free product thickness (mm)=	0	Measurement method: (meter, paste, etc)	
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra tubing
Volume Purged Water=	2000 mL		Foot Valve
Decontamination required: (Y/N)	N	Dedicated Waterra Tubing	
Number washes:	N/A		
Number rinses:	N/A		
Final pH=	6.78		
Final Conductivity (uS/cm)=	380		
Final Temperature (degC)=	0.4		

Site Name:	FOX-3	Dewar Lakes	
Date of Sampling Event:	2013-08-25	Time:	22:36
Names of Samplers:		Brandon MacKay	
Landfill Name:	Tier II		
Monitoring Well ID:	MW-03		
Sample Number:		2013-F3-MW-03	
Condition of Well:	Good		
Measured Data			
Well pipe height above ground (cm)=	85	*Top of pipe	
Diameter of well (cm)=	4		
Depth of well installation (cm)= (from ground surface)	440		
Length screened section (cm)=	300		
Depth to top of screen (cm)= (from ground surface)	36		
Depth to water surface (cm)= (from top of pipe)	120	Measurement method: (meter, tape, etc)	Interface meter
Static water level (cm)= (below ground surface)	35		
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	222	Evidence of sludge or siltation:	No
Thickness of water column (cm)=	102		
Static volume of water in well (mL)=	1282		
Free product thickness (mm)=	0	Measurement method: (meter, paste, etc)	
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra tubing
Volume Purged Water=	2000 mL		Foot Valve
Decontamination required: (Y/N)	N	Dedicated Waterra Tubing	
Number washes:	N/A		
Number rinses:	N/A		
Final pH=	6.27		
Final Conductivity (uS/cm)=	920		
Final Temperature (degC)=	3.0		

Site Name:	FOX-3	Dewar Lakes	
Date of Sampling Event:	2013-08-25	Time:	20:35
Names of Samplers:		Brandon MacKay	
Landfill Name:	Tier II		
Monitoring Well ID:	MW-04		
Sample Number:		2013-F3-MW-04	
Condition of Well:	Good		
Measured Data			
Well pipe height above ground (cm)=	71	*Top of pipe	
Diameter of well (cm)=	5		
Depth of well installation (cm)=	440		
(from ground surface)			
Length screened section (cm)=	300		
Depth to top of screen (cm)=	36		
(from ground surface)			
Depth to water surface (cm)=	90	Measurement method: (meter, tape, etc)	Interface meter
(from top of pipe)			
Static water level (cm)=	19		
(below ground surface)			
Measured well refusal depth (cm)=	210	Evidence of sludge or siltation:	No
(i.e. depth to frozen ground)			
Thickness of water column (cm)=	120		
Static volume of water in well (mL)=	1509		
Free product thickness (mm)=	0	Measurement method: (meter, paste, etc)	
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra tubing
Volume Purged Water=	2000 mL		Foot Valve
Decontamination required: (Y/N)	N	Dedicated Waterra Tubing	
Number washes:	N/A		
Number rinses:	N/A		
Final pH=	6.46		
Final Conductivity (uS/cm)=	500		
Final Temperature (degC)=	2.8		

APPENDIX A

Range of the Report and Limitation of Responsibilities



RANGE OF THE REPORT AND LIMITATION OF RESPONSIBILITIES

A – Recipient and Use

The Collection of Landfill Monitoring Data at the Former FOX-3 DEW Line Site, Mackar Inlet – Draft Report (“Report”) was prepared by Biogenie, a division of EnGlobe Corp., (“Biogenie”) at the request and for the sole benefit of Defence Construction Canada (“Client”), and is intended to be used exclusively by the Client.

B –Site Conditions

Any description of the target site (“Site”), soil and/or groundwater included in the Report is only provided as an indication to the Client, and unless otherwise specifically mentioned in the Report such description shall not at any time and under any circumstances be used for purposes other than to gain a better understanding of the Site and to fulfil the requirements of the mandate assigned to Biogenie by the Client (“Mandate”).

All information, including but not limiting the comprehensiveness of the data, charts, descriptions, drawings, tables, analysis results, compilations, and any conclusion and recommendation included in the Report, shall arise from the direct observation of the Site during a specific period, namely the fulfilment of the Mandate, and from the interpretation of such information and data available during the same period.

The content of the Report shall not apply in any way or to any part of the Site or to any parameter, material or analysis excluded from the Mandate.

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A review of the Report and/or changes in the parameters, conclusions and/or recommendations may prove to be necessary in the event of a change in the Site conditions or the discovery of pertinent information subsequent to the production of the Report.

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APPENDIX B

Field Notes

2013 Fox-3 LFM

August 23

Depart Igarka → Hull Beach → Dewar Lakes

Brandon Mackay - Inspector

Lamiki - Wildlife monitor

Jonah - cook

~~Josh Atwood~~ - Assistant

Glen & Cukib - Assistant

- Nursing Escort

Arrived at Fox-3: 10:48

station

Inspection of ↓ West landfill Lobe A

Date: August 23rd

Time: 14:39

Weather: 8°C overcast, 30 knot gusts from E

Team: Brandon, ~~Josh, Lamiki,~~
+ ~~Jolly, David~~

, Failed to
arrive due to
weather

Photo Graph: 746

①

Orientation: NW 2m NE of Survey monument

GPS: 152

Ref: 120

Description: Fuel tank

Photo: 747

(2)

Orientation: SW

GPS: 153

Ref: 121

Description: East landfill toe

(A)

Feature: staining

Hydrocarbon stain x2

60cm x 60cm

50cm x 40cm

10m SW of East corner 304

Photo: 748

(3)

Orientation: Close-up

GPS: 154

Photo: 749

(4)

Orientation: SW

Ref: 113

GPS: 155

Description: oil stains

Photo: 750

(5)

Orientation: Wide angle NW

GPS: 156

- Wide angle of LF surface from
East corner

Ref: Survey point 304

(B)

Feature: stang

Iron stang 6 m x 18m

Photo: 751 (6)

Orient: NNW

GPS: 157

- View NNW from top of iron stang $\rightarrow$ most concentrated area $\rightarrow$ lighter stang present at periphery

Photo: 752 (7)

Orient: NNW

GPS: 158

View: NNW from middle of stang

Photo 753 (8)

Orient: SSE

GPS 159

- view from toe of stang

Ref: 116

Photo: 754 (9)

Orient: S $\rightarrow$ wide Ang 4

GPS = 160

- landfill surface from North corner

Ref: 303 survey point

- stang visible

Photo: 755 (10)
Orient: NE
GPS: 161
Ref: 110
Des: landfill toe

Photo: 756 (11)
Orient: SW
GPS: 161
Ref: 111
Des: landfill toe

Photo: 757 (12)
Orient: SW
GPS: 162
Ref: 171
Des: Central LF surface

(C)

Feature: debris
- orange plastic stake used by surveyor
to indicate Height of soil left
- 4cm x 4cm → depth unknown 10" exposed

Photo: 758 (13)
Orient: close-up
GPS: 163
Ref: 172

Photo: ~~758~~ 759 (14)
Orient: SW
GPS: 164
Ref: 109

(D)

Feature: Depression
- small depression running parallel to R_c
LF toe

- ~~15cm x 10cm~~ 1m x 15cm x 10cm

Photo: 760 (15)
Orient: close-up
GPS: 165

Photo: 761 (16)
Orient: NW
GPS: 166

Photo: 762 (17)

orientation: NE

GPS = 167

Description landfill toe

(F)

Feature: Depression on landfill surface
associated with cobble

Photo: 763 (18)

Des: Closeup

GPS: 168

Photo 764 (19)

Des: view S

GPS = 169

(F)

Feature: Depression under Fuel tank
- Depression / erosion @ cross beams
of tank

3m x 40cm x 10cm

Photo 765 (20)

Close-up

GPS 170

Photo 766 (21)

→ SW

GPS 171

Photos: 767-768 (22) (23)

landfill surface

orient W → N

Ref: survey point 306

- landfill surface

GPS 172

(G)

Feature Scattered wood Debris
10m x 10m Area of small pieces
of wood south of R landfill

Photo 769 (24)
View NE of wood
GPS: 173
Ref 198

Photo 770 (25)
close-up
GPS: 174

Photo 771 (26)
View S of LF toe
GPS 175

Photo 772 (27)
View N
"

(C)

Feature Plastic Pipe
4cm x 8" exposed $\hookrightarrow$ 15x15x15 hole

Pic 773 (28)
view NW of pipe
Ref 173
GPS 176

Pic 774 (29)
close-up of pipe
GPS: 177

Photos 775 (30) 776 (31)
Ref survey point 307
~~NE~~ NE - NE
GPS 178 / 179
- Surface of landfill from
S corner

(H)

Feature

Small

Depression

30 x 30

x 0.08

Photo: 777

(32)

Photo 778

(33)

close up

view N

GPS 180

GPS 181

Photo 779

(34)

GPS: 182

Ref: 107

NWS landfill → NW

Lobe EZ: 15:57

Photo: 780

(35)

GPS: 183

Ref: 124

- view W of LF lobe

Photo: 781

(36)

GPS: 184

Orientation: W

- LF top

Survey 336 | LF toe

Photo: 782

(37)

N

Photo: 783 - S

(38)

784 - W

(39)

GPS: 185

- LF toe

Ref survey 334

(I)

Feature Geostert Debris
in low lying area
ground pending of water

Pic 785 (40)

View: W

GPS 186

Pic 786 (41)

View SE LF toe

GPS 187

Ref Survey 332
S

Pic 787 (42)

West

"

"

Pic 788 (43)

Ref 127

View SE

GPS: 188

789 (44)

S

(J)

Feature Small Depression

Ø. 20 dia x Ø10

Pic 790 (45) Close-up

GPS 189

Pic 791 (46) view S

GPS 190

Pic 792 (47)

view N

Pic 793 (48)

GPS 191

view East

Ref 128

Pic 794 $\rightarrow N$ ~~48~~ (49)
landfill surface
GPS 192 ~~48~~
Ref 337

|||||
||||| 212

New erosions channel
12m x 10cm x 0.01 - 0.10m

New crack 3m x 2-5mm
Parallel to erosion channel

Station Vest Landfill Lobe F
14:25

Pic = 795 ~~49~~ (50)
- SW view of lobe
GPS: 193
Ref: 132

(K)

Feature : Depression
0.5 x 0.6 x 0.05

Photo: 796 (51)

GPS: 194

- close-up

Photo 797 (52)

"

- view SW of depression

Pic 798 (53)

GPS 195

view ~~NE~~ Toe
SE

799 (54)

"

view SW toe

(L)

Feature: Depression New

40 x 30 x 0.05 m

Pic ~~800~~ 800 (55)

Pic ~~801~~ 801 (56)

GPS 196

GPS 197

Close up

view SW

Pic 802 (57)

803 (58)

GPS 198

199

View NE of toe

view ~~SW~~ of toe
SE

(M)

Feature: Damp area

lower 1/4 of lobe

Pic ~~804~~ 804 (59)

805 (60)

GPS 199

View NW of

Damp area

View East

of Damp area

(N)

Feature Erosion Channel New

12 m x 10 cm x 0.01 - 0.1

Pic 806 (61)

Pic 807 (62)

GPS 200

GPS 201

View S of

channel

view N

(P) Feature - crack New
 3m x 2-5 mm Discontinuous
 Parallel to toe
 Pic 808 (63) Pic 809 (64)
 GPS 202 GPS 203
 View S ~~Close-up~~ close-up

(P) ~~(P)~~ Feature 6 x Erosion channels
 10m x 20cm x 0.05-0.10
 Self armoring
 Pic 810 (65) Pic 811 (66)
 GPS 204 GPS 205
 View N of View S
 channels of channels
 Bottom Top

Pic 812 (67)
 GPS 206
 Close-up of channel

(P) ~~(P)~~ Feature = crack
 4 m x 2-5 mm Discontinuous
 Pic 813 (68) Pic 814 (69)
 GPS 207 GPS 208
 View W View close-up

Pic 815 (70) 816 (71) 817 (72)
 GPS 209
 SSW W NNE
 LF surface
 Ref Survey 214

~~A~~
R

Feature : Metal Bolts
Piece of a barrel 30 x 30 x 15

Pic 818 (73)
GPS 210
closeup

Pic 819 (74)
GPS 211
view SW

227/228

228/230

West

Landfill

Time

18:12

Temp

6°C

Overcast
North,

strong winds from the
steady rain

- 2) small depression 4x 0.10 x 0.10 x 0.10
- 1) cable debris black cable x2
- 3) small depression 20cm dia x ~~0.05~~ 0.05

GPS end 233

NHWL

18:50

GPS start 234

(1)

Pic start 845

Overcast, light rain ~~light~~ strong wind from
The ~~North~~ South

(1)

Pic 845

GPS 234

view SE of NHWL from Access road

Ref 142

(2)

Pic 846

GPS 235

view SSE of drainage channel

Ref 84

(F)

Feature - Ponded water
- length of north toe
Pic 847 → E (3)
GPS 236

Pic 848 → S along west toe
from NW corner (4)
GPS 236

Pic 849 NW corner (5)
view SW
GPS 236

Pic 850 → E (6) 851-S (7)
landfill surface
Ref survey 410
GPS 237

MW - 06
close-up Pic 852 GPS 238 (8)
view W 853 239 (9)

Pic 854 (10)
GPS ~~234~~ 240
View NNE of landfill surface
taken at the midpoint of
the west side

Pic 855 view E (11)
Pic 856 view S (12)

Pic 857 (13)
view N
GPS ~~240~~ 241

Pic 858 (14)
view E } from
SW corner
top

Pic 859
GPS ~~240~~ 242

(15)

View NNE of bottom of SW corner

MW -08

Pic 860 close-up of monitoring well (16)
GPS ~~242~~ 243

Pic 861 view N of MW-08 and south
slope of the landfill (17)
GPS ~~243~~ 244

Pic 862 view W of landfill south (18)
slope from north of MW-08
GPS (237) (19)

Pic 863 view E "

Pic 864 (20) 865 (21) 866 (22)

W

N

E

- from N of MW-08 on surface

GPS ~~244~~ 245

Pic 867 view NW of (23)
landfill SE corner
GPS ~~245~~ 246

GPS 247

corner

of SE

Top

*

Pic 868 view N of E side slope (24)

GPS 246

Pic 869 view W of S side slope (25)

GPS 246

Pic 870 view W surface (26)

@ ~~SE~~ SE corner

GPS 247

Pic 871 view N (27)

(A)

Feature small depression

40 cm x 30 cm x 0.05

Pic 872 close up (28)

GPS 248

Pic 873 view N of depression (29)

GPS 249

Pics 874 (30) 875 (31) 876 (32)

S W N

Mrd point of E slope

GPS 250

(B)

Feature Depression

Pic 877 close up (33)

GPS 251

Pic 878 view N (34)

60 dm x 0.15

Pic 879 (35) 880 (36)
N S
- E side slope
GPS 252

M W-07

Pic 881 close up (37)

GPS 253

Pic 882 view W (38)

GPS 254

Pic 883 (39)

view SW of NE corner of
landfill

GPS 255

Pic 884 (40)

view S of drainage channel

GPS: 256

Pic 885 (41) 886 (42)

GPS 257

view S W
of landfill surface from top
of ~~land~~ NE corner

Pic 887 (43) 888 (44) GPS 258

view W E
of side slope from mid
point of slope

Pic 889 (45) 890 (46) 891 (47) GPS
view E S W 2.89
of land fill surface
from mid point of N
slope

Pic 892 (48) GPS 260
close-up of MW-OS

Pic 893 (49) GPS 261
View S of MWS and
North slope of LF

(E)

Feature vegetation
- grassy on southern section
of LF surface from
edge to 3m NW

Pic 894 (50) GPS 262
close-up

Pic 895 (51) GPS 263
General Area of growth
southern slope
view NEN

(D)

Pic 897 (52) GPS 264
Feature crack
Discontinuous on parallel
to southern slope
1 m from edge

20m x 2cm

(53)

Pic 818 view W of creek
GPS 265

West landfill

Pic 820 GPS 212 (1)
view NW of low lying area
water visible drains along toe of landfill
+ wire debris

~~A~~ C Feature Debris (2) (C)
black cable 10cm (x2) x 2cm
Pic 821 GPS 213
close-up of wire

~~A~~ Feature 4x small depressions (A)
15 dia x 10cm deep
Pic 822 GPS 214 (3)
close-up

Pic 823 GPS 215 (4)
view W of 2 holes

Pic 824 GPS 216 (5)
close up of ~~east~~ most hole

Pic 825 GPS 217 (6)
eighth most hole

Pic 826 GPS 218 (7)
view W of holes

Pic 827 GPS 219 (8)

hole close up

Pic 828 GPS 220 (9)

hole W

Pic 829 GPS 221 (10)

view NWN of

low lying area

Pic 830 GPS 222 (11)

view NWN of surface

Pic 831 view S (12)

Pic 832 → ~~W~~ W GPS 223 ~~(12)~~ (13)

833 → ~~W~~ NW (14)

(B)

Feature Depression

20 cm dia x 0.05

834 close up GPS 224

835 view NW 225

8 36 GPS 226 (17)

view N of landfill from

tundra

8 37 view SE GPS ~~226~~ 227 (19)

8 38 view N * 228 may
be double

Pic 840 view ~~SE~~ GPS 228 (20)
of surface

Pic 841 view ~~SE~~ GPS 229 (21)

Pic 842 view ~~SE~~ SE of drainage GPS ~~229~~ 230 (22)

Pic 843 view ~~SE~~ SE of N toe GPS ~~230~~ 231 (23)
844 view V of N toe (24)

~~SE~~ ~~SE~~ ~~SE~~ ~~SE~~ ~~SE~~

Fox-3 August 24th

- Thick fog
- 6 °C light rain
light wind from the West

Soil Sampling at The Tiew II

MW-01

ID: 2013-F3-MW-01-A 0-15 cm * 10:00

" " - B 40-50 cm 10:05

* Duplicate: Client representative ESG

Pictures

Open: 901 (3) GPS 268

closed: 902 (4) "

MW-01: 899 (1) close-up GPS 266

: 900 (2) → SW GPS 267

Soil: Sandy + fines clay

Time: 0958

MW-02

10: 2013 - F3 - MW-02 - A
" " - B

0-15 cm
40-50 cm

Duplicate: None

Pictures

open: 905 (7) GPS 269

closed: 906 (8) "

MW-02: 903 (5) Close-up GPS: 270

904 (6) → SE 271

Soil: Organic + Sand at surface
Sand + fines at 1m

Time: 10:20 / 25

MW-03

10: 2013 - F3 - MW-03 - A
" " - B

0-15 cm
40-50 cm

✶ Duplicate Maxam

Pictures

GPS 272

open: 907 (9)

closed: 910 (10) (12)

MW-03

908 (11) 273 close up

909 (11) 274 → E

Time: 10:40 / 45

Soil: Sand + organic + silt

MW - 04

10: 2013 - F3 - MW - 04 - A 0-15 cm
" " - B 40-50 cm

Duplicate: E 2013

Pictures

GPS:

open:	911	(13)	275
closed:	914	(16)	
MW - 04	912	close-up (14)	276
	913	→ (15)	275 W
			277

Soil: organic + sand and silt

Time: 11:20 / 25

Visual Inspection of
Tier II

UT-4	(17)	UT-2	(18)
Pic: 915		Pic 916	
GPS 278		GPS 280	

Weather 3°C
light snow

Strong wind from the W

Pic: 917 19 GPS: 282
Ref 197

- view SW of the Tier II from
Access road

(C)

Feature Hydrocarbon stain on hill to
south of Tier II

17 m 030 x m

Pic 918 (20) GPS 283

- From top → N

Pic 919 (21) GPS 284

from Bottom → S

Bottom of SE corner

Pic 920 → N GPS 285 (22)

Pic 921 → W (23)

Top of SE corner

Pic 922 → N (24) GPS 286

Pic 923 → W (25) "

Top of SW corner Bottom

Pic 924 → N (26) GPS 287 Pic: 927 → N GPS (29)

Pic 925 → E (27) " ; 926 → E : (28)
288

Bottom of NW corner

Pic : 928 → S (28) GPS: 289

: 929 → E (31) "

Top of NW corner

Pic : 931 → S (33) GPS: 290

: 930 → ~~S~~ E (32)

Bottom of NE corner

Pic : 932 → S (34) GPS: 291 (34)

: 933 → ~~N~~ W 35 (35)

Top of NE corner

Pic : 934 → S GPS 292 (36)

: 935 → W (37)

(D) Feature Hydrocarbon stain
 10m from SE corner
 6m x 0.3 - 1m
 Pic ~~936~~ → W 936 GPS: 293 (38)
 Pic 937 → E : 294 (39)
 Pic 938 → E : 295 (40)

(A) Feature Depression NE corner
 0.30 m 0.30 x m 0.1 x m
 Pic 939 close-up GPS 296 (41)
 Pic 940 → NE GPS 297 (42)

(B) Feature linear Depression N middle
 1m x 0.15 x 0.05
 Pic 941 close GPS 298 (43)
 Pic 942 → SW 299 (44)
 UT 2 in back street

No ponded water GPS 289
 Pic 943 → W (45)
 944 → N (46)

(E) Feature stain
 Pic 945 close GPS 300 47
 Pic 946 E 301 (48)
 .40 x .30

(F)

	Feature	Stn		
1m	x 1m			
Pic	947	close	GPS 302	(49)
	948	-> E	303	(50)

(G)

	Feature	Stn		
0.20	dis			
Pic	949	close	GPS 304	(51)
	950	- E	305	(52)

Pic

From	Turn	Il	center	
951			-> NW	(53) GPS 306 or 307
952			NE	(54)
953			SE	(55)
954			SW	(56)

APPENDIX C

Maxxam and Exova QA/QC Reports and Certificates of Analysis

1 QUALITY ASSURANCE / QUALITY CONTROL

The Quality Assurance/Quality Control (QA/QC) program was implemented to monitor the quality of the analytical results. The main objective of this QA/QC program is to insure that sampling data and analysis results are complete, precise, exact, representative and comparable. The review consisted of evaluating sample collection/handling methodology, general laboratory comments, field (blind) duplicate samples, and inter-laboratory duplicate samples. Samples collected during the monitoring program were submitted to laboratories accredited by the Canadian Association for Environmental Analytical Laboratories (CAEAL).

All samples were collected following strict Biogenie sampling procedures. Samples were uniquely labelled and control was maintained through use of chain of custody forms. All samples were collected in laboratory supplied containers and preserved in insulated coolers. Appropriate QA/QC procedures were adhered to at all times.

Blind duplicate samples were submitted to Maxxam for intra-laboratory analysis, with additional duplicate samples were sent to Exova for inter-laboratory comparison purposes.

The relative percent difference (RPD) is used to evaluate the sample result variability. Average RPD values of less than 40% for soil samples and 30% for groundwater samples are considered an indication of acceptable duplicate sample variability. For groundwater samples, an RPD of greater than 30% may reflect difference in sample turbidity or variance in the sample procedures. Individual RPD values greater than 50% are not considered to reflect acceptable variability. RPD values are not used to evaluate those compounds that are present at concentrations less than five times the method detection limit (MDL).

1.1 SOIL SAMPLES

In case of soil samples, one blind duplicate sample was submitted for intra-laboratory comparisons. Review of blind duplicate results indicated little differences in the detected concentrations of the various parameters. All TPH RPD values were within the acceptable ranges and PCBs were below detection limits for all blind duplicate samples. Calculated RPD values ranged from 0.00% - 9.09% with several parameters having a RPD of 0.00%.. Overall, the soil sample results are coherent and within the same range of results for intra-laboratory samples. The reliability of soil analytical results is considered as good.

Sample #	Location	Depth [cm]	Cu [mg/kg]	Ni [mg/kg]	Co [mg/kg]	Cd [mg/kg]	Pb [mg/kg]	Zn [mg/kg]	Cr [mg/kg]	As [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	F1	F2	F3	TPH
													C ₆ -C ₁₀	C ₁₀ -C ₁₆	C ₁₆ -C ₃₄	C ₆ -C ₃₄
2013-F3-MW-03-A	MW3	0-15	34	34	11	<0.1	7	66	76	14	<0.05	<0.00001	<10	15	<10	15
2013-F3-MW-03-A-D			34	34	10	<0.1	7	67	75	14	<0.05	<0.00001	<10	<10	<10	<10
RPD			0.00%	0.00%	9.09%	N/A	0.00%	1.52%	1.32%	0.00%	N/A*	N/A	N/A	N/A	N/A	N/A

*N/A – Not Applicable

1.2 GROUNDWATER SAMPLES

In case of water samples, one blind duplicate sample was submitted for intra- and inter-laboratory comparisons. Review of intra-laboratory results indicated little difference in the detected concentrations of the various parameters. Calculated RPD values (where detected concentrations are five times the MDL) are all within acceptable range with values ranging from 0.00% - 24.07%.

Review of the inter-laboratory comparison show minor differences in detected parameter concentrations between Maxxam and Exova laboratories, with the majority of individual parameter concentrations less than five times the MDL. Five (5) calculated RPD values are outside the acceptable range (Copper, Nickel, Cobalt, Cadmium and Chromium) ranging in value from 34.29% to 96.43%. In the case of Chromium (RPD of 96.43%) the

detected concentrations are less than 5 times the MDL and therefore not included. The difference in detected concentrations may be attributed to sample turbidity and the relatively low concentrations that the parameters were detected at.

Overall, the groundwater sample results are coherent and within the same range of results for intra- and inter-laboratory samples. In general, the reliability of groundwater analytical results is considered as good.

Sample #	Location	Cu [mg/L]	Ni [mg/L]	Co [mg/L]	Cd [mg/L]	Pb [mg/L]	Zn [mg/L]	Cr [mg/L]	As [mg/L]	Hg [mg/L]	PCBs [mg/L]	F1	F2	F3	TPH
												C ₆ -C ₁₀	C ₁₀ -C ₁₆	C ₁₆ -C ₃₄	C ₈ -C ₃₄
2013-F3-MW-02	MW2	0.015	0.043	0.0035	0.00033	0.0086	0.017	0.028	0.0022	<0.01	<0.00001	<0.025	<0.10	<0.01	<0.025
2013-F3-MW-02 (Intra)		0.007	0.024	0.0023	0.00020	<0.001	<0.01	0.001	<0.01	<0.0001	<0.0001	<0.1	<0.1	<0.1	<0.1
RPD		53.33%	44.19%	34.29%	39.39%	N/A*	N/A	96.43%	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2013-F3-MW-04	MW4	0.016	0.24	0.0785	0.0017	0.0018	0.097	0.054	0.00220	<0.01	<0.00001	<0.025	<0.10	<0.01	<0.025
2013-F3-MW-04-D		0.015	0.23	0.0785	0.0018	0.0019	0.094	0.041	0.00210	<0.01	<0.00001	<0.025	<0.10	<0.01	<0.025
RPD		6.25%	4.17%	0.00%	5.88%	5.56%	3.09%	24.07%	4.55%	N/A	N/A	N/A	N/A	N/A	N/A

N/A* - Not Applicable

Your Project #: CD2655

Attention: Brandon MacKay

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Quebec
1170, rue Levis
Terrebonne, QC
CANADA J6W 5S6

Your C.O.C. #: 41622701, 416227-01-01, 416227-09-01

Report Date: 2013/09/09
CERTIFICATE OF ANALYSIS
MAXXAM JOB #: B3E4449
Received: 2013/08/28, 18:30

Sample Matrix: Soil
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Petroleum Hydro. CCME F1 & BTEX in Soil	9	2013/08/30	2013/09/05	OTT SOP-00002	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil	9	2013/08/30	2013/08/30	OTT SOP-00001	CCME CWS
Acid Extr. Metals (aqua regia) by ICPMS	9	2013/08/30	2013/09/03	OTT SOP-00003	EPA 6020
MOISTURE	9	N/A	2013/09/03	CAM SOP-00445	McKeague 2nd ed 1978
Polychlorinated Biphenyl in Soil (1)	7	2013/09/03	2013/09/03	CAM SOP-00309	SW846 8082
Polychlorinated Biphenyl in Soil (1)	2	2013/09/03	2013/09/04	CAM SOP-00309	SW846 8082

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Petroleum Hydro. CCME F1 & BTEX in Water	4	N/A	2013/08/30	OTT SOP-00002	CCME CWS
Petroleum Hydro. CCME F1 & BTEX in Water	1	N/A	2013/09/04	OTT SOP-00002	CCME CWS
Petroleum Hydrocarbons F2-F4 in Water	5	2013/09/03	2013/09/03	OTT SOP-00001	CCME Hydrocarbons
Mercury (low level) (1)	5	2013/09/05	2013/09/06	CAM SOP-00453	EPA 7470
Polychlorinated Biphenyl (PCB) (1)	5	2013/09/03	2013/09/04	CAM SOP-00309	SW846 8082

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

(1) This test was performed by Maxxam Analytics Mississauga

Your Project #: CD2655

Attention: Brandon MacKay

Biogenie Inc
Quebec
1170, rue Levis
Terrebonne, QC
CANADA J6W 5S6

Your C.O.C. #: 41622701, 416227-01-01, 416227-09-01

Report Date: 2013/09/09**CERTIFICATE OF ANALYSIS**

-2-

Encryption Key

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

Parnian Baber, Project Manager
Email: pbaber@maxxam.ca
Phone# (613) 274-0573

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Total cover pages: 2

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Maxxam Job #: B3E4449
Report Date: 2013/09/09

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

RESULTS OF ANALYSES OF SOIL

Maxxam ID		SV9291	SV9292	SV9293	SV9294	SV9295		
Sampling Date		2013/08/24 10:00	2013/08/24 10:05	2013/08/24 10:20	2013/08/24 10:25	2013/08/24 10:40		
COC Number		416227-01-01	416227-01-01	416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-01-A	2013-F3-MW-01-B	2013-F3-MW-02-A	2013-F3-MW-02-B	2013-F3-MW-03-A	RDL	QC Batch

Inorganics								
Moisture	%	19	12	19	15	15	0.2	3333656

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		SV9296	SV9297	SV9298	SV9299		
Sampling Date		2013/08/24 10:45	2013/08/24 11:20	2013/08/24 11:25	2013/08/24 10:40		
COC Number		416227-01-01	416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-03-B	2013-F3-MW-04-A	2013-F3-MW-04-B	2013-F3-MW-03-A-D	RDL	QC Batch

Inorganics							
Moisture	%	13	18	12	16	0.2	3333656

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/09

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		SV9291	SV9292	SV9293	SV9294		
Sampling Date		2013/08/24 10:00	2013/08/24 10:05	2013/08/24 10:20	2013/08/24 10:25		
COC Number		416227-01-01	416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-01-A	2013-F3-MW-01-B	2013-F3-MW-02-A	2013-F3-MW-02-B	RDL	QC Batch

Metals							
Acid Extractable Arsenic (As)	ug/g	18	16	14	11	1	3333952
Acid Extractable Cadmium (Cd)	ug/g	ND	ND	ND	ND	0.1	3333952
Acid Extractable Chromium (Cr)	ug/g	79	73	69	71	1	3333952
Acid Extractable Cobalt (Co)	ug/g	9.3	8.7	9.3	8.9	0.1	3333952
Acid Extractable Copper (Cu)	ug/g	48	33	31	30	0.5	3333952
Acid Extractable Lead (Pb)	ug/g	7	6	8	8	1	3333952
Acid Extractable Mercury (Hg)	ug/g	ND	ND	ND	ND	0.05	3333952
Acid Extractable Nickel (Ni)	ug/g	39	32	29	29	0.5	3333952
Acid Extractable Zinc (Zn)	ug/g	71	61	60	63	5	3333952

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		SV9295	SV9296	SV9297	SV9298		
Sampling Date		2013/08/24 10:40	2013/08/24 10:45	2013/08/24 11:20	2013/08/24 11:25		
COC Number		416227-01-01	416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-03-A	2013-F3-MW-03-B	2013-F3-MW-04-A	2013-F3-MW-04-B	RDL	QC Batch

Metals							
Acid Extractable Arsenic (As)	ug/g	14	12	19	21	1	3333952
Acid Extractable Cadmium (Cd)	ug/g	ND	ND	ND	ND	0.1	3333952
Acid Extractable Chromium (Cr)	ug/g	76	74	85	88	1	3333952
Acid Extractable Cobalt (Co)	ug/g	11	11	11	11	0.1	3333952
Acid Extractable Copper (Cu)	ug/g	34	30	35	39	0.5	3333952
Acid Extractable Lead (Pb)	ug/g	7	6	7	8	1	3333952
Acid Extractable Mercury (Hg)	ug/g	ND	ND	ND	ND	0.05	3333952
Acid Extractable Nickel (Ni)	ug/g	34	33	38	38	0.5	3333952
Acid Extractable Zinc (Zn)	ug/g	66	61	63	70	5	3333952

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/09

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		SV9299		
Sampling Date		2013/08/24 10:40		
COC Number		416227-01-01		
	Units	2013-F3-MW-03-A-D	RDL	QC Batch

Metals				
Acid Extractable Arsenic (As)	ug/g	14	1	3333952
Acid Extractable Cadmium (Cd)	ug/g	ND	0.1	3333952
Acid Extractable Chromium (Cr)	ug/g	75	1	3333952
Acid Extractable Cobalt (Co)	ug/g	10	0.1	3333952
Acid Extractable Copper (Cu)	ug/g	34	0.5	3333952
Acid Extractable Lead (Pb)	ug/g	7	1	3333952
Acid Extractable Mercury (Hg)	ug/g	ND	0.05	3333952
Acid Extractable Nickel (Ni)	ug/g	34	0.5	3333952
Acid Extractable Zinc (Zn)	ug/g	67	5	3333952

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/09

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		SV9291	SV9292	SV9293	SV9294		
Sampling Date		2013/08/24 10:00	2013/08/24 10:05	2013/08/24 10:20	2013/08/24 10:25		
COC Number		416227-01-01	416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-01-A	2013-F3-MW-01-B	2013-F3-MW-02-A	2013-F3-MW-02-B	RDL	QC Batch

BTEX & F1 Hydrocarbons							
Benzene	ug/g	ND	ND	ND	ND	0.005	3333650
Toluene	ug/g	ND	ND	ND	ND	0.02	3333650
Ethylbenzene	ug/g	ND	ND	ND	ND	0.01	3333650
o-Xylene	ug/g	ND	ND	ND	ND	0.02	3333650
p+m-Xylene	ug/g	ND	ND	ND	ND	0.04	3333650
Total Xylenes	ug/g	ND	ND	ND	ND	0.04	3333650
F1 (C6-C10)	ug/g	ND	ND	ND	ND	10	3333650
F1 (C6-C10) - BTEX	ug/g	ND	ND	ND	ND	10	3333650
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/g	ND	ND	ND	ND	10	3333470
F3 (C16-C34 Hydrocarbons)	ug/g	ND	ND	22	ND	10	3333470
F4 (C34-C50 Hydrocarbons)	ug/g	ND	ND	19	ND	10	3333470
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes		3333470
Surrogate Recovery (%)							
1,4-Difluorobenzene	%	93	94	90	92		3333650
4-Bromofluorobenzene	%	101	110	109	109		3333650
D10-Ethylbenzene	%	85	102	93	100		3333650
D4-1,2-Dichloroethane	%	110	110	116	113		3333650
o-Terphenyl	%	83	81	84	83		3333470

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/09

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		SV9295	SV9296	SV9297	SV9298		
Sampling Date		2013/08/24 10:40	2013/08/24 10:45	2013/08/24 11:20	2013/08/24 11:25		
COC Number		416227-01-01	416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-03-A	2013-F3-MW-03-B	2013-F3-MW-04-A	2013-F3-MW-04-B	RDL	QC Batch

BTEX & F1 Hydrocarbons							
Benzene	ug/g	ND	ND	ND	ND	0.005	3333650
Toluene	ug/g	ND	ND	ND	ND	0.02	3333650
Ethylbenzene	ug/g	ND	ND	ND	ND	0.01	3333650
o-Xylene	ug/g	ND	ND	ND	ND	0.02	3333650
p+m-Xylene	ug/g	ND	ND	ND	ND	0.04	3333650
Total Xylenes	ug/g	ND	ND	ND	ND	0.04	3333650
F1 (C6-C10)	ug/g	ND	ND	ND	ND	10	3333650
F1 (C6-C10) - BTEX	ug/g	ND	ND	ND	ND	10	3333650
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/g	ND	ND	ND	ND	10	3333470
F3 (C16-C34 Hydrocarbons)	ug/g	15	ND	11	ND	10	3333470
F4 (C34-C50 Hydrocarbons)	ug/g	ND	ND	ND	ND	10	3333470
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes		3333470
Surrogate Recovery (%)							
1,4-Difluorobenzene	%	97	95	96	97		3333650
4-Bromofluorobenzene	%	106	104	103	107		3333650
D10-Ethylbenzene	%	102	108	104	100		3333650
D4-1,2-Dichloroethane	%	108	108	108	108		3333650
o-Terphenyl	%	82	84	88	83		3333470

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/09

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		SV9299		
Sampling Date		2013/08/24 10:40		
COC Number		416227-01-01		
	Units	2013-F3-MW-03-A-D	RDL	QC Batch

BTEX & F1 Hydrocarbons				
Benzene	ug/g	ND	0.005	3333650
Toluene	ug/g	ND	0.02	3333650
Ethylbenzene	ug/g	ND	0.01	3333650
o-Xylene	ug/g	ND	0.02	3333650
p+m-Xylene	ug/g	ND	0.04	3333650
Total Xylenes	ug/g	ND	0.04	3333650
F1 (C6-C10)	ug/g	ND	10	3333650
F1 (C6-C10) - BTEX	ug/g	ND	10	3333650
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/g	ND	10	3333470
F3 (C16-C34 Hydrocarbons)	ug/g	ND	10	3333470
F4 (C34-C50 Hydrocarbons)	ug/g	ND	10	3333470
Reached Baseline at C50	ug/g	Yes		3333470
Surrogate Recovery (%)				
1,4-Difluorobenzene	%	97		3333650
4-Bromofluorobenzene	%	107		3333650
D10-Ethylbenzene	%	104		3333650
D4-1,2-Dichloroethane	%	120		3333650
o-Terphenyl	%	86		3333470

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/09

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		SV9291	SV9292	SV9293	SV9294		
Sampling Date		2013/08/24 10:00	2013/08/24 10:05	2013/08/24 10:20	2013/08/24 10:25		
COC Number		416227-01-01	416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-01-A	2013-F3-MW-01-B	2013-F3-MW-02-A	2013-F3-MW-02-B	RDL	QC Batch

PCBs							
Aroclor 1242	ug/g	ND	ND	ND	ND	0.010	3335545
Aroclor 1248	ug/g	ND	ND	ND	ND	0.010	3335545
Aroclor 1254	ug/g	ND	ND	ND	ND	0.010	3335545
Aroclor 1260	ug/g	ND	ND	ND	ND	0.010	3335545
Total PCB	ug/g	ND	ND	ND	ND	0.010	3335545
Surrogate Recovery (%)							
Decachlorobiphenyl	%	99	94	96	98		3335545

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		SV9295	SV9296	SV9297	SV9298		
Sampling Date		2013/08/24 10:40	2013/08/24 10:45	2013/08/24 11:20	2013/08/24 11:25		
COC Number		416227-01-01	416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-03-A	2013-F3-MW-03-B	2013-F3-MW-04-A	2013-F3-MW-04-B	RDL	QC Batch

PCBs							
Aroclor 1242	ug/g	ND	ND	ND	ND	0.010	3335545
Aroclor 1248	ug/g	ND	ND	ND	ND	0.010	3335545
Aroclor 1254	ug/g	ND	ND	ND	ND	0.010	3335545
Aroclor 1260	ug/g	ND	ND	ND	ND	0.010	3335545
Total PCB	ug/g	ND	ND	ND	ND	0.010	3335545
Surrogate Recovery (%)							
Decachlorobiphenyl	%	94	97	96	98		3335545

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/09

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		SV9299		
Sampling Date		2013/08/24 10:40		
COC Number		416227-01-01		
	Units	2013-F3-MW-03-A-D	RDL	QC Batch

PCBs				
Aroclor 1242	ug/g	ND	0.010	3335545
Aroclor 1248	ug/g	ND	0.010	3335545
Aroclor 1254	ug/g	0.015	0.010	3335545
Aroclor 1260	ug/g	ND	0.010	3335545
Total PCB	ug/g	0.015	0.010	3335545
Surrogate Recovery (%)				
Decachlorobiphenyl	%	101		3335545

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/09

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		SV9324	SV9325	SV9326	SV9327	SV9328		
Sampling Date		2013/08/25 21:22	2013/08/25 21:56	2013/08/25 22:36	2013/08/25 20:35	2013/08/25 20:35		
COC Number		416227-09-01	416227-09-01	416227-09-01	416227-09-01	416227-09-01		
	Units	2013-F3-MW-01	2013-F3-MW-02	2013-F3-MW-03	2013-F3-MW-04	2013-F3-MW-04-D	RDL	QC Batch

Metals								
Mercury (Hg)	ug/L	0.04	ND	0.02	ND	ND	0.01	3339086

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/09

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		SV9324	SV9325	SV9326	SV9327		
Sampling Date		2013/08/25 21:22	2013/08/25 21:56	2013/08/25 22:36	2013/08/25 20:35		
COC Number		416227-09-01	416227-09-01	416227-09-01	416227-09-01		
	Units	2013-F3-MW-01	2013-F3-MW-02	2013-F3-MW-03	2013-F3-MW-04	RDL	QC Batch

BTEX & F1 Hydrocarbons							
Benzene	ug/L	ND	ND	ND	ND	0.20	3333743
Toluene	ug/L	ND	ND	ND	ND	0.20	3333743
Ethylbenzene	ug/L	ND	ND	ND	ND	0.20	3333743
o-Xylene	ug/L	ND	ND	ND	ND	0.20	3333743
p+m-Xylene	ug/L	ND	ND	ND	ND	0.40	3333743
Total Xylenes	ug/L	ND	ND	ND	ND	0.40	3333743
F1 (C6-C10)	ug/L	ND	ND	ND	ND	25	3333743
F1 (C6-C10) - BTEX	ug/L	ND	ND	ND	ND	25	3333743
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/L	ND	ND	ND	ND	100	3335444
F3 (C16-C34 Hydrocarbons)	ug/L	ND	ND	ND	ND	100	3335444
F4 (C34-C50 Hydrocarbons)	ug/L	ND	ND	ND	ND	100	3335444
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes		3335444
Surrogate Recovery (%)							
1,4-Difluorobenzene	%	96	98	100	95		3333743
4-Bromofluorobenzene	%	106	106	98	100		3333743
D10-Ethylbenzene	%	102	115	127	110		3333743
D4-1,2-Dichloroethane	%	110	110	111	109		3333743
o-Terphenyl	%	74	73	75	74		3335444

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/09

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		SV9328		
Sampling Date		2013/08/25 20:35		
COC Number		416227-09-01		
	Units	2013-F3-MW-04-D	RDL	QC Batch

BTEX & F1 Hydrocarbons				
Benzene	ug/L	ND	0.20	3333743
Toluene	ug/L	ND	0.20	3333743
Ethylbenzene	ug/L	ND	0.20	3333743
o-Xylene	ug/L	ND	0.20	3333743
p+m-Xylene	ug/L	ND	0.40	3333743
Total Xylenes	ug/L	ND	0.40	3333743
F1 (C6-C10)	ug/L	ND	25	3333743
F1 (C6-C10) - BTEX	ug/L	ND	25	3333743
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/L	ND	100	3335444
F3 (C16-C34 Hydrocarbons)	ug/L	ND	100	3335444
F4 (C34-C50 Hydrocarbons)	ug/L	ND	100	3335444
Reached Baseline at C50	ug/L	Yes		3335444
Surrogate Recovery (%)				
1,4-Difluorobenzene	%	91		3333743
4-Bromofluorobenzene	%	86		3333743
D10-Ethylbenzene	%	126		3333743
D4-1,2-Dichloroethane	%	105		3333743
o-Terphenyl	%	74		3335444

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/09

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		SV9324		SV9325	SV9326	SV9327		
Sampling Date		2013/08/25 21:22		2013/08/25 21:56	2013/08/25 22:36	2013/08/25 20:35		
COC Number		416227-09-01		416227-09-01	416227-09-01	416227-09-01		
	Units	2013-F3-MW-01	RDL	2013-F3-MW-02	2013-F3-MW-03	2013-F3-MW-04	RDL	QC Batch

PCBs								
Aroclor 1016	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1221	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1232	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1262	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1268	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1242	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1248	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1254	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1260	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Total PCB	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Surrogate Recovery (%)								
Decachlorobiphenyl	%	91		77	78	78		3336314

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/09

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		SV9328		
Sampling Date		2013/08/25 20:35		
COC Number		416227-09-01		
	Units	2013-F3-MW-04-D	RDL	QC Batch

PCBs				
Aroclor 1016	ug/L	ND	0.01	3336314
Aroclor 1221	ug/L	ND	0.01	3336314
Aroclor 1232	ug/L	ND	0.01	3336314
Aroclor 1262	ug/L	ND	0.01	3336314
Aroclor 1268	ug/L	ND	0.01	3336314
Aroclor 1242	ug/L	ND	0.01	3336314
Aroclor 1248	ug/L	ND	0.01	3336314
Aroclor 1254	ug/L	ND	0.01	3336314
Aroclor 1260	ug/L	ND	0.01	3336314
Total PCB	ug/L	ND	0.01	3336314
Surrogate Recovery (%)				
Decachlorobiphenyl	%	77		3336314

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/09

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

GENERAL COMMENTS

Sample SV9299-01: PCB Analysis: The sample exhibits a distorted Aroclor (1254) pattern. There is a high uncertainty associated with the calculation of Total PCB concentration in such samples. View results with discretion.

Sample SV9324-01: PCB Analysis: Detection Limit was raised due to matrix interferences.

Results relate only to the items tested.

Biogenie Inc
Attention: Brandon MacKay
Client Project #: CD2655
P.O. #:
Site Location:

Quality Assurance Report
Maxxam Job Number: TB3E4449

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3333470 HES	Matrix Spike [SV9291-03]	o-Terphenyl	2013/08/30		74	%	30 - 130
		F2 (C10-C16 Hydrocarbons)	2013/08/30		89	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2013/08/30		89	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2013/08/30		89	%	50 - 130
	Spiked Blank	o-Terphenyl	2013/08/30		77	%	30 - 130
		F2 (C10-C16 Hydrocarbons)	2013/08/30		81	%	80 - 120
		F3 (C16-C34 Hydrocarbons)	2013/08/30		81	%	80 - 120
		F4 (C34-C50 Hydrocarbons)	2013/08/30		81	%	80 - 120
	Method Blank	o-Terphenyl	2013/08/30		82	%	30 - 130
		F2 (C10-C16 Hydrocarbons)	2013/08/30	ND, RDL=10		ug/g	
		F3 (C16-C34 Hydrocarbons)	2013/08/30	ND, RDL=10		ug/g	
		F4 (C34-C50 Hydrocarbons)	2013/08/30	ND, RDL=10		ug/g	
	RPD [SV9292-03]	F2 (C10-C16 Hydrocarbons)	2013/08/30	NC		%	50
		F3 (C16-C34 Hydrocarbons)	2013/08/30	NC		%	50
		F4 (C34-C50 Hydrocarbons)	2013/08/30	NC		%	50
3333650 STE	Matrix Spike [SV9292-02]	1,4-Difluorobenzene	2013/09/05		95	%	60 - 140
		4-Bromofluorobenzene	2013/09/05		102	%	60 - 140
		D10-Ethylbenzene	2013/09/05		124	%	30 - 130
		D4-1,2-Dichloroethane	2013/09/05		114	%	60 - 140
		Benzene	2013/09/05		86	%	60 - 140
		Toluene	2013/09/05		90	%	60 - 140
		Ethylbenzene	2013/09/05		98	%	60 - 140
		o-Xylene	2013/09/05		110	%	60 - 140
		p+m-Xylene	2013/09/05		96	%	60 - 140
		F1 (C6-C10)	2013/09/05		93	%	60 - 140
	Spiked Blank	1,4-Difluorobenzene	2013/09/05		97	%	60 - 140
		4-Bromofluorobenzene	2013/09/05		108	%	60 - 140
		D10-Ethylbenzene	2013/09/05		113	%	30 - 130
		D4-1,2-Dichloroethane	2013/09/05		110	%	60 - 140
		Benzene	2013/09/05		87	%	60 - 130
		Toluene	2013/09/05		95	%	60 - 130
		Ethylbenzene	2013/09/05		103	%	60 - 130
		o-Xylene	2013/09/05		116	%	60 - 130
		p+m-Xylene	2013/09/05		102	%	60 - 130
		F1 (C6-C10)	2013/09/05		96	%	80 - 120
	Method Blank	1,4-Difluorobenzene	2013/09/05		97	%	60 - 140
		4-Bromofluorobenzene	2013/09/05		105	%	60 - 140
		D10-Ethylbenzene	2013/09/05		100	%	30 - 130
		D4-1,2-Dichloroethane	2013/09/05		111	%	60 - 140
		Benzene	2013/09/05	ND, RDL=0.005		ug/g	
		Toluene	2013/09/05	ND, RDL=0.02		ug/g	
		Ethylbenzene	2013/09/05	ND, RDL=0.01		ug/g	
		o-Xylene	2013/09/05	ND, RDL=0.02		ug/g	
		p+m-Xylene	2013/09/05	ND, RDL=0.04		ug/g	
		Total Xylenes	2013/09/05	ND, RDL=0.04		ug/g	
		F1 (C6-C10)	2013/09/05	ND, RDL=10		ug/g	
		F1 (C6-C10) - BTEX	2013/09/05	ND, RDL=10		ug/g	
	RPD [SV9291-02]	Benzene	2013/09/05	NC		%	50
		Toluene	2013/09/05	NC		%	50
		Ethylbenzene	2013/09/05	NC		%	50
		o-Xylene	2013/09/05	NC		%	50
		p+m-Xylene	2013/09/05	NC		%	50
		Total Xylenes	2013/09/05	NC		%	50

Biogenie Inc
Attention: Brandon MacKay
Client Project #: CD2655
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: TB3E4449

QA/QC Batch			Date Analyzed				
Num Init	QC Type	Parameter	yyyy/mm/dd	Value	Recovery	Units	QC Limits
3333650 STE	RPD [SV9291-02]	F1 (C6-C10)	2013/09/05	NC		%	50
		F1 (C6-C10) - BTEX	2013/09/05	NC		%	50
3333656 HES	RPD [SV9292-03]	Moisture	2013/09/03	8.5		%	50
3333743 STE	Matrix Spike	1,4-Difluorobenzene	2013/08/30		96	%	70 - 130
		4-Bromofluorobenzene	2013/08/30		102	%	70 - 130
		D10-Ethylbenzene	2013/08/30		87	%	70 - 130
		D4-1,2-Dichloroethane	2013/08/30		107	%	70 - 130
		Benzene	2013/08/30		83	%	70 - 130
		Toluene	2013/08/30		95	%	70 - 130
		Ethylbenzene	2013/08/30		101	%	70 - 130
		o-Xylene	2013/08/30		109	%	70 - 130
		p+m-Xylene	2013/08/30		102	%	70 - 130
		F1 (C6-C10)	2013/08/30		87	%	70 - 130
	Spiked Blank	1,4-Difluorobenzene	2013/08/30		97	%	70 - 130
		4-Bromofluorobenzene	2013/08/30		103	%	70 - 130
		D10-Ethylbenzene	2013/08/30		92	%	70 - 130
		D4-1,2-Dichloroethane	2013/08/30		105	%	70 - 130
		Benzene	2013/08/30		82	%	60 - 130
		Toluene	2013/08/30		92	%	60 - 130
		Ethylbenzene	2013/08/30		101	%	60 - 130
		o-Xylene	2013/08/30		108	%	60 - 130
		p+m-Xylene	2013/08/30		99	%	60 - 130
		F1 (C6-C10)	2013/08/30		107	%	60 - 140
	Method Blank	1,4-Difluorobenzene	2013/08/30		101	%	70 - 130
		4-Bromofluorobenzene	2013/08/30		100	%	70 - 130
		D10-Ethylbenzene	2013/08/30		97	%	70 - 130
		D4-1,2-Dichloroethane	2013/08/30		104	%	70 - 130
		Benzene	2013/08/30	ND, RDL=0.20		ug/L	
		Toluene	2013/08/30	ND, RDL=0.20		ug/L	
		Ethylbenzene	2013/08/30	ND, RDL=0.20		ug/L	
		o-Xylene	2013/08/30	ND, RDL=0.20		ug/L	
		p+m-Xylene	2013/08/30	ND, RDL=0.40		ug/L	
		Total Xylenes	2013/08/30	ND, RDL=0.40		ug/L	
		F1 (C6-C10)	2013/08/30	ND, RDL=25		ug/L	
		F1 (C6-C10) - BTEX	2013/08/30	ND, RDL=25		ug/L	
	RPD	Benzene	2013/08/30	NC		%	40
		Toluene	2013/08/30	NC		%	40
		Ethylbenzene	2013/08/30	NC		%	40
		o-Xylene	2013/08/30	NC		%	40
		p+m-Xylene	2013/08/30	NC		%	40
		Total Xylenes	2013/08/30	NC		%	40
		F1 (C6-C10)	2013/08/30	NC		%	40
		F1 (C6-C10) - BTEX	2013/08/30	NC		%	40
3333952 RAI	Matrix Spike [SV9291-04]	Acid Extractable Arsenic (As)	2013/09/03		104	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/09/03		101	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/09/03		NC	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/09/03		104	%	75 - 125
		Acid Extractable Copper (Cu)	2013/09/03		NC	%	75 - 125
		Acid Extractable Lead (Pb)	2013/09/03		103	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/09/03		50 (1)	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/09/03		NC	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/09/03		NC	%	75 - 125
	Spiked Blank	Acid Extractable Arsenic (As)	2013/09/03		106	%	80 - 120
		Acid Extractable Cadmium (Cd)	2013/09/03		103	%	80 - 120

Biogenie Inc
Attention: Brandon MacKay
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P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: TB3E4449

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3333952 RAI	Spiked Blank	Acid Extractable Chromium (Cr)	2013/09/03		104	%	80 - 120
		Acid Extractable Cobalt (Co)	2013/09/03		104	%	80 - 120
		Acid Extractable Copper (Cu)	2013/09/03		103	%	80 - 120
		Acid Extractable Lead (Pb)	2013/09/03		104	%	80 - 120
		Acid Extractable Mercury (Hg)	2013/09/03		112	%	80 - 120
		Acid Extractable Nickel (Ni)	2013/09/03		103	%	80 - 120
	Method Blank	Acid Extractable Zinc (Zn)	2013/09/03		100	%	80 - 120
		Acid Extractable Arsenic (As)	2013/09/03	ND, RDL=1		ug/g	
		Acid Extractable Cadmium (Cd)	2013/09/03	ND, RDL=0.1		ug/g	
		Acid Extractable Chromium (Cr)	2013/09/03	ND, RDL=1		ug/g	
		Acid Extractable Cobalt (Co)	2013/09/03	ND, RDL=0.1		ug/g	
		Acid Extractable Copper (Cu)	2013/09/03	ND, RDL=0.5		ug/g	
		Acid Extractable Lead (Pb)	2013/09/03	ND, RDL=1		ug/g	
		Acid Extractable Mercury (Hg)	2013/09/03	ND, RDL=0.05		ug/g	
		Acid Extractable Nickel (Ni)	2013/09/03	ND, RDL=0.5		ug/g	
		Acid Extractable Zinc (Zn)	2013/09/03	ND, RDL=5		ug/g	
	RPD [SV9291-04]	Acid Extractable Arsenic (As)	2013/09/03	6.5		%	35
		Acid Extractable Cadmium (Cd)	2013/09/03	NC		%	35
		Acid Extractable Chromium (Cr)	2013/09/03	0.8		%	35
		Acid Extractable Cobalt (Co)	2013/09/03	0.9		%	35
		Acid Extractable Copper (Cu)	2013/09/03	5.5		%	35
		Acid Extractable Lead (Pb)	2013/09/03	7.4		%	35
		Acid Extractable Mercury (Hg)	2013/09/03	NC		%	35
		Acid Extractable Nickel (Ni)	2013/09/03	2.6		%	35
		Acid Extractable Zinc (Zn)	2013/09/03	1.1		%	35
	Matrix Spike	o-Terphenyl	2013/09/03		76	%	30 - 130
		F2 (C10-C16 Hydrocarbons)	2013/09/03		81	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2013/09/03		81	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2013/09/03		81	%	50 - 130
	Spiked Blank	o-Terphenyl	2013/09/03		75	%	30 - 130
		F2 (C10-C16 Hydrocarbons)	2013/09/03		83	%	70 - 130
		F3 (C16-C34 Hydrocarbons)	2013/09/03		83	%	70 - 130
		F4 (C34-C50 Hydrocarbons)	2013/09/03		83	%	70 - 130
	Method Blank	o-Terphenyl	2013/09/03		73	%	30 - 130
		F2 (C10-C16 Hydrocarbons)	2013/09/03	ND, RDL=100		ug/L	
		F3 (C16-C34 Hydrocarbons)	2013/09/03	ND, RDL=100		ug/L	
		F4 (C34-C50 Hydrocarbons)	2013/09/03	ND, RDL=100		ug/L	
	RPD	F2 (C10-C16 Hydrocarbons)	2013/09/03	NC		%	50
		F3 (C16-C34 Hydrocarbons)	2013/09/03	NC		%	50
		F4 (C34-C50 Hydrocarbons)	2013/09/03	NC		%	50
3335545 LPG	Matrix Spike	Decachlorobiphenyl	2013/09/03		88	%	60 - 130
		Aroclor 1260	2013/09/03		97	%	60 - 130
		Total PCB	2013/09/03		97	%	60 - 130
	Spiked Blank	Decachlorobiphenyl	2013/09/03		96	%	60 - 130
		Aroclor 1260	2013/09/03		103	%	60 - 130
		Total PCB	2013/09/03		103	%	60 - 130
	Method Blank	Decachlorobiphenyl	2013/09/03		93	%	60 - 130
		Aroclor 1242	2013/09/03	ND, RDL=0.010		ug/g	
		Aroclor 1248	2013/09/03	ND, RDL=0.010		ug/g	
		Aroclor 1254	2013/09/03	ND, RDL=0.010		ug/g	
		Aroclor 1260	2013/09/03	ND, RDL=0.010		ug/g	
		Total PCB	2013/09/03	ND, RDL=0.010		ug/g	
		Aroclor 1242	2013/09/03	NC		%	50
	RPD	Aroclor 1248	2013/09/03	NC		%	50
		Aroclor 1254	2013/09/03	NC		%	50
		Aroclor 1260	2013/09/03	NC		%	50
		Total PCB	2013/09/03	NC		%	50

Biogenie Inc
Attention: Brandon MacKay
Client Project #: CD2655
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: TB3E4449

QA/QC Batch			Date Analyzed					
Num Init	QC Type	Parameter	yyyy/mm/dd	Value	Recovery	Units	QC Limits	
3335545	LPG	RPD	Aroclor 1260	2013/09/03	NC	%	50	
			Total PCB	2013/09/03	NC	%	50	
3336314	SHG	Matrix Spike	Decachlorobiphenyl	2013/09/04		95	%	60 - 130
			Aroclor 1260	2013/09/04		82	%	60 - 130
			Total PCB	2013/09/04		82	%	60 - 130
		Spiked Blank	Decachlorobiphenyl	2013/09/04		86	%	60 - 130
			Aroclor 1260	2013/09/04		71	%	60 - 130
			Total PCB	2013/09/04		71	%	60 - 130
		Method Blank	Decachlorobiphenyl	2013/09/04		86	%	60 - 130
			Aroclor 1016	2013/09/04	ND, RDL=0.01	ug/L		
			Aroclor 1221	2013/09/04	ND, RDL=0.01	ug/L		
			Aroclor 1232	2013/09/04	ND, RDL=0.01	ug/L		
			Aroclor 1262	2013/09/04	ND, RDL=0.01	ug/L		
			Aroclor 1268	2013/09/04	ND, RDL=0.01	ug/L		
			Aroclor 1242	2013/09/04	ND, RDL=0.01	ug/L		
			Aroclor 1248	2013/09/04	ND, RDL=0.01	ug/L		
			Aroclor 1254	2013/09/04	ND, RDL=0.01	ug/L		
			Aroclor 1260	2013/09/04	ND, RDL=0.01	ug/L		
			Total PCB	2013/09/04	ND, RDL=0.01	ug/L		
		RPD	Aroclor 1016	2013/09/04	NC	%	40	
			Aroclor 1221	2013/09/04	NC	%	40	
			Aroclor 1232	2013/09/04	NC	%	40	
			Aroclor 1262	2013/09/04	NC	%	40	
			Aroclor 1268	2013/09/04	NC	%	40	
			Aroclor 1242	2013/09/04	NC	%	40	
			Aroclor 1248	2013/09/04	NC	%	40	
			Aroclor 1254	2013/09/04	NC	%	40	
			Aroclor 1260	2013/09/04	NC	%	40	
			Total PCB	2013/09/04	NC	%	40	
3339086	LCH	Matrix Spike	Mercury (Hg)	2013/09/06		97	%	80 - 120
		Spiked Blank	Mercury (Hg)	2013/09/06		111	%	80 - 120
		Method Blank	Mercury (Hg)	2013/09/06	ND, RDL=0.01	ug/L		
		RPD	Mercury (Hg)	2013/09/06	NC	%	20	

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

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

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

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

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

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

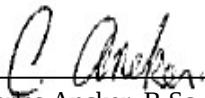
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.

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

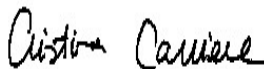
Validation Signature Page

Maxxam Job #: B3E4449

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



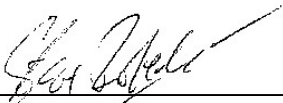
Charles Ancker, B.Sc., M.Sc., C.Chem, Senior Analyst



Cristina Carriere, Scientific Services



Paul Rubinato, Analyst, Maxxam Analytics



Steve Roberts, Lab Supervisor, Ottawa

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

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#9164 Biogenie Inc	Company Name:		Quotation #:	B32970	MAXXAM JOB #:	BOTTLE ORDER #:
Contact Name:	Brandon MacKay	Contact Name:	Brandon MacKay	P.O. #:			
Address:	1170, rue Levis Terrebonne QC J6W 5S6	Address:		Project #:	CD2655		
Phone:	(450)961-3535 Fax: (450)961-0220	Phone:		Project Name:			
Email:	bmackay@biogenie-env.com	Email:	bmackay@biogenie-env.com	Site #:			
				Sampled By:			

Regulation 153 (2011)		Other Regulations		SPECIAL INSTRUCTIONS		ANALYSIS REQUESTED (Please be specific):						TURNAROUND TIME (TAT) REQUIRED:		
☐ Table 1	☐ Res/Park	☐ Medium/Fine	☐ CCME	☐ Sanitary Sewer Bylaw	Regulated Drinking Water ? (Y/N) Metals Field Filtered ? (Y/N)	CCME Petroleum Hydrocarbons	ICPMS Metals & Mercury (Soil)	PCBs (Soil)	CCME Low Level Metals (Water)	CCME Petroleum Hydrocarbons (Water)	Mercury (low level)	PCB Low Level in Water	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS	
☐ Table 2	☐ Ind/Comm	☐ Coarse	☐ Reg. 558	☐ Storm Sewer Bylaw									Regular (Standard) TAT:	
☐ Table 3	☐ Agri/Other		☐ MISA	☐ Municipality									(will be applied if Rush TAT is not specified):	
☐ Table		☐ For RSC	☐ PWQO	☐ Other									Standard TAT = 5-7 Working days for most tests.	

Include Criteria on Certificate of Analysis (Y/N)? _____

Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	CCME Petroleum Hydrocarbons	ICPMS Metals & Mercury (Soil)	PCBs (Soil)	CCME Low Level Metals (Water)	CCME Petroleum Hydrocarbons (Water)	Mercury (low level)	PCB Low Level in Water	# of Bottles	Comments
1	2013-F3-MW-01-A	2013-08-24	10:00 am	Soil			✓	✓	✓					2	
2	2013-F3-MW-01-B	"	10:05 am	"			✓	✓	✓					"	
3	2013-F3-MW-02-A	"	10:20 am	"			✓	✓	✓					"	
4	2013-F3-MW-02-B	"	10:25 am	"			✓	✓	✓					"	
5	2013-F3-MW-03-A	"	10:40 am	"			✓	✓	✓					"	
6	2013-F3-MW-03-B	"	10:45 am	"			✓	✓	✓					"	
7	2013-F3-MW-04-A	"	11:20 am	"			✓	✓	✓					"	
8	2013-F3-MW-04-B	"	11:25 am	"			✓	✓	✓					"	
9	2013-F3-MW-03-A	"	10:40 am	"			✓	✓	✓					"	
10															

*RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)	Time:	# Jars Used and	Laboratory Use Only				
[Signature] / Brandon MacKay		13/08/25	10:18	[Signature] C. Bergeron		2013/08/28	18:30	Not Submitted	Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
										5/6/17	Present	✓	
											Intact	✓	

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

Maxxam Analytics International Corporation o/a Maxxam Analytics

REC'D IN OTTAWA

on ice packs

6/5/18

White: Maxxam Yellow: Client

INVOICE INFORMATION:		REPORT INFORMATION (If differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#9164 Biogenie Inc	Company Name:	Brandon MacKay	Quotation #:	B32970	MAXXAM JOB #:	BOTTLE ORDER #:
Contact Name:	Brandon MacKay	Contact Name:	Brandon MacKay	P.O. #:			
Address:	1170, rue Levis Terrebonne QC J6W 5S6	Address:		Project #:	CD2655	CHAIN OF CUSTODY #:	PROJECT MANAGER:
Phone:	(450)961-3535 Fax: (450)961-0220	Phone:		Project Name:			Parnian Baber
Email:	bmackay@biogenie-env.com	Email:	bmackay@biogenie-env.com	Site #:			
				Sampled By:			

Regulation 153 (2011)		Other Regulations		SPECIAL INSTRUCTIONS		ANALYSIS REQUESTED (Please be specific):										TURNAROUND TIME (TAT) REQUIRED:	
☐ Table 1	☐ Res/Park	☐ Medium/Fine	☐ CCME	☐ Sanitary Sewer Bylaw		Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	CCME Petroleum Hydrocarbons	ICP/MS Metals & Mercury (Soil)	PCBs (Soil)	CCME Low Level Metals (Water)	CCME Petroleum Hydrocarbons (Water)	Mercury (low level)	PCB Low Level in Water	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS		
☐ Table 2	☐ Ind/Comm	☐ Coarse	☐ Reg. 558	☐ Storm Sewer Bylaw											Regular (Standard) TAT:		
☐ Table 3	☐ Agri/Other		☐ MISA	Municipality _____											(will be applied if Rush TAT is not specified):		
☐ Table _____		☐ For RSC	☐ PWQO	Other _____											Standard TAT = 5-7 Working days for most tests.		
Include Criteria on Certificate of Analysis (Y/N)? _____						Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.										Job Specific Rush TAT (if applies to entire submission)	
Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form						Date Required: _____ Time Required: _____										Rush Confirmation Number: _____ (call lab for #)	

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	CCME Petroleum Hydrocarbons	ICP/MS Metals & Mercury (Soil)	PCBs (Soil)	CCME Low Level Metals (Water)	CCME Petroleum Hydrocarbons (Water)	Mercury (low level)	PCB Low Level in Water	# of Bottles	Comments
1	2013-F3-MW-01	13/08/25	21:22	Water	N	N								9	
2	2013-F3-MW-02	"	21:56	"	"	"								"	
3	2013-F3-MW-03	"	22:36	"	"	"								"	
4	2013-F3-MW-04	"	20:35	"	"	"								"	
5	2013-F3-M-04-D	"	"	"	"	"								"	
6															
7															
8															
9															
10															

28-Aug-13 18:30
Parnian Baber

B3E4449
KP2 OTT-002

REC'D IN OTTAWA

on ice packs

*RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)	Time:	# Jars Used and	Laboratory Use Only				
Brandon MacKay		13/08/25	23:54	C. Bergeron		2013/08/28	18:30	Not Submitted	Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
										5/6/17	Present	X	
											Intact	X	

*IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

Maxxam Analytics International Corporation o/a Maxxam Analytics

White: Maxxam Yellow: Client

6/5/18

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#9164 Biogenie Inc	Company Name:		Quotation #:	B32970	MAXXAM JOB #:	BOTTLE ORDER #:
Contact Name:	Brandon MacKay	Contact Name:	Brandon MacKay	P.O. #:			
Address:	1170, rue Levis Terrebonne QC J6W 5S6	Address:		Project #:	CD2655		
Phone:	(450)961-3535 Fax: (450)961-0220	Phone:		Project Name:			
Email:	bmackay@biogenie-env.com	Email:	bmackay@biogenie-env.com	Site #:			
				Sampled By:			

Regulation 153 (2011)		Other Regulations		SPECIAL INSTRUCTIONS		ANALYSIS REQUESTED (Please be specific):						TURNAROUND TIME (TAT) REQUIRED:		
☐ Table 1	☐ Res/Park	☐ Medium/Fine	☐ CCME	☐ Sanitary Sewer Bylaw	Regulated Drinking Water ? (Y/N) Metals Field Filtered ? (Y/N)	CCME Petroleum Hydrocarbons	ICPMS Metals & Mercury (Soil)	PCBs (Soil)	CCME Low Level Metals (Water)	CCME Petroleum Hydrocarbons (Water)	Mercury (low level)	PCB Low Level in Water	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS	
☐ Table 2	☐ Ind/Comm	☐ Coarse	☐ Reg. 558	☐ Storm Sewer Bylaw									Regular (Standard) TAT:	
☐ Table 3	☐ Agri/Other		☐ MISA	☐ Municipality									(will be applied if Rush TAT is not specified):	
☐ Table		☐ For RSC	☐ PWQO	☐ Other									Standard TAT = 5-7 Working days for most tests.	

Include Criteria on Certificate of Analysis (Y/N)? _____

Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	CCME Petroleum Hydrocarbons	ICPMS Metals & Mercury (Soil)	PCBs (Soil)	CCME Low Level Metals (Water)	CCME Petroleum Hydrocarbons (Water)	Mercury (low level)	PCB Low Level in Water	# of Bottles	Comments
1	2013-F3-MW-01-A	2013-08-24	10:00 am	Soil			✓	✓	✓					2	
2	2013-F3-MW-01-B	"	10:05 am	"			✓	✓	✓					"	
3	2013-F3-MW-02-A	"	10:20 am	"			✓	✓	✓					"	
4	2013-F3-MW-02-B	"	10:25 am	"			✓	✓	✓					"	
5	2013-F3-MW-03-A	"	10:40 am	"			✓	✓	✓					"	
6	2013-F3-MW-03-B	"	10:45 am	"			✓	✓	✓					"	
7	2013-F3-MW-04-A	"	11:20 am	"			✓	✓	✓					"	
8	2013-F3-MW-04-B	"	11:25 am	"			✓	✓	✓					"	
9	2013-F3-MW-03-A	"	10:40 am	"			✓	✓	✓					"	
10															

*RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)	Time:	# Jars Used and	Laboratory Use Only				
[Signature] / Brandon MacKay		13/08/25	10:18	[Signature] C. Bergeron		2013/08/28	18:30	Not Submitted	Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
										5/6/17	Present	✓	
											Intact	✓	

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

Maxxam Analytics International Corporation o/a Maxxam Analytics

REC'D IN OTTAWA

on ice packs

6/5/18

White: Maxxam Yellow: Client

Your Project #: MB3E4449

Attention: SUB CONTRACTOR

MAXXAM ANALYTICS
CAMPOBELLO
6740 CAMPOBELLO ROAD
MISSISSAUGA, ON
CANADA L5N 2L8

Report Date: 2013/09/06

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B377838

Received: 2013/08/30, 09:45

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Cadmium - low level CCME (Total)	5	2013/08/30	2013/09/05	AB SOP-00043	EPA 200.8
Elements by ICP - Total	5	2013/09/03	2013/09/05	AB SOP-00042	EPA 200.7
Elements by ICPMS - Total	5	2013/09/03	2013/09/05	AB SOP-00043	EPA 200.8

* Results relate only to the items tested.

Encryption Key

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

Carmen McKay, Project Manager Assistant
Email: CMcKay@maxxam.ca
Phone# (403) 291-3077

=====

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

Total cover pages: 1



Maxxam Job #: B377838
Report Date: 2013/09/06

MAXXAM ANALYTICS
Client Project #: MB3E4449

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		HJ2675	HJ2676	HJ2677	HJ2678	HJ2679		
Sampling Date		2013/08/25 21:22	2013/08/25 21:56	2013/08/25 22:36	2013/08/25 20:35	2013/08/25 20:35		
	UNITS	2013-F3-MW-01 (SV9324-03R)	2013-F3-MW-02 (SV9325-03R)	2013-F3-MW-03 (SV9326-03R)	2013-F3-MW-04 (SV9327-03R)	2013-F3-MW-04-D (SV9328-03R)	RDL	QC Batch
Low Level Elements								
Total Cadmium (Cd)	ug/L	2.8	0.33	1.2	1.8	1.7	0.0050	7132129

Maxxam Job #: B377838
Report Date: 2013/09/06

MAXXAM ANALYTICS
Client Project #: MB3E4449

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		HJ2675		HJ2676	HJ2677	HJ2678	HJ2679		
Sampling Date		2013/08/25 21:22		2013/08/25 21:56	2013/08/25 22:36	2013/08/25 20:35	2013/08/25 20:35		
	UNITS	2013-F3-MW-01 (SV9324-03R)	RDL	2013-F3-MW-02 (SV9325-03R)	2013-F3-MW-03 (SV9326-03R)	2013-F3-MW-04 (SV9327-03R)	2013-F3-MW-04-D (SV9328-03R)	RDL	QC Batch
Elements									
Total Aluminum (Al)	mg/L	66	0.0030	0.78	0.33	1.6	1.8	0.0030	7139023
Total Antimony (Sb)	mg/L	<0.00060	0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00060	7139023
Total Arsenic (As)	mg/L	0.13	0.00020	0.0022	0.0079	0.0022	0.0021	0.00020	7139023
Total Barium (Ba)	mg/L	0.64	0.010	0.046	0.030	0.050	0.050	0.010	7139034
Total Beryllium (Be)	mg/L	0.0046	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7139023
Total Boron (B)	mg/L	0.049	0.020	<0.020	<0.020	<0.020	<0.020	0.020	7139034
Total Calcium (Ca)	mg/L	100	0.30	36	120	61	61	0.30	7139034
Total Chromium (Cr)	mg/L	0.39	0.0010	0.028	0.020	0.054	0.041	0.0010	7139023
Total Cobalt (Co)	mg/L	0.13	0.00030	0.0035	0.020	0.079	0.078	0.00030	7139023
Total Copper (Cu)	mg/L	0.37	0.00020	0.015	0.037	0.016	0.015	0.00020	7139023
Total Iron (Fe)	mg/L	150	0.060	0.66	9.8	2.9	3.1	0.060	7139034
Total Lead (Pb)	mg/L	0.054	0.00020	0.00086	0.00044	0.0018	0.0019	0.00020	7139023
Total Lithium (Li)	mg/L	0.22	0.020	<0.020	<0.020	<0.020	<0.020	0.020	7139034
Total Magnesium (Mg)	mg/L	68	0.20	7.1	48	19	19	0.20	7139034
Total Manganese (Mn)	mg/L	2.8	0.0040	0.47	1.6	1.3	1.3	0.0040	7139034
Total Molybdenum (Mo)	mg/L	0.027	0.00020	0.0070	0.0029	0.0035	0.0030	0.00020	7139023
Total Nickel (Ni)	mg/L	0.72	0.00050	0.043	0.11	0.24	0.23	0.00050	7139023
Total Phosphorus (P)	mg/L	1.7	0.10	0.14	0.19	<0.10	<0.10	0.10	7139034
Total Potassium (K)	mg/L	47	0.30	6.2	12	6.8	6.9	0.30	7139034
Total Selenium (Se)	mg/L	0.0032	0.00020	0.00065	0.0017	0.00050	0.00045	0.00020	7139023
Total Silicon (Si)	mg/L	97	0.10	6.3	6.4	6.7	6.9	0.10	7139034
Total Silver (Ag)	mg/L	0.0085	0.00010	0.00019	0.00017	0.00080	0.00043	0.00010	7139023
Total Sodium (Na)	mg/L	27	0.50	25	20	15	15	0.50	7139034
Total Strontium (Sr)	mg/L	0.22	0.020	0.10	0.20	0.096	0.095	0.020	7139034
Total Sulphur (S)	mg/L	100	0.20	26	130	66	66	0.20	7139034
Total Thallium (Tl)	mg/L	0.00085	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	7139023
Total Tin (Sn)	mg/L	0.0069	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7139023
Total Titanium (Ti)	mg/L	6.2(1)	0.0050	0.032	0.011	0.14	0.14	0.0010	7139023
Total Uranium (U)	mg/L	0.027	0.00010	0.0017	0.00091	0.0010	0.00096	0.00010	7139023
Total Vanadium (V)	mg/L	0.22	0.0010	0.0013	0.0023	0.0048	0.0047	0.0010	7139023
Total Zinc (Zn)	mg/L	0.56	0.0030	0.017	0.37	0.097	0.094	0.0030	7139023

RDL = Reportable Detection Limit

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

Maxxam Job #: B377838
Report Date: 2013/09/06

MAXXAM ANALYTICS
Client Project #: MB3E4449

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7139023	Total Aluminum (Al)	2013/09/05	92	80 - 120	105	80 - 120	0.0043, RDL=0.0030	mg/L	NC	20
7139023	Total Antimony (Sb)	2013/09/05	106	80 - 120	107	80 - 120	<0.00060	mg/L	NC	20
7139023	Total Arsenic (As)	2013/09/05	104	80 - 120	102	80 - 120	<0.00020	mg/L	NC	20
7139023	Total Beryllium (Be)	2013/09/05	105	80 - 120	102	80 - 120	<0.0010	mg/L	NC	20
7139023	Total Chromium (Cr)	2013/09/05	104	80 - 120	102	80 - 120	<0.0010	mg/L	NC	20
7139023	Total Cobalt (Co)	2013/09/05	104	80 - 120	104	80 - 120	<0.00030	mg/L	NC	20
7139023	Total Copper (Cu)	2013/09/05	104	80 - 120	105	80 - 120	<0.00020	mg/L	NC	20
7139023	Total Lead (Pb)	2013/09/05	104	80 - 120	103	80 - 120	<0.00020	mg/L	NC	20
7139023	Total Molybdenum (Mo)	2013/09/05	111	80 - 120	104	80 - 120	<0.00020	mg/L	NC	20
7139023	Total Nickel (Ni)	2013/09/05	104	80 - 120	102	80 - 120	<0.00050	mg/L	NC	20
7139023	Total Selenium (Se)	2013/09/05	107	80 - 120	105	80 - 120	<0.00020	mg/L	NC	20
7139023	Total Silver (Ag)	2013/09/05	105	80 - 120	102	80 - 120	<0.00010	mg/L	NC	20
7139023	Total Thallium (Tl)	2013/09/05	97	80 - 120	95	80 - 120	<0.00020	mg/L	NC	20
7139023	Total Tin (Sn)	2013/09/05	105	80 - 120	103	80 - 120	<0.0010	mg/L	NC	20
7139023	Total Titanium (Ti)	2013/09/05	102	80 - 120	102	80 - 120	<0.0010	mg/L	NC	20
7139023	Total Uranium (U)	2013/09/05	99	80 - 120	96	80 - 120	<0.00010	mg/L	NC	20
7139023	Total Vanadium (V)	2013/09/05	111	80 - 120	107	80 - 120	<0.0010	mg/L	NC	20
7139023	Total Zinc (Zn)	2013/09/05	103	80 - 120	102	80 - 120	<0.0030	mg/L	NC	20
7139034	Total Barium (Ba)	2013/09/05	97	80 - 120	99	80 - 120	<0.010	mg/L	NC	20
7139034	Total Boron (B)	2013/09/05	116	80 - 120	117	80 - 120	<0.020	mg/L	NC	20
7139034	Total Calcium (Ca)	2013/09/05	101	80 - 120	102	80 - 120	<0.30	mg/L	2.1	20
7139034	Total Iron (Fe)	2013/09/05	99	80 - 120	99	80 - 120	<0.060	mg/L	NC	20
7139034	Total Lithium (Li)	2013/09/05	99	80 - 120	100	80 - 120	<0.020	mg/L	NC	20
7139034	Total Magnesium (Mg)	2013/09/05	101	80 - 120	103	80 - 120	<0.20	mg/L	2.2	20
7139034	Total Manganese (Mn)	2013/09/05	99	80 - 120	100	80 - 120	<0.0040	mg/L	0.8	20
7139034	Total Phosphorus (P)	2013/09/05	99	80 - 120	101	80 - 120	<0.10	mg/L	NC	20
7139034	Total Potassium (K)	2013/09/05	103	80 - 120	105	80 - 120	<0.30	mg/L	NC	20
7139034	Total Silicon (Si)	2013/09/05	120	80 - 120	117	80 - 120	<0.10	mg/L	NC	20
7139034	Total Sodium (Na)	2013/09/05	101	80 - 120	102	80 - 120	<0.50	mg/L	NC	20
7139034	Total Strontium (Sr)	2013/09/05	98	80 - 120	100	80 - 120	<0.020	mg/L	NC	20
7139034	Total Sulphur (S)	2013/09/05					<0.20	mg/L	NC	20

N/A = Not Applicable

RDL = Reportable Detection Limit

RPD = Relative Percent Difference

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

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

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

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



Maxxam Job #: B377838
Report Date: 2013/09/06

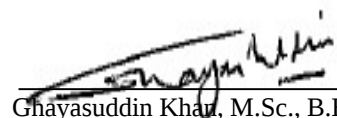
MAXXAM ANALYTICS
Client Project #: MB3E4449

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

Validation Signature Page

Maxxam Job #: B377838

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



Ghayasuddin Khan, M.Sc., B.Ed., P.Chem, Scientific Specialist

=====

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

MAXXAM ANALYTICS
32 Colonnade Unit 1000
Nepean, Ontario, K2E 7J6
Phone: (613) 274-0573
Fax: (613) 274-0574



Page #: 1

Biogenie Inc - Quebec
Maxxam PM Parnian Baber

To: Campo to Calgary Subcontract

Job# B3E4449

☐ Yes ☐ No International Sample/BioHazard (if yes, add copy of Movement Cert., heat treat is required prior to disposal)
☐ Yes ☐ No Special Protocol (if yes, Protocol _____)

Sample ID	Matrix	Test(s) Required	Container	Date Sampled	Date Required
SV9324-03R \ 2013-F3-MW-01	W	CCME Metals (low Level), total	1(G250)	2013/08/25 21:22	2013/09/06
SV9325-03R \ 2013-F3-MW-02	W	CCME Metals (low Level), total	1(G250)	2013/08/25 21:56	2013/09/06
SV9326-03R \ 2013-F3-MW-03	W	CCME Metals (low Level), total	1(G250)	2013/08/25 22:36	2013/09/06
SV9327-03R \ 2013-F3-MW-04	W	CCME Metals (low Level), total	1(G250)	2013/08/25 20:35	2013/09/06
SV9328-03R \ 2013-F3-MW-04-D	W	CCME Metals (low Level), total	1(G250)	2013/08/25 20:35	2013/09/06

	Temp. 1	Temp. 2	Temp. 3		
Cooler #1	10	10	10	Custody Seal Present	YES
				Custody Seal Intact	YES
				Ice Present Upon Receipt	YES
Cooler #2				Custody Seal Present	YES
				Custody Seal Intact	YES
				Ice Present Upon Receipt	YES
Cooler #3				Custody Seal Present	YES
				Custody Seal Intact	YES
				Ice Present Upon Receipt	YES

Receiving Maxxam Location: Campo to Calgary Subcontract

JOB # _____

Relinquished by (Sign) _____

(Print) _____

Date and Time 2013/08/29 17:15

Received by (Sign) _____

(Print) _____

Date and Time 2013/09/30

NOTES:

- 1) Please call us if due date cannot be met. Please reference Sample ID on your report.
- 2) Include copy of this completed form, Client COC & signed final report to scontractor@maxxamanalytics.com

Reporting Requirements:

National:

Regional:

30-Aug-13 09:45
Carmen McKay
B377838
CJ4 INS-0046

Re-run Results

Your Project #: CD2655

Attention: Brandon MacKay

Biogenie Inc
Quebec
1170, rue Levis
Terrebonne, QC
CANADA J6W 5S6

Your C.O.C. #: 41622701, 416227-01-01, 416227-09-01

Report Date: 2013/09/30

This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS
MAXXAM JOB #: B3E4449
Received: 2013/08/28, 18:30

Sample Matrix: Soil

Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Petroleum Hydro. CCME F1 & BTEX in Soil	9	2013/08/30	2013/09/05	OTT SOP-00002	CCME CWS
Petroleum Hydrocarbons F2-F4 in Soil	9	2013/08/30	2013/08/30	OTT SOP-00001	CCME CWS
Acid Extr. Metals (aqua regia) by ICPMS	9	2013/08/30	2013/09/03	OTT SOP-00003	EPA 6020
MOISTURE	9	N/A	2013/09/03	CAM SOP-00445	McKeague 2nd ed 1978
Polychlorinated Biphenyl in Soil (1)	6	2013/09/03	2013/09/03	CAM SOP-00309	SW846 8082
Polychlorinated Biphenyl in Soil (1)	1	2013/09/03	2013/09/04	CAM SOP-00309	SW846 8082
Polychlorinated Biphenyl in Soil (1)	4	2013/09/27	2013/09/27	CAM SOP-00309	SW846 8082

Sample Matrix: Water

Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Petroleum Hydro. CCME F1 & BTEX in Water	4	N/A	2013/08/30	OTT SOP-00002	CCME CWS
Petroleum Hydro. CCME F1 & BTEX in Water	1	N/A	2013/09/04	OTT SOP-00002	CCME CWS
Petroleum Hydrocarbons F2-F4 in Water	5	2013/09/03	2013/09/03	OTT SOP-00001	CCME Hydrocarbons
Mercury (low level) (1)	5	2013/09/05	2013/09/06	CAM SOP-00453	EPA 7470
Polychlorinated Biphenyl (PCB) (1)	5	2013/09/03	2013/09/04	CAM SOP-00309	SW846 8082

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

(1) This test was performed by Maxxam Analytics Mississauga

Your Project #: CD2655

Attention: Brandon MacKay

Biogenie Inc
Quebec
1170, rue Levis
Terrebonne, QC
CANADA J6W 5S6

Your C.O.C. #: 41622701, 416227-01-01, 416227-09-01

Report Date: 2013/09/30

This report supersedes all previous reports with the same Maxxam job number

CERTIFICATE OF ANALYSIS

-2-

Encryption Key

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

Parnian Baber, Project Manager
Email: pbaber@maxxam.ca
Phone# (613) 274-0573

=====

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

Total cover pages: 2

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Maxxam Job #: B3E4449
Report Date: 2013/09/30

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

RESULTS OF ANALYSES OF SOIL

Maxxam ID		SV9291	SV9292	SV9293	SV9294	SV9295		
Sampling Date		2013/08/24 10:00	2013/08/24 10:05	2013/08/24 10:20	2013/08/24 10:25	2013/08/24 10:40		
COC Number		416227-01-01	416227-01-01	416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-01-A	2013-F3-MW-01-B	2013-F3-MW-02-A	2013-F3-MW-02-B	2013-F3-MW-03-A	RDL	QC Batch

Inorganics								
Moisture	%	19	12	19	15	15	0.2	3333656

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		SV9296	SV9297	SV9298	SV9299		
Sampling Date		2013/08/24 10:45	2013/08/24 11:20	2013/08/24 11:25	2013/08/24 10:40		
COC Number		416227-01-01	416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-03-B	2013-F3-MW-04-A	2013-F3-MW-04-B	2013-F3-MW-03-A-D	RDL	QC Batch

Inorganics							
Moisture	%	13	18	12	16	0.2	3333656

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/30

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		SV9291	SV9292	SV9293	SV9294		
Sampling Date		2013/08/24 10:00	2013/08/24 10:05	2013/08/24 10:20	2013/08/24 10:25		
COC Number		416227-01-01	416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-01-A	2013-F3-MW-01-B	2013-F3-MW-02-A	2013-F3-MW-02-B	RDL	QC Batch

Metals							
Acid Extractable Arsenic (As)	ug/g	18	16	14	11	1	3333952
Acid Extractable Cadmium (Cd)	ug/g	ND	ND	ND	ND	0.1	3333952
Acid Extractable Chromium (Cr)	ug/g	79	73	69	71	1	3333952
Acid Extractable Cobalt (Co)	ug/g	9.3	8.7	9.3	8.9	0.1	3333952
Acid Extractable Copper (Cu)	ug/g	48	33	31	30	0.5	3333952
Acid Extractable Lead (Pb)	ug/g	7	6	8	8	1	3333952
Acid Extractable Mercury (Hg)	ug/g	ND	ND	ND	ND	0.05	3333952
Acid Extractable Nickel (Ni)	ug/g	39	32	29	29	0.5	3333952
Acid Extractable Zinc (Zn)	ug/g	71	61	60	63	5	3333952

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		SV9295	SV9296	SV9297	SV9298		
Sampling Date		2013/08/24 10:40	2013/08/24 10:45	2013/08/24 11:20	2013/08/24 11:25		
COC Number		416227-01-01	416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-03-A	2013-F3-MW-03-B	2013-F3-MW-04-A	2013-F3-MW-04-B	RDL	QC Batch

Metals							
Acid Extractable Arsenic (As)	ug/g	14	12	19	21	1	3333952
Acid Extractable Cadmium (Cd)	ug/g	ND	ND	ND	ND	0.1	3333952
Acid Extractable Chromium (Cr)	ug/g	76	74	85	88	1	3333952
Acid Extractable Cobalt (Co)	ug/g	11	11	11	11	0.1	3333952
Acid Extractable Copper (Cu)	ug/g	34	30	35	39	0.5	3333952
Acid Extractable Lead (Pb)	ug/g	7	6	7	8	1	3333952
Acid Extractable Mercury (Hg)	ug/g	ND	ND	ND	ND	0.05	3333952
Acid Extractable Nickel (Ni)	ug/g	34	33	38	38	0.5	3333952
Acid Extractable Zinc (Zn)	ug/g	66	61	63	70	5	3333952

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/30

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		SV9299		
Sampling Date		2013/08/24 10:40		
COC Number		416227-01-01		
	Units	2013-F3-MW-03-A-D	RDL	QC Batch

Metals				
Acid Extractable Arsenic (As)	ug/g	14	1	3333952
Acid Extractable Cadmium (Cd)	ug/g	ND	0.1	3333952
Acid Extractable Chromium (Cr)	ug/g	75	1	3333952
Acid Extractable Cobalt (Co)	ug/g	10	0.1	3333952
Acid Extractable Copper (Cu)	ug/g	34	0.5	3333952
Acid Extractable Lead (Pb)	ug/g	7	1	3333952
Acid Extractable Mercury (Hg)	ug/g	ND	0.05	3333952
Acid Extractable Nickel (Ni)	ug/g	34	0.5	3333952
Acid Extractable Zinc (Zn)	ug/g	67	5	3333952

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/30

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		SV9291	SV9292	SV9293	SV9294		
Sampling Date		2013/08/24 10:00	2013/08/24 10:05	2013/08/24 10:20	2013/08/24 10:25		
COC Number		416227-01-01	416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-01-A	2013-F3-MW-01-B	2013-F3-MW-02-A	2013-F3-MW-02-B	RDL	QC Batch

BTEX & F1 Hydrocarbons							
Benzene	ug/g	ND	ND	ND	ND	0.005	3333650
Toluene	ug/g	ND	ND	ND	ND	0.02	3333650
Ethylbenzene	ug/g	ND	ND	ND	ND	0.01	3333650
o-Xylene	ug/g	ND	ND	ND	ND	0.02	3333650
p+m-Xylene	ug/g	ND	ND	ND	ND	0.04	3333650
Total Xylenes	ug/g	ND	ND	ND	ND	0.04	3333650
F1 (C6-C10)	ug/g	ND	ND	ND	ND	10	3333650
F1 (C6-C10) - BTEX	ug/g	ND	ND	ND	ND	10	3333650
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/g	ND	ND	ND	ND	10	3333470
F3 (C16-C34 Hydrocarbons)	ug/g	ND	ND	22	ND	10	3333470
F4 (C34-C50 Hydrocarbons)	ug/g	ND	ND	19	ND	10	3333470
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes		3333470
Surrogate Recovery (%)							
1,4-Difluorobenzene	%	93	94	90	92		3333650
4-Bromofluorobenzene	%	101	110	109	109		3333650
D10-Ethylbenzene	%	85	102	93	100		3333650
D4-1,2-Dichloroethane	%	110	110	116	113		3333650
o-Terphenyl	%	83	81	84	83		3333470

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/30

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		SV9295	SV9296	SV9297	SV9298		
Sampling Date		2013/08/24 10:40	2013/08/24 10:45	2013/08/24 11:20	2013/08/24 11:25		
COC Number		416227-01-01	416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-03-A	2013-F3-MW-03-B	2013-F3-MW-04-A	2013-F3-MW-04-B	RDL	QC Batch

BTEX & F1 Hydrocarbons							
Benzene	ug/g	ND	ND	ND	ND	0.005	3333650
Toluene	ug/g	ND	ND	ND	ND	0.02	3333650
Ethylbenzene	ug/g	ND	ND	ND	ND	0.01	3333650
o-Xylene	ug/g	ND	ND	ND	ND	0.02	3333650
p+m-Xylene	ug/g	ND	ND	ND	ND	0.04	3333650
Total Xylenes	ug/g	ND	ND	ND	ND	0.04	3333650
F1 (C6-C10)	ug/g	ND	ND	ND	ND	10	3333650
F1 (C6-C10) - BTEX	ug/g	ND	ND	ND	ND	10	3333650
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/g	ND	ND	ND	ND	10	3333470
F3 (C16-C34 Hydrocarbons)	ug/g	15	ND	11	ND	10	3333470
F4 (C34-C50 Hydrocarbons)	ug/g	ND	ND	ND	ND	10	3333470
Reached Baseline at C50	ug/g	Yes	Yes	Yes	Yes		3333470
Surrogate Recovery (%)							
1,4-Difluorobenzene	%	97	95	96	97		3333650
4-Bromofluorobenzene	%	106	104	103	107		3333650
D10-Ethylbenzene	%	102	108	104	100		3333650
D4-1,2-Dichloroethane	%	108	108	108	108		3333650
o-Terphenyl	%	82	84	88	83		3333470

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/30

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		SV9299		
Sampling Date		2013/08/24 10:40		
COC Number		416227-01-01		
	Units	2013-F3-MW-03-A-D	RDL	QC Batch

BTEX & F1 Hydrocarbons				
Benzene	ug/g	ND	0.005	3333650
Toluene	ug/g	ND	0.02	3333650
Ethylbenzene	ug/g	ND	0.01	3333650
o-Xylene	ug/g	ND	0.02	3333650
p+m-Xylene	ug/g	ND	0.04	3333650
Total Xylenes	ug/g	ND	0.04	3333650
F1 (C6-C10)	ug/g	ND	10	3333650
F1 (C6-C10) - BTEX	ug/g	ND	10	3333650
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/g	ND	10	3333470
F3 (C16-C34 Hydrocarbons)	ug/g	ND	10	3333470
F4 (C34-C50 Hydrocarbons)	ug/g	ND	10	3333470
Reached Baseline at C50	ug/g	Yes		3333470
Surrogate Recovery (%)				
1,4-Difluorobenzene	%	97		3333650
4-Bromofluorobenzene	%	107		3333650
D10-Ethylbenzene	%	104		3333650
D4-1,2-Dichloroethane	%	120		3333650
o-Terphenyl	%	86		3333470

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/30

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		SV9291	SV9292	SV9293	SV9294		
Sampling Date		2013/08/24 10:00	2013/08/24 10:05	2013/08/24 10:20	2013/08/24 10:25		
COC Number		416227-01-01	416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-01-A	2013-F3-MW-01-B	2013-F3-MW-02-A	2013-F3-MW-02-B	RDL	QC Batch

PCBs							
Aroclor 1242	ug/g	ND	ND	ND	ND	0.010	3335545
Aroclor 1248	ug/g	ND	ND	ND	ND	0.010	3335545
Aroclor 1254	ug/g	ND	ND	ND	ND	0.010	3335545
Aroclor 1260	ug/g	ND	ND	ND	ND	0.010	3335545
Total PCB	ug/g	ND	ND	ND	ND	0.010	3335545
Surrogate Recovery (%)							
Decachlorobiphenyl	%	99	94	96	98		3335545

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam ID		SV9295		SV9296	SV9297	SV9298		
Sampling Date		2013/08/24 10:40		2013/08/24 10:45	2013/08/24 11:20	2013/08/24 11:25		
COC Number		416227-01-01		416227-01-01	416227-01-01	416227-01-01		
	Units	2013-F3-MW-03-A	QC Batch	2013-F3-MW-03-B	2013-F3-MW-04-A	2013-F3-MW-04-B	RDL	QC Batch

PCBs								
Aroclor 1242	ug/g	ND	3365522	ND	ND	ND	0.010	3335545
Aroclor 1248	ug/g	ND	3365522	ND	ND	ND	0.010	3335545
Aroclor 1254	ug/g	ND	3365522	ND	ND	ND	0.010	3335545
Aroclor 1260	ug/g	ND	3365522	ND	ND	ND	0.010	3335545
Total PCB	ug/g	ND	3365522	ND	ND	ND	0.010	3335545
Surrogate Recovery (%)								
Decachlorobiphenyl	%	88	3365522	97	96	98		3335545

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/30

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		SV9299		
Sampling Date		2013/08/24 10:40		
COC Number		416227-01-01		
	Units	2013-F3-MW-03-A-D	RDL	QC Batch

PCBs				
Aroclor 1242	ug/g	ND	0.010	3365522
Aroclor 1248	ug/g	ND	0.010	3365522
Aroclor 1254	ug/g	ND	0.010	3365522
Aroclor 1260	ug/g	ND	0.010	3365522
Total PCB	ug/g	ND	0.010	3365522
Surrogate Recovery (%)				
Decachlorobiphenyl	%	92		3365522

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/30

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		SV9324	SV9325	SV9326	SV9327	SV9328		
Sampling Date		2013/08/25 21:22	2013/08/25 21:56	2013/08/25 22:36	2013/08/25 20:35	2013/08/25 20:35		
COC Number		416227-09-01	416227-09-01	416227-09-01	416227-09-01	416227-09-01		
	Units	2013-F3-MW-01	2013-F3-MW-02	2013-F3-MW-03	2013-F3-MW-04	2013-F3-MW-04-D	RDL	QC Batch

Metals								
Mercury (Hg)	ug/L	0.04	ND	0.02	ND	ND	0.01	3339086

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/30

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		SV9324	SV9325	SV9326	SV9327		
Sampling Date		2013/08/25 21:22	2013/08/25 21:56	2013/08/25 22:36	2013/08/25 20:35		
COC Number		416227-09-01	416227-09-01	416227-09-01	416227-09-01		
	Units	2013-F3-MW-01	2013-F3-MW-02	2013-F3-MW-03	2013-F3-MW-04	RDL	QC Batch

BTEX & F1 Hydrocarbons							
Benzene	ug/L	ND	ND	ND	ND	0.20	3333743
Toluene	ug/L	ND	ND	ND	ND	0.20	3333743
Ethylbenzene	ug/L	ND	ND	ND	ND	0.20	3333743
o-Xylene	ug/L	ND	ND	ND	ND	0.20	3333743
p+m-Xylene	ug/L	ND	ND	ND	ND	0.40	3333743
Total Xylenes	ug/L	ND	ND	ND	ND	0.40	3333743
F1 (C6-C10)	ug/L	ND	ND	ND	ND	25	3333743
F1 (C6-C10) - BTEX	ug/L	ND	ND	ND	ND	25	3333743
F2-F4 Hydrocarbons							
F2 (C10-C16 Hydrocarbons)	ug/L	ND	ND	ND	ND	100	3335444
F3 (C16-C34 Hydrocarbons)	ug/L	ND	ND	ND	ND	100	3335444
F4 (C34-C50 Hydrocarbons)	ug/L	ND	ND	ND	ND	100	3335444
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes		3335444
Surrogate Recovery (%)							
1,4-Difluorobenzene	%	96	98	100	95		3333743
4-Bromofluorobenzene	%	106	106	98	100		3333743
D10-Ethylbenzene	%	102	115	127	110		3333743
D4-1,2-Dichloroethane	%	110	110	111	109		3333743
o-Terphenyl	%	74	73	75	74		3335444

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/30

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

PETROLEUM HYDROCARBONS (CCME)

Maxxam ID		SV9328		
Sampling Date		2013/08/25 20:35		
COC Number		416227-09-01		
	Units	2013-F3-MW-04-D	RDL	QC Batch

BTEX & F1 Hydrocarbons				
Benzene	ug/L	ND	0.20	3333743
Toluene	ug/L	ND	0.20	3333743
Ethylbenzene	ug/L	ND	0.20	3333743
o-Xylene	ug/L	ND	0.20	3333743
p+m-Xylene	ug/L	ND	0.40	3333743
Total Xylenes	ug/L	ND	0.40	3333743
F1 (C6-C10)	ug/L	ND	25	3333743
F1 (C6-C10) - BTEX	ug/L	ND	25	3333743
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/L	ND	100	3335444
F3 (C16-C34 Hydrocarbons)	ug/L	ND	100	3335444
F4 (C34-C50 Hydrocarbons)	ug/L	ND	100	3335444
Reached Baseline at C50	ug/L	Yes		3335444
Surrogate Recovery (%)				
1,4-Difluorobenzene	%	91		3333743
4-Bromofluorobenzene	%	86		3333743
D10-Ethylbenzene	%	126		3333743
D4-1,2-Dichloroethane	%	105		3333743
o-Terphenyl	%	74		3335444

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/30

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		SV9324		SV9325	SV9326	SV9327		
Sampling Date		2013/08/25 21:22		2013/08/25 21:56	2013/08/25 22:36	2013/08/25 20:35		
COC Number		416227-09-01		416227-09-01	416227-09-01	416227-09-01		
	Units	2013-F3-MW-01	RDL	2013-F3-MW-02	2013-F3-MW-03	2013-F3-MW-04	RDL	QC Batch

PCBs								
Aroclor 1016	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1221	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1232	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1262	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1268	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1242	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1248	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1254	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Aroclor 1260	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Total PCB	ug/L	ND	0.02	ND	ND	ND	0.01	3336314
Surrogate Recovery (%)								
Decachlorobiphenyl	%	91		77	78	78		3336314

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/30

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		SV9328		
Sampling Date		2013/08/25 20:35		
COC Number		416227-09-01		
	Units	2013-F3-MW-04-D	RDL	QC Batch

PCBs				
Aroclor 1016	ug/L	ND	0.01	3336314
Aroclor 1221	ug/L	ND	0.01	3336314
Aroclor 1232	ug/L	ND	0.01	3336314
Aroclor 1262	ug/L	ND	0.01	3336314
Aroclor 1268	ug/L	ND	0.01	3336314
Aroclor 1242	ug/L	ND	0.01	3336314
Aroclor 1248	ug/L	ND	0.01	3336314
Aroclor 1254	ug/L	ND	0.01	3336314
Aroclor 1260	ug/L	ND	0.01	3336314
Total PCB	ug/L	ND	0.01	3336314
Surrogate Recovery (%)				
Decachlorobiphenyl	%	77		3336314

ND = Not detected
RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Job #: B3E4449
Report Date: 2013/09/30

Biogenie Inc
Client Project #: CD2655

Sampler Initials: B.M

GENERAL COMMENTS

Sample SV9324-01: PCB Analysis: Detection Limit was raised due to matrix interferences.

Results relate only to the items tested.

Biogenie Inc
Attention: Brandon MacKay
Client Project #: CD2655
P.O. #:
Site Location:

Quality Assurance Report

Maxxam Job Number: TB3E4449

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3333470 HES	Matrix Spike [SV9291-03]	o-Terphenyl	2013/08/30		74	%	30 - 130
		F2 (C10-C16 Hydrocarbons)	2013/08/30		89	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2013/08/30		89	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2013/08/30		89	%	50 - 130
	Spiked Blank	o-Terphenyl	2013/08/30		77	%	30 - 130
		F2 (C10-C16 Hydrocarbons)	2013/08/30		81	%	80 - 120
		F3 (C16-C34 Hydrocarbons)	2013/08/30		81	%	80 - 120
		F4 (C34-C50 Hydrocarbons)	2013/08/30		81	%	80 - 120
	Method Blank	o-Terphenyl	2013/08/30		82	%	30 - 130
		F2 (C10-C16 Hydrocarbons)	2013/08/30	ND, RDL=10		ug/g	
		F3 (C16-C34 Hydrocarbons)	2013/08/30	ND, RDL=10		ug/g	
		F4 (C34-C50 Hydrocarbons)	2013/08/30	ND, RDL=10		ug/g	
	RPD [SV9292-03]	F2 (C10-C16 Hydrocarbons)	2013/08/30	NC		%	50
		F3 (C16-C34 Hydrocarbons)	2013/08/30	NC		%	50
		F4 (C34-C50 Hydrocarbons)	2013/08/30	NC		%	50
3333650 STE	Matrix Spike [SV9292-02]	1,4-Difluorobenzene	2013/09/05		95	%	60 - 140
		4-Bromofluorobenzene	2013/09/05		102	%	60 - 140
		D10-Ethylbenzene	2013/09/05		124	%	30 - 130
		D4-1,2-Dichloroethane	2013/09/05		114	%	60 - 140
		Benzene	2013/09/05		86	%	60 - 140
		Toluene	2013/09/05		90	%	60 - 140
		Ethylbenzene	2013/09/05		98	%	60 - 140
		o-Xylene	2013/09/05		110	%	60 - 140
		p+m-Xylene	2013/09/05		96	%	60 - 140
		F1 (C6-C10)	2013/09/05		93	%	60 - 140
	Spiked Blank	1,4-Difluorobenzene	2013/09/05		97	%	60 - 140
		4-Bromofluorobenzene	2013/09/05		108	%	60 - 140
		D10-Ethylbenzene	2013/09/05		113	%	30 - 130
		D4-1,2-Dichloroethane	2013/09/05		110	%	60 - 140
		Benzene	2013/09/05		87	%	60 - 130
		Toluene	2013/09/05		95	%	60 - 130
		Ethylbenzene	2013/09/05		103	%	60 - 130
		o-Xylene	2013/09/05		116	%	60 - 130
		p+m-Xylene	2013/09/05		102	%	60 - 130
		F1 (C6-C10)	2013/09/05		96	%	80 - 120
	Method Blank	1,4-Difluorobenzene	2013/09/05		97	%	60 - 140
		4-Bromofluorobenzene	2013/09/05		105	%	60 - 140
		D10-Ethylbenzene	2013/09/05		100	%	30 - 130
		D4-1,2-Dichloroethane	2013/09/05		111	%	60 - 140
		Benzene	2013/09/05	ND, RDL=0.005		ug/g	
		Toluene	2013/09/05	ND, RDL=0.02		ug/g	
		Ethylbenzene	2013/09/05	ND, RDL=0.01		ug/g	
		o-Xylene	2013/09/05	ND, RDL=0.02		ug/g	
		p+m-Xylene	2013/09/05	ND, RDL=0.04		ug/g	
		Total Xylenes	2013/09/05	ND, RDL=0.04		ug/g	
		F1 (C6-C10)	2013/09/05	ND, RDL=10		ug/g	
		F1 (C6-C10) - BTEX	2013/09/05	ND, RDL=10		ug/g	
	RPD [SV9291-02]	Benzene	2013/09/05	NC		%	50
		Toluene	2013/09/05	NC		%	50
		Ethylbenzene	2013/09/05	NC		%	50
		o-Xylene	2013/09/05	NC		%	50
		p+m-Xylene	2013/09/05	NC		%	50
		Total Xylenes	2013/09/05	NC		%	50

Biogenie Inc
Attention: Brandon MacKay
Client Project #: CD2655
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: TB3E4449

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3333650 STE	RPD [SV9291-02]	F1 (C6-C10)	2013/09/05	NC		%	50
		F1 (C6-C10) - BTEX	2013/09/05	NC		%	50
3333656 HES	RPD [SV9292-03]	Moisture	2013/09/03	8.5		%	50
3333743 STE	Matrix Spike	1,4-Difluorobenzene	2013/08/30		96	%	70 - 130
		4-Bromofluorobenzene	2013/08/30		102	%	70 - 130
		D10-Ethylbenzene	2013/08/30		87	%	70 - 130
		D4-1,2-Dichloroethane	2013/08/30		107	%	70 - 130
		Benzene	2013/08/30		83	%	70 - 130
		Toluene	2013/08/30		95	%	70 - 130
		Ethylbenzene	2013/08/30		101	%	70 - 130
		o-Xylene	2013/08/30		109	%	70 - 130
		p+m-Xylene	2013/08/30		102	%	70 - 130
		F1 (C6-C10)	2013/08/30		87	%	70 - 130
	Spiked Blank	1,4-Difluorobenzene	2013/08/30		97	%	70 - 130
		4-Bromofluorobenzene	2013/08/30		103	%	70 - 130
		D10-Ethylbenzene	2013/08/30		92	%	70 - 130
		D4-1,2-Dichloroethane	2013/08/30		105	%	70 - 130
		Benzene	2013/08/30		82	%	60 - 130
		Toluene	2013/08/30		92	%	60 - 130
		Ethylbenzene	2013/08/30		101	%	60 - 130
		o-Xylene	2013/08/30		108	%	60 - 130
		p+m-Xylene	2013/08/30		99	%	60 - 130
		F1 (C6-C10)	2013/08/30		107	%	60 - 140
	Method Blank	1,4-Difluorobenzene	2013/08/30		101	%	70 - 130
		4-Bromofluorobenzene	2013/08/30		100	%	70 - 130
		D10-Ethylbenzene	2013/08/30		97	%	70 - 130
		D4-1,2-Dichloroethane	2013/08/30		104	%	70 - 130
		Benzene	2013/08/30	ND, RDL=0.20		ug/L	
		Toluene	2013/08/30	ND, RDL=0.20		ug/L	
		Ethylbenzene	2013/08/30	ND, RDL=0.20		ug/L	
		o-Xylene	2013/08/30	ND, RDL=0.20		ug/L	
		p+m-Xylene	2013/08/30	ND, RDL=0.40		ug/L	
		Total Xylenes	2013/08/30	ND, RDL=0.40		ug/L	
		F1 (C6-C10)	2013/08/30	ND, RDL=25		ug/L	
		F1 (C6-C10) - BTEX	2013/08/30	ND, RDL=25		ug/L	
	RPD	Benzene	2013/08/30	NC		%	40
		Toluene	2013/08/30	NC		%	40
		Ethylbenzene	2013/08/30	NC		%	40
		o-Xylene	2013/08/30	NC		%	40
		p+m-Xylene	2013/08/30	NC		%	40
		Total Xylenes	2013/08/30	NC		%	40
		F1 (C6-C10)	2013/08/30	NC		%	40
		F1 (C6-C10) - BTEX	2013/08/30	NC		%	40
3333952 RAI	Matrix Spike [SV9291-04]	Acid Extractable Arsenic (As)	2013/09/03		104	%	75 - 125
		Acid Extractable Cadmium (Cd)	2013/09/03		101	%	75 - 125
		Acid Extractable Chromium (Cr)	2013/09/03		NC	%	75 - 125
		Acid Extractable Cobalt (Co)	2013/09/03		104	%	75 - 125
		Acid Extractable Copper (Cu)	2013/09/03		NC	%	75 - 125
		Acid Extractable Lead (Pb)	2013/09/03		103	%	75 - 125
		Acid Extractable Mercury (Hg)	2013/09/03		50 (1)	%	75 - 125
		Acid Extractable Nickel (Ni)	2013/09/03		NC	%	75 - 125
		Acid Extractable Zinc (Zn)	2013/09/03		NC	%	75 - 125
	Spiked Blank	Acid Extractable Arsenic (As)	2013/09/03		106	%	80 - 120
		Acid Extractable Cadmium (Cd)	2013/09/03		103	%	80 - 120

Biogenie Inc
Attention: Brandon MacKay
Client Project #: CD2655
P.O. #:
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Quality Assurance Report (Continued)

Maxxam Job Number: TB3E4449

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3333952 RAI	Spiked Blank	Acid Extractable Chromium (Cr)	2013/09/03		104	%	80 - 120
		Acid Extractable Cobalt (Co)	2013/09/03		104	%	80 - 120
		Acid Extractable Copper (Cu)	2013/09/03		103	%	80 - 120
		Acid Extractable Lead (Pb)	2013/09/03		104	%	80 - 120
		Acid Extractable Mercury (Hg)	2013/09/03		112	%	80 - 120
		Acid Extractable Nickel (Ni)	2013/09/03		103	%	80 - 120
	Method Blank	Acid Extractable Zinc (Zn)	2013/09/03		100	%	80 - 120
		Acid Extractable Arsenic (As)	2013/09/03	ND, RDL=1		ug/g	
		Acid Extractable Cadmium (Cd)	2013/09/03	ND, RDL=0.1		ug/g	
		Acid Extractable Chromium (Cr)	2013/09/03	ND, RDL=1		ug/g	
		Acid Extractable Cobalt (Co)	2013/09/03	ND, RDL=0.1		ug/g	
		Acid Extractable Copper (Cu)	2013/09/03	ND, RDL=0.5		ug/g	
	RPD [SV9291-04]	Acid Extractable Lead (Pb)	2013/09/03	ND, RDL=1		ug/g	
		Acid Extractable Mercury (Hg)	2013/09/03	ND, RDL=0.05		ug/g	
		Acid Extractable Nickel (Ni)	2013/09/03	ND, RDL=0.5		ug/g	
		Acid Extractable Zinc (Zn)	2013/09/03	ND, RDL=5		ug/g	
		Acid Extractable Arsenic (As)	2013/09/03	6.5		%	35
		Acid Extractable Cadmium (Cd)	2013/09/03	NC		%	35
		Acid Extractable Chromium (Cr)	2013/09/03	0.8		%	35
		Acid Extractable Cobalt (Co)	2013/09/03	0.9		%	35
		Acid Extractable Copper (Cu)	2013/09/03	5.5		%	35
		Acid Extractable Lead (Pb)	2013/09/03	7.4		%	35
		Acid Extractable Mercury (Hg)	2013/09/03	NC		%	35
		Acid Extractable Nickel (Ni)	2013/09/03	2.6		%	35
		Acid Extractable Zinc (Zn)	2013/09/03	1.1		%	35
3335444 HES	Matrix Spike	o-Terphenyl	2013/09/03		76	%	30 - 130
		F2 (C10-C16 Hydrocarbons)	2013/09/03		81	%	50 - 130
		F3 (C16-C34 Hydrocarbons)	2013/09/03		81	%	50 - 130
		F4 (C34-C50 Hydrocarbons)	2013/09/03		81	%	50 - 130
	Spiked Blank	o-Terphenyl	2013/09/03		75	%	30 - 130
		F2 (C10-C16 Hydrocarbons)	2013/09/03		83	%	70 - 130
		F3 (C16-C34 Hydrocarbons)	2013/09/03		83	%	70 - 130
		F4 (C34-C50 Hydrocarbons)	2013/09/03		83	%	70 - 130
	Method Blank	o-Terphenyl	2013/09/03		73	%	30 - 130
		F2 (C10-C16 Hydrocarbons)	2013/09/03	ND, RDL=100		ug/L	
		F3 (C16-C34 Hydrocarbons)	2013/09/03	ND, RDL=100		ug/L	
		F4 (C34-C50 Hydrocarbons)	2013/09/03	ND, RDL=100		ug/L	
	RPD	F2 (C10-C16 Hydrocarbons)	2013/09/03	NC		%	50
		F3 (C16-C34 Hydrocarbons)	2013/09/03	NC		%	50
		F4 (C34-C50 Hydrocarbons)	2013/09/03	NC		%	50
3335545 LPG	Matrix Spike	Decachlorobiphenyl	2013/09/03		88	%	60 - 130
		Aroclor 1260	2013/09/03		97	%	60 - 130
		Total PCB	2013/09/03		97	%	60 - 130
	Spiked Blank	Decachlorobiphenyl	2013/09/03		96	%	60 - 130
		Aroclor 1260	2013/09/03		103	%	60 - 130
		Total PCB	2013/09/03		103	%	60 - 130
	Method Blank	Decachlorobiphenyl	2013/09/03		93	%	60 - 130
		Aroclor 1242	2013/09/03	ND, RDL=0.010		ug/g	
		Aroclor 1248	2013/09/03	ND, RDL=0.010		ug/g	
	RPD	Aroclor 1254	2013/09/03	ND, RDL=0.010		ug/g	
		Aroclor 1260	2013/09/03	ND, RDL=0.010		ug/g	
		Total PCB	2013/09/03	ND, RDL=0.010		ug/g	
		Aroclor 1242	2013/09/03	NC		%	50
		Aroclor 1248	2013/09/03	NC		%	50
		Aroclor 1254	2013/09/03	NC		%	50

Biogenie Inc
Attention: Brandon MacKay
Client Project #: CD2655
P.O. #:
Site Location:

Quality Assurance Report (Continued)

Maxxam Job Number: TB3E4449

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3335545 LPG	RPD	Aroclor 1260	2013/09/03	NC		%	50
		Total PCB	2013/09/03	NC		%	50
3336314 SHG	Matrix Spike	Decachlorobiphenyl	2013/09/04		95	%	60 - 130
		Aroclor 1260	2013/09/04		82	%	60 - 130
		Total PCB	2013/09/04		82	%	60 - 130
	Spiked Blank	Decachlorobiphenyl	2013/09/04		86	%	60 - 130
		Aroclor 1260	2013/09/04		71	%	60 - 130
		Total PCB	2013/09/04		71	%	60 - 130
	Method Blank	Decachlorobiphenyl	2013/09/04		86	%	60 - 130
		Aroclor 1016	2013/09/04	ND, RDL=0.01		ug/L	
		Aroclor 1221	2013/09/04	ND, RDL=0.01		ug/L	
		Aroclor 1232	2013/09/04	ND, RDL=0.01		ug/L	
		Aroclor 1262	2013/09/04	ND, RDL=0.01		ug/L	
		Aroclor 1268	2013/09/04	ND, RDL=0.01		ug/L	
		Aroclor 1242	2013/09/04	ND, RDL=0.01		ug/L	
		Aroclor 1248	2013/09/04	ND, RDL=0.01		ug/L	
		Aroclor 1254	2013/09/04	ND, RDL=0.01		ug/L	
		Aroclor 1260	2013/09/04	ND, RDL=0.01		ug/L	
		Total PCB	2013/09/04	ND, RDL=0.01		ug/L	
	RPD	Aroclor 1016	2013/09/04	NC		%	40
		Aroclor 1221	2013/09/04	NC		%	40
		Aroclor 1232	2013/09/04	NC		%	40
		Aroclor 1262	2013/09/04	NC		%	40
		Aroclor 1268	2013/09/04	NC		%	40
		Aroclor 1242	2013/09/04	NC		%	40
		Aroclor 1248	2013/09/04	NC		%	40
		Aroclor 1254	2013/09/04	NC		%	40
		Aroclor 1260	2013/09/04	NC		%	40
		Total PCB	2013/09/04	NC		%	40
3339086 LCH	Matrix Spike	Mercury (Hg)	2013/09/06		97	%	80 - 120
	Spiked Blank	Mercury (Hg)	2013/09/06		111	%	80 - 120
	Method Blank	Mercury (Hg)	2013/09/06	ND, RDL=0.01		ug/L	
	RPD	Mercury (Hg)	2013/09/06	NC		%	20
3365522 LPG	Matrix Spike	Decachlorobiphenyl	2013/09/27		90	%	60 - 130
		Aroclor 1260	2013/09/27		90	%	60 - 130
		Total PCB	2013/09/27		90	%	60 - 130
	Spiked Blank	Decachlorobiphenyl	2013/09/27		91	%	60 - 130
		Aroclor 1260	2013/09/27		92	%	60 - 130
		Total PCB	2013/09/27		92	%	60 - 130
	Method Blank	Decachlorobiphenyl	2013/09/27		90	%	60 - 130
		Aroclor 1242	2013/09/27	ND, RDL=0.010		ug/g	
		Aroclor 1248	2013/09/27	ND, RDL=0.010		ug/g	
		Aroclor 1254	2013/09/27	ND, RDL=0.010		ug/g	
		Aroclor 1260	2013/09/27	ND, RDL=0.010		ug/g	
		Total PCB	2013/09/27	ND, RDL=0.010		ug/g	
	RPD	Aroclor 1242	2013/09/27	NC		%	50
		Aroclor 1248	2013/09/27	NC		%	50
		Aroclor 1254	2013/09/27	NC		%	50
		Aroclor 1260	2013/09/27	NC		%	50
		Total PCB	2013/09/27	NC		%	50

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

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

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

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

Biogenie Inc
Attention: Brandon MacKay
Client Project #: CD2655
P.O. #:
Site Location:

Quality Assurance Report (Continued)

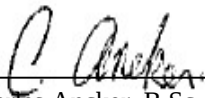
Maxxam Job Number: TB3E4449

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was not sufficiently significant to permit a reliable recovery calculation.
NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.
(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Validation Signature Page

Maxxam Job #: B3E4449

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



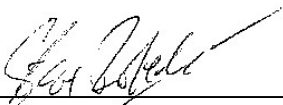
Charles Ancker, B.Sc., M.Sc., C.Chem, Senior Analyst



Cristina Carriere, Scientific Services



Paul Rubinato, Analyst, Maxxam Analytics



Steve Roberts, Lab Supervisor, Ottawa

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

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name: #9164 Biogenie Inc		Company Name:		Quotation #: B32970		MAXXAM JOB #:	
Contact Name: Brandon MacKay		Contact Name: Brandon MacKay		P.O. #:		BOTTLE ORDER #:	
Address: 1170, rue Levis		Address:		Project #: CD2655		CHAIN OF CUSTODY #:	
Terrebonne QC J6W 5S6				Project Name:		PROJECT MANAGER:	
Phone: (450)961-3535 Fax: (450)961-0220		Phone: Fax:		Site #:		Parnian Baber	
Email: bmackay@biogenie-env.com		Email: bmackay@biogenie-env.com		Sampled By:		C#416227-09-01	

Regulation 153 (2011)		Other Regulations		SPECIAL INSTRUCTIONS		ANALYSIS REQUESTED (Please be specific):										TURNAROUND TIME (TAT) REQUIRED:			
☐ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table 4		☐ Res/Park ☐ Ind/Comm ☐ Agri/Other ☐ For RSC		☐ CCME ☐ Reg. 558 ☐ MISA ☐ PWQO ☐ Other		☐ Sanitary Sewer Bylaw ☐ Storm Sewer Bylaw ☐ Municipality		Regular (Standard) TAT: (will be applied if Rush TAT is not specified) Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details. Job Specific Rush TAT (if applies to entire submission) Date Required: Time Required:										☒	

Include Criteria on Certificate of Analysis (Y/N)?
 Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form
 SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	CCME Petroleum Hydrocarbons	ICPMS Metals & Mercury (Soil)	PCBs (Soil)	CCME Low Level Metals (Water)	CCME Petroleum Hydrocarbons (Water)	Mercury (low level)	PCB Low Level in Water	# of Bottles	Comments
1	2013-F3-MW-01	13/08/25	21:22	Water	N	N								9	
2	2013-F3-MW-02	"	21:56	"	"	"								"	
3	2013-F3-MW-03	"	22:36	"	"	"								"	
4	2013-F3-MW-04	"	20:35	"	"	"								"	
5	2013-F3-M-04-D	"	"	"	"	"								"	
6															
7															
8															
9															
10															

28-Aug-13 18:30
 Parnian Baber
 B3E4449
 KP2 OTT-002

REC'D IN OTTAWA

on ice packs

*RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)		Time:		RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)		Time:		# Jars Used and		Laboratory Use Only									
Brandon MacKay		13/08/25		23:54		C. Bergeron		2013/08/28		18:30		Not Submitted		Time Sensitive		Temperature (°C) on Receipt		Custody Seal		Yes		No	
														5/6/17		Intact		X		X			

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

INVOICE INFORMATION:		REPORT INFORMATION (if differs from invoice):		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name:	#9164 Biogenie Inc	Company Name:		Quotation #:	B32970	MAXXAM JOB #:	BOTTLE ORDER #:
Contact Name:	Brandon MacKay	Contact Name:	Brandon MacKay	P.O. #:			
Address:	1170, rue Levis Terrebonne QC J6W 5S6	Address:		Project #:	CD2655		
Phone:	(450)961-3535 Fax: (450)961-0220	Phone:		Project Name:			
Email:	bmackay@biogenie-env.com	Email:	bmackay@biogenie-env.com	Site #:			
				Sampled By:			

Regulation 153 (2011)		Other Regulations		SPECIAL INSTRUCTIONS		ANALYSIS REQUESTED (Please be specific):						TURNAROUND TIME (TAT) REQUIRED:		
☐ Table 1	☐ Res/Park	☐ Medium/Fine	☐ CCME	☐ Sanitary Sewer Bylaw	Regulated Drinking Water ? (Y/N) Metals Field Filtered ? (Y/N)	CCME Petroleum Hydrocarbons	ICPMS Metals & Mercury (Soil)	PCBs (Soil)	CCME Low Level Metals (Water)	CCME Petroleum Hydrocarbons (Water)	Mercury (low level)	PCB Low Level in Water	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS	
☐ Table 2	☐ Ind/Comm	☐ Coarse	☐ Reg. 558	☐ Storm Sewer Bylaw									Regular (Standard) TAT:	
☐ Table 3	☐ Agri/Other		☐ MISA	☐ Municipality									(will be applied if Rush TAT is not specified):	
☐ Table			☐ PWQO										Standard TAT = 5-7 Working days for most tests.	
			☐ Other										Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.	

Include Criteria on Certificate of Analysis (Y/N)? _____

Note: For MOE regulated drinking water samples - please use the Drinking Water Chain of Custody Form

SAMPLES MUST BE KEPT COOL (< 10°C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM

Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	CCME Petroleum Hydrocarbons	ICPMS Metals & Mercury (Soil)	PCBs (Soil)	CCME Low Level Metals (Water)	CCME Petroleum Hydrocarbons (Water)	Mercury (low level)	PCB Low Level in Water	# of Bottles	Comments
1	2013-F3-MW-01-A	2013-08-24	10:00 am	Soil			✓	✓	✓					2	
2	2013-F3-MW-01-B	"	10:05 am	"			✓	✓	✓					"	
3	2013-F3-MW-02-A	"	10:20 am	"			✓	✓	✓					"	
4	2013-F3-MW-02-B	"	10:25 am	"			✓	✓	✓					"	
5	2013-F3-MW-03-A	"	10:40 am	"			✓	✓	✓					"	
6	2013-F3-MW-03-B	"	10:45 am	"			✓	✓	✓					"	
7	2013-F3-MW-04-A	"	11:20 am	"			✓	✓	✓					"	
8	2013-F3-MW-04-B	"	11:25 am	"			✓	✓	✓					"	
9	2013-F3-MW-03-A	"	10:40 am	"			✓	✓	✓					"	
10															

REC'D IN OTTAWA

on ice packs

*RELINQUISHED BY: (Signature/Print)		Date: (YY/MM/DD)	Time:	RECEIVED BY: (Signature/Print)		Date: (YY/MM/DD)	Time:	# Jars Used and	Laboratory Use Only				
[Signature] / Brandon MacKay		13/08/25	10:18	[Signature] C. Bergeron		2013/08/28	18:30	Not Submitted	Time Sensitive	Temperature (°C) on Receipt	Custody Seal	Yes	No
										5/6/17	Present	✓	
											Intact	✓	

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

Maxxam Analytics International Corporation o/a Maxxam Analytics

White: Maxxam Yellow: Client

6/5/18

Your Project #: MB3E4449

Attention: SUB CONTRACTOR

MAXXAM ANALYTICS
CAMPOBELLO
6740 CAMPOBELLO ROAD
MISSISSAUGA, ON
CANADA L5N 2L8

Report Date: 2013/09/06

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B377838

Received: 2013/08/30, 09:45

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Cadmium - low level CCME (Total)	5	2013/08/30	2013/09/05	AB SOP-00043	EPA 200.8
Elements by ICP - Total	5	2013/09/03	2013/09/05	AB SOP-00042	EPA 200.7
Elements by ICPMS - Total	5	2013/09/03	2013/09/05	AB SOP-00043	EPA 200.8

* Results relate only to the items tested.

Encryption Key

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

Carmen McKay, Project Manager Assistant
Email: CMcKay@maxxam.ca
Phone# (403) 291-3077

=====

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

Total cover pages: 1



Maxxam Job #: B377838
Report Date: 2013/09/06

MAXXAM ANALYTICS
Client Project #: MB3E4449

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		HJ2675	HJ2676	HJ2677	HJ2678	HJ2679		
Sampling Date		2013/08/25 21:22	2013/08/25 21:56	2013/08/25 22:36	2013/08/25 20:35	2013/08/25 20:35		
	UNITS	2013-F3-MW-01 (SV9324-03R)	2013-F3-MW-02 (SV9325-03R)	2013-F3-MW-03 (SV9326-03R)	2013-F3-MW-04 (SV9327-03R)	2013-F3-MW-04-D (SV9328-03R)	RDL	QC Batch
Low Level Elements								
Total Cadmium (Cd)	ug/L	2.8	0.33	1.2	1.8	1.7	0.0050	7132129

Maxxam Job #: B377838
Report Date: 2013/09/06

MAXXAM ANALYTICS
Client Project #: MB3E4449

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		HJ2675		HJ2676	HJ2677	HJ2678	HJ2679		
Sampling Date		2013/08/25 21:22		2013/08/25 21:56	2013/08/25 22:36	2013/08/25 20:35	2013/08/25 20:35		
	UNITS	2013-F3-MW-01 (SV9324-03R)	RDL	2013-F3-MW-02 (SV9325-03R)	2013-F3-MW-03 (SV9326-03R)	2013-F3-MW-04 (SV9327-03R)	2013-F3-MW-04-D (SV9328-03R)	RDL	QC Batch
Elements									
Total Aluminum (Al)	mg/L	66	0.0030	0.78	0.33	1.6	1.8	0.0030	7139023
Total Antimony (Sb)	mg/L	<0.00060	0.00060	<0.00060	<0.00060	<0.00060	<0.00060	0.00060	7139023
Total Arsenic (As)	mg/L	0.13	0.00020	0.0022	0.0079	0.0022	0.0021	0.00020	7139023
Total Barium (Ba)	mg/L	0.64	0.010	0.046	0.030	0.050	0.050	0.010	7139034
Total Beryllium (Be)	mg/L	0.0046	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7139023
Total Boron (B)	mg/L	0.049	0.020	<0.020	<0.020	<0.020	<0.020	0.020	7139034
Total Calcium (Ca)	mg/L	100	0.30	36	120	61	61	0.30	7139034
Total Chromium (Cr)	mg/L	0.39	0.0010	0.028	0.020	0.054	0.041	0.0010	7139023
Total Cobalt (Co)	mg/L	0.13	0.00030	0.0035	0.020	0.079	0.078	0.00030	7139023
Total Copper (Cu)	mg/L	0.37	0.00020	0.015	0.037	0.016	0.015	0.00020	7139023
Total Iron (Fe)	mg/L	150	0.060	0.66	9.8	2.9	3.1	0.060	7139034
Total Lead (Pb)	mg/L	0.054	0.00020	0.00086	0.00044	0.0018	0.0019	0.00020	7139023
Total Lithium (Li)	mg/L	0.22	0.020	<0.020	<0.020	<0.020	<0.020	0.020	7139034
Total Magnesium (Mg)	mg/L	68	0.20	7.1	48	19	19	0.20	7139034
Total Manganese (Mn)	mg/L	2.8	0.0040	0.47	1.6	1.3	1.3	0.0040	7139034
Total Molybdenum (Mo)	mg/L	0.027	0.00020	0.0070	0.0029	0.0035	0.0030	0.00020	7139023
Total Nickel (Ni)	mg/L	0.72	0.00050	0.043	0.11	0.24	0.23	0.00050	7139023
Total Phosphorus (P)	mg/L	1.7	0.10	0.14	0.19	<0.10	<0.10	0.10	7139034
Total Potassium (K)	mg/L	47	0.30	6.2	12	6.8	6.9	0.30	7139034
Total Selenium (Se)	mg/L	0.0032	0.00020	0.00065	0.0017	0.00050	0.00045	0.00020	7139023
Total Silicon (Si)	mg/L	97	0.10	6.3	6.4	6.7	6.9	0.10	7139034
Total Silver (Ag)	mg/L	0.0085	0.00010	0.00019	0.00017	0.00080	0.00043	0.00010	7139023
Total Sodium (Na)	mg/L	27	0.50	25	20	15	15	0.50	7139034
Total Strontium (Sr)	mg/L	0.22	0.020	0.10	0.20	0.096	0.095	0.020	7139034
Total Sulphur (S)	mg/L	100	0.20	26	130	66	66	0.20	7139034
Total Thallium (Tl)	mg/L	0.00085	0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	7139023
Total Tin (Sn)	mg/L	0.0069	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0010	7139023
Total Titanium (Ti)	mg/L	6.2(1)	0.0050	0.032	0.011	0.14	0.14	0.0010	7139023
Total Uranium (U)	mg/L	0.027	0.00010	0.0017	0.00091	0.0010	0.00096	0.00010	7139023
Total Vanadium (V)	mg/L	0.22	0.0010	0.0013	0.0023	0.0048	0.0047	0.0010	7139023
Total Zinc (Zn)	mg/L	0.56	0.0030	0.017	0.37	0.097	0.094	0.0030	7139023

RDL = Reportable Detection Limit

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

Maxxam Job #: B377838
Report Date: 2013/09/06

MAXXAM ANALYTICS
Client Project #: MB3E4449

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
7139023	Total Aluminum (Al)	2013/09/05	92	80 - 120	105	80 - 120	0.0043, RDL=0.0030	mg/L	NC	20
7139023	Total Antimony (Sb)	2013/09/05	106	80 - 120	107	80 - 120	<0.00060	mg/L	NC	20
7139023	Total Arsenic (As)	2013/09/05	104	80 - 120	102	80 - 120	<0.00020	mg/L	NC	20
7139023	Total Beryllium (Be)	2013/09/05	105	80 - 120	102	80 - 120	<0.0010	mg/L	NC	20
7139023	Total Chromium (Cr)	2013/09/05	104	80 - 120	102	80 - 120	<0.0010	mg/L	NC	20
7139023	Total Cobalt (Co)	2013/09/05	104	80 - 120	104	80 - 120	<0.00030	mg/L	NC	20
7139023	Total Copper (Cu)	2013/09/05	104	80 - 120	105	80 - 120	<0.00020	mg/L	NC	20
7139023	Total Lead (Pb)	2013/09/05	104	80 - 120	103	80 - 120	<0.00020	mg/L	NC	20
7139023	Total Molybdenum (Mo)	2013/09/05	111	80 - 120	104	80 - 120	<0.00020	mg/L	NC	20
7139023	Total Nickel (Ni)	2013/09/05	104	80 - 120	102	80 - 120	<0.00050	mg/L	NC	20
7139023	Total Selenium (Se)	2013/09/05	107	80 - 120	105	80 - 120	<0.00020	mg/L	NC	20
7139023	Total Silver (Ag)	2013/09/05	105	80 - 120	102	80 - 120	<0.00010	mg/L	NC	20
7139023	Total Thallium (Tl)	2013/09/05	97	80 - 120	95	80 - 120	<0.00020	mg/L	NC	20
7139023	Total Tin (Sn)	2013/09/05	105	80 - 120	103	80 - 120	<0.0010	mg/L	NC	20
7139023	Total Titanium (Ti)	2013/09/05	102	80 - 120	102	80 - 120	<0.0010	mg/L	NC	20
7139023	Total Uranium (U)	2013/09/05	99	80 - 120	96	80 - 120	<0.00010	mg/L	NC	20
7139023	Total Vanadium (V)	2013/09/05	111	80 - 120	107	80 - 120	<0.0010	mg/L	NC	20
7139023	Total Zinc (Zn)	2013/09/05	103	80 - 120	102	80 - 120	<0.0030	mg/L	NC	20
7139034	Total Barium (Ba)	2013/09/05	97	80 - 120	99	80 - 120	<0.010	mg/L	NC	20
7139034	Total Boron (B)	2013/09/05	116	80 - 120	117	80 - 120	<0.020	mg/L	NC	20
7139034	Total Calcium (Ca)	2013/09/05	101	80 - 120	102	80 - 120	<0.30	mg/L	2.1	20
7139034	Total Iron (Fe)	2013/09/05	99	80 - 120	99	80 - 120	<0.060	mg/L	NC	20
7139034	Total Lithium (Li)	2013/09/05	99	80 - 120	100	80 - 120	<0.020	mg/L	NC	20
7139034	Total Magnesium (Mg)	2013/09/05	101	80 - 120	103	80 - 120	<0.20	mg/L	2.2	20
7139034	Total Manganese (Mn)	2013/09/05	99	80 - 120	100	80 - 120	<0.0040	mg/L	0.8	20
7139034	Total Phosphorus (P)	2013/09/05	99	80 - 120	101	80 - 120	<0.10	mg/L	NC	20
7139034	Total Potassium (K)	2013/09/05	103	80 - 120	105	80 - 120	<0.30	mg/L	NC	20
7139034	Total Silicon (Si)	2013/09/05	120	80 - 120	117	80 - 120	<0.10	mg/L	NC	20
7139034	Total Sodium (Na)	2013/09/05	101	80 - 120	102	80 - 120	<0.50	mg/L	NC	20
7139034	Total Strontium (Sr)	2013/09/05	98	80 - 120	100	80 - 120	<0.020	mg/L	NC	20
7139034	Total Sulphur (S)	2013/09/05					<0.20	mg/L	NC	20

N/A = Not Applicable

RDL = Reportable Detection Limit

RPD = Relative Percent Difference

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

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

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

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



Maxxam Job #: B377838
Report Date: 2013/09/06

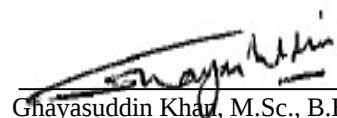
MAXXAM ANALYTICS
Client Project #: MB3E4449

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

Validation Signature Page

Maxxam Job #: B377838

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



Ghayasuddin Khan, M.Sc., B.Ed., P.Chem, Scientific Specialist

=====

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

MAXXAM ANALYTICS
32 Colonnade Unit 1000
Nepean, Ontario, K2E 7J6
Phone: (613) 274-0573
Fax: (613) 274-0574



Page #: 1

Biogenie Inc - Quebec
Maxxam PM Parnian Baber

To: Campo to Calgary Subcontract

Job# B3E4449

☐ Yes ☐ No International Sample/BioHazard (if yes, add copy of Movement Cert., heat treat is required prior to disposal)
☐ Yes ☐ No Special Protocol (if yes, Protocol _____)

Sample ID	Matrix	Test(s) Required	Container	Date Sampled	Date Required
SV9324-03R \ 2013-F3-MW-01	W	CCME Metals (low Level), total	1(G250)	2013/08/25 21:22	2013/09/06
SV9325-03R \ 2013-F3-MW-02	W	CCME Metals (low Level), total	1(G250)	2013/08/25 21:56	2013/09/06
SV9326-03R \ 2013-F3-MW-03	W	CCME Metals (low Level), total	1(G250)	2013/08/25 22:36	2013/09/06
SV9327-03R \ 2013-F3-MW-04	W	CCME Metals (low Level), total	1(G250)	2013/08/25 20:35	2013/09/06
SV9328-03R \ 2013-F3-MW-04-D	W	CCME Metals (low Level), total	1(G250)	2013/08/25 20:35	2013/09/06

	Temp. 1	Temp. 2	Temp. 3			
Cooler #1	10	10	10	Custody Seal Present	YES	NO
				Custody Seal Intact	YES	NO
				Ice Present Upon Receipt	YES	NO
Cooler #2				Custody Seal Present	YES	NO
				Custody Seal Intact	YES	NO
				Ice Present Upon Receipt	YES	NO
Cooler #3				Custody Seal Present	YES	NO
				Custody Seal Intact	YES	NO
				Ice Present Upon Receipt	YES	NO

Receiving Maxxam Location: Campo to Calgary Subcontract

JOB # _____

Relinquished by (Sign) _____

(Print) _____

C. Bergeron

Date and Time 2013/08/29 17:15

Received by (Sign) _____

(Print) _____

H. D. ...

Date and Time 2013/09/30

NOTES:

- 1) Please call us if due date cannot be met. Please reference Sample ID on your report.
- 2) Include copy of this completed form, Client COC & signed final report to scontractor@maxxamanalytics.com

Reporting Requirements:

National:

Regional:

30-Aug-13 09:45

Carmen McKay



B377838

CJ4

INS-0046

Client: Biogenie S.R.D.C. Inc.
1140 Levis
Terrebonne, QC
J6W 5S6
Attention: Mr. Brandon MacKay
PO#:
Invoice to: Biogenie S.R.D.C. Inc.

Report Number: 1319422
Date Submitted: 2013-08-30
Date Reported: 2013-10-18
Project: CD2655
COC #: 775390

Page 1 of 5

Dear Brandon MacKay:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

Revised Report

This is an amendment and supercedes all previous copies of this report. The sample ID's have been amended as per client.

APPROVAL: _____

Lorna Wilson
Laboratory Supervisor, Inorganics

APPROVAL: _____

Charlie (Long) Qu
Laboratory Supervisor, Organics

Exova (Ottawa) is certified and accredited for specific parameters by:

CALA, Canadian Association for Laboratory Accreditation (to ISO 17025), OMAFRA, Ontario Ministry of Agriculture, Food and Rural Affairs (for farm soils), Licensed by Ontario MOE for specific tests in drinking water.

Exova (Mississauga) is accredited for specific parameters by:

SCC, Standards Council of Canada (to ISO 17025)

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only.

Client: Biogenie S.R.D.C. Inc.
 1140 Levis
 Terrebonne, QC
 J6W 5S6
 Attention: Mr. Brandon MacKay
 PO#:
 Invoice to: Biogenie S.R.D.C. Inc.

Report Number: 1319422
 Date Submitted: 2013-08-30
 Date Reported: 2013-10-18
 Project: CD2655
 COC #: 775390

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1055852 Water 2013-08-24 2013-F3-MW-02	1055853 Water 2013-08-25 2013-F3-MW-02
Group	Analyte	MRL	Units	Guideline			
Hydrocarbons	F1 (C6-C10)	100	ug/L				<100
	F2 (C10-C16)	100	ug/L			<100	<100
	F3 (C16-C34)	200	ug/L			<200	<200
Mercury	Hg Total	0.0001	mg/L				<0.0001
Metals	As	0.01	mg/L				<0.01
	Cd	0.0001	mg/L				0.0002
	Co	0.0002	mg/L				0.0023
	Cr	0.001	mg/L				0.001
	Cu	0.001	mg/L				0.007
	Ni	0.005	mg/L				0.024
	Pb	0.001	mg/L				<0.001
	Zn	0.01	mg/L				<0.01
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L			<0.1	

Guideline = *** = Guideline Exceedence**

** = Analysis completed at Mississauga, Ontario.

Results relate only to the parameters tested on the samples submitted.

Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline,
 MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable
 Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO
 = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Biogenie S.R.D.C. Inc.
1140 Levis
Terrebonne, QC
J6W 5S6
Attention: Mr. Brandon MacKay
PO#:
Invoice to: Biogenie S.R.D.C. Inc.

Report Number: 1319422
Date Submitted: 2013-08-30
Date Reported: 2013-10-18
Project: CD2655
COC #: 775390

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 208523 Analysis Date 2013-09-09 Method P 8081A			
Polychlorinated Biphenyls (PCBs)	<0.1 ug/L	61	50-120
Run No 257249 Analysis Date 2013-09-06 Method EPA 200.8			
As	<0.01 mg/L	105	81-119
Co	<0.0002 mg/L	100	88-112
Cr	<0.001 mg/L	96	89-111
Cu	<0.001 mg/L	99	86-114
Ni	<0.005 mg/L	100	92-108
Pb	<0.001 mg/L	99	89-111
Zn	<0.01 mg/L	97	89-111
Run No 257267 Analysis Date 2013-09-06 Method M SM3112B-3500B			
Hg Total	<0.0001 mg/L		
Run No 257327 Analysis Date 2013-09-09 Method O CCME			
F1 (C6-C10)	<100 ug/L	83	80-120
Run No 257371 Analysis Date 2013-09-10 Method O CCME Reg 153			

Guideline = * = **Guideline Exceedence**
 ** = Analysis completed at Mississauga, Ontario.
 Results relate only to the parameters tested on the samples submitted.
 Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline,
 MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable
 Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO
 = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Client: Biogenie S.R.D.C. Inc.
1140 Levis
Terrebonne, QC
J6W 5S6
Attention: Mr. Brandon MacKay
PO#:
Invoice to: Biogenie S.R.D.C. Inc.

Report Number: 1319422
Date Submitted: 2013-08-30
Date Reported: 2013-10-18
Project: CD2655
COC #: 775390

QC Summary

Analyte	Blank	QC % Rec	QC Limits
F2 (C10-C16)	<100 µg/L	72	50-120
F3 (C16-C34)	<200 µg/L	72	50-120
Run No 257409 Analysis Date 2013-09-10 Method EPA 200.8			
Cd	<0.0001 mg/L	99	86-114

Guideline = *** = Guideline Exceedence**
** = Analysis completed at Mississauga, Ontario.
Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline,
MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable
Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO
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Sample Comment Summary

Sample ID: 1055853 2013-F3-MW-02 Arsenic MRL elevated due to matrix interference (dilution was done).

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