THE COLLECTION OF LANDFILL MONITORING DATA AT THE FORMER PIN-4 DISTANT EARLY WARNING LINE SITE

Byron Bay, Nunavut

FINAL REPORT - 2014
(O/Ref.: CD3654) (Y/Ref.: DLC MON (KITIK 13))

DEFENCE CONSTRUCTION CANADA

JUNE 2015

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DEFENCE CONSTRUCTION CANADA

JUNE 2015

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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 Distant Early Warning (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 entitled *"Terms of Reference – Contracting Services for the Collection of Landfill Monitoring Data – PIN-2 Cape Young, PIN-4 Byron Bay, CAM-1 Jenny Lind Island - DEW LINE SITES, NUNAVUT, KITIKMEOT REGION, DCC PROJECT #: DLC MON(KITIK13)*, April 18, 2013*"*. This report contains a summary of the findings from the 2014 inspection of the PIN-4 Byron Bay site.

During the 2014 monitoring program, a visual inspection was completed at all site landfills identified on the overall site plan (Figure PIN-4.1), in addition to soil and groundwater sampling, and thermal monitoring completed at the Tier II Disposal Facility. Table I summarizes the monitoring requirements of the 2014 season. No deviations from the TOR were experienced while completing the 2014 monitoring.

Table I: **2014 Monitoring Requirements for PIN-4 Landfills**

Landfill	Visual Inspection	Soil Sampling	Groundwater Sampling	Thermal Monitoring
Northwest Landfill	✓			
North Landfill	✓			
Non-Hazardous Waste Landfill	✓			
Station Area Landfill – West	✓			
USAF Landfill	✓			
Tier II Disposal Facility	✓	✓	✓	✓
Airstrip Landfill	✓			

1.2 FIELD PROGRAM STAFF AND TIMING

The 2014 on-site field program at PIN-4 Byron Bay took place on August 25, 2014. Biogénie, a division of EnGlobe Corp. (Biogénie) subcontracted Sila Remediation Inc. (Sila), from Igloolik, Nunavut to perform the fieldwork. The Sila field program was executed by Mr. Andrew Passalis with the assistance of three local representatives, whose names and responsibilities are detailed below:

- Mr. Andrew Passalis, Project Engineer (Sila)
- John Henry Etegak, Field Technician (Sila)
- Kaylene Epilon, Field Technician (Sila)
- Joe Koaha, Wildlife Monitor (Sila)

1.3 2014 WEATHER CONDITIONS

Seasonally warm weather conditions were observed during the PIN-4 Byron Bay monitoring event with daytime temperatures ranging between 4-8ºC. Skies were cloudy with extended periods of fog and light rain observed throughout the day. Winds generally ranged between 20-30 km/h from the southwest throughout the day.

1.4 REPORT FORMAT

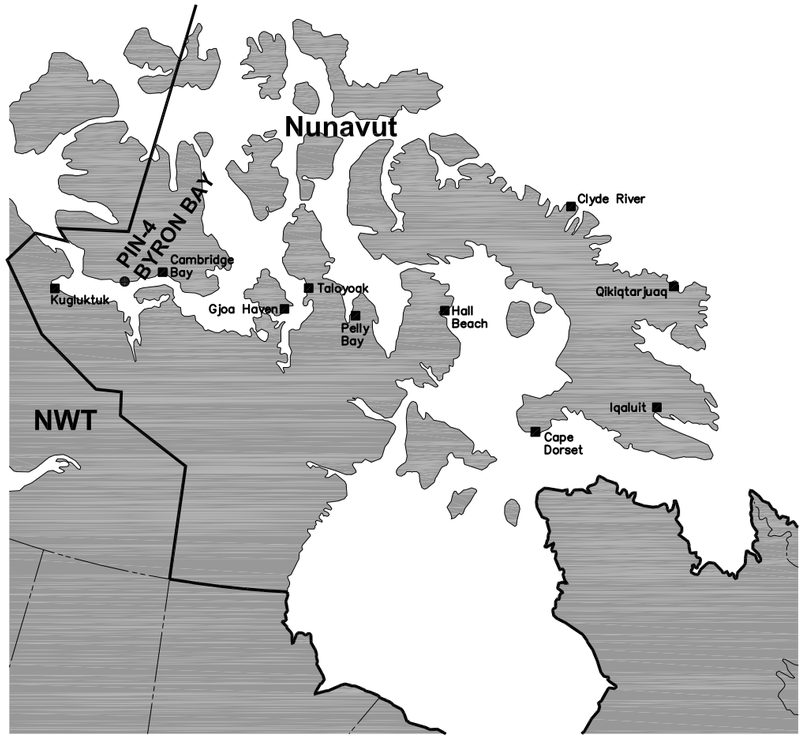
This report describes the work carried out in August 2014, at the seven landfill sites at PIN-4 Byron Bay. Results from soil and groundwater sampling, thermal monitoring, and visual inspection of the sites are also presented in the formats described in the TOR (Reference A). An electronic version of the report and its associated 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 2014 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 2014 soil analytical data (where applicable)

- Summary of 2014 groundwater analytical data (where applicable)
- Monitoring well development/sampling reports (where applicable)

An overall site plan (Figure PIN-4.1) presents an overview of the former PIN-4 site with the localization of each landfill areas. For the photographic record, a photographic index has been completed as per the TOR for each of the landfill areas. The full resolution photos are included in electronic format in the Addendum DVD-ROM attached to this report. Certificates of Analyses, Quality Assurance/Quality Control (QA/QC) analytical results and field notes are attached in the Annexes.

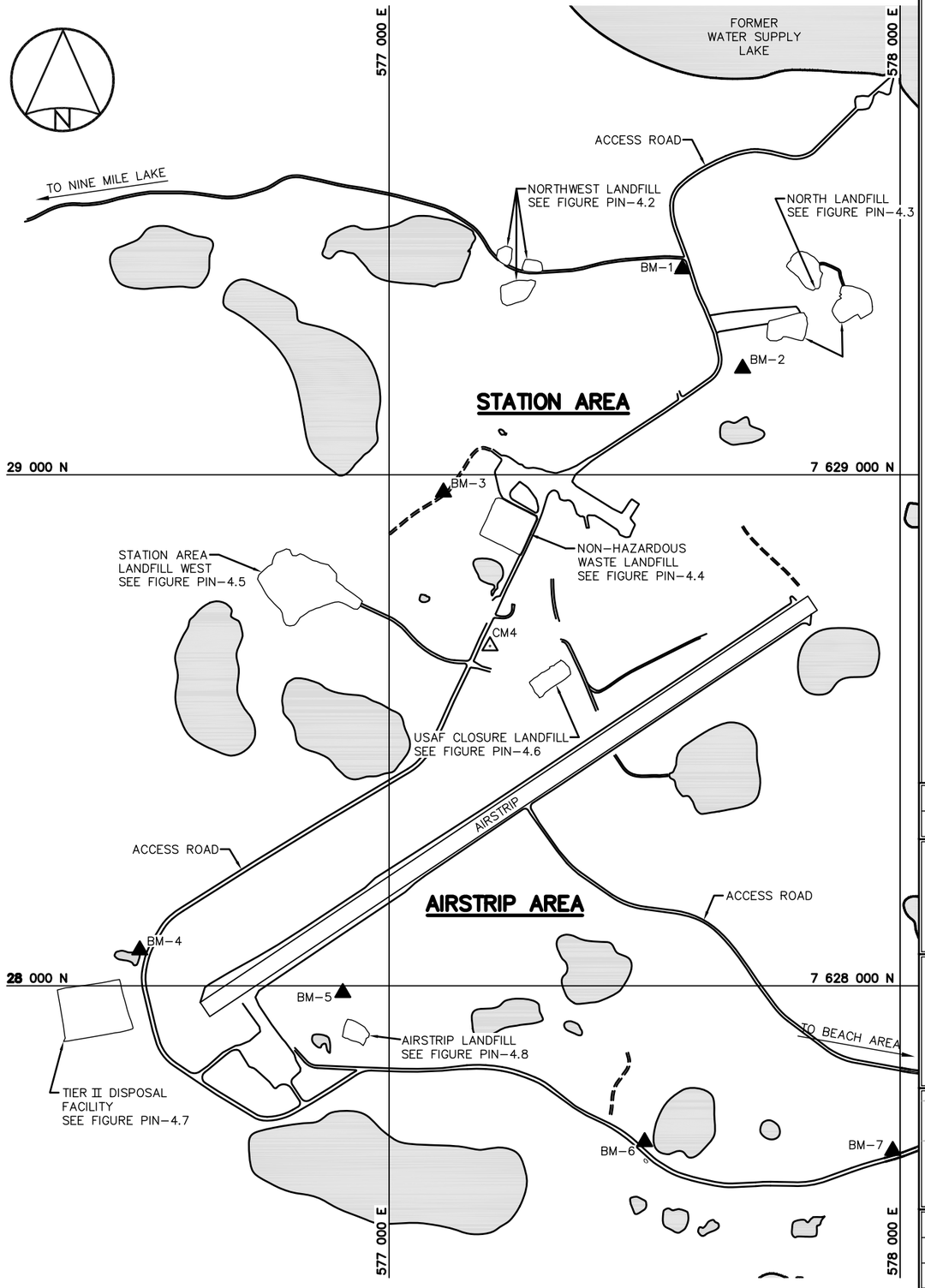


LOCATION OF BYRON BAY WITHIN NUNAVUT TERRITORY

SCALE: NTS

SURVEY CONTROL MONUMENTS				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
CM4	7 628 665.138	577 197.194	106.968	GEODETIC MONUMENT 649020

PERMANENT BENCHMARK (AS-BUILT)				
NO.	UTM COORDINATES		ELEV.	DESCRIPTION
	NORTHING	EASTING		
BM-1	7 629 402.938	577 573.748	105.711	25mm DIA. STEEL PIPE
BM-2	7 629 208.381	577 691.650	106.895	25mm DIA. STEEL PIPE
BM-3	7 628 966.171	577 106.215	102.610	25mm DIA. STEEL PIPE
BM-4	7 628 070.119	576 511.803	90.608	25mm DIA. STEEL PIPE
BM-5	7 627 986.564	576 909.188	87.778	25mm DIA. STEEL PIPE
BM-6	7 627 694.789	577 499.858	88.479	25mm DIA. STEEL PIPE
BM-7	7 627 677.411	577 985.417	88.710	25mm DIA. STEEL PIPE



LEGEND

- CM4 — SURVEY CONTROL MONUMENT
- BM-1 — PERMANENT BENCHMARK LOCATION (7)
- BODY OF WATER

0 100m 200m 300m 400m 500m

NO.	VERSION	DATE	P.L.	A.P.	P.G.
1	FINAL	15-06-29	PAR	VERIF.	APPR.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-4, BYRON BAY, 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	SCALE:	DATE (month-year):
Metre	1 : 10,000	JUNE 2015
DRAWN BY:	VERIFIED BY:	APPROVED BY:
L. LA PIERRE	A. PASSALIS	P. GELINAS, P. ENG.
PROJECT NO:	DRAWING NO:	PAGE
CD3654_310_313	CD3654_310_313-PIN-4.1-PL	PL

FIGURE PIN-4.1

G:\CD3654\PIN-4\2014\FINAL\CD3654_310_313-PIN-4.1-PL.dwg, PL, 2015-06-29 8:21:53 AM

2 METHODOLOGY

2.1 VISUAL INSPECTION

Data and information collected during the visual inspection of the PIN-4 landfills are included in the visual inspection data sheets. These data sheets include inspection data such 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 or numerical 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 Sony DSC-TX5 10.2 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).

Testpits were dug using a hand shovel down to refusal or permafrost. The shovel was cleaned between testpits. Soil samples were placed directly in the laboratory provided jars/bottles and were not mixed. Disposable nitrile glove were worn and disposed of after each sample collection. Jars/bottles were cleaned prior to placement into the cooler. For the 2014 monitoring event, 4 soil sampling stations were visited. A surface sample (0-15 cm depth) and subsurface sample (40-50 cm depth below surface) were taken at each sampling station. Bedrock, frozen ground or frost was not encountered at any of the soil stations during the August 2014 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, making sure to stay away from soil disturbed during previous years sampling campaigns.
- 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. It should be noted that:

- Exova performed Total PCBs analysis with a method detection limit of 0.1 mg/kg, whereas the contractual requirement is 0.05 mg/kg;
- Exova performed PHC Fractions F2 and F3 with a detection limit of 50 mg/kg, whereas the contractual requirement is 40 mg/kg.

Table II below summarizes the soil sampling at PIN-4 during the August 2014 field program:

Table II: **Summary of Soil Sampling at PIN-4 - August 2014**

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

2.3 GROUNDWATER SAMPLING

The groundwater sampling methodology conformed to guidance provided in the following 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. The samples were not acidified and were not filtered (as directed in the TOR).

The 2014 field program included sampling four monitoring wells at the Tier II Disposal Facility. A summary of the groundwater sampling undertaken at PIN-4 is summarized in Table III.

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 III: **Summary of Groundwater Sampling at PIN-4 - August 2014**

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

2.4 THERMAL MONITORING

The 2014 thermal monitoring program at PIN-4 consisted of an inspection of four thermistors and data loggers, the downloading of datasets and the manual reading of thermistors at all datalogger locations. Monitoring data and manual temperature readings were not obtained from the datalogger at VT-2 due to extremely low battery levels. Specific detailed information regarding temperature data is contained in the Tier II Disposal Facility section of this report.

2.5 FIELD NOTES

Field notes from the 2014 Landfill Monitoring program, including soil and water sampling, are included in Annex 3 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 backup. Locations of all observations and features for the visual inspection were recorded using a Garmin Oregon 400 hand held GPS, which included a combination of continuous tracks and discrete way points. Data sets collected from the individual vertical thermistors were downloaded directly to a field lab top computer.

2.6 QUALITY CONTROL

It should be noted that, although samples were sent to Exova and Maxxam laboratories, only Exova's bottles/jars were used.

Sila implemented standard sample collection techniques to decrease the likelihood of compromising collected samples. The methods used for sample collection are summarized in Sections 2.2 and 2.3 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 prepared prior to mobilisation to the site and completed by the Project Engineer after sample collection. The samples were refrigerated prior to off-site shipment, in chilled coolers, by First Air Cargo directly to Maxxam (via Yellowknife) and Exova in Edmonton and ESG, via Ottawa to Kingston, Ontario (via Edmonton), where they were checked in by laboratory representatives. All analyses were completed as specified on COC forms.

Annexe 1 provides a sample integrity report from Exova. This report indicates that all samples received were acceptable for analysis.

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% field Blind Duplicate Samples of soil and water were sent to Exova. Results can be found in Annex 1.
- 10% Inter-laboratory Duplicate Samples were sent to Maxxam (to determine if variation in procedures may cause significant difference in analytical results).
- 10% Archival Samples of soil were sent to ESG.

Exova has QA/QC measures for sample analysis. Exova QC samples will typically be introduced into the analytical stream on a batch basis, normally comprising 20% – 30% of the total sample throughput. A batch size of 15 – 20 typically includes one of each control standard, reference standard, surrogate spike, duplicate sample, and method blank. A control sample is a blank matrix fortified with analyte of interest and carried through all analytical steps to monitor lab performance (recovery & basis) on clean matrix. A reference sample is a sample with predetermined certified characteristics that undergoes the same processing as samples used to evaluate accuracy of procedure. A surrogate spike is an organic compound with similar chemical composition and behaviour in the analytical process used to monitor recovery in each sample. A duplicate sample occurs when client samples are analyzed in duplicate to monitor reproducibility in analysis and preparation. Finally, a method blank is a blank sample matrix carried through the same procedure as the samples, and is used to monitor for process contamination.

Maxxam follows similar in-house QA/QC procedures. Exova and Maxxam QA/QC reports can be found within the certificates of analysis in Annex 1.

2.8 PROJECT REFERENCES

The following references are specifically relevant to the 2014 Landfill Monitoring activities:

A. Invitation to Tender - *Contractor Services for the Collection of Landfill Monitoring Data: PIN-2 Cape Young, PIN-4 Byron Bay, CAM-1 Jenny Lind Island - DEW LINE SITES, NUNAVUT, KITIKMEOT REGION, DCC PROJECT #: DLC MON(KITIK13)*,

B. Terms of Reference – *Contracting Services for the Collection of Landfill Monitoring Data – PIN-2 Cape Young, PIN-4 Byron Bay, CAM-1 Jenny Lind Island - DEW LINE SITES, NUNAVUT, KITIKMEOT REGION, DCC PROJECT #: DLC MON (KITIK13)*, April 18, 2013.

C. Technical Proposal – *The Collection of Landfill Monitoring Data for the DEW Line Sites*: *PIN-2 Cape Young, PIN-4 Byron Bay, CAM-1 Jenny Lind Island - DEW LINE SITES, NUNAVUT, KITIKMEOT REGION, DCC PROJECT #: DLC MON (KITIK13)*, April 18, 2013. *Project Ref 6121-150,* May 2013.

D. Post-Field Progress Report, PIN-4 Landfill Monitoring 2014, October 2014*.*

3 NORTHWEST LANDFILL

3.1 SUMMARY

On August 25, 2014 a visual inspection was completed at the Northwest Landfill. Neither soil nor groundwater sampling was performed.

As of 2014, no erosion features with “significant” or “unacceptable” severity ratings were identified in the Preliminary Stability Assessment of the Northwest Landfill. Indications of minor settlement were noted at two locations, including two minor depressions on the northwest cover of Lobe B. Several smaller linear and pot-hole type depressions were also noted on the north side of Lobe D. These features were not noted during the previous 2013 assessment. One isolated area of erosion was noted along the north side of Lobe B. The erosion extended along the toe of the lobe. The area was not in direct contact with the landfill and appears to be the result of directed runoff and washing of fines along the toe. This feature was not noted during the previous 2013 assessment. No exposed debris is present at the lobes.

At this time, the overall performance of the landfill is rated as acceptable.

The Visual Inspection Checklist is included in Table IV of this report and has been completed as per the TOR. Please refer to Figure PIN-4.2 for a sketch of the Northwest Landfill detailing the location of photographs and erosional features.

Table IV: **Visual Inspection Checklist / Report – Northwest Landfill**

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

INSPECTION REPORT – PAGE 1 of 2

SITE NAME: PIN-4 Byron Bay
LANDFILL DESIGNATION: Northwest Landfill (Regrade Landfill)
DATE OF INSPECTION: August 25, 2014
DATE OF PREVIOUS INSPECTION: August 15, 2013
INSPECTED BY: A. Passalis
REPORT PREPARED BY: A. Passalis
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.

TABLE IV : NORTHWEST LANDFILL VISUAL INSPECTION (PAGE 2 OF 2)

Site Name: PIN-4, Byron Bay
Landfill: Northwest Landfill
Designation: Existing Regrade Area
Date Inspected: August 25, 2014
Inspected by: Andrew Passalis, P.Eng.

Signature: 

Checklist Item	Present (Yes/No)	Location	Length	Width	Depth	Extent	Description	Photographic Record	Severity Rating	Additional Comments
Settlement	Yes	FEATURE A See Figure PIN-4.2 (Lobe B - NW cover) - New Obs.	0.15 - 0.4 m	0.1 - 0.15 m	0.03 - 0.05 m	Isolated	2 minor depressions	NWLF-11, 12	Acceptable	Subtle depression on SE top corner.
		FEATURE B See Figure PIN-4.2 (Lobe D - N side) - New Obs.	0.2 - 0.3 m	0.2 - 0.3 m	0.05 - 0.1 m	Isolated	2 pothole type depressions	NWLF-29, 30	Acceptable	Subtle depression on SE top corner.
Erosion	Yes	FEATURE C See Figure PIN-4.2 (Lobe B - N side) - New Obs.	30 m	0.1 - 0.15 m	0.02 m	Isolated	Minor erosion along toe	NWLF-13	Acceptable	Self armouring. Not in direct contact with landfill.
Frost Action	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Animal Burrows	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Vegetation	Yes	See Figure PIN-4.2 Lobe B (SW cover and side) Lobe D (E, W, S sides)	Varies	Varies	N/A	N/A	Moderate coverage on side slopes	NWLF-3, 4, 6, 7, 26, 31	N/A	No Significant Change from Past Observation.
Staining	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Vegetation Stress	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Seepage Points	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Debris Exposed	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Presence/Condition of Monitoring Instruments	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Other Features of Note:	No	Tensions Crack Lobe D - N crest	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	Previously noted tension crack not visible during 2014 assessment.
Additional Photos	Yes	See Figure PIN-4.2 and Photographic Record	N/A	N/A	N/A	N/A	General Photographic Record	N/A	Not Observable	General photos for documentation, no additional features of note.
Overall Landfill Performance:	**Acceptable**									

3.2 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for Northwest Landfill has been completed as per the ToR and is included as Table V hereafter.

Table V: **Preliminary Stability Assessment – Northwest Landfill**

Feature	**Severity Rating**	**Extent**
Settlement	Acceptable	Isolated
Erosion	Acceptable	Isolated
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris exposure	Not observed	None
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 landfill is compromised to the extent that 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, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

3.3 LOCATION PLAN

The Location Plan for the Northwest Landfill has been completed as per the ToR and is presented in Figure PIN-4.2.

577 175 E

577 250 E

577 325 E

7 629 450 N

7 629 375 N

ACCESS ROAD

FEATURE B
2 x SETTLEMENT

FEATURE A
2 x SETTLEMENT

FEATURE C
EROSION

NORTHWEST LANDFILL
(LOBE D)

NORTHWEST LANDFILL
(LOBE C)

NORTHWEST LANDFILL
(LOBE B)

102m

103m

104m

105m

LEGEND

- COORDINATE POINT
- BODY OF WATER
- SPARSE VEGETATION
- SETTLEMENT (NTS)
- EROSION (NTS)
- APPROX. PHOTOGRAPHIC VIEWPOINT

0m 7,5m 15,0m 22,5m 30,0m 37,5m

NO.	VERSION	DATE	P.L.	A.P.	P.G.
1	FINAL	15-06-29	PAR	VERIF.	APPR.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-4, BYRON BAY, NUNAVUT

NORTHWEST 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	SCALE:	DATE (month-year):
Metre	1 : 750	JUNE 2015
DRAWN BY: L. LA PIERRE	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GELINAS, P. ENG.
PROJECT NO: CD3654_310_313	DRAWING NO: CD3654_310_313-PIN-4.2-PL	PAGE PL

FIGURE PIN-4.2

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3.4 PHOTOGRAPHIC RECORDS

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

Table VI: **Landfill Visual Inspection Photo Log – Northwest Landfill**

Site Name: PIN-4, Byron Bay
Landfill: Northwest Landfill
Date Inspected: August 25, 2014
Inspected by: Andrew Passalis, P.Eng.

Photo (NWLF-)	Filename	Size (KB)	Date	Vantage Point Easting	Vantage Point Northing	Caption
LOBE B						
1	P414_3516	4 367	14-08-25	577287	7629380	View looking west along north side of Lobe B
2	P414_3517	4 322	14-08-25	577288	7629378	View looking southwest along east side of Lobe B
3	P414_3518	4 442	14-08-25	577263	7629344	View looking northeast along east side of Lobe B
4	P414_3519	4 263	14-08-25	577261	7629344	View looking west along south side of Lobe B
5	P414_3520	1 310	14-08-25	577261	7629346	Panoramic view looking southwest to northeast across Lobe B
6	P414_3521	4 300	14-08-25	577228	7629332	View looking northeast along south side of Lobe B
7	P414_3522	4 315	14-08-25	577226	7629333	View looking north along west side of Lobe B
8	P414_3523	1 288	14-08-25	577227	7629335	Panoramic view looking northwest to east across Lobe B
9	P414_3524	4 323	14-08-25	577222	7629370	View looking south along west side of Lobe B
10	P414_3525	4 334	14-08-25	577223	7629371	View looking east along north side of Lobe B
11	P414_3526	4 397	14-08-25	577226	7629370	View looking east at two minor depressions on northwest cover of Lobe B - FEATURE A (new)
12	P414_3527	4 429	14-08-25	577231	7629375	View looking south at two minor depressions on northwest cover of Lobe B - FEATURE A (new)
13	P414_3528	4 392	14-08-25	577241	7629381	View looking east at minor erosion along toe on north side of Lobe B - FEATURE C (new)

Table VI: Landfill Visual Inspection Photo Log – Northwest Landfill (page 2 of 2)

Photo (NWLF-)	Filename	Size (KB)	Date	Vantage Point		Caption
				Easting	Northing	
LOBE C						
14	P414_3505	4 241	14-08-25	577247	7629405	View looking east at west side of Lobe C
15	P414_3506	4 270	14-08-25	577264	7629399	View looking east along south side of Lobe C
16	P414_3507	4 433	14-08-25	577263	7629399	View looking north along west side of Lobe C
17	P414_3508	1 230	14-08-25	577264	7629400	Panoramic view looking northwest to east from southwest corner of Lobe C
18	P414_3509	4 435	14-08-25	577269	7629420	View looking south along west side of Lobe C
19	P414_3510	4 281	14-08-25	577270	7629420	View looking east along north side of Lobe C
20	P414_3511	4 415	14-08-25	577299	7629414	View looking west along north side of Lobe C
21	P414_3512	4 324	14-08-25	577300	7629414	View looking south along east side of Lobe C
22	P414_3513	1 476	14-08-25	577298	7629412	Panoramic view looking southeast to west from northeast corner of Lobe C
23	P414_3514	4 447	14-08-25	577301	7629400	View looking north along east side of Lobe C
24	P414_3515	4 381	14-08-25	577300	7629399	View looking west along south side of Lobe C
LOBE D						
25	P414_3494	4 453	14-08-25	577208	7629427	View looking southeast along south side of Lobe D
26	P414_3495	4 324	14-08-25	577208	7629428	View looking north along west side of Lobe D
27	P414_3496	4 309	14-08-25	577219	7629444	View looking northeast along northwest toe of Lobe D
28	P414_3497	4 465	14-08-25	577238	7629442	View looking south along west side of Lobe D
29	P414_3498	4 412	14-08-25	577233	7629442	View looking north at two pothole depressions below northeast crest - FEATURE B (new)
30	P414_3499	4 383	14-08-25	577237	7629444	View looking west at two pothole depressions below northeast crest - FEATURE B (new)
31	P414_3500	4 290	14-08-25	577235	7629410	View looking north along east side of Lobe D
32	P414_3501	4 337	14-08-25	577233	7629410	View looking northwest along south side of Lobe D
33	P414_3503	1 286	14-08-25	577233	7629412	Panoramic view looking west to northeast from southwest corner of Lobe D
34	P414_3504	1 367	14-08-25	577236	7629434	Panoramic view looking southeast to west from north side of Lobe D

4 NORTH LANDFILL

4.1 SUMMARY

On August 25, a visual inspection was completed at the North Landfill. Neither soil nor groundwater sampling was performed.

As of the 2014 monitoring event, no features were identified with “significant” or “unacceptable” severity ratings. Minor settlement was noted at one location on the south side of Lobe A. The settlement area extends along the base of the side slope. This feature was not noted during the previous 2013 assessment. Minor erosion features were observed in four areas on Lobes A, B and C at the North Landfill, including; localized areas on the south cover of Lobe A, southeast crest of Lobe B , northwest corner of Lobe C and east side of Lobe C. Surface runoff in each area has resulted in the washing and re-deposition of finer grained materials. All features appear to be self-armouring and were not noted during the previous 2013 assessment. No exposed debris was noted.

At this time, the overall performance of the landfill is rated as acceptable.

The Visual Inspection Checklist is included in Table VII of this report and has been completed as per the TOR. Please refer to Figure PIN-4.3 for a sketch of the North Landfill detailing the location of photographs and erosional features.

Table VII: **Visual Inspection Checklist - North Landfill**

DEW Line Cleanup: Post-construction - Landfill Monitoring
Visual Inspection Checklist

Inspection Report - Page 1 of 2

SITE NAME: PIN-4 Byron Bay
LANDFILL DESIGNATION: North Landfill (Existing Regrade Landfill)
DATE OF INSPECTION: August 25, 2014
DATE OF PREVIOUS INSPECTION: August 15, 2013
INSPECTED BY: A. Passalis
REPORT PREPARED BY: A. Passalis
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.

TABLE VII: NORTH LANDFILL VISUAL INSPECTION (PAGE 2 OF 2)

Site Name: PIN-4, Byron Bay
Landfill: North Landfill
Designation: Existing Regrade Area
Date Inspected: August 25, 2014
Inspected by: Andrew Passalis, P.Eng.

Signature: 

Checklist Item	Present (Yes/No)	Location	Length	Width	Depth	Extent	Description	Photographic Record	Severity Rating	Additional Comments
Settlement	Yes	FEATURE A See Figure PIN-4.3 (Lobe A-S side slope) - New Obs.	5 m	0.3 - 0.5 m	0.1 - 0.2 m	Isolated	Settlement along base of side slope	NLF-4	Acceptable	Suspected settlement at base of Type 1 material.
Erosion	Yes	FEATURE B See Figure PIN-4.3 (Lobe A-S cover) - New Obs.	14 m	0.1 m	0.01 - 0.02 m	Isolated	Minor erosion	NLF-14, 15	Acceptable	Washing of fines. Self armouring.
		FEATURE C See Figure PIN-4.3 (Lobe B-SE crest) - New Obs.	5 m	0.15 m	0.1 - 0.15 m	Isolated	Minor erosion	NLF-18	Acceptable	Scouring in Type 1 material on crest.
		FEATURE D See Figure PIN-4.3 (Lobe C-NW corner) - New Obs.	2 m	0.15 - 0.4 m	0.02 - 0.03 m	Isolated	Minor erosion on side slope	NLF-34, 35	Acceptable	Self armouring.
		FEATURE E See Figure PIN-4.3 (Lobe C-E side) - New Obs.	4 m	0.1 m	0.01 - 0.03 m	Isolated	Minor erosion on side slope	NLF-41, 42	Acceptable	Self armouring.
Frost Action	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Animal Burrows	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Vegetation	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Staining	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Vegetation Stress	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Seepage Points	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Debris Exposed	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Presence/Condition of Monitoring Instruments	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Other Features of Note:	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Additional Photos	Yes	See Figure PIN-4.3 and Photographic Record	N/A	N/A	N/A	N/A	General Photographic Record	N/A	Not Observable	General photos for documentation, no additional features of note.
Overall Landfill Performance:	**Acceptable**									

4.2 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for North Landfill has been completed as per the ToR and is included as Table VIII hereafter.

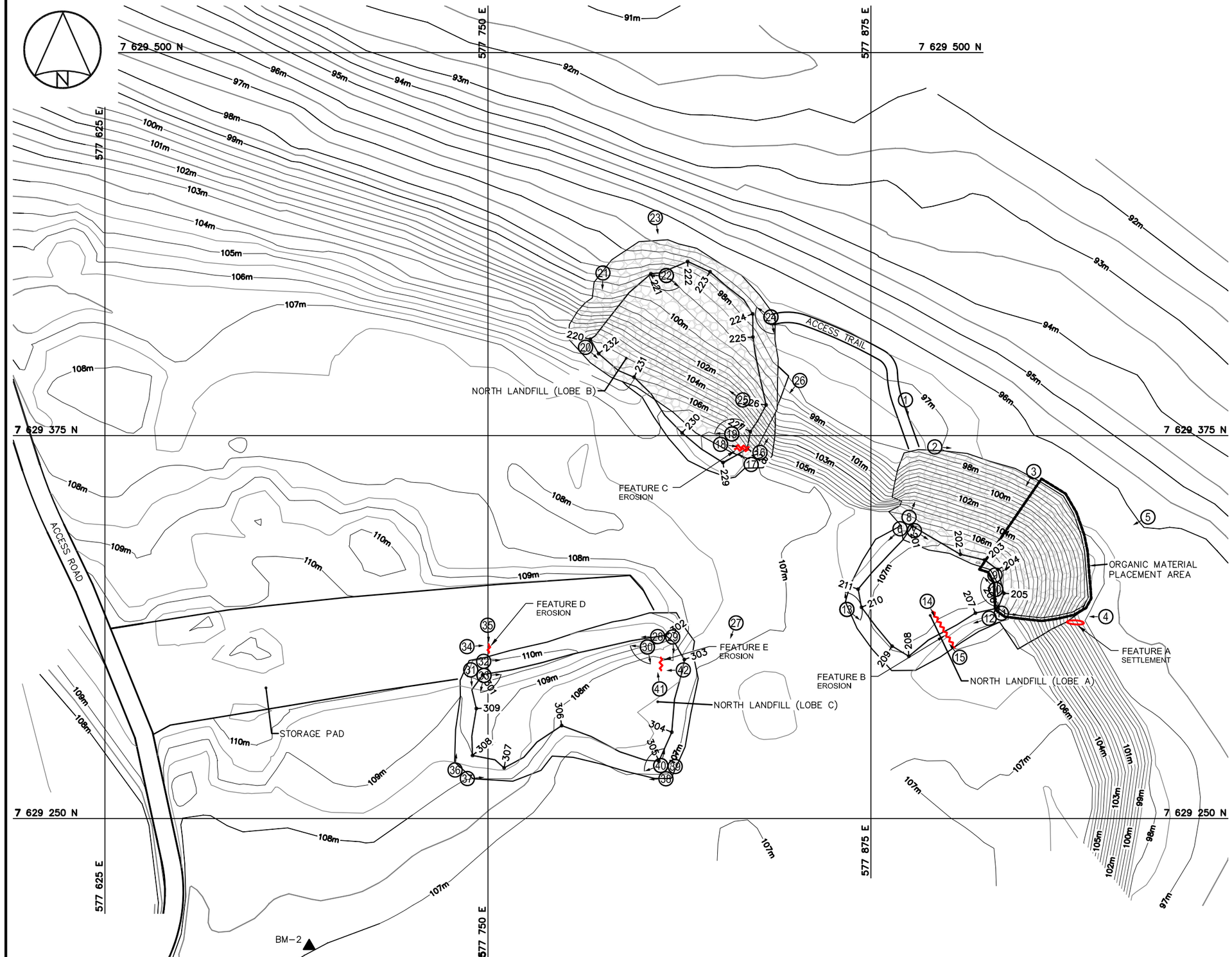
Table VIII: **Preliminary Stability Assessment – North Landfill**

Feature	Severity Rating	Extent
Settlement	Acceptable	Isolated
Erosion	Acceptable	Isolated
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris exposure	Not observed	None
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 landfill is compromised to the extent that 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, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

4.3 LOCATION PLAN

The Location Plan for the North Landfill has been completed as per the ToR and is presented in Figure PIN-4.3.



LEGEND

- BM–2 ▲ PERMANENT BENCHMARK LOCATION
- 110 COORDINATE POINT
- SETTLEMENT (NTS)
- EROSION (NTS)
- 1 APPROX. PHOTOGRAPHIC VIEWPOINT

0m 12,5m 25m 37,5m 50m 62,5m

NO.	VERSION	DATE	PAR	VERIF.	APPR.
1	FINAL	15–06–29	P.L.	A.P.	P.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-4, BYRON BAY, NUNAVUT

NORTH 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	SCALE:	DATE (month–year):
Metre	1 : 1,250	JUNE 2015
DRAWN BY: L. LA PIERRE	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GELINAS, P. ENG.
PROJECT NO: CD3654_310_313	DRAWING NO: CD3654_310_313-PIN-4.3-PL	PAGE PL

FIGURE PIN-4.3

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4.4 PHOTOGRAPHIC RECORDS

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

Table IX: **Landfill Visual Inspection Photo Log – North Landfill (page 1 of 2)**

Site Name: PIN-4, Byron Bay
Landfill: North Landfill
Date Inspected: August 25, 2014
Inspected by: Andrew Passalis, P.Eng.

Photo (NLF-)	Filename	Size (KB)	Date	Vantage Point		Caption
				Easting	Northing	
LOBE A						
1	P414_3556	4 379	14-08-25	577887	7629387	View looking south-southeast at north slope on Lobe A
2	P414_3557	4 407	14-08-25	577895	7629371	View looking east along to of north slope on Lobe A
3	P414_3558	4 371	14-08-25	577929	7629362	View southwest at west edge of organic cover placed on north slope of Lobe A
4	P414_3560	4 255	14-08-25	577950	7629317	View looking west upslope along edge of organic cover on Lobe A. Suspected settlement near base of side slope of Type I cover - FEATURE A (new)
5	P414_3561	4 452	14-08-25	577965	7629348	View looking west-southwest at organic cover placed on slope of Lobe A
6	P414_3562	4 391	14-08-25	577886	7629345	View looking southwest along northwest side of Lobe A
7	P414_3563	4 400	14-08-25	577888	7629344,8	View looking southeast along crest side of Lobe A
8	P414_3564	4 350	14-08-25	577888	7629347,1	View looking north at from northwest crest of Lobe A
9	P414_3565	4 372	14-08-25	577916	7629327,5	View looking northeast at organic cover placed on crest of Lobe A
10	P414_3566	1 051	14-08-25	577916	7629325,7	Panoramic view looking south to northwest from east crest of Lobe A
11	P414_3567	4 326	14-08-25	577918	7629317,1	View looking east downslope from east crest of Lobe A
12	P414_3568	4 269	14-08-25	577914	7629316,3	View looking southwest along south side of Lobe A
13	P414_3569	982	14-08-25	577868	7629318,4	Panoramic view looking north to southeast from west corner of Lobe A
14	P414_3570	4 424	14-08-25	577894	7629319,4	View looking southeast a minor erosion across south cover of Lobe A - FEATURE B (new)
15	P414_3571	4 255	14-08-25	577903	7629303,9	View looking northwest a minor erosion across south cover of Lobe A - FEATURE B (new)

Table IX: Landfill Visual Inspection Photo Log – North Landfill (page 2 of 2)

Photo (NLF-)	Filename	Size (KB)	Date	Vantage Point		Caption
				Easting	Northing	
LOBE B						
16	P414_3545	4 342	14-08-25	577838	7629368	View looking northeast from southeast corner of Lobe B
17	P414_3546	4 274	14-08-25	577837	7629367	View looking northwest along southwest side of Lobe B
18	P414_3547	4 296	14-08-25	577827	7629372	View looking east at scours on southeast crest of Lobe B - FEATURE C (new)
19	P414_3548	1 316	14-08-25	577829	7629374	Panoramic view looking west to northeast from southeast corner of Lobe B
20	P414_3549	4 269	14-08-25	577783	7629403	View looking southeast along southwest side of Lobe B
21	P414_3550	4 265	14-08-25	577787	7629427	View looking south upslope from northwest corner of Lobe B
22	P414_3551	1 449	14-08-25	577807	7629427	Panoramic view looking south to west at north side of Lobe B
23	P414_3552	4 305	14-08-25	577804	7629446	View looking south at north side of Lobe B
24	P414_3553	887	14-08-25	577842	7629414	Panoramic view looking south to west at north side of Lobe B
25	P414_3554	4 371	14-08-25	577834	7629387	View looking northwest along north toe of mid-slope bench of Lobe B
26	P414_3555	4 244	14-08-25	577851	7629392	View looking southwest along east side slope of Lobe B
LOBE C						
27	P414_3529	4 305	14-08-25	577830	7629314	View looking southwest at east end of Lobe C
28	P414_3530	4 111	14-08-25	577807	7629309	View looking west along north side of Lobe C
29	P414_3531	4 357	14-08-25	577810	7629309	View looking south along east side of Lobe C
30	P414_3532	920	14-08-25	577803	7629305	Panoramic view looking west to south from northeast corner of Lobe C
31	P414_3533	4 312	14-08-25	577745	7629300	View looking south along west side of Lobe C
32	P414_3534	4 291	14-08-25	577748	7629301	View looking east along north side of Lobe C
33	P414_3535	1 185	14-08-25	577748	7629298	Panoramic view looking east to south from northwest corner of Lobe C
34	P414_3536	4 297	14-08-25	577744	7629306	View looking east at minor erosion on northwest corner of Lobe C - FEATURE D (new)
35	P414_3537	4 414	14-08-25	577750	7629313	View looking south at minor erosion on northwest corner of Lobe C - FEATURE D (new)
36	P414_3538	4 287	14-08-25	577740	7629265	View looking north along west side of Lobe C
37	P414_3539	4 402	14-08-25	577742	7629264	View looking east along south side of Lobe C
38	P414_3540	4 327	14-08-25	577809	7629264	View looking west along south side of Lobe C
39	P414_3541	4 293	14-08-25	577810	7629266	View looking north along east side of Lobe C
40	P414_3542	1 016	14-08-25	577807	7629266	Panoramic view looking southwest to north from southeast corner of Lobe C
41	P414_3543	4 405	14-08-25	577806	7629293	View looking north at minor erosion along toe on east side of Lobe C - FEATURE E (new)
42	P414_3544	4 331	14-08-25	577813	7629299	View looking west at minor erosion along toe on east side of Lobe C - FEATURE E (new)

5 NON-HAZARDOUS WASTE LANDFILL

5.1 SUMMARY

On August 25, 2014 a visual inspection was completed at the Non-Hazardous Waste Landfill. Neither soil nor groundwater sampling was performed.

As of the 2014 monitoring event, no features were identified with “significant” or “unacceptable” severity ratings. One isolated area of minor settlement was noted on the north crest of the Non-Hazardous Waste Landfill. This feature was not noted during the previous 2013 assessment. Several shallow ridges and depressions were also noted across the cover of the landfill. These features appear to be associated with final rough grading of organic material on the landfill surface and are consistent with previous observation.

At this time, the overall performance of the landfill is rated as acceptable.

The Visual Inspection Checklist is included in Table X of this report and has been completed as per the TOR. Please refer to Figure PIN-4.4 for a sketch of the Non-Hazardous Waste Landfill detailing the location of photographs and erosional features.

Table X: **Visual Inspection Checklist / Report – NHWLF**

DEW Line Cleanup: Post-construction - Landfill Monitoring
Visual Inspection Checklist

Inspection Report - Page 1 of 2

SITE NAME: PIN-4 Byron Bay
LANDFILL DESIGNATION: Non-Hazardous Waste Landfill (Existing Regraded Landfill)
DATE OF INSPECTION: August 25, 2014
DATE OF PREVIOUS INSPECTION: August 14, 2013
INSPECTED BY: A. Passalis
REPORT PREPARED BY: A. Passalis
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.

TABLE X: NON-HAZARDOUS WASTE LANDFILL VISUAL INSPECTION (PAGE 2 OF 2)

Site Name: PIN-4, Byron Bay
Landfill: Non-Hazardous Waste Landfill
Designation: Existing Regrade Area
Date Inspected: August 25, 2014
Inspected by: Andrew Passalis, P.Eng.
Signature:

Checklist Item	Present (Yes/No)	Location	Length	Width	Depth	Extent	Description	Photographic Record	Severity Rating	Additional Comments
Settlement	Yes	FEATURE A See Figure PIN-4.4 (N crest) - New Obs.	0.7 m	0.3 m	0.1 m	Isolated	Minor depression	NHWLF-5, 6	Acceptable	Slope appears stable.
Erosion	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Frost Action	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Animal Burrows	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Vegetation	Yes	See Figure PIN-4.4 (landfill cover)	Varies	Varies	N/A	<2%	Sparse vegetation across cover	NHWLF-12, 13, 20	N/A	No Significant Change from Past Observation.
Staining	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Vegetation Stress	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Seepage Points	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Debris Exposed	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Presence/Condition of Monitoring Instruments	Yes	See Figure PIN-4.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Other Features of Note:	No	See Figure PIN-4.4 and Photographic Record	2 - 5 m	0.3 - 0.5 m	0.1 - 0.15 m	N/A	Ridges and depressions on cover	NHWLF-22, 23	Acceptable	Possible construction artifact (rough grading of landfill cover with organic material). No Significant Change from Past Observation.
Additional Photos	Yes	See Figure PIN-4.4 and Photographic Record	N/A	N/A	N/A	N/A	General Photographic Record	N/A	Not Observable	General photos for documentation, no additional features of note.
Overall Landfill Performance:	**Acceptable**									

5.2 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for NHWLF has been completed as per the ToR and is included as Table XI hereafter.

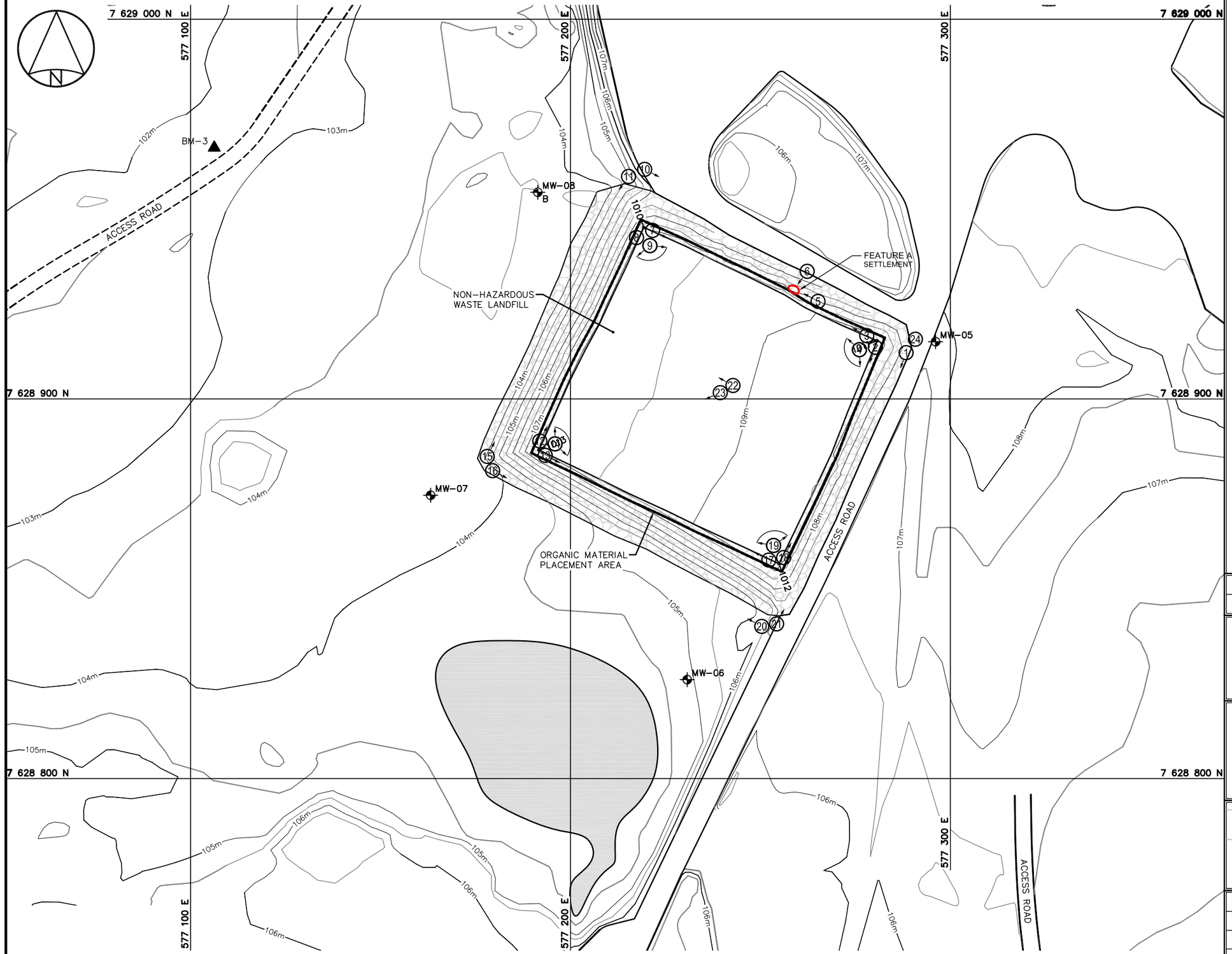
Table XI: **Preliminary Stability Assessment – NHWLF**

Feature	Severity Rating	Extent
Settlement	Acceptable	Isolated
Erosion	Not observed	None
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris exposure	Not observed	None
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 landfill is compromised to the extent that 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, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

5.3 LOCATION PLAN

The Location Plan for the NHWLF has been completed as per the ToR and is presented in Figure PIN-4.4.



LEGEND

- BM-3 — PERMANENT BENCHMARK LOCATION
- 1010 — COORDINATE POINT
- MW-05 — MONITORING WELL LOCATION
- MW-08 B — BACKGROUND MONITORING WELL LOCATION
- BODY OF WATER
- SETTLEMENT (NTS)
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT

0m 10m 20m 30m 40m 50m

NO.	VERSION	DATE	P.L.	A.P.	P.G.
1	FINAL	15-06-29	PAR	VERIF.	APPR.

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COLLECTION OF LANDFILL MONITORING DATA

PIN-4, BYRON BAY, 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	SCALE:	DATE (month-year):
Metre	1 : 1,000	JUNE 2015
DRAWN BY: L. LA PIERRE	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GELINAS, P. ENG.
PROJECT NO: CD3654_310_313	DRAWING NO: CD3654_310_313-PIN-4.4-PL	PAGE PL

FIGURE PIN-4.4

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5.4 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 XII. Full-sized photographs are contained in the Addendum DVD-ROM.

Table XII: **Landfill Visual Inspection Photo Log – NHWLF**

Site Name: PIN-4, Byron Bay
Landfill: Non-Hazardous Waste Landfill
Date Inspected: August 25, 2014
Inspected by: Andrew Passalis, P.Eng.

Photo (NHWLF-)	Filename	Size (KB)	Date	Vantage Point		Caption
				Easting	Northing	
1	P414_3572	4 291	14-08-25	577288	7628912	View looking southwest along east toe of NHWLF
2	P414_3573	4 325	14-08-25	577280	7628914	View looking southwest along east crest of NHWLF
3	P414_3574	4 317	14-08-25	577279	7628916	View looking northwest along north crest of NHWLF
4	P414_3575	1 342	14-08-25	577277	7628913	Panoramic view looking south to northwest from northeast corner of NHWLF
5	P414_3576	4 446	14-08-25	577264	7628926	View looking northwest at minor depression along north crest of NHWLF - FEATURE A (new)
6	P414_3577	4 315	14-08-25	577262	7628932	View looking southwest at minor depression along north crest of NHWLF - FEATURE A (new)
7	P414_3578	4 309	14-08-25	577222	7628943	View looking southeast along north crest of NHWLF
8	P414_3579	4 247	14-08-25	577219	7628943	View looking southwest along west crest of NHWLF
9	P414_3580	1 150	14-08-25	577221	7628941	Panoramic view looking east to southwest from northwest corner of NHWLF
10	P414_3581	4 232	14-08-25	577218	7628960	View looking southeast along north toe of NHWLF
11	P414_3582	4 434	14-08-25	577217	7628959	View looking southwest along west toe of NHWLF
12	P414_3583	4 413	14-08-25	577192	7628888	View looking northeast along west crest of NHWLF
13	P414_3584	4 346	14-08-25	577192	7628886	View looking southeast along south crest of NHWLF
14	P414_3585	1 507	14-08-25	577196	7628889	Panoramic view looking north to southeast from southwest corner of NHWLF
15	P414_3586	4 400	14-08-25	577179	7628884	View looking northeast along west toe of NHWLF
16	P414_3587	4 315	14-08-25	577179	7628882	View looking southeast along south toe of NHWLF
17	P414_3588	4 290	14-08-25	577253	7628858	View looking northwest along south crest of NHWLF
18	P414_3589	4 430	14-08-25	577255	7628858	View looking northeast along east crest of NHWLF
19	P414_3590	1 238	14-08-25	577253	7628860	Panoramic view looking west to northeast from southwest corner of NHWLF
20	P414_3591	4 348	14-08-25	577251	7628840	View looking northwest along south toe of NHWLF
21	P414_3592	4 426	14-08-25	577253	7628840	View looking northeast along east toe of NHWLF
22	P414_3594	4 404	14-08-25	577242	7628904	View looking northwest at typical heavy equipment tracks/ruts on cover of NHWLF
23	P414_3595	4 382	14-08-25	577241	7628902	View looking southwest at sparse vegetation on cover of NHWLF
24	P414_3596	4 384	14-08-25	577292	7628916	Three small pieces of surficial metal debris near access road northeast of NHWLF

6 STATION AREA LANDFILL –WEST

6.1 SUMMARY

On August 25, 2014 a visual inspection was completed at the Station Area Landfill. Neither soil nor groundwater sampling was performed.

As of the 2014 monitoring event, no features were identified with “significant” or “unacceptable” severity ratings. Several new localized areas of settlement and erosional features were noted on the northwest cover, the west side, the south crest, the northeast cover and side slope, and south cover and side slope. These features were not noted during the previous 2013 assessment. One area of minor staining was also noted on the north cover of the landfill and has not significantly changed since the last observation. No exposed debris was noted.

At this time, the overall performance of the landfill is rated as acceptable.

The Visual Inspection Checklist is included in Table XIII of this report and has been completed as per the TOR. Please refer to Figure PIN-4.5 for a sketch of the Station Area Landfill detailing the location of photographs and erosional features.

Table XIII: **Visual Inspection Checklist - Station Area Landfill**

DEW Line Cleanup: Post-construction - Landfill Monitoring
Visual Inspection Checklist

Inspection Report - Page 1 of 2

SITE NAME: PIN-4 Byron Bay
LANDFILL DESIGNATION: Station Area Landfill – West (Existing Regrade Landfill)
DATE OF INSPECTION: August 25, 2014
DATE OF PREVIOUS INSPECTION: August 14, 2013
INSPECTED BY: A. Passalis
REPORT PREPARED BY: A. Passalis
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.

TABLE XIII: STATION AREA LANDFILL - WEST - VISUAL INSPECTION (PAGE 2 OF 2)

Site Name: PIN-4, Byron Bay
Landfill: Station Area Landfill - West
Designation: Existing Regrade Area
Date Inspected: August 25, 2014
Inspected by: Andrew Passalis, P.Eng.

Signature: 

Checklist Item	Present (Yes/No)	Location	Length	Width	Depth	Extent	Description	Photographic Record	Severity Rating	Additional Comments
Settlement	Yes	FEATURE A See Figure PIN-4.5 (NW cover, W side) - New Obs.	0.3 - 5 m	0.2 - 0.3 m	0.05 - 0.15 m	Occasional	Minor pothole and linear depressions	NWLF-12, 27, 28	Acceptable	Slope and side slope appear stable.
		FEATURE B See Figure PIN-4.5 (S crest) - New Obs.	1.5 m	1 m	0.15 m	Isolated	Single depression	NWLF-18, 19	Acceptable	Subtle depression on S crest.
		FEATURE C See Figure PIN-4.5 (W side) - New Obs.	0.4 m	0.6 m	0.1 m	Isolated	Single minor depression	NWLF-25	Acceptable	Subtle depression on S crest.
Erosion	Yes	FEATURE D See Figure PIN-4.5 (NE cover and side slope) - New Obs.	13 - 18 m	0.1 - 0.2 m	0.01 - 0.03 m	Isolated	Two locations of minor erosion	NWLF-4, 5, 9, 10	Acceptable	Washing of fines. Self armouring.
		FEATURE E See Figure PIN-4.5 (S cover and side slope) - New Obs.	5 - 10 m	0.1 - 0.15 m	0.01 m	Isolated	Single area of minor erosion	NWLF-22	Acceptable	Washing of fines. Self armouring.
Frost Action	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Animal Burrows	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Vegetation	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Staining	Yes	FEATURE F See Figure PIN-4.5 (NW cover)	0. 3 m	0.6 m	Unknown	Isolated	Single area of dark staining	NWLF-26	Acceptable	No Significant Change from Past Observation.
Vegetation Stress	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Seepage Points	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Debris Exposed	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Presence/Condition of Monitoring Instruments	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Other Features of Note:	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Additional Photos	Yes	See Figure PIN-4.5 and Photographic Record	N/A	N/A	N/A	N/A	General Photographic Record	N/A	Not Observable	General photos for documentation, no additional features of note.
Overall Landfill Performance:	**Acceptable**									

6.2 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for Station Area Landfill has been completed as per the ToR and is included as Table XIV hereafter.

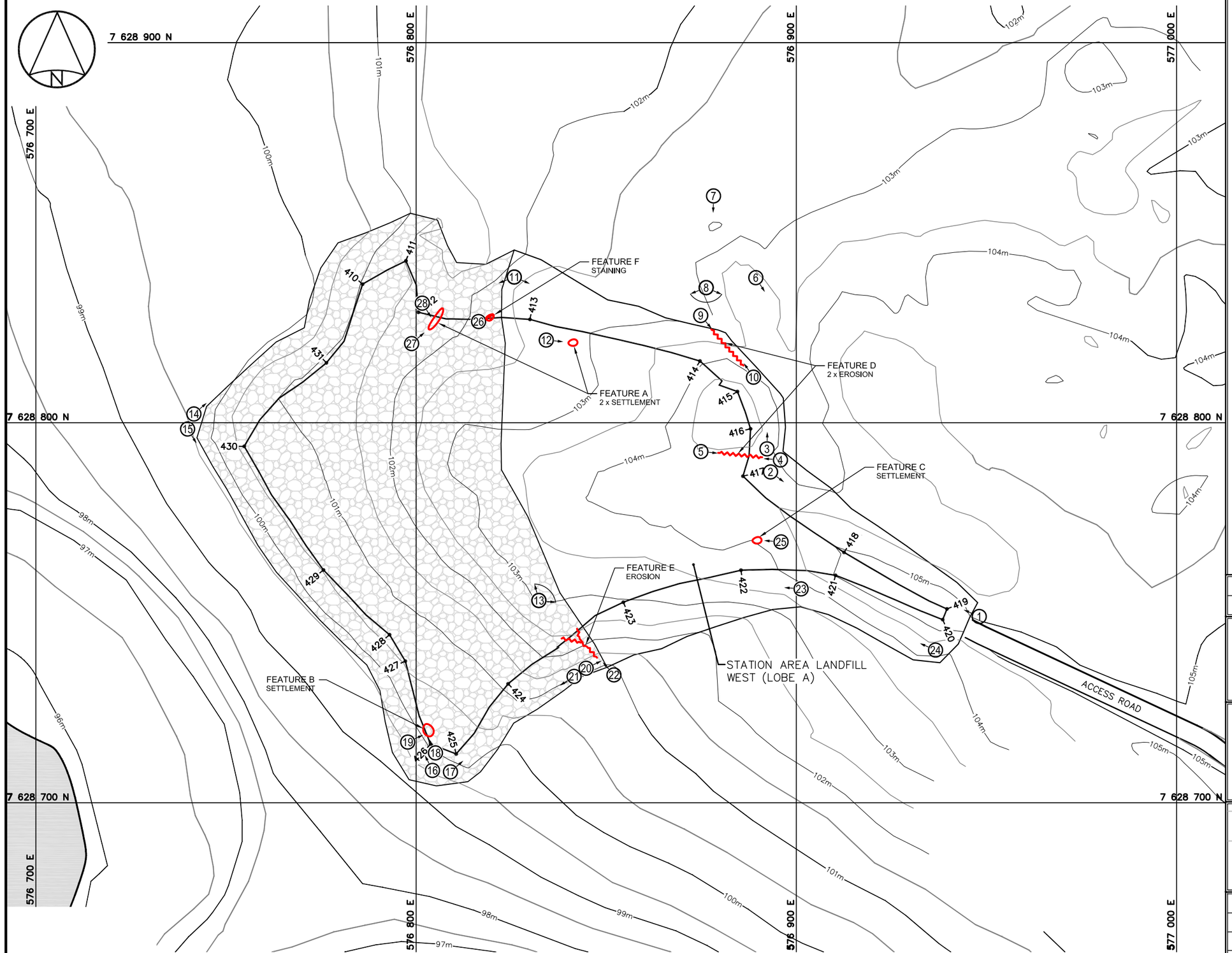
Table XIV: **Preliminary Stability Assessment – Station Area Landfill**

Feature	Severity Rating	Extent
Settlement	Acceptable	Occasional
Erosion	Acceptable	Isolated
Frost Action	Not observed	None
Staining	Acceptable	Isolated
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris exposure	Not observed	None
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 landfill is compromised to the extent that 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, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

6.3 LOCATION PLAN

The Location Plan for the Station Area Landfill has been completed as per the ToR and is presented in Figure PIN-4.5.



LEGEND

- 410 — COORDINATE POINT
- BODY OF WATER
- SETTLEMENT (NTS)
- STAINING (NTS)
- EROSION (NTS)
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT

0m 10m 20m 30m 40m 50m

NO.	VERSION	DATE	PAR	VERIF.	APPR.
1	FINAL	15-06-29	P.L.	A.P.	P.G.

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COLLECTION OF LANDFILL MONITORING DATA

PIN-4, BYRON BAY, NUNAVUT

STATION AREA LANDFILL WEST

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	SCALE:	DATE (month-year):
Metre	1 : 1,000	JUNE 2015
DRAWN BY: L. LA PIERRE	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GELINAS, P. ENG.
PROJECT NO: CD3654_310_313	DRAWING NO: CD3654_310_313-PIN-4.5-PL	PAGE PL

FIGURE PIN-4.5

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6.4 PHOTOGRAPHIC RECORDS

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

Table XV: **Landfill Visual Inspection Photo Log – Station Area Landfill**

Site Name: PIN-4, Byron Bay
Landfill: Station Area Landfill - West
Date Inspected: August 25, 2014
Inspected by: Andrew Passalis, P.Eng.

Photo (SLF-)	Filename	Size (KB)	Date	Vantage Point		Caption
				Easting	Northing	
1	P414_3598	4 373	14-08-25	576948	7628748	View looking northwest along north side of Station Area Landfill Station Area Landfill
2	P414_3599	4 370	14-08-25	576893	7628788	View looking southeast along north side of Station Area Landfill
3	P414_3600	4 277	14-08-25	576893	7628792	View looking north along north side of Station Area Landfill
4	P414_3601	4 385	14-08-25	576895	7628790	View looking west at minor erosion on west cover of Station Area Landfill - FEATURE D (New)
5	P414_3602	4 280	14-08-25	576876	7628792	View looking east at minor erosion on west cover of Station Area Landfill - FEATURE D (new)
6	P414_3603	4 451	14-08-25	576890	7628837	View looking southeast along north side of Station Area Landfill
7	P414_3604	4 295	14-08-25	576878	7628860	View south at north side of Station Area Landfill
8	P414_3605	1 107	14-08-25	576876	7628834	Panoramic view looking southeast to southwest at northwest side of Station Area Landfill
9	P414_3606	4 330	14-08-25	576875	7628828	View looking southwest at minor erosion on cover of Station Area Landfill - FEATURE D (new)
10	P414_3607	4 374	14-08-25	576888	7628812	View looking northwest at minor erosion on cover of Station Area Landfill - FEATURE D (new)
11	P414_3608	4 339	14-08-25	576826	7628838	View looking southwest along northwest side of Station Area Landfill
12	P414_3609	4 403	14-08-25	576834	7628822	View looking east at pothole depression on northwest cover of Station Area Landfill - FEATURE A (new)
13	P414_3611	1 087	14-08-25	576831	7628753	Panoramic view looking east to north across east cover of Station Area Landfill
14	P414_3612	4 359	14-08-25	576741	7628801	View looking northeast along northwest side of Station Area Landfill
15	P414_3613	4 286	14-08-25	576741	7628799	View looking southeast along northwest side of Station Area Landfill
16	P414_3614	4 402	14-08-25	576804	7628709	View looking northwest along southwest side of Station Area Landfill
17	P414_3615	4 401	14-08-25	576808	7628708	View looking northeast along southeast side of Station Area Landfill
18	P414_3616	4 350	14-08-25	576805	7628713	View looking northwest at depression on south crest of Station Area Landfill - FEATURE B (new)
19	P414_3617	4 239	14-08-25	576799	7628716	View looking northeast at depression on south crest of Station Area Landfill - FEATURE B (new)
20	P414_3618	4 439	14-08-25	576844	7628735	View looking northeast along south side of Station Area Landfill
21	P414_3619	4 395	14-08-25	576843	7628734	View looking southwest along south side of Station Area Landfill
22	P414_3620	4 287	14-08-25	576852	7628733	View looking northwest at minor erosion on cover and side slope of Station Area Landfill - FEATURE E (new)
23	P414_3621	4 286	14-08-25	576901	7628756	View looking west at mound of granular material on cover from grading
24	P414_3622	4 399	14-08-25	576937	7628741	View looking west-northwest along south side of Station Area Landfill
25	P414_3623	4 418	14-08-25	576896	7628768	View west at localized depression on east side of Station Area Landfill cover - FEATURE C (new)
26	P414_3624	4 394	14-08-25	576818	7628827	View of surface stain on northwest cover of Station Area Landfill - FEATURE F
27	P414_3625	4 397	14-08-25	576799	7628822	View looking northeast at linear depression on west side of Station Area Landfill - FEATURE A (new)
28	P414_3626	4 359	14-08-25	576802	7628830	View looking southeast at linear depression on west side of Station Area Landfill - FEATURE A (new)

7 USAF LANDFILL

7.1 SUMMARY

On August 25, 2014 a visual inspection was completed at the USAF Landfill. Neither soil nor groundwater sampling was performed.

As of the 2014 monitoring event, no features were identified with “significant” or “unacceptable” severity ratings. Indications of settlement or erosion were not observed, however two localized areas of seepage were observed along the south toe of the landfill. No exposed debris was noted.

At this time, the overall performance of the landfill is rated as acceptable.

The Visual Inspection Checklist is included in Table XVI of this report and has been completed as per the TOR. Please refer to Figure PIN-4.6 for a sketch of the USAF Landfill detailing the location of photographs and erosional features.

Table XVI: **Visual Inspection Checklist - USAF Landfill**

DEW Line Cleanup: Post-construction - Landfill Monitoring
Visual Inspection Checklist

Inspection Report - Page 1 of 2

SITE NAME: PIN-4 Byron Bay
LANDFILL DESIGNATION: USAF Landfill
DATE OF INSPECTION: August 25, 2014
DATE OF PREVIOUS INSPECTION: August 14, 2013
INSPECTED BY: A. Passalis
REPORT PREPARED BY: A. Passalis
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.

TABLE XVI: USAF LANDFILL VISUAL INSPECTION (PAGE 2 OF 2)

Site Name: PIN-4, Byron Bay
Landfill: USAF Landfill
Designation: Existing Regrade Area
Date Inspected: August 25, 2014
Inspected by: Andrew Passalis, P.Eng.

Signature: 

Checklist Item	Present (Yes/No)	Location	Length	Width	Depth	Extent	Description	Photographic Record	Severity Rating	Additional Comments
Settlement	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Erosion	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Frost Action	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Animal Burrows	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Vegetation	Yes	See Figure PIN-4.6 and Photographic Record	N/A	N/A	N/A	<1%	Sparse vegetation on south side	USAF-10	N/A	No Significant Change from Past Observation.
Staining	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Vegetation Stress	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Seepage Points	Yes	Feature A See Figure PIN-4.6 (S toe)	8 - 10 m	2 - 3 m	N/A	Isolated	Two areas of seepage along toe	USAF-10, 11	Acceptable	Minor staining and vegetation growth also noted in seepage areas. No Significant Change from Past Observation.
Debris Exposed	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Presence/Condition of Monitoring Instruments	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Other Features of Note:	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Additional Photos	Yes	See Figure PIN-4.6 and Photographic Record	N/A	N/A	N/A	N/A	General Photographic Record	N/A	Not Observable	General photos for documentation, no additional features of note.
Overall Landfill Performance:	**Acceptable**									

7.2 PRELIMINARY STABILITY ASSESSMENT

The Preliminary Stability Assessment for USAF Landfill has been completed as per the ToR and is included as Table XVII hereafter.

Table XVII: **Preliminary Stability Assessment – USAF Landfill**

Feature	Severity Rating	Extent
Settlement	Not observed	None
Erosion	Not observed	None
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**	

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 landfill is compromised to the extent that 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, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

7.3 LOCATION PLAN

The Location Plan for the USAF Landfill has been completed as per the TOR and is presented in Figure PIN-4.6.

7 628 700 N

7 628 625 N

7 628 550 N

577 250 E

577 325 E

577 400 E

105m

104m

103m

102m

101m

100m

99m

98m

97m

96m

95m

ACCESS ROAD

620

621

623

624

625

USAF LANDFILL

FEATURE A
2 x SEEPAGE

1 2 3 4 5 6 7 8 9 10 11

LEGEND

620 COORDINATE POINT

SEEPAGE (NTS)

1 APPROX. PHOTOGRAPHIC VIEWPOINT

0m 7,5m 15,0m 22,5m 30,0m 37,5m

NO.	VERSION	DATE	P.L. PAR	A.P. VERIF.	P.G. APPR.
1	FINAL	15-06-29			

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-4, BYRON BAY, NUNAVUT

USAF 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	SCALE:	DATE (month-year):
Metre	1 : 750	JUNE 2015
DRAWN BY: L. LA PIERRE	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GELINAS, P. ENG.
PROJECT NO: CD3654_310_313	DRAWING NO: CD3654_310_313-PIN-4.6-PL	PAGE PL

FIGURE PIN-4.6

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7.4 PHOTOGRAPHIC RECORDS

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

Table XVIII: **Landfill Visual Inspection Photo Log – USAF Landfill**

Site Name: PIN-4, Byron Bay
Landfill: USAF Landfill
Date Inspected: August 25, 2014
Inspected by: Andrew Passalis, P.Eng.

Photo (USAF-)	Filename	Size (KB)	Date	Vantage Point		Caption
				Easting	Northing	
1	P414_3643	4 010	14-08-25	577294	7628565	View looking northeast along south side of USAF Landfill
2	P414_3644	4 347	14-08-25	577293	7628566	View looking northwest along west side of USAF Landfill
3	P414_3645	4 160	14-08-25	577281	7628585	View looking northeast along north side of USAF Landfill
4	P414_3646	4 403	14-08-25	577341	7628623	View looking southwest along north side of USAF Landfill
5	P414_3647	4 315	14-08-25	577341	7628622	View looking southeast along east side of USAF Landfill
6	P414_3648	4 291	14-08-25	577352	7628626	View looking southeast along east crest of USAF Landfill
7	P414_3649	4 411	14-08-25	577354	7628609	View looking southeast along east toe of USAF Landfill
8	P414_3650	4 419	14-08-25	577313	7628573	View looking northwest at south side of USAF Landfill
9	P414_3651	881	14-08-25	577325	7628569	Panoramic view looking west to northeast at south side of USAF Landfill
10	P414_3652	4 404	14-08-25	577312	7628585	View northeast at wetted area along south toe of landfill - FEATURE A
11	P414_3653	4 318	14-08-25	577319	7628579	View northwest at wetted area and seepage along south toe of landfill - FEATURE A

8 TIER II DISPOSAL FACILITY

8.1 SUMMARY

The 2014 monitoring of the Tier II Disposal Facility conducted on August 25, 2014 consisted of a visual inspection to identify areas of erosion and, as per the TOR, the collection of soil and groundwater samples, as well as thermal monitoring.

No PCB or relatively high metal concentrations were detected in any of the soil samples collected. Detectable concentrations of TPH (PHC F3 Fraction) were noted in the surface sample collected at down gradient location MW-2 (118 mg/kg) and in surface and depth samples at downgradient location MW-3 (123 mg/kg and 63 mg/kg, respectively).

No PCB, TPH or relatively high metal concentrations were detected at any of the wells sampled, with the exception of downgradient well MW-4, which noted slightly elevated levels of chromium (5.57 mg/L), zinc (1.88 mg/L) and nickel (2.00 mg/L).

All thermistors at the Tier II Soil Disposal Facility were inspected and found to be in good condition with no significant concerns identified. Data from all thermistors was successfully retrieved with the exception of VT-2, where all communication failed. Data logger was taken south for repair.

As of the 2014 monitoring event, no features were identified with “significant” or “unacceptable” severity ratings. Indications of minor settlement were noted at two locations on the Tier II Disposal Facility, including: one localized depression on the top southeast corner and one small linear type feature on the west crest. Both features were not observed during the previous 2013 inspection. Evidence of minor surface erosion was noted at a single location on the east crest and upper slope. A moderate sized area of ponded water was noted in a low lying area adjacent to the southeast corner of the facility. No exposed debris were noted.

At this time, the overall performance of the landfill is rated as acceptable.

The Visual Inspection Checklist is included in Table XIX of this report and has been completed as per the TOR. Please refer to Figure PIN-4.7 for a sketch of the Tier II Disposal Facility detailing the location of photographs and erosional features.

Table XIX: **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: PIN-4 Byron Bay
LANDFILL DESIGNATION: Tier II Disposal Facility (New Landfill)
DATE OF INSPECTION: August 25, 2014
DATE OF PREVIOUS INSPECTION: August 13, 2013
INSPECTED BY: A. Passalis
REPORT PREPARED BY: A. Passalis
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.

TABLE XIX: TIER II DISPOSAL FACILITY VISUAL INSPECTION (PAGE 2 OF 2)

Site Name: PIN-4, Byron Bay
Landfill: Tier II Disposal Facility
Designation: New Landfill
Date Inspected: August 25, 2014
Inspected by: Andrew Passalis, P.Eng.

Signature: 

Checklist Item	Present (Yes/No)	Location	Length	Width	Depth	Extent	Description	Photographic Record	Severity Rating	Additional Comments
Settlement	Yes	FEATURE A See Figure PIN-4.7 (SE corner) - New Obs.	1.5 m	2 m	0.1 m	Isolated	Minor depression	Tier II-13, 14	Acceptable	Subtle depression on SE top corner.
		FEATURE B See Figure PIN-4.7 (W crest) - New Obs.	0.5 m	0.15 m	0.05 m	Isolated	Minor depression	Tier II-19, 20	Acceptable	Subtle depression on SE top corner.
Erosion	Yes	FEATURE C See Figure PIN-4.7 (E crest/slope) - New Obs.	5 m	0.2 m	0.02 - 0.05 m	Isolated	Minor erosion	Tier II-15, 16	Acceptable	Self armouring. Slope appears stable.
Frost Action	No		N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Animal Burrows	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Vegetation	Yes	See Figure PIN-4.7 and Photographic Record	N/A	N/A	N/A	Isolated	Sparse vegetation on cover	Tier II-10, 11, 27, 28	N/A	No Significant Change from Past Observation.
Staining	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Vegetation Stress	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Seepage Points	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Debris Exposed	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Presence/Condition of Monitoring Instruments	Yes	N/A	N/A	N/A	N/A	N/A	VT-1, 2, 3, 4 MW-1, 2, 3, 4	Tier II - 26, 17, 18, 9 MW1, MW2, MW3, MW4	Not Observable	N/A
Other Features of Note:	Yes	See Figure PIN-4.7 and Photographic Record	2 - 5 m	0.3 - 0.5 m	0.1 - 0.15 m	N/A	Ridges and depressions on cover	Tier II-10, 17	Acceptable	Possible construction artifact (rough grading of landfill cover with organic material). No Significant Change from Past Observation.
		FEATURE D See Figure PIN-4.7 and Photographic Record	7 m	5 m	Unknown	N/A	Localized ponding on SE toe	Tier II-13, 33	Acceptable	Localized ponding in low lying area. No Significant Change from Past Observation.
Additional Photos	Yes	See Figure PIN-4.7 and Photographic Record	N/A	N/A	N/A	N/A	General Photographic Record	N/A	Not Observable	General photos for documentation, no additional features of note.
Overall Landfill Performance:	**Acceptable**									

8.2 PRELIMINARY STABILITY ASSESSMENT

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

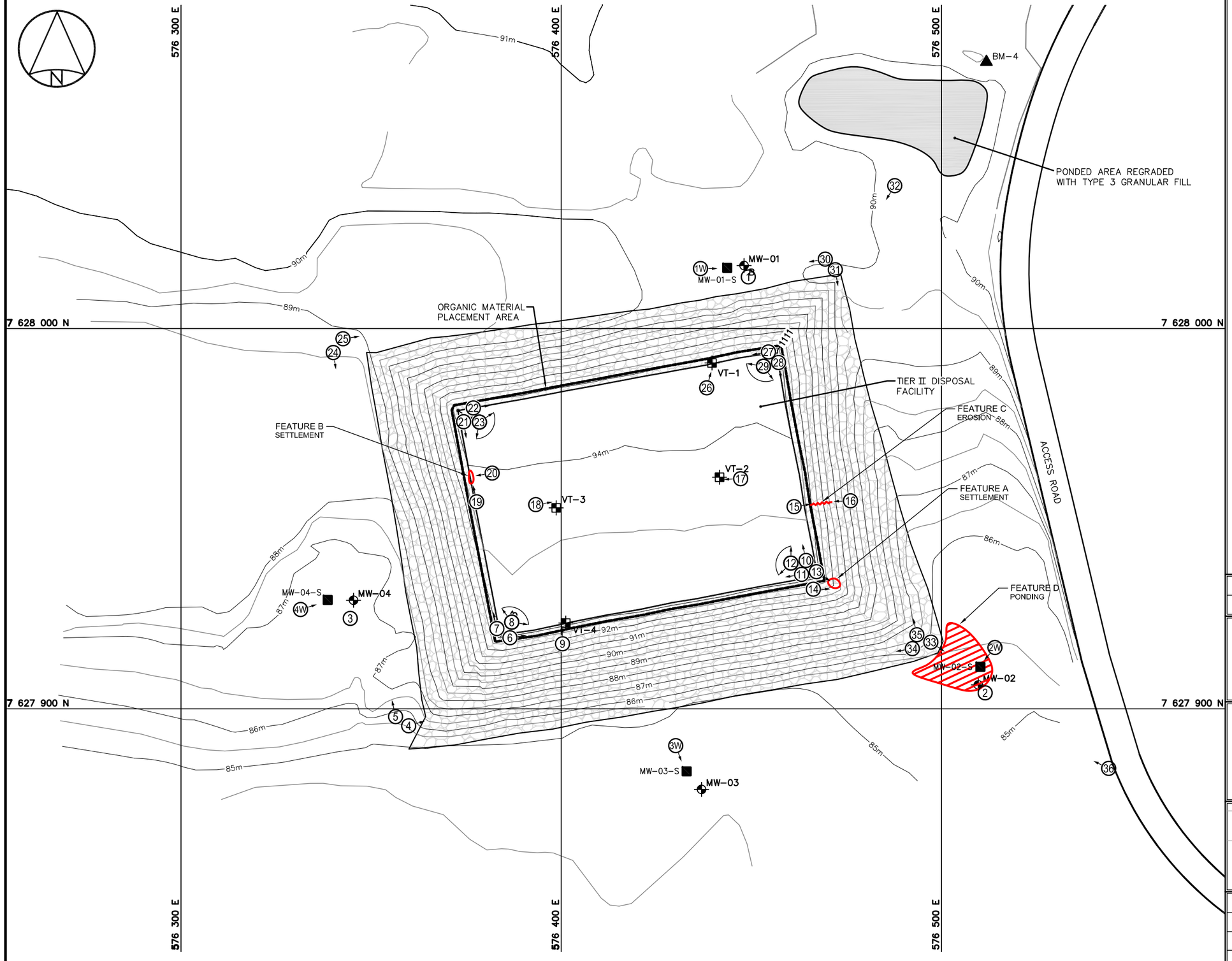
Table XX: **Preliminary Stability Assessment – Tier II Disposal Facility**

Feature	Severity Rating	Extent
Settlement/Cracks	Acceptable	Isolated
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**	

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 landfill is compromised to the extent that 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, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

8.3 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 PIN-4.7.



LEGEND

- BM-4 — PERMANENT BENCHMARK LOCATION
- 1110 — COORDINATE POINT
- MW-02 — MONITORING WELL LOCATION
- MW-01 B — BACKGROUND MONITORING WELL LOCATION
- VT-1 — GROUND TEMPERATURE CABLE LOCATION
- BODY OF WATER
- SETTLEMENT (NTS)
- PONDING (NTS)
- EROSION (NTS)
- MONITORING SOIL SAMPLE LOCATION
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT

0m 10m 20m 30m 40m 50m

NO.	VERSION	DATE	PAR	VERIF.	APPR.
1	FINAL	15-06-29	P.L.	A.P.	P.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-4, BYRON BAY, 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	SCALE:	DATE (month-year):
Metre	1 : 1,000	JUNE 2015
DRAWN BY:	VERIFIED BY:	APPROVED BY:
L. LA PIERRE	A. PASSALIS	P. GELINAS, P. ENG.
PROJECT NO:	DRAWING NO:	PAGE
CD3654_310_313	CD3654_310_313-PIN-4.7-PL	PL

FIGURE PIN-4.7

G:\CD3654\PIN-4\2014\FINAL\CD3654_310_313-PIN-4.7-PL.dwg, PL, 2015-06-29 8:33:30 AM

8.4 PHOTOGRAPHIC RECORDS

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

Table XXI: **Visual Inspection Photo Log – Tier II Disposal Facility (page 1 of 2)**

Site Name: PIN-4, Byron Bay
Landfill: Tier II Disposal Facility
Date Inspected: August 25, 2014
Inspected by: Andrew Passalis, P.Eng.

Photo (Tier II-)	Filename	Size (KB)	Date	Vantage Point		Caption
				Easting	Northing	
1	P414_3448	4 236	14-08-25	576448.1	7628015	MW-1
2	P414_3451	4 210	14-08-25	576510.5	7627905.9	MW-2
3	P414_3458	4 331	14-08-25	576343.7	7627926.2	MW-4
4	P414_3460	4 334	14-08-25	576358.6	7627895.9	View looking east along south toe of Tier II DF
5	P414_3461	4 416	14-08-25	576356.9	7627897.1	View looking north along west toe of Tier II DF
6	P414_3462	4 455	14-08-25	576385.3	7627919.4	View looking east along south crest of Tier II DF
7	P414_3463	4 329	14-08-25	576383.9	7627920.5	View looking north along west crest of Tier II DF
8	P414_3464	1 239	14-08-25	576386.8	7627921.6	Panoramic view looking northwest to east from southwest corner of Tier II DF
9	P414_3465	4 210	14-08-25	576400.2	7627919	View looking north at VT-4. VT-3 in background
10	P414_3466	4 390	14-08-25	576464.8	7627938.6	View looking north along east crest of Tier II DF
11	P414_3467	4311	14-08-25	576464	7627936	View looking west along south crest of Tier II DF
12	P414_3468	1 419	14-08-25	576462	7627937	Panoramic view looking southwest to north from northwest corner of Tier II DF
13	P414_3469	4 435	14-08-25	576468	7627936	View looking southeast at subtle depression on southeast corner of Tier II DF - FEATURE A (new)
14	P414_3470	4 374	14-08-25	576467	7627931	View looking east at subtle depression on southeast corner of Tier II DF - FEATURE A (new)
15	P414_3471	4 413	14-08-25	576462	7627953	View looking east at minor erosion at east crest of Tier II DF - FEATURE C (new)
16	P414_3472	4 312	14-08-25	576474	7627955	View looking west at minor erosion at east crest of Tier II DF - FEATURE C (new)
17	P414_3473	4 390	14-08-25	576447	7627961	View looking west at VT-2. VT-3 in background
18	P414_3474	4 259	14-08-25	576394	7627953	View looking east at VT-3. VT-2 in background
19	P414_3476	4 338	14-08-25	576377	7627956	View looking north at linear depression along west crest of Tier II DF- FEATURE B (new)
20	P414_3477	4 375	14-08-25	576380	7627961	View looking west at linear depression along west crest of Tier II DF- FEATURE B (new)

Table XXI: Landfill Visual Inspection Photo Log – Tier II Disposal Facility (page 2 of 2)

Photo (Tier II-)	Filename	Size (KB)	Date	Vantage Point		Caption
				Easting	Northing	
21	P414_3478	4 400	14-08-25	576375	7627976	View looking south along west crest of Tier II DF
22	P414_3479	4 307	14-08-25	576376	7627978	View looking east along north crest of Tier II DF
23	P414_3480	1 384	14-08-25	576378	7627975	Panoramic view looking northeast to south from northwest corner of Tier II DF
24	P414_3481	4 255	14-08-25	576341,2	7627994,7	View looking south along west toe of Tier II DF
25	P414_3482	4 294	14-08-25	576342	7627997	View looking east along north toe of Tier II DF
26	P414_3483	4 333	14-08-25	576439	7627986	View looking north-northeast at VT-1
27	P414_3484	4 220	14-08-25	576455	7627993	View looking west along north crest of Tier II DF
28	P414_3485	4 304	14-08-25	576456	7627992	View looking south along east crest of Tier II DF
29	P414_3486	1 407	14-08-25	576453	7627990	Panoramic view looking southeast to west from northeast corner of Tier II DF
30	P414_3487	4 246	14-08-25	576470	7628018	View looking west along north toe of Tier II DF
31	P414_3488	4 423	14-08-25	576471	7628016	View looking south along east toe of Tier II DF
32	P414_3489	4 102	14-08-25	576488	7628036	View looking southwest at north and east sides of Tier II DF
33	P414_3490	4 393	14-08-25	576496	7627918	View looking southeast at ponded water around MW-2 southeast of Tier II DF
34	P414_3491	4 127	14-08-25	576493	7627917	View looking west along south toe of Tier II DF
35	P414_3492	4 352	14-08-25	576493	7627918	View looking north along east toe of Tier II DF
36	P414_3493	3 897	14-08-25	576544	7627884	View looking northwest at south and east sides of Tier II DF
Soil Sampling						
1W	P414_3449	4 386	14-08-25	576443,1	7628016,2	Sampling location P414-1W located upgradient of Tier II DF
MW1	P414_3450	4 051	14-08-25	576438	7628015	View looking east at MW-01 located upgradient of Tier II DF
2W	P414_3452	4 199	14-08-25	576511	7627911	Sampling location P414-2W located downgradient of Tier II DF
MW2	P414_3453	4 239	14-08-25	576513	7627915	View looking southwest at MW-02 located downgradient of Tier II DF
3W	P414_3454	4 351	14-08-25	576433	7627883	Sampling location P414-3W located downgradient of Tier II DF
MW3	P414_3455	4 335	14-08-25	576431	7627890	View looking south at MW-03 located downgradient of Tier II DF
4W	P414_3456	4 294	14-08-25	576339	7627928	Sampling location P414-4W located downgradient of Tier II DF
MW4	P414_3457	4 263	14-08-25	576332	7627926	View looking east at MW-04 located downgradient of Tier II DF

8.5 THERMISTOR ANNUAL MAINTENANCE REPORTS

Data from all thermistors was successfully retrieved with the exception of VT-2, where all communication failed due to extremely low battery levels (associated with the use of a non-manufacturer supplied battery). New batteries were installed in the VT-2 data logger, however the communication issue could not be resolved and the data logger was removed from site and shipped to the manufacturer for evaluation and repair.

Review of the downloaded thermal data identified all analogues/thermocouples to be functioning properly during the 2013/2014 monitoring period.

Internal memories were reset and clocks were synchronized using the Prolog Software. Manual resistive readings were collected from the thermistor strings as per the ToR. Manual readings and inspection results for each thermistor are presented on the Thermistor Annual Maintenance Reports (VT-1 to VT-4) included in this section of the report.

Contractor Name:	**Sila Remediation Inc.**	Inspection Date:	**2014-08-25**
Prepared By:	**A.Passalis**		

Thermistor Information

Site Name:	**PIN-4**	Thermistor Location		**Tier II Disposal Facility**			
Thermistor Number:	**VT-1**	Inclination		**Vertical**			
Install Date:	**13-08-2012**	First Date Event		**01-08-2012**	Last Date Event		**2013-08-13**
Coordinates and Elevation	N	**7627991**	E	**576439.6**	Elev	**94.4**	
Length of Cable (m)	**9.2**	Cable Lead Above Ground (m)	**2.35**	Nodal Points			**13**
Datalogger Serial #	**12030012**			Cable Serial Number			**TS07060012**

Thermistor Inspection

	Good			
	Yes		No	Problem/Maintenance
Casing	**x**			
Cover	**x**			
Data Logger	**x**			
Cable	**x**			
Beads	**x**			
Battery Installation Date		**08-2012**		
Battery Levels	Main	**11.34 V**	Aux	**13.5 V**

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	13.448	3.9687
2	15.253	1.4524
3	16.405	-0.0166
4	17.012	-0.6898
5	18.18	-2.0647
6	19.11	-3.0219
7	20.05	-4.0019
8	20.95	-4.8683

Bead	ohms	Degrees C
9	21.7	-5.5565
10	22.37	-6.2433
11	22.97	-6.8004
12	23.64	-7.354
13	24.21	-7.6825
-	-	-
-	-	-
-	-	-

Observations and Proposed Maintenance

Download thermistor data. File: Site_001_VT-1 PIN-4_Aug_25_2014

Reset clock and restart datalogger.

Contractor Name:	**Sila Remediation Inc.**	Inspection Date:	**2014-08-25**
Prepared By:	**A.Passalis**		

Thermistor Information

Site Name:	**PIN-4**		Thermistor Location		**Tier II Disposal Facility**		
Thermistor Number:	**VT-2**		Inclination		**Vertical**		
Install Date:	**13-08-2012**		First Date Event		**01-08-2012**	Last Date Event	**2013-08-13**
Coordinates and Elevation	N	**7627960.9**	E	**576441.6**	Elev	**93.9**	
Length of Cable (m)	**9.2**		Cable Lead Above Ground (m)	**3.7**	Nodal Points		**13**
Datalogger Serial #	**07060012**				Cable Serial Number		**TS07060014**

Thermistor Inspection

	Good			
	Yes		No	Problem/Maintenance
Casing	**x**			
Cover	**x**			
Data Logger			**x**	Retrieved for off-site servicing/repair
Cable	**x**			
Beads	**x**			
Battery Installation Date		**08-2012**		
Battery Levels	Main	**0 (Vray-o-vac battery)**	Aux	**??**

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	10.013	-
2	10.216	-
3	11.107	-
4	12.467	-
5	18.823	-
6	14.803	-
7	15.158	-
8	15.979	-

Bead	ohms	Degrees C
9	16.867	-
10	17.123	-
11	18.109	-
12	18.645	-
13	19.37	-
-	-	-
-	-	-
-	-	-

Observations and Proposed Maintenance

Unable to communicate with datalogger to download data or obtain temperature readings. Batteries completely dead. Replace with ULB-1 and still no response from datalogger.

Retrieve datalogger for off-site servicing/repair.

Contractor Name:	**Sila Remediation Inc.**	Inspection Date:	**2014-08-25**
Prepared By:	**A.Passalis**		

Thermistor Information

Site Name:	**PIN-4**		Thermistor Location	**Tier II Disposal Facility**			
Thermistor Number:	**VT-3**		Inclination	**Vertical**			
Install Date:	**13-08-2012**		First Date Event	**01-08-2012**	Last Date Event		**2013-08-13**
Coordinates and Elevation	N	**7627952.9**	E	**576398.7**	Elev	**93.8**	
Length of Cable (m)	**9.2**	Cable Lead Above Ground (m)	**3.75**	Nodal Points			**13**
Datalogger Serial #	**07040011**			Cable Serial Number			**TS07060021**

Thermistor Inspection

	Good			
	Yes		No	Problem/Maintenance
Casing	**x**			
Cover	**x**			
Data Logger	**x**			
Cable	**x**			
Beads	**x**			
Battery Installation Date		**08-2012**		
Battery Levels	Main	**11.34 V**	Aux	**13.26 V**

Manual Ground Temperature Readings

Bead	ohms	Degrees C	Bead	ohms	Degrees C
1	9.513	9.4204	9	15.756	-2.2142
2	9.518	9.1176	10	16.496	-3.2901
3	10.137	7.788	11	17.026	-4.0413
4	11.021	5.9675	12	17.516	-4.7595
5	12.446	3.1969	13	18.11	-5.4976
6	13.516	1.3292	-	-	-
7	14.282	0.062	-	-	-
8	14.969	-0.9836	-	-	-

Observations and Proposed Maintenance

Download thermistor data. File: Site_default_Aug_16_2013.
Reset clock and restart datalogger.

Contractor Name:	**Sila Remediation Inc.**	Inspection Date:	**2014-08-25**
Prepared By:	**A.Passalis**		

Thermistor Information

Site Name:	**PIN-4**		Thermistor Location		**Tier II Disposal Facility**		
Thermistor Number:	**VT-4**		Inclination		**Vertical**		
Install Date:	**13-08-2012**		First Date Event		**01-08-2012**	Last Date Event	**2013-08-13**
Coordinates and Elevation	N	**7627922.6**	E	**576401.2**	Elev	**93.3**	
Length of Cable (m)	**10.5**	Cable Lead Above Ground (m)	**4.35**	Nodal Points			**16**
Datalogger Serial #	**07060014**			Cable Serial Number			**TS07040011**

Thermistor Inspection

	Good			
	Yes		No	Problem/Maintenance
Casing	**x**			
Cover	**x**			
Data Logger	**x**			
Cable	**x**			
Beads	**x**			
Battery Installation Date		**08-2012**		
Battery Levels	Main	**11.34 V**	Aux	**13.5 V**

Manual Ground Temperature Readings

Bead	ohms	Degrees C
1	9.531	9.0118
2	10.009	7.9485
3	10.776	6.2721
4	12.4	3.0944
5	13.355	1.3896
6	14.277	-0.1383
7	14.89	-1.1055
8	15.595	-2.2142

Bead	ohms	Degrees C
9	16.119	-3.0037
10	16.751	-3.8549
11	17.186	-4.5688
12	17.679	-5.289
13	17.964	-5.7659
14	18.38	-6.3639
15	18.45	-6.7131
16	18.607	-6.9096

Observations and Proposed Maintenance

Download thermistor data. File: Site_001_0705006_Aug_16_2013.
Reset clock and restart datalogger.

8.6 SOIL SAMPLE ANALYTICAL DATA

The soil chemical analysis results for the 2014 Tier II Disposal Facility samples are presented in Table XXII hereafter. Certificates of analyses and results of field duplicates collected as part of the QA/QC program are presented in Annexes 1 and 2 at the end of this report.

Table XXII: **Tier II Summary Table for Soil Analytical Data**

Sample #	Location	Depth (cm)	Parameters										F1	F2	F3
			As [mg/kg]	Cd [mg/kg]	Cr [mg/kg]	Co [mg/kg]	Cu [mg/kg]	Pb [mg/kg]	Ni [mg/kg]	Zn [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	C_6-C_{10} [mg/kg]	C_{10}-C_{16} [mg/kg]	C_{16}-C_{34} [mg/kg]
Detection Limit			0.2	0.01	0.5	0.1	1.0	5.0	0.5	1	0.01	0.1	10	50	50
Upgradient Soil Samples															
P414-1WA	MW-1	0-15	1.7	0.02	7.1	6.7	14.9	<5.0	18.8	11	<0.01	<0.1	<10	<50	<50
P414-1WB		40-50	1.9	0.02	12.5	9.3	37.7	<4.9	21.5	24	<0.01	<0.1	<10	<50	<50
Downgradient Soil Samples															
P414-2WA	MW-2	0-15	2.0	0.06	12.1	8.7	50.7	<4.9	20.9	34	0.01	<0.1	<10	<50	118
P414-2WB		40-50	1.6	0.01	11.3	8.1	45.6	<4.9	16.5	24	<0.01	<0.1	<10	<50	<50
P414-3WA	MW-3	0-15	2.0	0.07	8.1	5.1	88.6	<5.0	12.6	11	0.07	<0.1	<10	<50	123
P414-3WB		40-50	1.3	0.06	7.7	5.9	73.1	<5.0	10.2	14	0.04	<0.1	<10	<50	63
P414-4WA	MW-4	0-15	1.9	0.01	11.0	7.2	23.2	<5.0	19.0	17	<0.01	<0.1	<10	<50	<50
P414-4WB		40-50	1.8	<0.01	10.5	7.6	25.2	<5.0	16.9	18	<0.01	<0.1	<10	<50	<50

8.7 GROUNDWATER SAMPLE ANALYTICAL DATA

The groundwater chemical analysis results and evaluation for the analytical data for the 2014 Tier II Disposal Facility samples are presented in Table XXIII hereafter. Certificates of analyses and results for groundwater samples collected as part of the QA/QC program are presented in Annexes 1 and 2, at the end of this report.

Table XXIII: **Tier II Summary Table for Groundwater Analytical Data**

Sample #	Location	Parameters												
												F1	F2	F3
		As [mg/L]	Cd [ug/L]	Cr [mg/L]	Co [mg/L]	Cu [mg/L]	Pb [mg/L]	Ni [mg/L]	Zn [mg/L]	Hg [ug/L]	PCBs [ug/L]	C_6-C_{10} [mg/L]	C_{10}-C_{16} [mg/L]	C_{10}-C_{34} [mg/L]
Detection Limit		0.0002	0.00001	0.0005	0.0001	0.001	0.0001	0.0005	0.001	0.005	0.1	0.2	0.2	0.1
Upgradient Groundwater Sample														
P414-1W	MW-1	0.0021	0.00028	0.8990	0.0140	0.061	0.0025	0.6710	0.338	<0.005	<0.1	<0.2	<0.2	0.1
Downgradient Groundwater Samples														
P414-2W	MW-2	0.0042	0.00024	0.0509	0.0261	0.020	0.0045	0.0869	0.516	0.023	<0.1	<0.2	<0.2	<0.1
P414-3W	MW-3	0.0009	0.00008	0.1800	0.0078	0.021	0.0010	0.0546	0.092	0.015	<0.1	<0.2	<0.2	<0.1
P414-4W	MW-4	0.0040	0.00041	5.5700	0.0380	0.130	0.0010	2.0000	1.880	<0.005	<0.1	<0.2	<0.2	<0.1

8.8 MONITORING WELL SAMPLING / INSPECTION LOGS

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

Site Name:	**PIN-4**	**Byron Bay**	**Nunavut**
Date of Sampling Event:	2014-08-25	Time:	10:40
Names of Samplers:	A.Passalis		
Landfill Name:	Tier II Disposal Facility		
Monitoring Well ID:	MW-1		
Sample Number:	P414-1W		
Condition of Well:	Good		
Measured Data			
Well pipe height above ground	51		
Diameter of well (cm)=	5	ID	
Depth of well installation (cm)= (from ground surface)	450		
Length screened section (cm)=	300		
Depth to top of screen (cm)= (from ground surface)	50		
Depth to water surface (cm)= (from top of pipe)	148	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)	97		
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	215	Evidence of sludge or siltation:	No
Thickness of water column (cm)=	67		
Static volume of water in well (mL)=	1316		
Free product thickness (mm)=	0	Measurement method: (meter, paste, etc)	Interface Meter
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra Tubing, Foot Valve
Volume Purged Water=	1.5 L		
Decontamination required: (Y/N)	N, dedicated		
Number washes:	N/A		
Number rinses:	N/A		
Final pH=	8.1		
Final Conductivity (uS/cm)=	6120		
Final Temperature (degC)=	3.1		

Site Name:	**PIN-4**	**Byron Bay**	**Nunavut**
Date of Sampling Event:	2014-08-25	Time:	11:15
Names of Samplers:	A.Passalis		
Landfill Name:	Tier II Disposal Facility		
Monitoring Well ID:	MW-2		
Sample Number:	P414-2W		
Condition of Well:	Good		
Measured Data			
Well pipe height above ground	58		
Diameter of well (cm)=	5	ID	
Depth of well installation (cm)= (from ground surface)	450		
Length screened section (cm)=	300		
Depth to top of screen (cm)= (from ground surface)	60		
Depth to water surface (cm)= (from top of pipe)	78.5	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)	20.5		
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	165	Evidence of sludge or siltation:	No
Thickness of water column (cm)=	86.5		
Static volume of water in well (mL)=	1698		
Free product thickness (mm)=	0	Measurement method: (meter, paste, etc)	Interface Meter
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra Tubing, Foot Valve
Volume Purged Water=	2.5 L		
Decontamination required: (Y/N)	N, dedicated		
Number washes:	N/A		
Number rinses:	N/A		
Final pH=	7.4		
Final Conductivity (uS/cm)=	2250		
Final Temperature (degC)=	3.2		

Site Name:	**PIN-4**	**Byron Bay**	**Nunavut**
Date of Sampling Event:	2014-08-25	Time:	11:40
Names of Samplers:	A.Passalis		
Landfill Name:	Tier II Disposal Facility		
Monitoring Well ID:	MW-3		
Sample Number:	P414-3W	(Dup: P414-BDW1)	
Condition of Well:	Good		
Measured Data			
Well pipe height above ground	47		
Diameter of well (cm)=	5	ID	
Depth of well installation (cm)= (from ground surface)	450		
Length screened section (cm)=	300		
Depth to top of screen (cm)= (from ground surface)	40		
Depth to water surface (cm)= (from top of pipe)	86	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)	39		
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	226	Evidence of sludge or siltation:	No
Thickness of water column (cm)=	140		
Static volume of water in well (mL)=	2749		
Free product thickness (mm)=	0	Measurement method: (meter, paste, etc)	Interface Meter
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra Tubing, Foot Valve
Volume Purged Water=	4.5 L		
Decontamination required: (Y/N)	N, dedicated		
Number washes:	N/A		
Number rinses:	N/A		
Final pH=	7.5		
Final Conductivity (uS/cm)=	3320		
Final Temperature (degC)=	2.2		

Site Name:	**PIN-4**	**Byron Bay**	**Nunavut**
Date of Sampling Event:	2014-08-25	Time:	12:15
Names of Samplers:	A.Passalis		
Landfill Name:	Tier II Disposal Facility		
Monitoring Well ID:	MW-4		
Sample Number:	P414-4W		
Condition of Well:	Good		
Measured Data			
Well pipe height above ground	39		
Diameter of well (cm)=	5	ID	
Depth of well installation (cm)= (from ground surface)	450		
Length screened section (cm)=	300		
Depth to top of screen (cm)= (from ground surface)	50		
Depth to water surface (cm)= (from top of pipe)	85	Measurement method: (meter, tape, etc)	Interface Meter
Static water level (cm)= (below ground surface)	46		
Measured well refusal depth (cm)= (i.e. depth to frozen ground)	210	Evidence of sludge or siltation:	No
Thickness of water column (cm)=	125		
Static volume of water in well (mL)=	2454		
Free product thickness (mm)=	0	Measurement method: (meter, paste, etc)	Interface Meter
Purging: (Y/N)	Y	Purging/Sampling Equipment:	Waterra Tubing, Foot Valve
Volume Purged Water=	3.0 L		
Decontamination required: (Y/N)	N, dedicated		
Number washes:	N/A		
Number rinses:	N/A		
Final pH=	7.6		
Final Conductivity (uS/cm)=	>20000		
Final Temperature (degC)=	2.1		

9 AIRSTRIP LANDFILL

9.1 SUMMARY

On August 25, 2014 a visual inspection was completed at the Airstrip Landfill. Neither soil nor groundwater sampling was performed.

As of the 2014 monitoring event, no features were identified with “significant” or “unacceptable” severity ratings. Isolated areas of minor settlement and erosion were noted on the northeast cover and east side of the Airstrip Landfill. Two relatively small tension cracks were also noted on the east side of the landfill and are consistent with the 2013 observation.

At this time, the overall performance of the landfill is rated as acceptable.

The Visual Inspection Checklist is included in Table XXIV of this report and has been completed as per the TOR. Please refer to Figure PIN-4.8 for a sketch of the Airstrip Landfill detailing the location of photographs and erosional features.

Table XXIV: **Visual Inspection Checklist / Report – Airstrip Landfill**

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

INSPECTION REPORT – PAGE 1 of 2

SITE NAME: PIN-4 Byron Bay
LANDFILL DESIGNATION: Airstrip Landfill (Regrade Landfill)
DATE OF INSPECTION: August 25, 2014
DATE OF PREVIOUS INSPECTION: August 13, 2012
INSPECTED BY: A. Passalis
REPORT PREPARED BY: A. Passalis
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.

TABLE XXIV: AIRSTRIP LANDFILL VISUAL INSPECTION (PAGE 2 OF 2)

Site Name: PIN-4, Byron Bay
Landfill: Airstrip Landfill
Designation: Existing Regrade Area
Date Inspected: August 25, 2014
Inspected by: Andrew Passalis, P.Eng.

Signature: 

Checklist Item	Present (Yes/No)	Location	Length	Width	Depth	Extent	Description	Photographic Record	Severity Rating	Additional Comments
Settlement	Yes	FEATURE A See Figure PIN-4.8 (NE cover) - New Obs.	1 m	0.3 m	0.15 m	Isolated	Minor depression	ALF-13, 14	Acceptable	Subtle depression on cover.
Erosion	Yes	FEATURE B See Figure PIN-4.8 (E side slope) - New Obs.	2 - 6 m	0.1 m	0.05 m	Isolated	Minor erosion	ALF-8, 9	Acceptable	Self armouring.
Frost Action	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Animal Burrows	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Vegetation	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Staining	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Vegetation Stress	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Seepage Points	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Debris Exposed	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Presence/Condition of Monitoring Instruments	No	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Not Observable	N/A
Other Features of Note:	Yes	FEATURE C See Figure PIN-4.8 (E side) - New Obs.	3 m	1 - 3 mm	Unknown	Occasional	Partially infilled tension cracks	ALF-6, 7, 12	Acceptable	Two new tension cracks noted on the east side.
Additional Photos	Yes	See Figure PIN-4.8 and Photographic Record	N/A	N/A	N/A	N/A	General Photographic Record	N/A	Not Observable	General photos for documentation, no additional features of note.
Overall Landfill Performance:	**Acceptable**									

9.2 PRELIMINARY STABILITY ASSESSMENT

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

Table XXV: **Preliminary Stability Assessment – Airstrip Landfill**

Feature	Severity Rating	Extent
Settlement/Cracks	Acceptable	Occasional
Erosion	Acceptable	Isolated
Frost Action	Not observed	None
Staining	Not observed	None
Vegetation Stress	Not observed	None
Seepage/Ponded Water	Not observed	None
Debris exposure	Not observed	None
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 landfill is compromised to the extent that 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, impacted less than 50% of the surface area of the landfill
Extensive	Impacting greater than 50% of the surface area of the landfill

9.3 LOCATION PLAN

The Location Plan for the Airstrip Landfill has been completed as per the TOR and is presented in Figure PIN-4.8.

576 875 E | 576 950 E | 577 025 E

7 627 950 N | 7 627 875 N

BM-5

87m | 86m | 85m

AIRSTRIP LANDFILL (LOBE B)

ACCESS ROAD

FEATURE A
SETTLEMENT

FEATURE B
EROSION

FEATURE C
CRACK

FEATURE B
EROSION

FEATURE C
CRACK

701 | 702 | 703 | 704 | 705 | 706 | 707

1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15

LEGEND

- BM-5 — PERMANENT BENCHMARK LOCATION
- 701 — COORDINATE POINT
- BODY OF WATER
- SETTLEMENT (NTS)
- CRACK (NTS)
- EROSION (NTS)
- 1 — APPROX. PHOTOGRAPHIC VIEWPOINT

0m 7,5m 15,0m 22,5m 30,0m 37,5m

NO.	VERSION	DATE	P.L.	A.P.	P.G.
1	FINAL	15-06-29	P.L.	A.P.	P.G.

Construction de Défense Canada
Defence Construction Canada

COLLECTION OF LANDFILL MONITORING DATA

PIN-4, BYRON BAY, NUNAVUT

AIRSTRIP 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	SCALE:	DATE (month-year):
Metre	1 : 750	JUNE 2015
DRAWN BY: L. LA PIERRE	VERIFIED BY: A. PASSALIS	APPROVED BY: P. GELINAS, P. ENG.
PROJECT NO: CD3654_310_313	DRAWING NO: CD3654_310_313-PIN-4.8-PL	PAGE PL

FIGURE PIN-4.8

G:\CD3654\PIN-4\2014\FINAL\CD3654_310_313-PIN-4.8-PL.dwg, PL, 2015-06-29 8:35:02 AM

9.4 PHOTOGRAPHIC RECORDS

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

Table XXVI: **Landfill Visual Inspection Photo Log – Airstrip Landfill**

Site Name: PIN-4, Byron Bay
Landfill: Airstrip Landfill
Date Inspected: August 25, 2014
Inspected by: Andrew Passalis, P.Eng.

Photo (ALF-)	Filename	Size (KB)	Date	Vantage Point		Caption
				Easting	Northing	
1	P414_3627	4 322	14-08-25	576903,4	7627936,9	View looking southeast at north and west sides of Airstrip Landfill
2	P414_3628	4 074	14-08-25	576953,3	7627938,1	View looking southwest at north side of Airstrip Landfill
3	P414_3629	4 106	14-08-25	576972,6	7627901,2	View looking west at east side of Airstrip Landfill
4	P414_3630	4 373	14-08-25	576954,9	7627875,9	View northwest at southeast corner of Airstrip Landfill
5	P414_3631	1 033	14-08-25	576947,7	7627883,7	Panoramic view looking west to north from southeast corner of Airstrip Landfill
6	P414_3632	4 422	14-08-25	576950,0	7627889,1	View looking north at crack on east side slope of Airstrip Landfill - FEATURE C
7	P414_3633	4 414	14-08-25	576950,0	7627895,7	View of crack on east side slope of Airstrip Landfill - FEATURE C
8	P414_3634	4 409	14-08-25	576944,7	7627896,0	View looking east at erosion and partially infilled crack on east side slope of Airstrip Landfill - FEATURE B
9	P414_3635	4 422	14-08-25	576957,8	7627899,2	View looking west at erosion and partially infilled crack on east side slope of Airstrip Landfill - FEATURE B
10	P414_3636	4 405	14-08-25	576959,5	7627908,3	View looking south along east side of Airstrip Landfill
11	P414_3637	4 435	14-08-25	576944,2	7627900,9	View looking northeast at erosion and crack on east side slope of Airstrip Landfill - FEATURE B
12	P414_3638	4 250	14-08-25	576950,0	7627902,5	View of crack on east side slope of Airstrip Landfill - FEATURE C
13	P414_3639	4 420	14-08-25	576943,1	7627908,3	View looking east at depression on cover - FEATURE A (new)
14	P414_3640	4 401	14-08-25	576946,1	7627905,5	View looking north at depression on cover - FEATURE A (new)
15	P414_3641	1 299	14-08-25	576918,3	7627906,8	Panoramic view looking north to southeast from southwest corner of Airstrip Landfill

ANNEX 1

Laboratory Results

Exova
7217 Roper Road NW
Edmonton, Alberta
Canada, T6B 3J4

T: (780) 438-5522
F: (780) 434-8586
E: Edmonton@exova.com
W www.exova.com

Sample Integrity Scorecard

Lots received between 'Aug 01, 2014' and 'Dec 05, 2014'

Client: sila

Sample Integrity Summary

	Total Lots	Total	Total Failed	% Passed
Process	5	3	2	60
Data Quality	5	4	1	80

Agreement: 105540 (Special Project - Cambridge Bay)

Lot ID: 1022226 PIN-3

Process

Was the waybill clearly filled in? Yes

Were the sample containers packaged well? Yes If No, please explain:

Was the COC received? Yes

Was the COC filled in adequately and legibly? Yes If No, please explain:

Was the COC received without damage? Yes If No, please explain:

Were Exova supplies used? No * If No, please explain: Maxxam containers

Were the sample containers clearly labelled? Yes If No, please explain:

Data Quality

Were the samples received within recommended holding times? Yes

Were samples received in containers appropriate to the matrix and analysis required? Yes

Were the expected number of samples received? No * If No, please explain: See note.

Was the sample received in the prescribed temperature range? Yes Please provide temperature ℃:

Were all samples received intact (not damaged/broken)? No * If No, please explain: See note.

Were all samples received without adhesive tape sealing the lids? Yes If No, please explain:

For water samples only, were they received without a noticeable layer of sediment? Yes If No, please explain:

Was sufficient sample volume received? Yes If No, please explain:

Were non-conformance/verification notes entered into Sample Login for any of the above items that did not meet Exova's sample or COC requirements? Yes

Non-Conformances

Process: 1 Data Quality: 2 *Total: 3*

Lot ID: 1022352 PIN-2

Process

Was the waybill clearly filled in? Yes

Were the sample containers packaged well? Yes If No, please explain:

Was the COC received? Yes

Was the COC filled in adequately and legibly? Yes If No, please explain:

Was the COC received without damage? Yes If No, please explain:

Were Exova supplies used? Yes If No, please explain:

Were the sample containers clearly labelled? Yes If No, please explain:

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W www.exova.com

Sample Integrity Scorecard

Lots received between 'Aug 01, 2014' and 'Dec 05, 2014'

Lot ID: 1022352 PIN-2

Data Quality

Were the samples received within recommended holding times? Yes

Were samples received in containers appropriate to the matrix and analysis required? Yes

Were the expected number of samples received? Yes If No, please explain:

Was the sample received in the prescribed temperature range? Yes Please provide temperature ℃: 4.0

Were all samples received intact (not damaged/broken)? Yes If No, please explain:

Were all samples received without adhesive tape sealing the lids? Yes If No, please explain:

For water samples only, were they received without a noticeable layer of sediment? Yes If No, please explain:

Was sufficient sample volume received? Yes If No, please explain:

Were non-conformance/verification notes entered into Sample Login for any of the above items that did not meet Exova's sample or COC requirements? Yes

Non-Conformances

Process: 0 Data Quality: 0 *Total: 0*

Lot ID: 1023068 CAM-3

Process

Was the waybill clearly filled in? Yes

Were the sample containers packaged well? Yes If No, please explain:

Was the COC received? Yes

Was the COC filled in adequately and legibly? Yes If No, please explain:

Was the COC received without damage? Yes If No, please explain:

Were Exova supplies used? Yes If No, please explain:

Were the sample containers clearly labelled? Yes If No, please explain:

Data Quality

Were the samples received within recommended holding times? Yes

Were samples received in containers appropriate to the matrix and analysis required? Yes

Were the expected number of samples received? Yes If No, please explain:

Was the sample received in the prescribed temperature range? Yes Please provide temperature ℃:

Were all samples received intact (not damaged/broken)? Yes If No, please explain:

Were all samples received without adhesive tape sealing the lids? Yes If No, please explain:

For water samples only, were they received without a noticeable layer of sediment? Yes If No, please explain:

Was sufficient sample volume received? Yes If No, please explain:

Were non-conformance/verification notes entered into Sample Login for any of the above items that did not meet Exova's sample or COC requirements? Yes

Non-Conformances

Process: 0 Data Quality: 0 *Total: 0*

Lot ID: 1023106 PIN-4

Process

Was the waybill clearly filled in? Yes

Were the sample containers packaged well? Yes If No, please explain:

Was the COC received? Yes

Was the COC filled in adequately and legibly? Yes If No, please explain:

Was the COC received without damage? Yes If No, please explain:

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Sample Integrity Scorecard

Lots received between 'Aug 01, 2014' and 'Dec 05, 2014'

Lot ID: 1023106 PIN-4

Process

Were Exova supplies used? Yes If No, please explain:

Were the sample containers clearly labelled? Yes If No, please explain:

Data Quality

Were the samples received within recommended holding times? Yes

Were samples received in containers appropriate to the matrix and analysis required? Yes

Were the expected number of samples received? Yes If No, please explain:

Was the sample received in the prescribed temperature range? Yes Please provide temperature ℃:

Were all samples received intact (not damaged/broken)? Yes If No, please explain:

Were all samples received without adhesive tape sealing the lids? Yes If No, please explain:

For water samples only, were they received without a noticeable layer of sediment? Yes If No, please explain:

Was sufficient sample volume received? Yes If No, please explain:

Were non-conformance/verification notes entered into Sample Login for any of the above items that did not meet Exova's sample or COC requirements? Yes

Non-Conformances

Process: 0 Data Quality: 0 *Total: 0*

Lot ID: 1023703 CAM-1

Process

Was the waybill clearly filled in? Yes

Were the sample containers packaged well? Yes If No, please explain:

Was the COC received? Yes

Was the COC filled in adequately and legibly? No * If No, please explain: see nots

Was the COC received without damage? Yes If No, please explain:

Were Exova supplies used? Yes If No, please explain:

Were the sample containers clearly labelled? Yes If No, please explain:

Data Quality

Were the samples received within recommended holding times? Yes

Were samples received in containers appropriate to the matrix and analysis required? Yes

Were the expected number of samples received? Yes If No, please explain:

Was the sample received in the prescribed temperature range? Yes Please provide temperature ℃:

Were all samples received intact (not damaged/broken)? Yes If No, please explain:

Were all samples received without adhesive tape sealing the lids? Yes If No, please explain:

For water samples only, were they received without a noticeable layer of sediment? Yes If No, please explain:

Was sufficient sample volume received? Yes If No, please explain:

Were non-conformance/verification notes entered into Sample Login for any of the above items that did not meet Exova's sample or COC requirements? Yes

Non-Conformances

Process: 1 Data Quality: 0 *Total: 1*

* is a non-conformance

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Report Transmission Cover Page

Bill To:	Biogenie S.R.D.C. Inc.	Project:	
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM
	350, rue Franquet	Name:	PIN-4
	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID:	**1023106**
Control Number:	
Date Received:	Aug 28, 2014
Date Reported:	Sep 8, 2014
Report Number:	1943987

Contact & Affiliation	Address	Delivery Commitments
Accounts Payable Biogenie S.R.D.C. Inc.	350, rue Franquet Sainte-Foy, Quebec G1P 4P3 Phone: (418) 653-4422 Fax: (418) 653-3583 Email: n/a	On [Lot Approval and Final Test Report Approval] send (Invoice) by Post M
Eric Thomassin-Lacroix Biogenie S.R.D.C. Inc.	350, rue Franquet Sainte-Foy, Quebec G1P 4P3 Phone: (418) 653-4422 Fax: (418) 653-3583 Email: n/a	On [Lot Approval and Final Test Report Approval] send (COC, Test Report, Invoice) by Post M
Andrew Passalis Biogenie S.R.D.C. Inc.	350, rue Franquet Sainte-Foy, Quebec G1P 4P3 Phone: (418) 653-4422 Fax: (418) 653-3583 Email: andrew.passalis@gmail.com	On [Report Approval] send (Test Report, COC) by Email - Single Report
Jean-Pierre Pelletier Biogenie S.R.D.C. Inc.	350, rue Franquet Sainte-Foy, Quebec G1P 4P3 Phone: (418) 653-4422 Fax: (418) 653-3583 Email: jean-peirre.pelletier@lvm.ca	On [Report Approval] send (Test Report, COC) by Email - Single Report

Notes To Clients:

- Analysis was performed on samples 1023106 (1-9) that exceeded the recommended holding time for BTEX/F1 analysis

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Analytical Report

Bill To:	Biogenie S.R.D.C. Inc.	Project:		Lot ID:	**1023106**
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM	Control Number:	
	350, rue Franquet	Name:	PIN-4	Date Received:	Aug 28, 2014
	Sainte-Foy, QC, Canada	Location:	Byron Bay	Date Reported:	Sep 8, 2014
	G1P 4P3	LSD:		Report Number:	1943987
Attn:	Jean-Pierre Pelletier	P.O.:			
Sampled By:	A. Passaus	Acct code:			
Company:	Sila				

Reference Number	1023106-1	1023106-2	1023106-3
Sample Date	Aug 25, 2014	Aug 25, 2014	Aug 25, 2014
Sample Time	NA	NA	NA
Sample Location			
Sample Description	P414-1WA	P414-1WB	P414-2WA
Matrix	Soil	Soil	Soil

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Strong Acid Digestion						
Mercury	Strong Acid Extractable	mg/kg	<0.01	<0.01	0.01	0.01
Antimony	Strong Acid Extractable	mg/kg	<0.2	<0.2	<0.2	0.2
Arsenic	Strong Acid Extractable	mg/kg	1.7	1.9	2.0	0.2
Barium	Strong Acid Extractable	mg/kg	35	59	35	1
Beryllium	Strong Acid Extractable	mg/kg	0.3	0.5	0.5	0.1
Cadmium	Strong Acid Extractable	mg/kg	0.02	0.02	0.06	0.01
Chromium	Strong Acid Extractable	mg/kg	7.1	12.5	12.1	0.5
Cobalt	Strong Acid Extractable	mg/kg	6.7	9.3	8.7	0.1
Copper	Strong Acid Extractable	mg/kg	14.9	37.7	50.7	1
Lead	Strong Acid Extractable	mg/kg	<5.0	<4.9	<4.9	5
Molybdenum	Strong Acid Extractable	mg/kg	<1.0	<1.0	3.8	1
Nickel	Strong Acid Extractable	mg/kg	18.8	21.5	20.9	0.5
Selenium	Strong Acid Extractable	mg/kg	<0.3	<0.3	<0.3	0.3
Silver	Strong Acid Extractable	mg/kg	<0.1	<0.1	<0.1	0.1
Thallium	Strong Acid Extractable	mg/kg	0.08	0.13	0.30	0.05
Tin	Strong Acid Extractable	mg/kg	2.1	1.9	1.9	1
Uranium	Strong Acid Extractable	mg/kg	0.6	0.7	12.9	0.5
Vanadium	Strong Acid Extractable	mg/kg	11.0	17.7	23.5	0.1
Zinc	Strong Acid Extractable	mg/kg	11	24	34	1
Mono-Aromatic Hydrocarbons - Soil						
Extraction Date	Volatiles		2-Sep-14	2-Sep-14	2-Sep-14	
Benzene	Dry Weight	mg/kg	<0.005	<0.005	<0.005	0.005
Toluene	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02
Ethylbenzene	Dry Weight	mg/kg	<0.010	<0.010	<0.010	0.010
Total Xylenes (m,p,o)	Dry Weight	mg/kg	<0.03	<0.03	<0.03	0.03
Volatile Petroleum Hydrocarbons - Soil						
Extraction Date	Volatiles		2-Sep-14	2-Sep-14	2-Sep-14	
F1 C6-C10	Dry Weight	mg/kg	<10	<10	<10	10
F1 -BTEX	Dry Weight	mg/kg	<10	<10	<10	10
Extractable Petroleum Hydrocarbons - Soil						
Extraction Date	Total Extractables		2-Sep-14	2-Sep-14	2-Sep-14	
F2c C10-C16	Dry Weight	mg/kg	<50	<50	<50	50
F3c C16-C34	Dry Weight	mg/kg	<50	<50	118	50
F4c C34-C50	Dry Weight	mg/kg	<100	<100	<100	100
F4HTGCc C34-C50+	Dry Weight	mg/kg	<100	<100	240	100
% C50+		%	<5	<5	43.0	

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Analytical Report

Bill To:	Biogenie S.R.D.C. Inc.	Project:		Lot ID:	**1023106**
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM	Control Number:	
	350, rue Franquet	Name:	PIN-4	Date Received:	Aug 28, 2014
	Sainte-Foy, QC, Canada	Location:	Byron Bay	Date Reported:	Sep 8, 2014
	G1P 4P3	LSD:		Report Number:	1943987
Attn:	Jean-Pierre Pelletier	P.O.:			
Sampled By:	A. Passaus	Acct code:			
Company:	Sila				

		Reference Number	1023106-1	1023106-2	1023106-3	
		Sample Date	Aug 25, 2014	Aug 25, 2014	Aug 25, 2014	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	P414-1WA	P414-1WB	P414-2WA	
		Matrix	Soil	Soil	Soil	
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Silica Gel Cleanup						
Silica Gel Cleanup			Done	Done	Done	
Soil % Moisture						
Moisture	Soil % Moisture	% by weight	6.84	11.60	57.20	
Polychlorinated Biphenyls - Soil						
Aroclor 1016	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1221	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1232	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1242	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1248	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1254	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1260	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1262	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1268	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Total PCBs	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Polychlorinated Biphenyls - Soil - Surrogate						
Decachlorobiphenyl	Surrogate	%	130	130	110	50-150

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Analytical Report

Bill To:	Biogenie S.R.D.C. Inc.	Project:		Lot ID:	**1023106**
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM	Control Number:	
	350, rue Franquet	Name:	PIN-4	Date Received:	Aug 28, 2014
	Sainte-Foy, QC, Canada	Location:	Byron Bay	Date Reported:	Sep 8, 2014
	G1P 4P3	LSD:		Report Number:	1943987
Attn:	Jean-Pierre Pelletier	P.O.:			
Sampled By:	A. Passaus	Acct code:			
Company:	Sila				

Reference Number	1023106-4	1023106-5	1023106-6
Sample Date	Aug 25, 2014	Aug 25, 2014	Aug 25, 2014
Sample Time	NA	NA	NA
Sample Location			
Sample Description	P414-2WB	P414-3WA	P414-3WB
Matrix	Soil	Soil	Soil

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Strong Acid Digestion						
Mercury	Strong Acid Extractable	mg/kg	<0.01	0.07	0.04	0.01
Antimony	Strong Acid Extractable	mg/kg	<0.2	<0.2	<0.2	0.2
Arsenic	Strong Acid Extractable	mg/kg	1.6	2.0	1.3	0.2
Barium	Strong Acid Extractable	mg/kg	43	106	95	1
Beryllium	Strong Acid Extractable	mg/kg	0.6	0.5	0.4	0.1
Cadmium	Strong Acid Extractable	mg/kg	0.01	0.07	0.06	0.01
Chromium	Strong Acid Extractable	mg/kg	11.3	8.1	7.7	0.5
Cobalt	Strong Acid Extractable	mg/kg	8.1	5.1	5.9	0.1
Copper	Strong Acid Extractable	mg/kg	45.6	88.6	73.1	1
Lead	Strong Acid Extractable	mg/kg	<4.9	<5.0	<5.0	5
Molybdenum	Strong Acid Extractable	mg/kg	<1.0	<1.0	<1.0	1
Nickel	Strong Acid Extractable	mg/kg	16.5	12.6	10.2	0.5
Selenium	Strong Acid Extractable	mg/kg	<0.3	0.7	0.4	0.3
Silver	Strong Acid Extractable	mg/kg	<0.1	<0.1	<0.1	0.1
Thallium	Strong Acid Extractable	mg/kg	0.13	<0.05	0.06	0.05
Tin	Strong Acid Extractable	mg/kg	1.7	1.8	2.0	1
Uranium	Strong Acid Extractable	mg/kg	0.8	6.4	4.4	0.5
Vanadium	Strong Acid Extractable	mg/kg	20.4	12.7	15.8	0.1
Zinc	Strong Acid Extractable	mg/kg	24	11	14	1
Mono-Aromatic Hydrocarbons - Soil						
Extraction Date	Volatiles		2-Sep-14	2-Sep-14	2-Sep-14	
Benzene	Dry Weight	mg/kg	<0.005	<0.005	<0.005	0.005
Toluene	Dry Weight	mg/kg	0.04	0.09	<0.02	0.02
Ethylbenzene	Dry Weight	mg/kg	<0.010	<0.010	<0.010	0.010
Total Xylenes (m,p,o)	Dry Weight	mg/kg	<0.03	<0.03	<0.03	0.03
Volatile Petroleum Hydrocarbons - Soil						
Extraction Date	Volatiles		2-Sep-14	2-Sep-14	2-Sep-14	
F1 C6-C10	Dry Weight	mg/kg	<10	<10	<10	10
F1 -BTEX	Dry Weight	mg/kg	<10	<10	<10	10
Extractable Petroleum Hydrocarbons - Soil						
Extraction Date	Total Extractables		2-Sep-14	2-Sep-14	2-Sep-14	
F2c C10-C16	Dry Weight	mg/kg	<50	<50	<50	50
F3c C16-C34	Dry Weight	mg/kg	<50	123	63	50
F4c C34-C50	Dry Weight	mg/kg	<100	<100	<100	100
F4HTGCc C34-C50+	Dry Weight	mg/kg	<100	130	<100	100
% C50+		%	28.0	17.4	13.3	

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Analytical Report

Bill To:	Biogenie S.R.D.C. Inc.	Project:	
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM
	350, rue Franquet	Name:	PIN-4
	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID:	**1023106**
Control Number:	
Date Received:	Aug 28, 2014
Date Reported:	Sep 8, 2014
Report Number:	1943987

		Reference Number	1023106-4	1023106-5	1023106-6	
		Sample Date	Aug 25, 2014	Aug 25, 2014	Aug 25, 2014	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	P414-2WB	P414-3WA	P414-3WB	
		Matrix	Soil	Soil	Soil	
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Silica Gel Cleanup						
Silica Gel Cleanup			Done	Done	Done	
Soil % Moisture						
Moisture	Soil % Moisture	% by weight	19.40	71.20	77.30	
Polychlorinated Biphenyls - Soil						
Aroclor 1016	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1221	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1232	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1242	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1248	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1254	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1260	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1262	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1268	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Total PCBs	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Polychlorinated Biphenyls - Soil - Surrogate						
Decachlorobiphenyl	Surrogate	%	120	110	120	50-150

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Analytical Report

Bill To:	Biogenie S.R.D.C. Inc.	Project:		Lot ID:	**1023106**
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM	Control Number:	
	350, rue Franquet	Name:	PIN-4	Date Received:	Aug 28, 2014
	Sainte-Foy, QC, Canada	Location:	Byron Bay	Date Reported:	Sep 8, 2014
	G1P 4P3	LSD:		Report Number:	1943987
Attn:	Jean-Pierre Pelletier	P.O.:			
Sampled By:	A. Passaus	Acct code:			
Company:	Sila				

Reference Number	1023106-7	1023106-8	1023106-9
Sample Date	Aug 25, 2014	Aug 25, 2014	Aug 25, 2014
Sample Time	NA	NA	NA
Sample Location			
Sample Description	P414-4WA	P414-4WB	P414-BD1
Matrix	Soil	Soil	Soil

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Strong Acid Digestion						
Mercury	Strong Acid Extractable	mg/kg	<0.01	<0.01	<0.01	0.01
Antimony	Strong Acid Extractable	mg/kg	<0.2	<0.2	<0.2	0.2
Arsenic	Strong Acid Extractable	mg/kg	1.9	1.8	2.0	0.2
Barium	Strong Acid Extractable	mg/kg	25	25	27	1
Beryllium	Strong Acid Extractable	mg/kg	0.5	0.5	0.5	0.1
Cadmium	Strong Acid Extractable	mg/kg	0.01	<0.01	<0.01	0.01
Chromium	Strong Acid Extractable	mg/kg	11.0	10.5	10.4	0.5
Cobalt	Strong Acid Extractable	mg/kg	7.2	7.6	7.2	0.1
Copper	Strong Acid Extractable	mg/kg	23.2	25.2	23.5	1
Lead	Strong Acid Extractable	mg/kg	<5.0	<5.0	<4.9	5
Molybdenum	Strong Acid Extractable	mg/kg	<1.0	<1.0	<1.0	1
Nickel	Strong Acid Extractable	mg/kg	19.0	16.9	20.5	0.5
Selenium	Strong Acid Extractable	mg/kg	<0.3	<0.3	<0.3	0.3
Silver	Strong Acid Extractable	mg/kg	<0.1	<0.1	<0.1	0.1
Thallium	Strong Acid Extractable	mg/kg	0.11	0.11	0.11	0.05
Tin	Strong Acid Extractable	mg/kg	2.2	2.0	2.1	1
Uranium	Strong Acid Extractable	mg/kg	1.0	0.8	0.9	0.5
Vanadium	Strong Acid Extractable	mg/kg	14.9	15.2	14.4	0.1
Zinc	Strong Acid Extractable	mg/kg	17	18	16	1
Mono-Aromatic Hydrocarbons - Soil						
Extraction Date	Volatiles		2-Sep-14	2-Sep-14	2-Sep-14	
Benzene	Dry Weight	mg/kg	<0.005	<0.005	<0.005	0.005
Toluene	Dry Weight	mg/kg	<0.02	<0.02	<0.02	0.02
Ethylbenzene	Dry Weight	mg/kg	<0.010	<0.010	<0.010	0.010
Total Xylenes (m,p,o)	Dry Weight	mg/kg	<0.03	<0.03	<0.03	0.03
Volatile Petroleum Hydrocarbons - Soil						
Extraction Date	Volatiles		2-Sep-14	2-Sep-14	2-Sep-14	
F1 C6-C10	Dry Weight	mg/kg	<10	<10	<10	10
F1 -BTEX	Dry Weight	mg/kg	<10	<10	<10	10
Extractable Petroleum Hydrocarbons - Soil						
Extraction Date	Total Extractables		2-Sep-14	2-Sep-14	2-Sep-14	
F2c C10-C16	Dry Weight	mg/kg	<50	<50	<50	50
F3c C16-C34	Dry Weight	mg/kg	<50	<50	<50	50
F4c C34-C50	Dry Weight	mg/kg	<100	<100	<100	100
F4HTGCc C34-C50+	Dry Weight	mg/kg	<100	<100	<100	100
% C50+		%	<5	<5	<5	

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Analytical Report

Bill To:	Biogenie S.R.D.C. Inc.	Project:	
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM
	350, rue Franquet	Name:	PIN-4
	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID: **1023106**
Control Number:
Date Received: Aug 28, 2014
Date Reported: Sep 8, 2014
Report Number: 1943987

		Reference Number	1023106-7	1023106-8	1023106-9	
		Sample Date	Aug 25, 2014	Aug 25, 2014	Aug 25, 2014	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	P414-4WA	P414-4WB	P414-BD1	
		Matrix	Soil	Soil	Soil	
Analyte		**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Silica Gel Cleanup						
Silica Gel Cleanup			Done	Done	Done	
Soil % Moisture						
Moisture	Soil % Moisture	% by weight	7.64	7.76	6.97	
Polychlorinated Biphenyls - Soil						
Aroclor 1016	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1221	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1232	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1242	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1248	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1254	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1260	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1262	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Aroclor 1268	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Total PCBs	Dry Weight	mg/kg	<0.1	<0.1	<0.1	0.1
Polychlorinated Biphenyls - Soil - Surrogate						
Decachlorobiphenyl	Surrogate	%	130	130	140	50-150

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Analytical Report

Bill To:	Biogenie S.R.D.C. Inc.	Project:	
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM
	350, rue Franquet	Name:	PIN-4
	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID: **1023106**
Control Number:
Date Received: Aug 28, 2014
Date Reported: Sep 8, 2014
Report Number: 1943987

Reference Number	1023106-10	1023106-11	1023106-12
Sample Date	Aug 25, 2014	Aug 25, 2014	Aug 25, 2014
Sample Time	NA	NA	NA
Sample Location			
Sample Description	P414-3W	P414-BDW1	P414-FB
Matrix	Water	Water	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total						
Aluminum	Total	mg/L	1.1	4.28	<0.02	0.02
Calcium	Total	mg/L	253	260	<0.2	0.2
Iron	Total	mg/L	1.4	4.68	<0.05	0.05
Magnesium	Total	mg/L	184	185	<0.20	0.2
Manganese	Total	mg/L	0.624	0.733	<0.005	0.005
Potassium	Total	mg/L	17	17	<0.4	0.4
Silicon	Total	mg/L	5.28	10.7	0.12	0.05
Sodium	Total	mg/L	274	267	<0.4	0.4
Sulfur	Total	mg/L	310	303	<0.3	0.3
Mercury	Total	mg/L	0.000015	<0.000005	<0.000005	0.000005
Antimony	Total	mg/L	<0.0004	<0.0004	<0.0002	0.0002
Arsenic	Total	mg/L	0.0009	0.002	<0.0002	0.0002
Barium	Total	mg/L	0.029	0.056	<0.001	0.001
Beryllium	Total	mg/L	<0.0002	<0.0002	<0.0001	0.0001
Bismuth	Total	mg/L	<0.001	<0.001	<0.0005	0.0005
Boron	Total	mg/L	0.225	0.220	<0.002	0.002
Cadmium	Total	mg/L	0.00008	0.00008	<0.00001	0.00001
Chromium	Total	mg/L	0.180	0.114	<0.0005	0.0005
Cobalt	Total	mg/L	0.0078	0.011	<0.0001	0.0001
Copper	Total	mg/L	0.021	0.030	<0.001	0.001
Lead	Total	mg/L	0.001	0.0030	<0.0001	0.0001
Lithium	Total	mg/L	0.026	0.027	<0.001	0.001
Molybdenum	Total	mg/L	0.004	0.003	<0.001	0.001
Nickel	Total	mg/L	0.0546	0.0654	<0.0005	0.0005
Selenium	Total	mg/L	<0.0004	0.0009	<0.0002	0.0002
Silver	Total	mg/L	0.00006	0.00009	<0.00001	0.00001
Strontium	Total	mg/L	0.328	0.338	<0.001	0.001
Thallium	Total	mg/L	0.00027	0.00032	<0.00005	0.00005
Tin	Total	mg/L	<0.002	<0.002	<0.001	0.001
Titanium	Total	mg/L	0.0557	0.199	<0.0005	0.0005
Uranium	Total	mg/L	0.0372	0.0357	<0.0005	0.0005
Vanadium	Total	mg/L	0.0031	0.0080	0.0002	0.0001
Zinc	Total	mg/L	0.092	0.16	<0.001	0.001
Zirconium	Total	mg/L	0.005	0.007	<0.001	0.001
Mono-Aromatic Hydrocarbons - Water						
Benzene		mg/L	<0.001	<0.001	<0.001	0.001

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Analytical Report

Bill To:	Biogenie S.R.D.C. Inc.	Project:	
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM
	350, rue Franquet	Name:	PIN-4
	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID: **1023106**
Control Number:
Date Received: Aug 28, 2014
Date Reported: Sep 8, 2014
Report Number: 1943987

	Reference Number	1023106-10	1023106-11	1023106-12	
	Sample Date	Aug 25, 2014	Aug 25, 2014	Aug 25, 2014	
	Sample Time	NA	NA	NA	
	Sample Location				
	Sample Description	P414-3W	P414-BDW1	P414-FB	
	Matrix	Water	Water	Water	
Analyte	**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Mono-Aromatic Hydrocarbons - Water - Continued					
Toluene	mg/L	<0.001	<0.001	<0.001	0.001
Ethylbenzene	mg/L	<0.001	<0.001	<0.001	0.001
Total Xylenes (m,p,o)	mg/L	<0.001	<0.001	<0.001	0.001
Volatile Petroleum Hydrocarbons - Water					
F1 -BTEX	mg/L	<0.2	<0.2	<0.2	0.2
F1 C6-C10	mg/L	<0.2	<0.2	<0.2	0.2
F2 C10-C16	mg/L	<0.2	<0.2	<0.2	0.2
Extractable Petroleum Hydrocarbons - Water					
F3 C16-C34	mg/L	<0.1	<0.1	<0.1	0.1
F3+ C34+	mg/L	<0.1	<0.1	<0.1	0.1
Polychlorinated Biphenyls - Water					
Aroclor 1016	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1221	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1232	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1242	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1248	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1254	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1260	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1262	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1268	ug/L	<0.1	<0.1	<0.1	0.1
Total PCBs	ug/L	<0.1	<0.1	<0.1	0.1
Polychlorinated Biphenyls - Water - Surrogate					
Decachlorobiphenyl Surrogate	%	76	88	79	50-150

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Analytical Report

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Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM
	350, rue Franquet	Name:	PIN-4
	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID: **1023106**
Control Number:
Date Received: Aug 28, 2014
Date Reported: Sep 8, 2014
Report Number: 1943987

Reference Number	1023106-13	1023106-14	1023106-15
Sample Date	Aug 25, 2014	Aug 25, 2014	Aug 25, 2014
Sample Time	NA	NA	NA
Sample Location			
Sample Description	P414-1W	P414-2W	P414-4W
Matrix	Water	Water	Water

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Metals Total						
Aluminum	Total	mg/L	2.0	2.96	1.4	0.02
Calcium	Total	mg/L	228	167	460	0.2
Iron	Total	mg/L	7.49	28.8	16.7	0.05
Magnesium	Total	mg/L	167	143	456	0.2
Manganese	Total	mg/L	0.373	2.59	1.06	0.005
Potassium	Total	mg/L	58.7	5.5	140	0.4
Silicon	Total	mg/L	4.79	10.9	5.3	0.05
Sodium	Total	mg/L	568	177	3690	0.4
Sulfur	Total	mg/L	374	57.2	1170	0.3
Mercury	Total	mg/L	<0.000005	0.000023	<0.000005	0.000005
Antimony	Total	mg/L	0.0005	0.0006	<0.002	0.0002
Arsenic	Total	mg/L	0.0021	0.0042	0.004	0.0002
Barium	Total	mg/L	0.214	0.212	0.05	0.001
Beryllium	Total	mg/L	<0.0002	<0.0002	<0.001	0.0001
Bismuth	Total	mg/L	<0.001	<0.001	<0.005	0.0005
Boron	Total	mg/L	0.761	0.098	1.35	0.002
Cadmium	Total	mg/L	0.00028	0.00024	0.00041	0.00001
Chromium	Total	mg/L	0.899	0.0509	5.57	0.0005
Cobalt	Total	mg/L	0.014	0.0261	0.038	0.0001
Copper	Total	mg/L	0.061	0.02	0.13	0.001
Lead	Total	mg/L	0.0025	0.0045	0.001	0.0001
Lithium	Total	mg/L	0.041	0.02	0.14	0.001
Molybdenum	Total	mg/L	0.030	0.003	0.18	0.001
Nickel	Total	mg/L	0.671	0.0869	2.00	0.0005
Selenium	Total	mg/L	0.0007	0.0007	<0.002	0.0002
Silver	Total	mg/L	0.00003	0.00008	<0.0001	0.00001
Strontium	Total	mg/L	0.620	0.13	2.99	0.001
Thallium	Total	mg/L	0.0002	0.0002	<0.0005	0.00005
Tin	Total	mg/L	<0.002	<0.002	<0.01	0.001
Titanium	Total	mg/L	0.144	0.161	0.078	0.0005
Uranium	Total	mg/L	0.019	0.0060	0.062	0.0005
Vanadium	Total	mg/L	0.0086	0.0073	0.039	0.0001
Zinc	Total	mg/L	0.338	0.516	1.88	0.001
Zirconium	Total	mg/L	0.003	0.004	<0.01	0.001
Mono-Aromatic Hydrocarbons - Water						
Benzene		mg/L	<0.001	<0.001	<0.001	0.001

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Analytical Report

Bill To:	Biogenie S.R.D.C. Inc.	Project:		Lot ID:	**1023106**
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM	Control Number:	
	350, rue Franquet	Name:	PIN-4	Date Received:	Aug 28, 2014
	Sainte-Foy, QC, Canada	Location:	Byron Bay	Date Reported:	Sep 8, 2014
	G1P 4P3	LSD:		Report Number:	1943987
Attn:	Jean-Pierre Pelletier	P.O.:			
Sampled By:	A. Passaus	Acct code:			
Company:	Sila				

	Reference Number	1023106-13	1023106-14	1023106-15	
	Sample Date	Aug 25, 2014	Aug 25, 2014	Aug 25, 2014	
	Sample Time	NA	NA	NA	
	Sample Location				
	Sample Description	P414-1W	P414-2W	P414-4W	
	Matrix	Water	Water	Water	
Analyte	**Units**	**Results**	**Results**	**Results**	Nominal Detection Limit
Mono-Aromatic Hydrocarbons - Water - Continued					
Toluene	mg/L	<0.001	<0.001	<0.001	0.001
Ethylbenzene	mg/L	<0.001	<0.001	<0.001	0.001
Total Xylenes (m,p,o)	mg/L	<0.001	<0.001	<0.001	0.001
Volatile Petroleum Hydrocarbons - Water					
F1 -BTEX	mg/L	<0.2	<0.2	<0.2	0.2
F1 C6-C10	mg/L	<0.2	<0.2	<0.2	0.2
F2 C10-C16	mg/L	<0.2	<0.2	<0.2	0.2
Extractable Petroleum Hydrocarbons - Water					
F3 C16-C34	mg/L	0.1	<0.1	<0.1	0.1
F3+ C34+	mg/L	<0.1	<0.1	<0.1	0.1
Polychlorinated Biphenyls - Water					
Aroclor 1016	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1221	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1232	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1242	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1248	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1254	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1260	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1262	ug/L	<0.1	<0.1	<0.1	0.1
Aroclor 1268	ug/L	<0.1	<0.1	<0.1	0.1
Total PCBs	ug/L	<0.1	<0.1	<0.1	0.1
Polychlorinated Biphenyls - Water - Surrogate					
Decachlorobiphenyl Surrogate	%	90	82	86	50-150

Approved by:

Darlene Lintott, MSc
Consulting Scientist

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS).
Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

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Quality Control

Bill To:	Biogenie S.R.D.C. Inc.	Project:	
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM
	350, rue Franquet	Name:	PIN-4
	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID: **1023106**
Control Number:
Date Received: Aug 28, 2014
Date Reported: Sep 8, 2014
Report Number: 1943987

Metals Strong Acid Digestion

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Mercury	ug/L	-0.04	-0.07	0.13	yes
Antimony	ug/L	0.112	-0.1	0.2	yes
Arsenic	ug/L	0.04	-0.2	0.2	yes
Barium	ug/L	0.434	-1	1	yes
Beryllium	ug/L	0	-0.1	0.1	yes
Cadmium	ug/L	-0.006	-0.01	0.01	yes
Chromium	ug/L	0.036	-0.5	0.5	yes
Cobalt	ug/L	-0.001	-0.1	0.1	yes
Copper	ug/L	0.423	-0.6	1.2	yes
Lead	ug/L	0.119	-5.0	5.0	yes
Molybdenum	ug/L	0.073	-1.0	1.0	yes
Nickel	ug/L	0.041	-0.4	0.7	yes
Selenium	ug/L	-0.079	-0.3	0.3	yes
Silver	ug/L	0.047	-0.09	0.14	yes
Thallium	ug/L	0	-0.04	0.04	yes
Tin	ug/L	4.001	0.0	7.2	yes
Uranium	ug/L	0.022	-0.5	0.5	yes
Vanadium	ug/L	0.011	-0.1	0.1	yes
Zinc	ug/L	0.287	-1	1	yes
Date Acquired:	September 04, 2014				

Client Sample Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Mercury	mg/kg	<0.01	<0.01	10	0.03	yes
Antimony	mg/kg	<0.2	<0.2	20	0.4	yes
Arsenic	mg/kg	1.7	1.4	20	0.4	yes
Barium	mg/kg	35	34	20	2	yes
Beryllium	mg/kg	0.3	0.3	20	0.2	yes
Cadmium	mg/kg	0.02	0.02	20	0.02	yes
Chromium	mg/kg	7.1	6.9	20	1.1	yes
Cobalt	mg/kg	6.7	5.5	20	0.2	yes
Copper	mg/kg	14.9	14.9	20	2.2	yes
Lead	mg/kg	<5.0	<5.0	20	0.2	yes
Molybdenum	mg/kg	<1.0	<1.0	20	2.2	yes
Nickel	mg/kg	18.8	15.4	20	1.1	yes
Selenium	mg/kg	<0.3	<0.3	20	0.7	yes
Silver	mg/kg	<0.1	<0.1	20	0.22	yes
Thallium	mg/kg	0.08	0.09	20	0.11	yes
Tin	mg/kg	2.1	2.3	20	2.2	yes
Uranium	mg/kg	0.6	0.6	20	1.1	yes
Vanadium	mg/kg	11.0	12.2	20	0.2	yes
Zinc	mg/kg	11	12	20	2	yes
Date Acquired:	September 04, 2014					

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC

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Quality Control

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Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM
	350, rue Franquet	Name:	PIN-4
	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID:	**1023106**
Control Number:	
Date Received:	Aug 28, 2014
Date Reported:	Sep 8, 2014
Report Number:	1943987

Metals Strong Acid Digestion - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Mercury	mg/kg	0.31	0.28	0.34	yes
Antimony	mg/kg	39.3	36.1	43.9	yes
Arsenic	mg/kg	40.0	36.7	44.3	yes
Barium	mg/kg	198	185	215	yes
Beryllium	mg/kg	19.3	17.4	22.2	yes
Cadmium	mg/kg	2.03	1.80	2.20	yes
Chromium	mg/kg	100	92.2	105.8	yes
Cobalt	mg/kg	20.2	18.5	22.5	yes
Copper	mg/kg	196	176.3	207.3	yes
Lead	mg/kg	20.6	18.6	21.8	yes
Molybdenum	mg/kg	195	172.6	215.4	yes
Nickel	mg/kg	97.1	90.6	107.4	yes
Selenium	mg/kg	39.0	36.1	42.9	yes
Silver	mg/kg	20.6	16.69	21.97	yes
Thallium	mg/kg	10.2	9.57	11.23	yes
Tin	mg/kg	190	171.9	201.9	yes
Uranium	mg/kg	101	90.3	108.0	yes
Vanadium	mg/kg	17.7	16.3	20.3	yes
Zinc	mg/kg	195	180	220	yes
Date Acquired:	September 04, 2014				
Mercury	mg/kg	0.08	0.05	0.11	yes
Date Acquired:	September 04, 2014				
Mercury	mg/kg	0.39	0.15	0.42	yes
Antimony	mg/kg	0.9	0.3	1.1	yes
Arsenic	mg/kg	80.3	65.9	97.9	yes
Barium	mg/kg	261	213	270	yes
Beryllium	mg/kg	0.8	0.5	0.9	yes
Cadmium	mg/kg	1.94	1.50	2.64	yes
Chromium	mg/kg	35.6	27.4	39.2	yes
Cobalt	mg/kg	13.7	11.3	16.0	yes
Copper	mg/kg	201	162.7	222.9	yes
Lead	mg/kg	127	99.6	135.6	yes
Molybdenum	mg/kg	2.8	2.0	3.8	yes
Nickel	mg/kg	61.3	47.1	73.5	yes
Selenium	mg/kg	0.8	0.3	1.3	yes
Silver	mg/kg	0.8	0.25	1.15	yes
Thallium	mg/kg	0.36	0.26	0.40	yes
Tin	mg/kg	3.5	1.0	5.4	yes
Uranium	mg/kg	1.2	0.9	1.5	yes
Vanadium	mg/kg	43.7	31.5	56.1	yes
Zinc	mg/kg	489	355	550	yes
Date Acquired:	September 04, 2014				

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	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID: **1023106**
Control Number:
Date Received: Aug 28, 2014
Date Reported: Sep 8, 2014
Report Number: 1943987

Metals Strong Acid Digestion - Continued

Metals Total

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Aluminum	mg/L	0.0043	-0.01	0.02	yes
Calcium	mg/L	0.0071	-0.1	0.1	yes
Iron	mg/L	0.0015	-0.01	0.02	yes
Magnesium	mg/L	0.0054	-0.04	0.04	yes
Manganese	mg/L	-0.0001	-0.003	0.003	yes
Potassium	mg/L	0.014	-0.1	0.2	yes
Silicon	mg/L	0.0026	-0.03	0.04	yes
Sodium	mg/L	0.0134	-0.1	0.2	yes
Sulfur	mg/L	0.0123	-0.1	0.2	yes
Mercury	ug/L	0.0034	-0.038000	0.070000	yes
Antimony	ug/L	0.00028326	-0.2	0.2	yes
Arsenic	ug/L	0.0134757	-0.2	0.2	yes
Barium	ug/L	0.00987838	-1	1	yes
Beryllium	ug/L	0	-0.1	0.1	yes
Bismuth	ug/L	0.00671813	-0.5	0.5	yes
Boron	ug/L	0.0826097	-1	3	yes
Cadmium	ug/L	0.00957206	-0.007	0.012	yes
Chromium	ug/L	0.00351784	-0.7	0.3	yes
Cobalt	ug/L	-0.00132446	-0.1	0.1	yes
Copper	ug/L	0.796508	-1	1	yes
Lead	ug/L	0.00554493	-0.1	0.1	yes
Lithium	ug/L	0.0120698	-1	1	yes
Molybdenum	ug/L	0.0573581	-1	1	yes
Nickel	ug/L	-0.00784534	-0.5	0.5	yes
Selenium	ug/L	0.0089705	-0.2	0.2	yes
Silver	ug/L	0.00226237	-0.02	0.10	yes
Strontium	ug/L	0.0330841	-1	1	yes
Thallium	ug/L	0.00173928	-0.05	0.05	yes
Tin	ug/L	-0.0331463	-1	1	yes
Titanium	ug/L	0	-0.5	0.5	yes
Uranium	ug/L	0.00181467	-0.5	0.5	yes
Vanadium	ug/L	0.0875498	-0.1	0.1	yes
Zinc	ug/L	0.643524	-0	1	yes
Zirconium	ug/L	0.00970992	-1	1	yes

Date Acquired: September 02, 2014

Client Sample Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Aluminum	mg/L	13.1	13.6	15	0.03	yes
Calcium	mg/L	169	170	15	0.6	yes
Iron	mg/L	22.8	23.7	15	0.20	yes
Magnesium	mg/L	71.3	71.7	15	0.40	yes

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	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID:	**1023106**
Control Number:	
Date Received:	Aug 28, 2014
Date Reported:	Sep 8, 2014
Report Number:	1943987

Metals Total - Continued

Client Sample Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Manganese	mg/L	0.320	0.326	15	0.010	yes
Potassium	mg/L	13.9	14.1	15	1.2	yes
Silicon	mg/L	16.4	17.0	15	0.10	yes
Sodium	mg/L	261	262	15	1.2	yes
Sulfur	mg/L	146	148	15	0.1	yes
Mercury	mg/L	0.000015	0.000016	10	0.000300	yes
Antimony	ug/L	<0.2	<0.2	15	0.4	yes
Arsenic	ug/L	0.5	0.5	15	0.4	yes
Barium	ug/L	179	179	15	2	yes
Beryllium	ug/L	<0.1	<0.1	15	0.2	yes
Bismuth	ug/L	<0.5	<0.5	15	1.1	yes
Boron	ug/L	9	8	15	4	yes
Cadmium	ug/L	<0.005	<0.005	15	0.022	yes
Chromium	ug/L	<0.5	<0.5	15	1.1	yes
Cobalt	ug/L	<0.1	<0.1	15	0.2	yes
Copper	ug/L	<1	<1	15	2	yes
Lead	ug/L	0.1	0.1	15	0.2	yes
Lithium	ug/L	4	4	15	2	yes
Molybdenum	ug/L	<1	<1	15	2	yes
Nickel	ug/L	<0.5	<0.5	15	1.1	yes
Selenium	ug/L	<0.2	<0.2	15	0.4	yes
Silver	ug/L	<0.01	<0.01	15	0.22	yes
Strontium	ug/L	306	316	15	2	yes
Thallium	ug/L	<0.05	<0.05	15	0.11	yes
Tin	ug/L	<1	<1	15	2	yes
Titanium	ug/L	2.6	2.4	15	1.1	yes
Uranium	ug/L	<0.5	<0.5	15	1.1	yes
Vanadium	ug/L	0.2	0.2	15	0.2	yes
Zinc	ug/L	2	3	15	2	yes
Zirconium	ug/L	<10	<10	15	2	yes

Date Acquired: September 02, 2014

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Aluminum	mg/L	4.08	3.46	4.30	yes
Calcium	mg/L	50.9	45.5	52.7	yes
Iron	mg/L	2.08	1.83	2.19	yes
Magnesium	mg/L	19.7	18.14	22.14	yes
Manganese	mg/L	0.526	0.442	0.538	yes
Potassium	mg/L	49.6	45.8	55.8	yes
Silicon	mg/L	2.06	1.81	2.21	yes
Sodium	mg/L	50.3	45.9	56.0	yes
Sulfur	mg/L	10.4	8.9	10.9	yes
Mercury	mg/L	0.000755	0.000600	0.000960	yes

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Quality Control

Bill To:	Biogenie S.R.D.C. Inc.	Project:	
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM
	350, rue Franquet	Name:	PIN-4
	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID: **1023106**
Control Number:
Date Received: Aug 28, 2014
Date Reported: Sep 8, 2014
Report Number: 1943987

Metals Total - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Antimony	ug/L	12.2	10.8	13.2	yes
Arsenic	ug/L	12.4	10.4	12.5	yes
Barium	ug/L	64	54	68	yes
Beryllium	ug/L	6.0	4.9	6.8	yes
Bismuth	ug/L	29.6	24.8	34.4	yes
Boron	ug/L	121	102	139	yes
Cadmium	ug/L	0.664	0.473	0.781	yes
Chromium	ug/L	31.7	26.5	33.7	yes
Cobalt	ug/L	6.2	5.2	6.7	yes
Copper	ug/L	65	53	67	yes
Lead	ug/L	6.3	5.2	7.1	yes
Lithium	ug/L	62	53	77	yes
Molybdenum	ug/L	63	56	66	yes
Nickel	ug/L	32.3	25.6	33.4	yes
Selenium	ug/L	11.7	9.9	12.3	yes
Silver	ug/L	6.51	5.39	7.13	yes
Strontium	ug/L	61	54	69	yes
Thallium	ug/L	3.26	2.81	3.89	yes
Tin	ug/L	63	56	66	yes
Titanium	ug/L	32.6	26.6	35.7	yes
Uranium	ug/L	29.6	25.7	36.3	yes
Vanadium	ug/L	6.4	5.1	7.2	yes
Zinc	ug/L	61	53	67	yes
Zirconium	ug/L	64	53	67	yes
Date Acquired:	September 02, 2014				
Mercury	mg/L	0.00299	0.002600	0.003200	yes
Antimony	ug/L	41.0	37.5	43.1	yes
Arsenic	ug/L	41.0	37.7	44.7	yes
Barium	ug/L	206	190	214	yes
Beryllium	ug/L	19.1	17.4	22.2	yes
Bismuth	ug/L	93.5	91.3	106.3	yes
Boron	ug/L	387	343	436	yes
Cadmium	ug/L	2.11	1.915	2.205	yes
Chromium	ug/L	101	90.0	110.0	yes
Cobalt	ug/L	19.9	18.1	21.4	yes
Copper	ug/L	202	185	208	yes
Lead	ug/L	19.4	18.6	21.8	yes
Lithium	ug/L	194	173	222	yes
Molybdenum	ug/L	206	189	225	yes
Nickel	ug/L	103	90.0	110.0	yes
Selenium	ug/L	40.0	36.1	42.9	yes
Silver	ug/L	20.3	18.00	22.00	yes

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Quality Control

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Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM
	350, rue Franquet	Name:	PIN-4
	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID:	**1023106**
Control Number:	
Date Received:	Aug 28, 2014
Date Reported:	Sep 8, 2014
Report Number:	1943987

Metals Total - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Strontium	ug/L	192	182	212	yes
Thallium	ug/L	9.42	9.16	10.96	yes
Tin	ug/L	200	191	213	yes
Titanium	ug/L	106	91.5	106.3	yes
Uranium	ug/L	93.9	90.2	109.0	yes
Vanadium	ug/L	20.6	16.9	22.1	yes
Zinc	ug/L	202	183	218	yes
Date Acquired:	September 02, 2014				
Mercury	mg/L	0.000792	0.000700	0.000880	yes
Antimony	ug/L	11.6	10.8	13.2	yes
Arsenic	ug/L	12.4	11.2	13.6	yes
Barium	ug/L	60	54	66	yes
Beryllium	ug/L	5.7	5.2	6.5	yes
Bismuth	ug/L	28.5	27.0	33.0	yes
Boron	ug/L	112	108	132	yes
Cadmium	ug/L	0.629	0.560	0.692	yes
Chromium	ug/L	30.7	27.0	33.0	yes
Cobalt	ug/L	6.1	5.4	6.6	yes
Copper	ug/L	64	54	66	yes
Lead	ug/L	6.0	5.4	6.6	yes
Lithium	ug/L	58	53	66	yes
Molybdenum	ug/L	59	54	66	yes
Nickel	ug/L	31.2	27.0	33.0	yes
Selenium	ug/L	11.5	10.3	13.4	yes
Silver	ug/L	6.05	5.40	6.60	yes
Strontium	ug/L	60	54	66	yes
Thallium	ug/L	2.96	0.00	6.00	yes
Tin	ug/L	61	54	66	yes
Titanium	ug/L	32.7	27.0	33.0	yes
Uranium	ug/L	28.8	27.0	33.0	yes
Vanadium	ug/L	6.3	5.4	6.6	yes
Zinc	ug/L	61	57	69	yes
Zirconium	ug/L	61	54	66	yes
Date Acquired:	September 02, 2014				
Mercury	mg/L	0.000070	0.000065	0.000089	yes
Antimony	ug/L	2.0	1.8	2.2	yes
Arsenic	ug/L	2.1	1.8	2.3	yes
Barium	ug/L	10	9	11	yes
Beryllium	ug/L	1	0.8	1.1	yes
Bismuth	ug/L	5.2	4.5	5.4	yes
Boron	ug/L	20	17	23	yes
Cadmium	ug/L	0.103	0.092	0.116	yes

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Quality Control

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Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM
	350, rue Franquet	Name:	PIN-4
	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID:	**1023106**
Control Number:	
Date Received:	Aug 28, 2014
Date Reported:	Sep 8, 2014
Report Number:	1943987

Metals Total - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Chromium	ug/L	5.2	4.6	5.4	yes
Cobalt	ug/L	1.0	0.9	1.1	yes
Copper	ug/L	11	9	11	yes
Lead	ug/L	1.0	0.9	1.1	yes
Lithium	ug/L	10	9	11	yes
Molybdenum	ug/L	10	9	11	yes
Nickel	ug/L	5.2	4.5	5.5	yes
Selenium	ug/L	1.9	1.6	2.2	yes
Silver	ug/L	1.00	0.87	1.07	yes
Strontium	ug/L	10	9	11	yes
Thallium	ug/L	0.50	0.48	0.57	yes
Tin	ug/L	10	10	11	yes
Titanium	ug/L	4.7	4.5	5.4	yes
Uranium	ug/L	4.8	4.5	5.5	yes
Vanadium	ug/L	1.0	0.8	1.1	yes
Zinc	ug/L	10	9	11	yes
Zirconium	ug/L	10	9	11	yes
Date Acquired:	September 02, 2014				
Aluminum	mg/L	19.0	18.80	20.60	yes
Calcium	mg/L	239	230.0	257.6	yes
Iron	mg/L	9.43	9.07	10.15	yes
Magnesium	mg/L	95.5	92.78	104.72	yes
Manganese	mg/L	2.39	2.260	2.560	yes
Potassium	mg/L	237	232.2	259.9	yes
Silicon	mg/L	9.88	9.48	10.74	yes
Sodium	mg/L	238	226.8	267.4	yes
Sulfur	mg/L	148	136.5	166.3	yes
Date Acquired:	September 02, 2014				
Aluminum	mg/L	3.98	3.46	4.44	yes
Calcium	mg/L	51.0	45.0	55.0	yes
Iron	mg/L	2.08	1.80	2.20	yes
Magnesium	mg/L	19.8	17.99	22.01	yes
Manganese	mg/L	0.526	0.449	0.551	yes
Potassium	mg/L	49.5	45.0	55.0	yes
Silicon	mg/L	2.07	1.92	2.22	yes
Sodium	mg/L	50.2	45.0	55.0	yes
Sulfur	mg/L	10.4	9.0	11.0	yes
Date Acquired:	September 02, 2014				
Aluminum	mg/L	0.39	0.36	0.44	yes
Calcium	mg/L	5.1	4.6	5.6	yes
Iron	mg/L	0.21	0.18	0.22	yes

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Quality Control

Bill To:	Biogenie S.R.D.C. Inc.	Project:	
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM
	350, rue Franquet	Name:	PIN-4
	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID: **1023106**
Control Number:
Date Received: Aug 28, 2014
Date Reported: Sep 8, 2014
Report Number: 1943987

Metals Total - Continued

Control Sample	Units	Measured	Lower Limit	Upper Limit	Passed QC
Magnesium	mg/L	1.96	1.84	2.18	yes
Manganese	mg/L	0.052	0.046	0.056	yes
Potassium	mg/L	4.9	4.5	5.5	yes
Silicon	mg/L	0.20	0.18	0.22	yes
Sodium	mg/L	4.9	4.7	5.5	yes
Sulfur	mg/L	3.0	2.8	3.2	yes

Date Acquired: September 02, 2014

Mono-Aromatic Hydrocarbons - Soil

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Benzene	ng	0	-0.005	0.005	yes
Toluene	ng	0	-0.06	0.06	yes
Ethylbenzene	ng	0	-0.030	0.030	yes
Total Xylenes (m,p,o)	ng	0	-0.09	0.09	yes
Styrene	ng	0	-0.030	0.030	yes

Date Acquired: September 02, 2014

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Benzene	ng	112.00	85	115	yes
Toluene	ng	110.60	85	115	yes
Ethylbenzene	ng	103.80	85	115	yes
Total Xylenes (m,p,o)	ng	97.33	85	115	yes
Styrene	ng	91.60	85	115	yes

Date Acquired: September 02, 2014

Mono-Aromatic Hydrocarbons - Water

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Benzene	ng	0	-0.002	0.002	yes
Toluene	ng	0	-0.002	0.002	yes
Ethylbenzene	ng	0	-0.002	0.002	yes
Total Xylenes (m,p,o)	ng	0	-0.002	0.002	yes
Styrene	ng	0	-0.002	0.002	yes

Date Acquired: September 06, 2014

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Benzene	ng	104.60	85	115	yes
Toluene	ng	102.40	85	115	yes
Ethylbenzene	ng	87.60	85	115	yes
Total Xylenes (m,p,o)	ng	85.33	85	115	yes
Styrene	ng	86.20	85	115	yes

Date Acquired: September 06, 2014

Client Sample Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Benzene	mg/L	<0.001	<0.001	15	0.002	yes

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Quality Control

Bill To:	Biogenie S.R.D.C. Inc.	Project:	
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM
	350, rue Franquet	Name:	PIN-4
	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID: **1023106**
Control Number:
Date Received: Aug 28, 2014
Date Reported: Sep 8, 2014
Report Number: 1943987

Mono-Aromatic Hydrocarbons - Water - Continued

Client Sample Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Toluene	mg/L	<0.001	<0.001	15	0.002	yes
Ethylbenzene	mg/L	<0.001	<0.001	15	0.002	yes
Total Xylenes (m,p,o)	mg/L	<0.001	<0.001	15	0.002	yes
Styrene	mg/L	<0.001	<0.001	15	0.002	yes

Date Acquired: September 06, 2014

Volatile Petroleum Hydrocarbons - Soil

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
F1 C6-C10	ng	0	-10	10	yes

Date Acquired: September 02, 2014

Volatile Petroleum Hydrocarbons - Water

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
F1 -BTEX	ng	0	-0.30	0.30	yes
F1 C6-C10	ng	0	-0.30	0.30	yes
F2 C10-C16	ng	0	-0.30	0.30	yes

Date Acquired: September 06, 2014

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
F2 C10-C16	ng	82.00	80	120	yes

Date Acquired: September 06, 2014

Client Sample Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
F1 C6-C10	mg/L	<0.2	<0.2	50		yes
F2 C10-C16	mg/L	<0.2	<0.2	50		yes

Date Acquired: September 06, 2014

Extractable Petroleum Hydrocarbons - Soil

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
F2c C10-C16	ug/mL	0	-10	10	yes
F3c C16-C34	ug/mL	0	-30	30	yes
F4c C34-C50	ug/mL	0	-20	20	yes
F4HTGCc C34-C50+	ug/mL	0	-20	20	yes

Date Acquired: September 02, 2014

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
F2c C10-C16	ug/mL	101.14	85	115	yes
F3c C16-C34	ug/mL	100.81	85	115	yes
F4c C34-C50	ug/mL	95.51	85	115	yes
F4HTGCc C34-C50+	ug/mL	93.04	85	115	yes

Date Acquired: September 02, 2014

Matrix Spike	Units	% Recovery	Lower Limit	Upper Limit	Passed QC

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Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM
	350, rue Franquet	Name:	PIN-4
	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID:	**1023106**
Control Number:	
Date Received:	Aug 28, 2014
Date Reported:	Sep 8, 2014
Report Number:	1943987

Extractable Petroleum Hydrocarbons - Soil - Continued

Matrix Spike	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
F2c C10-C16	mg/kg	100	65	135	yes
F3c C16-C34	mg/kg	116	65	135	yes
F4c C34-C50	mg/kg	108	65	135	yes
F4HTGCc C34-C50+	mg/kg	97	65	135	yes

Date Acquired: September 02, 2014

Extractable Petroleum Hydrocarbons - Water

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
F2 C10-C16	ug/mL	0	-0.2	0.2	yes
F3 C16-C34	ug/mL	0	-0.2	0.2	yes
F3+ C34+	ug/mL	0	-0.2	0.2	yes

Date Acquired: September 02, 2014

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
F2 C10-C16	ug/mL	95.38	85	115	yes
F3 C16-C34	ug/mL	96.72	85	115	yes
F3+ C34+	ug/mL	93.35	85	115	yes

Date Acquired: September 02, 2014

Polychlorinated Biphenyls - Soil

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Aroclor 1016	ug/mL	0	-0.3	0.3	yes
Aroclor 1221	ug/mL	0	-0.3	0.3	yes
Aroclor 1232	ug/mL	0	-0.3	0.3	yes
Aroclor 1242	ug/mL	0	-0.3	0.3	yes
Aroclor 1248	ug/mL	0	-0.3	0.3	yes
Aroclor 1254	ug/mL	0	-0.3	0.3	yes
Aroclor 1260	ug/mL	0	-0.3	0.3	yes
Aroclor 1262	ug/mL	0	-0.3	0.3	yes
Aroclor 1268	ug/mL	0	-0.3	0.3	yes

Date Acquired: September 02, 2014

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Aroclor 1254	ug/mL	110.00	80	120	yes

Date Acquired: September 02, 2014

Polychlorinated Biphenyls - Soil - Surrogate

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Decachlorobiphenyl	%	133.491	50	150	yes

Date Acquired: September 02, 2014

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Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM	Control Number:	
	350, rue Franquet	Name:	PIN-4	Date Received:	Aug 28, 2014
	Sainte-Foy, QC, Canada	Location:	Byron Bay	Date Reported:	Sep 8, 2014
	G1P 4P3	LSD:		Report Number:	1943987
Attn:	Jean-Pierre Pelletier	P.O.:			
Sampled By:	A. Passaus	Acct code:			
Company:	Sila				

Polychlorinated Biphenyls - Water

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Aroclor 1016	ug/mL	0	-0.3	0.3	yes
Aroclor 1221	ug/mL	0	-0.3	0.3	yes
Aroclor 1232	ug/mL	0	-0.3	0.3	yes
Aroclor 1242	ug/mL	0	-0.3	0.3	yes
Aroclor 1248	ug/mL	0	-0.3	0.3	yes
Aroclor 1254	ug/mL	0	-0.3	0.3	yes
Aroclor 1260	ug/mL	0	-0.3	0.3	yes
Aroclor 1262	ug/mL	0	-0.3	0.3	yes
Aroclor 1268	ug/mL	0	-0.3	0.3	yes
Date Acquired:	September 03, 2014				

Calibration Check	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Aroclor 1254	ug/mL	110.00	80	120	yes
Date Acquired:	September 03, 2014				

Replicates	Units	Replicate 1	Replicate 2	% RSD Criteria	Absolute Criteria	Passed QC
Aroclor 1016	ug/L	<0.1	<0.1	20	0.2	yes
Aroclor 1221	ug/L	<0.1	<0.1	20	0.2	yes
Aroclor 1232	ug/L	<0.1	<0.1	20	0.2	yes
Aroclor 1242	ug/L	<0.1	<0.1	20	0.2	yes
Aroclor 1248	ug/L	<0.1	<0.1	20	0.2	yes
Aroclor 1254	ug/L	0.8	1	20	0.2	yes
Aroclor 1260	ug/L	<0.1	<0.1	20	0.2	yes
Aroclor 1262	ug/L	<0.1	<0.1	20	0.2	yes
Aroclor 1268	ug/L	<0.1	<0.1	20	0.2	yes
Date Acquired:	September 03, 2014					

Matrix Spike	Units	% Recovery	Lower Limit	Upper Limit	Passed QC
Aroclor 1254	ug/L	95	50	150	yes
Date Acquired:	September 03, 2014				

Polychlorinated Biphenyls - Water - Surrogate

Blanks	Units	Measured	Lower Limit	Upper Limit	Passed QC
Decachlorobiphenyl	%	79.4089	50	150	yes
Date Acquired:	September 03, 2014				

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Methodology and Notes

Bill To:	Biogenie S.R.D.C. Inc.	Project:		Lot ID:	**1023106**
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM	Control Number:	
	350, rue Franquet	Name:	PIN-4	Date Received:	Aug 28, 2014
	Sainte-Foy, QC, Canada	Location:	Byron Bay	Date Reported:	Sep 8, 2014
	G1P 4P3	LSD:		Report Number:	1943987
Attn:	Jean-Pierre Pelletier	P.O.:			
Sampled By:	A. Passaus	Acct code:			
Company:	Sila				

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
BTEX-CCME - Soil	CCME	*	Reference Method for Canada-Wide Standard for PHC in Soil, CWS PHCS TIER 1	02-Sep-14	Exova Calgary
BTEX-CCME - Soil	US EPA	*	Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis/Gas Chromatography Mass Spectrometry, 5021/8260	02-Sep-14	Exova Calgary
BTEX-CCME - Water	US EPA	*	Volatile Organic Compounds in Various Sample Matrices Using Equilibrium Headspace Analysis/Gas Chromatography Mass Spectrometry, 5021/8260	06-Sep-14	Exova Calgary
Mercury (Hot Block) in Soil	US EPA	*	Determination of Hg in Sediment by Cold Vapor Atomic Absorption Spec, 245.5	03-Sep-14	Exova Edmonton
Mercury (Total) in water	EPA	*	Mercury in Water by Cold Vapor Atomic Fluorescence Spectrometry, 245.7	02-Sep-14	Exova Edmonton
Metals ICP-MS (Hot Block) in soil	SW-846	*	Acid Digestion of Sediments, Sludges, and Soils, EPA 3050B	03-Sep-14	Exova Edmonton
Metals ICP-MS (Total) in water	APHA/USEPA	*	Metals By Inductively Coupled Plasma/Mass Spectrometry, APHA 3125 B / USEPA 200.2, 200.8	02-Sep-14	Exova Edmonton
Metals Trace (Total) in water	APHA	*	Inductively Coupled Plasma (ICP) Method, 3120 B	02-Sep-14	Exova Edmonton
PCB - Soil	US EPA	*	Polychlorinated Biphenyls (PCBs) by Gas Chromatography, 8082A	02-Sep-14	Exova Calgary
PCB - Water	US EPA	*	Polychlorinated Biphenyls (PCBs) by Gas Chromatography, 8082A	03-Sep-14	Exova Calgary
TEH-CCME - Water	EPA/CCME	*	Separatory Funnel Liquid-liquid Extraction/CCME, EPA 3510/CCME	02-Sep-14	Exova Calgary
TEH-CCME-Soil (Shake)	CCME	*	Reference Method for Canada-Wide Standard for PHC in Soil, CWS PHCS TIER 1	02-Sep-14	Exova Calgary

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Methodology and Notes

Bill To:	Biogenie S.R.D.C. Inc.	Project:	
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM
	350, rue Franquet	Name:	PIN-4
	Sainte-Foy, QC, Canada	Location:	Byron Bay
	G1P 4P3	LSD:	
Attn:	Jean-Pierre Pelletier	P.O.:	
Sampled By:	A. Passaus	Acct code:	
Company:	Sila		

Lot ID:	**1023106**
Control Number:	
Date Received:	Aug 28, 2014
Date Reported:	Sep 8, 2014
Report Number:	1943987

** Reference Method Modified*

References

APHA	Standard Methods for the Examination of Water and Wastewater
CCME	Canadian Council of Ministers of the Environment
EPA/CCME	Environmental Protection Agency Test Methods - US/CCME
SW-846	Test Methods for Evaluating Solid Waste
US EPA	US Environmental Protection Agency Test Methods

Comments:

- Analysis was performed on samples 1023106 (1-9) that exceeded the recommended holding time for BTEX/F1 analysis

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Exova

Analytical Report

Bill To:	Biogenie S.R.D.C. Inc.	Project:		Lot ID:	**1023106**
Report To:	Biogenie S.R.D.C. Inc.	ID:	2014 LFM	Control Number:	
	350, rue Franquet	Name:	PIN-4	Date Received:	Aug 28, 2014
	Sainte-Foy, QC, Canada	Location:	Byron Bay	Date Reported:	Sep 8, 2014
	G1P 4P3	LSD:		Report Number:	1943987
Attn:	Jean-Pierre Pelletier	P.O.:			
Sampled By:	A. Passaus	Acct code:			
Company:	Sila				

Petroleum Hydrocarbons in Soil

Batch Notes

1. The method used complies with the Reference Method for the Canada Wide Standards for Petroleum Hydrocarbons in Soil - Tier 1, April 2001, including Addendum 1, and is accredited for use in Exova.
2. Modifications of the method: See Notes and Methodology for nonconformances (if applicable).
3. Qualifications on results: See Notes and Methodology for nonconformances (if applicable).
4. Silica gel treatment is performed for fractions F2, F3, F4.
5. F1-BTEX: BTEX has been subtracted from the F1 fraction.
6. If analyzed, naphthalene has been subtracted from fraction F2 and selected PAHs have been subtracted from fraction F3.
7. F4HTGC is reported when more than 5% of the total carbon envelope elutes past C_{50}.
8. Exova does not routinely report Gravimetric Heavy Hydrocarbons (F4G or F4G-sg), F4HTGC through extended range high temperature GC is reported instead.
9. When both F4(C_{34}-C_{50}) and F4HTGC are reported, F4HTGC is the final F4 that is to be used for interpreting the CWS.
10. Quality criteria met for the batch: Data is reported in Quality Control Section of report (if requested).
    -nC_6 and nC_{10} response factors (RF) are within 30% of RF for toluene
    -nC_{10}, nC_{16} and nC_{34} RFs are within 10% of each other
    -nC_{50} RF is within 30% of the average RF for nC_{10}+nC_{16}+nC_{34}
    -linearity is within 15% for each of the calibrated carbon ranges
11. Batch data for analytical quality control are available on request.
12. Extraction and analysis holding times were met: See Notes and Methodology for nonconformances (if applicable).

Approved by:

Darlene Lintott, MSc
Consulting Scientist

Data have been validated by Analytical Quality Control and Exova's Integrated Data Validation System (IDVS).
Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Your Project #: PIN-4 RFM
Site Location: BYRON BAY
Your C.O.C. #: A135191

Attention:JEAN-PIERRE PELLETIER

SILA REMEDIATION
4495 BL. WILFRID- HAMEL, BUR 1
QUEBEC, PQ
CANADA G1P 2T7

Report Date: 2014/09/22
Report #: R1646813
Version: 2R

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B478404
Received: 2014/09/04, 10:45

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS (MeOH extract)	1	2014/09/05	2014/09/08	AB SOP-00039	CCME CWS/EPA 8260C m
CCME Hydrocarbons (F2-F4 in soil)	1	2014/09/05	2014/09/09	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS
Elements by ICPMS - Soils	1	2014/09/11	2014/09/11	AB SOP-00001 / AB SOP-00043	EPA 200.8 R5.4 m
Moisture	1	N/A	2014/09/06	AB SOP-00002	CCME PHC-CWS
Polychlorinated Biphenyls (1)	1	2014/09/06	2014/09/08	CAL SOP-00149	EPA 8082A R1 m

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS	1	N/A	2014/09/05	AB SOP-00039	CCME CWS/EPA 8260C m
CCME Hydrocarbons (F2-F4 in water)	1	2014/09/11	2014/09/11	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
Mercury - Low Level (Total) (1)	1	2014/09/09	2014/09/09	CAL SOP-00007	EPA 1631 RE 20460 m
Elements by ICPMS - Total	1	2014/09/12	2014/09/12	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4 m
Polychlorinated Biphenyls (1)	1	2014/09/06	2014/09/08	CAL SOP-00149	EPA 8082A R1 m

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Maxxam Calgary Environmental

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Tanya Eugine, M.Sc., Project Manager
Email: TEugine@maxxam.ca
Phone# (780)577-7144

==========

Maxxam Job #: B478404
Report Date: 2014/09/22

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KN2961		
Sampling Date		2014/08/25		
COC Number		A135191		
	Units	P414-4WB	RDL	QC Batch
Physical Properties				
Moisture	%	8.5	0.30	7627619
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	10	7627782
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	50	7627782
Reached Baseline at C50	mg/kg	Yes		7627782
Volatiles				
F1 (C6-C10) - BTEX	mg/kg	<12	12	7627727
(C6-C10)	mg/kg	<12	12	7627727
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	103		7627727
4-Bromofluorobenzene (sur.)	%	100		7627727
D10-ETHYLBENZENE (sur.)	%	106		7627727
D4-1,2-Dichloroethane (sur.)	%	95		7627727
O-TERPHENYL (sur.)	%	99		7627782
RDL = Reportable Detection Limit				

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Maxxam Job #: B478404
Report Date: 2014/09/22

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

AT1 BTEX AND F1-F4 IN WATER (WATER)

Maxxam ID		KN2962		
Sampling Date		2014/08/25		
COC Number		A135191		
	Units	P414-3W	RDL	QC Batch
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/L	<0.71 (1)	0.71	7633499
F3 (C16-C34 Hydrocarbons)	mg/L	<1.4 (1)	1.4	7633499
Reached Baseline at C50	mg/L	Yes		7633499
Volatiles				
F1 (C6-C10) - BTEX	ug/L	<100	100	7627246
(C6-C10)	ug/L	<100	100	7627246
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	99		7627246
4-Bromofluorobenzene (sur.)	%	97		7627246
D4-1,2-Dichloroethane (sur.)	%	99		7627246
O-TERPHENYL (sur.)	%	93		7633499

RDL = Reportable Detection Limit

(1) Detection limit raised based on sample volume used for analysis. Sample extracted past method-specified hold time.

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Maxxam Job #: B478404
Report Date: 2014/09/22

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		KN2961		
Sampling Date		2014/08/25		
COC Number		A135191		
	Units	**P414-4WB**	**RDL**	**QC Batch**
Polychlorinated Biphenyls				
Aroclor 1016	mg/kg	<0.010	0.010	7628083
Aroclor 1221	mg/kg	<0.010	0.010	7628083
Aroclor 1232	mg/kg	<0.010	0.010	7628083
Aroclor 1242	mg/kg	<0.010	0.010	7628083
Aroclor 1248	mg/kg	<0.010	0.010	7628083
Aroclor 1254	mg/kg	<0.010	0.010	7628083
Aroclor 1260	mg/kg	<0.010	0.010	7628083
Aroclor 1262	mg/kg	<0.010	0.010	7628083
Aroclor 1268	mg/kg	<0.010	0.010	7628083
Total Aroclors	mg/kg	<0.010	0.010	7628083
Surrogate Recovery (%)				
NONACHLOROBIPHENYL (sur.)	%	77		7628083
RDL = Reportable Detection Limit				

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Maxxam Job #: B478404
Report Date: 2014/09/22

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		KN2961		
Sampling Date		2014/08/25		
COC Number		A135191		
	Units	**P414-4WB**	**RDL**	**QC Batch**
Elements				
Total Arsenic (As)	mg/kg	2.1	1.0	7634239
Total Cadmium (Cd)	mg/kg	<0.10	0.10	7634239
Total Chromium (Cr)	mg/kg	49	1.0	7634239
Total Cobalt (Co)	mg/kg	7.4	1.0	7634239
Total Copper (Cu)	mg/kg	21	5.0	7634239
Total Lead (Pb)	mg/kg	3.8	1.0	7634239
Total Mercury (Hg)	mg/kg	<0.050	0.050	7634239
Total Nickel (Ni)	mg/kg	26	1.0	7634239
Total Zinc (Zn)	mg/kg	17	10	7634239
RDL = Reportable Detection Limit				

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Maxxam Job #: B478404
Report Date: 2014/09/22

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		KN2962		
Sampling Date		2014/08/25		
COC Number		A135191		
	Units	**P414-3W**	**RDL**	**QC Batch**
Polychlorinated Biphenyls				
Aroclor 1016	mg/L	<0.000050	0.000050	7627921
Aroclor 1221	mg/L	<0.000050	0.000050	7627921
Aroclor 1232	mg/L	<0.000050	0.000050	7627921
Aroclor 1242	mg/L	<0.000050	0.000050	7627921
Aroclor 1248	mg/L	<0.000050	0.000050	7627921
Aroclor 1254	mg/L	<0.000050	0.000050	7627921
Aroclor 1260	mg/L	<0.000050	0.000050	7627921
Aroclor 1262	mg/L	<0.000050	0.000050	7627921
Aroclor 1268	mg/L	<0.000050	0.000050	7627921
Total Aroclors	mg/L	<0.000050	0.000050	7627921
Surrogate Recovery (%)				
NONACHLOROBIPHENYL (sur.)	%	78		7627921
RDL = Reportable Detection Limit				

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Maxxam Job #: B478404
Report Date: 2014/09/22

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		KN2962		
Sampling Date		2014/08/25		
COC Number		A135191		
	Units	**P414-3W**	**RDL**	**QC Batch**
Elements				
Total Arsenic (As)	mg/L	0.0012	0.00020	7635264
Total Cadmium (Cd)	mg/L	0.000070	0.000020	7635264
Total Chromium (Cr)	mg/L	0.24	0.0010	7635264
Total Cobalt (Co)	mg/L	0.0093	0.00030	7635264
Total Copper (Cu)	mg/L	0.027	0.00020	7635264
Total Lead (Pb)	mg/L	0.0033	0.00020	7635264
Total Nickel (Ni)	mg/L	0.10	0.00050	7635264
Total Zinc (Zn)	mg/L	0.14	0.0030	7635264
Low Level Elements				
Total Mercury (Hg)	ug/L	0.028 (1)	0.020	7630982

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

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Maxxam Job #: B478404
Report Date: 2014/09/22

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

GENERAL COMMENTS

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER) Comments

Sample KN2962-01 Polychlorinated Biphenyls: Sample extracted past method-specified hold time.

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics Edmonton: 9331 - 48th Street T6B 2R4 Telephone (780)577-7100 Fax (780)450-4187

Maxxam Job #: B478404
Report Date: 2014/09/22

QUALITY ASSURANCE REPORT

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
7627246	1,4-Difluorobenzene (sur.)	2014/09/05	96	70 - 130	97	70 - 130	99	%				
7627246	4-Bromofluorobenzene (sur.)	2014/09/05	99	70 - 130	97	70 - 130	98	%				
7627246	D4-1,2-Dichloroethane (sur.)	2014/09/05	101	70 - 130	96	70 - 130	99	%				
7627727	1,4-Difluorobenzene (sur.)	2014/09/08	107	60 - 140	99	60 - 140	97	%				
7627727	4-Bromofluorobenzene (sur.)	2014/09/08	102	60 - 140	101	60 - 140	99	%				
7627727	D10-ETHYLBENZENE (sur.)	2014/09/08	105	60 - 130	104	60 - 130	105	%				
7627727	D4-1,2-Dichloroethane (sur.)	2014/09/08	95	60 - 140	93	60 - 140	93	%				
7627782	O-TERPHENYL (sur.)	2014/09/09	79	50 - 130	80	50 - 130	88	%				
7627921	NONACHLOROBIPHENYL (sur.)	2014/09/08	89	30 - 130	90	30 - 130	91	%				
7628083	NONACHLOROBIPHENYL (sur.)	2014/09/08	78	30 - 130	82	30 - 130	81	%				
7633499	O-TERPHENYL (sur.)	2014/09/11	94	50 - 130	101	50 - 130	92	%				
7627246	(C6-C10)	2014/09/05	92	70 - 130	117	70 - 130	<100	ug/L	NC	40		
7627246	F1 (C6-C10) - BTEX	2014/09/05					<100	ug/L	NC	40		
7627619	Moisture	2014/09/06					<0.30	%	9.0	20		
7627727	(C6-C10)	2014/09/08	105	60 - 140	109	60 - 140	<12	mg/kg	NC	50		
7627727	F1 (C6-C10) - BTEX	2014/09/08					<12	mg/kg	NC	50		
7627782	F2 (C10-C16 Hydrocarbons)	2014/09/09	86	50 - 130	93	70 - 130	<10	mg/kg	NC	50		
7627782	F3 (C16-C34 Hydrocarbons)	2014/09/09	90	50 - 130	96	70 - 130	<50	mg/kg	NC	50		
7627921	Aroclor 1016	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Aroclor 1221	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Aroclor 1232	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Aroclor 1242	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Aroclor 1248	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Aroclor 1254	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Aroclor 1260	2014/09/09	90	30 - 130	96	30 - 130	<0.000050	mg/L	NC	40		
7627921	Aroclor 1262	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Aroclor 1268	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Total Aroclors	2014/09/09					<0.000050	mg/L	NC	40		
7628083	Aroclor 1016	2014/09/08					<0.010	mg/kg	NC	50		
7628083	Aroclor 1221	2014/09/08					<0.010	mg/kg	NC	50		
7628083	Aroclor 1232	2014/09/08					<0.010	mg/kg	NC	50		
7628083	Aroclor 1242	2014/09/08					<0.010	mg/kg	NC	50		

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Maxxam Job #: B478404
Report Date: 2014/09/22

QUALITY ASSURANCE REPORT(CONT'D)

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
7628083	Aroclor 1248	2014/09/08					<0.010	mg/kg	NC	50		
7628083	Aroclor 1254	2014/09/08					<0.010	mg/kg	NC	50		
7628083	Aroclor 1260	2014/09/08	72	30 - 130	89	30 - 130	<0.010	mg/kg	NC	50		
7628083	Aroclor 1262	2014/09/08					<0.010	mg/kg	NC	50		
7628083	Aroclor 1268	2014/09/08					<0.010	mg/kg	NC	50		
7628083	Total Aroclors	2014/09/08					<0.010	mg/kg	NC	50		
7630982	Total Mercury (Hg)	2014/09/09	94	80 - 120	101	80 - 120	<0.0020	ug/L	NC	20		
7633499	F2 (C10-C16 Hydrocarbons)	2014/09/11	102	50 - 130	115	70 - 130	<0.10	mg/L				
7633499	F3 (C16-C34 Hydrocarbons)	2014/09/11	103	50 - 130	117	70 - 130	<0.20	mg/L				
7634239	Total Arsenic (As)	2014/09/11	93	75 - 125	95	75 - 125	<1.0	mg/kg	NC	35	122	50 - 150
7634239	Total Cadmium (Cd)	2014/09/11	92	75 - 125	92	75 - 125	<0.10	mg/kg	NC	35		
7634239	Total Chromium (Cr)	2014/09/11	93	75 - 125	94	75 - 125	<1.0	mg/kg	3.0	35	104	41 - 159
7634239	Total Cobalt (Co)	2014/09/11	92	75 - 125	94	75 - 125	<1.0	mg/kg	NC	35	107	75 - 125
7634239	Total Copper (Cu)	2014/09/11	91	75 - 125	96	75 - 125	<5.0	mg/kg	NC	35	107	73 - 127
7634239	Total Lead (Pb)	2014/09/11	96	75 - 125	99	75 - 125	<1.0	mg/kg	NC	35	110	54 - 146
7634239	Total Mercury (Hg)	2014/09/11	98	75 - 125	107	75 - 125	<0.050	mg/kg	NC	35		
7634239	Total Nickel (Ni)	2014/09/11	92	75 - 125	95	75 - 125	<1.0	mg/kg	2.3	35	112	61 - 139
7634239	Total Zinc (Zn)	2014/09/11	98	75 - 125	99	75 - 125	<10	mg/kg	NC	35	113	72 - 128
7635264	Total Arsenic (As)	2014/09/12	98	80 - 120	102	80 - 120	<0.00020	mg/L	NC	20		
7635264	Total Cadmium (Cd)	2014/09/12	100	80 - 120	101	80 - 120	<0.000020	mg/L				
7635264	Total Chromium (Cr)	2014/09/12	98	80 - 120	101	80 - 120	<0.0010	mg/L	NC	20		
7635264	Total Cobalt (Co)	2014/09/12	98	80 - 120	102	80 - 120	<0.00030	mg/L	NC	20		
7635264	Total Copper (Cu)	2014/09/12	NC	80 - 120	103	80 - 120	0.00028 ,RDL=0.00020	mg/L	0.55	20		
7635264	Total Lead (Pb)	2014/09/12	96	80 - 120	106	80 - 120	<0.00020	mg/L	NC	20		
7635264	Total Nickel (Ni)	2014/09/12	97	80 - 120	101	80 - 120	<0.00050	mg/L	NC	20		
7635264	Total Zinc (Zn)	2014/09/12	NC	80 - 120	104	80 - 120	<0.0030	mg/L	0.56	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.

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

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

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QUALITY ASSURANCE REPORT(CONT'D)

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B478404
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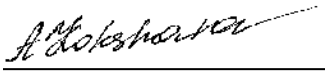
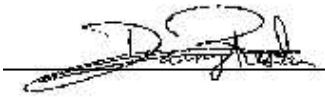
SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

VALIDATION SIGNATURE PAGE

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



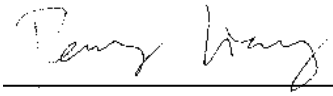
Anna Koksharova, M.Sc., Senior Analyst



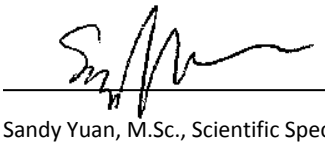
Daniel Reslan, Chem. Tech., Volatiles Supervisor

Justin Geisel, B.Sc., Supervisor, Organics

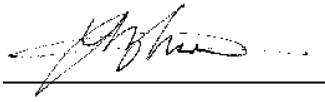
Luba Shymushovska, Senior Analyst, Organic Department



Peng Liang, Analyst II



Sandy Yuan, M.Sc., Scientific Specialist



Yashu Mohan, B.Sc. B.Tech., Senior Analyst

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

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Maxxam Job #: B478404
Report Date: 2014/09/22

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

VALIDATION SIGNATURE PAGE(CONT'D)

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

17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Your Project #: PIN-4 RFM
Site Location: BYRON BAY
Your C.O.C. #: A135191

Attention:JEAN-PIERRE PELLETIER

SILA REMEDIATION
4495 BL. WILFRID- HAMEL, BUR 1
QUEBEC, PQ
CANADA G1P 2T7

Report Date: 2014/09/22
Report #: R1646810
Version: 2R

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B478404
Received: 2014/09/04, 10:45

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 by HS GC/MS (MeOH extract)	1	2014/09/05	2014/09/08	AB SOP-00039	CCME CWS/EPA 8260C m
CCME Hydrocarbons (F2-F4 in soil)	1	2014/09/05	2014/09/09	AB SOP-00036 / AB SOP-00040	CCME PHC-CWS
Elements by ICPMS - Soils	1	2014/09/11	2014/09/11	AB SOP-00001 / AB SOP-00043	EPA 200.8 R5.4 m
Moisture	1	N/A	2014/09/06	AB SOP-00002	CCME PHC-CWS
Polychlorinated Biphenyls (1)	1	2014/09/06	2014/09/08	CAL SOP-00149	EPA 8082A R1 m

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
BTEX/F1 in Water by HS GC/MS	1	N/A	2014/09/05	AB SOP-00039	CCME CWS/EPA 8260C m
CCME Hydrocarbons (F2-F4 in water)	1	2014/09/11	2014/09/11	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
Mercury - Low Level (Total) (1)	1	2014/09/09	2014/09/09	CAL SOP-00007	EPA 1631 RE 20460 m
Elements by ICPMS - Total	1	2014/09/12	2014/09/12	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4 m
Polychlorinated Biphenyls (1)	1	2014/09/06	2014/09/08	CAL SOP-00149	EPA 8082A R1 m

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Maxxam Calgary Environmental

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Tanya Eugine, M.Sc., Project Manager
Email: TEugine@maxxam.ca
Phone# (780)577-7144

==========

Maxxam Job #: B478404
Report Date: 2014/09/22

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

AT1 BTEX AND F1-F4 IN SOIL (SOIL)

Maxxam ID		KN2961		
Sampling Date		2014/08/25		
COC Number		A135191		
	Units	P414-4WB	RDL	QC Batch
Physical Properties				
Moisture	%	8.5	0.30	7627619
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/kg	<10	10	7627782
F3 (C16-C34 Hydrocarbons)	mg/kg	<50	50	7627782
Reached Baseline at C50	mg/kg	Yes		7627782
Volatiles				
F1 (C6-C10) - BTEX	mg/kg	<12	12	7627727
(C6-C10)	mg/kg	<12	12	7627727
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	103		7627727
4-Bromofluorobenzene (sur.)	%	100		7627727
D10-ETHYLBENZENE (sur.)	%	106		7627727
D4-1,2-Dichloroethane (sur.)	%	95		7627727
O-TERPHENYL (sur.)	%	99		7627782
RDL = Reportable Detection Limit				

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Maxxam Job #: B478404
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SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

AT1 BTEX AND F1-F4 IN WATER (WATER)

Maxxam ID		KN2962		
Sampling Date		2014/08/25		
COC Number		A135191		
	Units	P414-3W	RDL	QC Batch
Ext. Pet. Hydrocarbon				
F2 (C10-C16 Hydrocarbons)	mg/L	<0.71 (1)	0.71	7633499
F3 (C16-C34 Hydrocarbons)	mg/L	<1.4 (1)	1.4	7633499
Reached Baseline at C50	mg/L	Yes		7633499
Volatiles				
F1 (C6-C10) - BTEX	ug/L	<100	100	7627246
(C6-C10)	ug/L	<100	100	7627246
Surrogate Recovery (%)				
1,4-Difluorobenzene (sur.)	%	99		7627246
4-Bromofluorobenzene (sur.)	%	97		7627246
D4-1,2-Dichloroethane (sur.)	%	99		7627246
O-TERPHENYL (sur.)	%	93		7633499

RDL = Reportable Detection Limit

(1) Detection limit raised based on sample volume used for analysis. Sample extracted past method-specified hold time.

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Maxxam Job #: B478404
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SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)

Maxxam ID		KN2961		
Sampling Date		2014/08/25		
COC Number		A135191		
	Units	**P414-4WB**	**RDL**	**QC Batch**
Polychlorinated Biphenyls				
Aroclor 1016	mg/kg	<0.010	0.010	7628083
Aroclor 1221	mg/kg	<0.010	0.010	7628083
Aroclor 1232	mg/kg	<0.010	0.010	7628083
Aroclor 1242	mg/kg	<0.010	0.010	7628083
Aroclor 1248	mg/kg	<0.010	0.010	7628083
Aroclor 1254	mg/kg	<0.010	0.010	7628083
Aroclor 1260	mg/kg	<0.010	0.010	7628083
Aroclor 1262	mg/kg	<0.010	0.010	7628083
Aroclor 1268	mg/kg	<0.010	0.010	7628083
Total Aroclors	mg/kg	<0.010	0.010	7628083
Surrogate Recovery (%)				
NONACHLOROBIPHENYL (sur.)	%	77		7628083
RDL = Reportable Detection Limit				

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Maxxam Job #: B478404
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SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		KN2961		
Sampling Date		2014/08/25		
COC Number		A135191		
	Units	**P414-4WB**	**RDL**	**QC Batch**
Elements				
Total Arsenic (As)	mg/kg	2.1	1.0	7634239
Total Cadmium (Cd)	mg/kg	<0.10	0.10	7634239
Total Chromium (Cr)	mg/kg	49	1.0	7634239
Total Cobalt (Co)	mg/kg	7.4	1.0	7634239
Total Copper (Cu)	mg/kg	21	5.0	7634239
Total Lead (Pb)	mg/kg	3.8	1.0	7634239
Total Mercury (Hg)	mg/kg	<0.050	0.050	7634239
Total Nickel (Ni)	mg/kg	26	1.0	7634239
Total Zinc (Zn)	mg/kg	17	10	7634239
RDL = Reportable Detection Limit				

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Maxxam Job #: B478404
Report Date: 2014/09/22

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		KN2962		
Sampling Date		2014/08/25		
COC Number		A135191		
	Units	**P414-3W**	**RDL**	**QC Batch**
Polychlorinated Biphenyls				
Aroclor 1016	mg/L	<0.000050	0.000050	7627921
Aroclor 1221	mg/L	<0.000050	0.000050	7627921
Aroclor 1232	mg/L	<0.000050	0.000050	7627921
Aroclor 1242	mg/L	<0.000050	0.000050	7627921
Aroclor 1248	mg/L	<0.000050	0.000050	7627921
Aroclor 1254	mg/L	<0.000050	0.000050	7627921
Aroclor 1260	mg/L	<0.000050	0.000050	7627921
Aroclor 1262	mg/L	<0.000050	0.000050	7627921
Aroclor 1268	mg/L	<0.000050	0.000050	7627921
Total Aroclors	mg/L	<0.000050	0.000050	7627921
Surrogate Recovery (%)				
NONACHLOROBIPHENYL (sur.)	%	78		7627921
RDL = Reportable Detection Limit				

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Maxxam Job #: B478404
Report Date: 2014/09/22

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		KN2962		
Sampling Date		2014/08/25		
COC Number		A135191		
	Units	**P414-3W**	**RDL**	**QC Batch**
Elements				
Total Arsenic (As)	mg/L	0.0012	0.00020	7635264
Total Cadmium (Cd)	mg/L	0.000070	0.000020	7635264
Total Chromium (Cr)	mg/L	0.24	0.0010	7635264
Total Cobalt (Co)	mg/L	0.0093	0.00030	7635264
Total Copper (Cu)	mg/L	0.027	0.00020	7635264
Total Lead (Pb)	mg/L	0.0033	0.00020	7635264
Total Nickel (Ni)	mg/L	0.10	0.00050	7635264
Total Zinc (Zn)	mg/L	0.14	0.0030	7635264
Low Level Elements				
Total Mercury (Hg)	ug/L	0.028 (1)	0.020	7630982

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

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SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

GENERAL COMMENTS

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER) Comments

Sample KN2962-01 Polychlorinated Biphenyls: Sample extracted past method-specified hold time.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
7627246	1,4-Difluorobenzene (sur.)	2014/09/05	96	70 - 130	97	70 - 130	99	%				
7627246	4-Bromofluorobenzene (sur.)	2014/09/05	99	70 - 130	97	70 - 130	98	%				
7627246	D4-1,2-Dichloroethane (sur.)	2014/09/05	101	70 - 130	96	70 - 130	99	%				
7627727	1,4-Difluorobenzene (sur.)	2014/09/08	107	60 - 140	99	60 - 140	97	%				
7627727	4-Bromofluorobenzene (sur.)	2014/09/08	102	60 - 140	101	60 - 140	99	%				
7627727	D10-ETHYLBENZENE (sur.)	2014/09/08	105	60 - 130	104	60 - 130	105	%				
7627727	D4-1,2-Dichloroethane (sur.)	2014/09/08	95	60 - 140	93	60 - 140	93	%				
7627782	O-TERPHENYL (sur.)	2014/09/09	79	50 - 130	80	50 - 130	88	%				
7627921	NONACHLOROBIPHENYL (sur.)	2014/09/08	89	30 - 130	90	30 - 130	91	%				
7628083	NONACHLOROBIPHENYL (sur.)	2014/09/08	78	30 - 130	82	30 - 130	81	%				
7633499	O-TERPHENYL (sur.)	2014/09/11	94	50 - 130	101	50 - 130	92	%				
7627246	(C6-C10)	2014/09/05	92	70 - 130	117	70 - 130	<100	ug/L	NC	40		
7627246	F1 (C6-C10) - BTEX	2014/09/05					<100	ug/L	NC	40		
7627619	Moisture	2014/09/06					<0.30	%	9.0	20		
7627727	(C6-C10)	2014/09/08	105	60 - 140	109	60 - 140	<12	mg/kg	NC	50		
7627727	F1 (C6-C10) - BTEX	2014/09/08					<12	mg/kg	NC	50		
7627782	F2 (C10-C16 Hydrocarbons)	2014/09/09	86	50 - 130	93	70 - 130	<10	mg/kg	NC	50		
7627782	F3 (C16-C34 Hydrocarbons)	2014/09/09	90	50 - 130	96	70 - 130	<50	mg/kg	NC	50		
7627921	Aroclor 1016	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Aroclor 1221	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Aroclor 1232	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Aroclor 1242	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Aroclor 1248	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Aroclor 1254	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Aroclor 1260	2014/09/09	90	30 - 130	96	30 - 130	<0.000050	mg/L	NC	40		
7627921	Aroclor 1262	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Aroclor 1268	2014/09/09					<0.000050	mg/L	NC	40		
7627921	Total Aroclors	2014/09/09					<0.000050	mg/L	NC	40		
7628083	Aroclor 1016	2014/09/08					<0.010	mg/kg	NC	50		
7628083	Aroclor 1221	2014/09/08					<0.010	mg/kg	NC	50		
7628083	Aroclor 1232	2014/09/08					<0.010	mg/kg	NC	50		
7628083	Aroclor 1242	2014/09/08					<0.010	mg/kg	NC	50		

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Maxxam Job #: B478404
Report Date: 2014/09/22

QUALITY ASSURANCE REPORT(CONT'D)

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
7628083	Aroclor 1248	2014/09/08					<0.010	mg/kg	NC	50		
7628083	Aroclor 1254	2014/09/08					<0.010	mg/kg	NC	50		
7628083	Aroclor 1260	2014/09/08	72	30 - 130	89	30 - 130	<0.010	mg/kg	NC	50		
7628083	Aroclor 1262	2014/09/08					<0.010	mg/kg	NC	50		
7628083	Aroclor 1268	2014/09/08					<0.010	mg/kg	NC	50		
7628083	Total Aroclors	2014/09/08					<0.010	mg/kg	NC	50		
7630982	Total Mercury (Hg)	2014/09/09	94	80 - 120	101	80 - 120	<0.0020	ug/L	NC	20		
7633499	F2 (C10-C16 Hydrocarbons)	2014/09/11	102	50 - 130	115	70 - 130	<0.10	mg/L				
7633499	F3 (C16-C34 Hydrocarbons)	2014/09/11	103	50 - 130	117	70 - 130	<0.20	mg/L				
7634239	Total Arsenic (As)	2014/09/11	93	75 - 125	95	75 - 125	<1.0	mg/kg	NC	35	122	50 - 150
7634239	Total Cadmium (Cd)	2014/09/11	92	75 - 125	92	75 - 125	<0.10	mg/kg	NC	35		
7634239	Total Chromium (Cr)	2014/09/11	93	75 - 125	94	75 - 125	<1.0	mg/kg	3.0	35	104	41 - 159
7634239	Total Cobalt (Co)	2014/09/11	92	75 - 125	94	75 - 125	<1.0	mg/kg	NC	35	107	75 - 125
7634239	Total Copper (Cu)	2014/09/11	91	75 - 125	96	75 - 125	<5.0	mg/kg	NC	35	107	73 - 127
7634239	Total Lead (Pb)	2014/09/11	96	75 - 125	99	75 - 125	<1.0	mg/kg	NC	35	110	54 - 146
7634239	Total Mercury (Hg)	2014/09/11	98	75 - 125	107	75 - 125	<0.050	mg/kg	NC	35		
7634239	Total Nickel (Ni)	2014/09/11	92	75 - 125	95	75 - 125	<1.0	mg/kg	2.3	35	112	61 - 139
7634239	Total Zinc (Zn)	2014/09/11	98	75 - 125	99	75 - 125	<10	mg/kg	NC	35	113	72 - 128
7635264	Total Arsenic (As)	2014/09/12	98	80 - 120	102	80 - 120	<0.00020	mg/L	NC	20		
7635264	Total Cadmium (Cd)	2014/09/12	100	80 - 120	101	80 - 120	<0.000020	mg/L				
7635264	Total Chromium (Cr)	2014/09/12	98	80 - 120	101	80 - 120	<0.0010	mg/L	NC	20		
7635264	Total Cobalt (Co)	2014/09/12	98	80 - 120	102	80 - 120	<0.00030	mg/L	NC	20		
7635264	Total Copper (Cu)	2014/09/12	NC	80 - 120	103	80 - 120	0.00028 ,RDL=0.00020	mg/L	0.55	20		
7635264	Total Lead (Pb)	2014/09/12	96	80 - 120	106	80 - 120	<0.00020	mg/L	NC	20		
7635264	Total Nickel (Ni)	2014/09/12	97	80 - 120	101	80 - 120	<0.00050	mg/L	NC	20		
7635264	Total Zinc (Zn)	2014/09/12	NC	80 - 120	104	80 - 120	<0.0030	mg/L	0.56	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.

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

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

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Maxxam Job #: B478404
Report Date: 2014/09/22

QUALITY ASSURANCE REPORT(CONT'D)

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

			Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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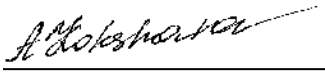
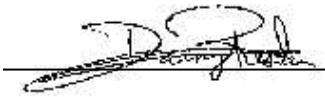
SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

VALIDATION SIGNATURE PAGE

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



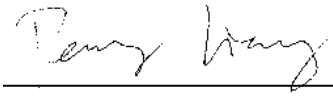
Anna Koksharova, M.Sc., Senior Analyst



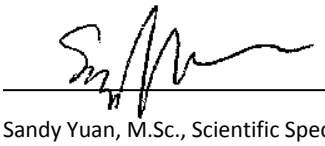
Daniel Reslan, Chem. Tech., Volatiles Supervisor

Justin Geisel, B.Sc., Supervisor, Organics

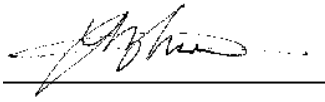
Luba Shymushovska, Senior Analyst, Organic Department



Peng Liang, Analyst II



Sandy Yuan, M.Sc., Scientific Specialist



Yashu Mohan, B.Sc. B.Tech., Senior Analyst

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

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Maxxam Job #: B478404
Report Date: 2014/09/22

SILA REMEDIATION
Client Project #: PIN-4 RFM
Site Location: BYRON BAY
Sampler Initials: AP

VALIDATION SIGNATURE PAGE(CONT'D)

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

17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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ANNEX 2

QA/QC Discussion

QUALITY ASSURANCE / QUALITY CONTROL

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.

1. LABORATORIES

Samples collected during the monitoring program were submitted to laboratories accredited by the Canadian Association for Laboratory Accreditation (CALA):

- **Main Laboratory**
  EXOVA
  7217 Roper Road NW
  Edmonton, Alberta
  T6B 3J4, Canada
  CALA Registration number: 2602

- **Quality Assurance Laboratory**
  Maxxam Analytics International Corporation
  o/a Maxxam Analytics Edmonton
  9331 - 48th Street T6B 2R4
  CALA Registration number: 2996

2. FIELD QA/QC

Standard sample collection techniques were implemented to decrease the likelihood of compromising collected samples, such as:

- Pre-cleaned sample containers were provided by the laboratory.
- Monitoring equipment was decontaminated between sampling stations and dedicated sampling systems were utilized.
- Soil samples were placed directly in the laboratory provided jars/bottles and were not mixed.
- Disposable nitrile glove were worn and disposed of after each sample collection.
- Jars/bottles were cleaned prior to placement into the cooler.
- Water samples were collected through the use of dedicated Waterra foot valves and tubing.

- Ice Packs or bagged ice (Ziplock bags) were used to ensure that sample temperature would be kept below 10°C during transportation.
- Samples were kept at the laboratory at temperatures below 4°C.

A sample integrity report from Exova is provided in Annex 1. This report indicates that all samples received were acceptable for analysis. It should be noted that some PHC analyses were performed after method recommended holding time (Fraction F1 for Exova and Fractions F2 and F3 for Maxxam).

The following is a summary of the analytical QA/QC procedure implemented in the field:

- 10% field Blind Duplicate Samples of soil and water were sent to Exova: 1 blind duplicate soil sample (P414-BD1) and one blind duplicate groundwater sample (P414-BDW1) were submitted, as an independent check on data reproducibility, and to assess the field QA/QC protocols. One field blank (P414-FB) was submitted for analysis.
- 10% Inter-laboratory Duplicate Samples were sent to Maxxam: one blind duplicate soil sample (P414-4WB) and one blind duplicate groundwater sample (P414-3W) were submitted (to determine if variation in procedures may cause significant difference in analytical results).
- 10% Archival Samples of soil were sent to ESG.

3. LABORATORIES QA/QC

Quality assurance documents from Exova only provide a summary of the QA/QC results. The quantity of samples per batch per analysis is not provided.

Quality assurance documents from Maxxam indicate that the soil samples were in the following batches:

- Batch 7634239 for metals
- Batch 7628083 for PCBs
- Batch 7627727 for PHC Fraction F1
- Batch 7627782 for PHC fraction F2-F3
-

The water samples were analyzed was analyzed the following batches:

- Batch 7635264 for most metals
  - Batch 7630982 for mercury
- Batch 7627921 for PCBs
- Batch 7627246 for PHC fraction F1
- Batch 7633499 for PHC fraction F2-F3

4. DATA MANAGEMENT AND INTERPRETATION

4.1. FIELD WORK

The relative percent difference (RPD) is used to evaluate the sample result variability. Average RPD values of 30% for each parameter analyzed from the same laboratory 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. These performance criteria are applicable when the concentrations of the original and duplicate sample are five times or greater than the laboratory method detection limit, since the uncertainty increases dramatically as the concentration approaches the detection limit. Table I provides the detection limit for each parameter and the associated minimum concentration to be reached in order to be eligible for RPD calculation.

Table I: Minimum Concentration for QA/QC RPD Calculation

		Soil			Water		
Parameter	**Laboratory**	**Units**	**MDL**	**RPD Minimum***	**Units**	**MDL**	**RPD Minimum***
As	Exova	mg/kg	0.2	1.0	mg/L	0.0002	0.0010
	Maxxam	mg/kg	1.0	5.0	mg/L	0.0002	0.0010
Cd	Exova	mg/kg	0.01	0.05	mg/L	0.00001	0.00005
	Maxxam	mg/kg	0.10	0.50	mg/L	0.00002	0.00010
Cr	Exova	mg/kg	0.5	2.5	mg/L	0.0005	0.0025
	Maxxam	mg/kg	1.0	5.0	mg/L	0.0010	0.0050
Co	Exova	mg/kg	0.1	0.5	mg/L	0.0001	0.0005
	Maxxam	mg/kg	1.0	5.0	mg/L	0.0003	0.0015
Cu	Exova	mg/kg	1.0	5.0	mg/L	0.0010	0.0050
	Maxxam	mg/kg	5.0	25.0	mg/L	0.0002	0.0010
Pb	Exova	mg/kg	5.0	25.0	mg/L	0.0001	0.0005
	Maxxam	mg/kg	1.0	5.0	mg/L	0.0002	0.0010
Ni	Exova	mg/kg	0.5	2.5	mg/L	0.0005	0.0025
	Maxxam	mg/kg	1.0	5.0	mg/L	0.0005	0.0025
Zn	Exova	mg/kg	1	5	mg/L	0.001	0.005
	Maxxam	mg/kg	10	50	mg/L	0.003	0.015
Hg	Exova	mg/kg	0.01	0.05	mg/L	0.000005	0.000025
	Maxxam	mg/kg	0.05	0.25	mg/L	0.000020	0.000100
Total PCBs	Exova	mg/kg	0.10	0.50	ug/L	0.10	0.50
	Maxxam	mg/kg	0.01	0.05	ug/L	0.05	0.25
PHC F1	Exova	mg/kg	10	50	mg/L	0.2	1.0
	Maxxam	mg/kg	12	60	mg/L	0.1	0.5
PHC F2	Exova	mg/kg	50	250	mg/L	0.2	1
	Maxxam	mg/kg	10	50	mg/L	0.71	3.55
PHC F3	Exova	mg/kg	50	250	mg/L	0.1	0.5
	Maxxam	mg/kg	50	250	mg/L	1.4	7.0

* : The RPD Minimum is the minimum concentration to be reached for QA/QC Relative Percent Difference Calculation

4.1.1. SOIL SAMPLES

One blind duplicate soil sample was submitted for intra- and inter-laboratory comparisons. The original and duplicate intra- and inter-laboratory metal, PCB and PHC soil sample results are summarized in Tables II, along with the calculated RPD for each parameter. As noted in the tables, several of the results from the original and/or duplicate samples were below or within five times the laboratory method detection limits, and therefore RPD values were not calculated for these parameters.

Review of results indicated relatively minor differences in metal concentrations within the intra-laboratory duplicate samples (highest RPD calculated at 19.3% for nickel).

Results from the inter-laboratory duplicate samples shows that the acceptance criterion was exceeded for chromium and nickel (129.4 and 42.4%, respectively). No conclusion can be derived from only one sample.

4.1.2. WATER SAMPLES

One blind duplicate groundwater sample (P414-BDW1 / P214-3W) was submitted for intra- and inter-laboratory comparisons. The original and duplicate intra- and inter-laboratory metal, PCB and PHC sample results are summarized in Table IV, along with the calculated RPD for each parameter and average RPD for each sample. As noted in the table, all organic parameters from the original and/or duplicate samples were below or within five times the laboratory method detection limits, and therefore RPD values were not calculated for these parameters.

Review of the results indicated significant differences in most metal concentrations between the original and intra-laboratory duplicate sample (between 34.0 and 100.0%). It should be noted that all concentrations recorded are still fairly low and could lead to analytical variations.

Review of the inter-laboratory duplicate results also indicated significant concentration variations for lead, nickel and zinc (107.0, 58.7 and 41.4%, respectively).

Trends and conclusions cannot be derived from only 1 sample.

The results from field blank sample (P414-FB) that was submitted for metals, PCB and PHC analyses are also summarized in Tables III. All other parameters are below the detection limit.

4.2. LABORATORIES

QA/QC results from both laboratories do not raise any concern or provide any explanation concerning the concentration difference noticed in the inter-laboratory duplicate samples.

It should be noted that inter-laboratory variations are common. QA/QC results from both laboratories are appended.

4.2.1. BLANKS

All blanks from both laboratories, for both matrices and for all parameters were below the detection limits.

4.2.2. ANALYTICAL DUPLICATES

All analytical duplicates from both laboratories, for both matrices and for all parameters had RSD's at or below 20%.

4.2.3. CONTROL SAMPLES

All control samples from both laboratories, for both matrices and for all parameters had concentrations between the upper and lower concentration established for each parameter.

Table II: Soil Chemical Analysis Results - Quality Assurance Samples

Sample #	Laboratory	Parameters												
												F1	F2	F3
		As [mg/kg]	Cd [mg/kg]	Cr [mg/kg]	Co [mg/kg]	Cu [mg/kg]	Pb [mg/kg]	Ni [mg/kg]	Zn [mg/kg]	Hg [mg/kg]	PCBs [mg/kg]	C_6-C_{10} [mg/kg]	C_{10}-C_{16} [mg/kg]	C_{16}-C_{34} [mg/kg]
MDL (Exova)		0.2	0.01	0.5	0.1	1.0	5.0	0.5	1	0.01	0.10	10	50	50
RPD Minimum (Exova)		1.0	0.05	2.5	0.5	5.0	25.0	2.5	5	0.05	0.50	50	250	250
MDL (Maxxam)		1.0	0.10	1.0	1.0	5.0	1.0	1.0	10	0.05	0.01	12	10	50
RPD Minimum (Maxxam)		5.0	0.50	5.0	5.0	25.0	5.0	5.0	50	0.25	0.05	60	50	250
Intra-Lab Duplicate Samples (Exova)														
P414-4WB	Exova	1.8	<0.01	10.5	7.6	25.2	<5	16.9	18	<0.01	<0.1	<10	<50	<50
P414-BD1		2.0	<0.1	10.4	7.2	23.5	<1	20.5	16	<0.05	<0.01	<12	<10	<50
Relative % Difference		10.5	N/A	1.0	5.4	N/A	N/A	19.3	11.8	N/A	N/A	N/A	N/A	N/A
Inter-Lab Duplicate Samples (Exova-Maxxam)														
P414-4WB	Exova	1.8	<0.01	10.5	7.6	25.2	<5	16.9	18	<0.01	<0.1	<10	<50	<50
	Maxxam	2.1	<0.1	49.0	7.4	21.0	3.8	26.0	17	<0.05	<0.01	<12	<10	<50
Relative % Difference		N/A	N/A	129.4	2.7	N/A	N/A	42.4	N/A	N/A	N/A	N/A	N/A	N/A

Table III: Groundwater Chemical Analysis Results - Quality Control Samples

Sample #	Laboratory	Parameters												
												F1	F2	F3
		As [mg/L]	Cd [ug/L]	Cr [mg/L]	Co [mg/L]	Cu [mg/L]	Pb [mg/L]	Ni [mg/L]	Zn [mg/L]	Hg [ug/L]	PCBs [ug/L]	C_6-C_{10} [mg/L]	C_{10}-C_{16} [mg/L]	C_{10}-C_{34} [mg/L]
MDL (Exova)		0.0002	0.00001	0.0005	0.0001	0.0010	0.0001	0.0005	0.001	0.005	0.10	0.2	0.20	0.1
RPD Minimum (Exova)		0.0010	0.00005	0.0025	0.0005	0.0050	0.0005	0.0025	0.005	0.025	0.50	1.0	1.00	0.5
MDL (Maxxam)		0.0002	0.00002	0.0010	0.0003	0.0002	0.0002	0.0005	0.003	0.020	0.05	0.1	0.71	1.4
RPD Minimum (Maxxam)		0.0010	0.00010	0.0050	0.0015	0.0010	0.0010	0.0025	0.015	0.100	0.25	0.5	3.55	7.0
Intra-Lab Duplicate Samples (Exova)														
P414-3W	Exova	0.0009	0.00008	0.1800	0.0078	0.0210	0.0010	0.0546	0.092	0.015	<0.1	<0.2	<0.2	<0.1
P414-BDW1		0.0020	0.00008	0.1140	0.0110	0.0300	0.0030	0.0654	0.160	<0.005	<0.1	<0.2	<0.2	<0.1
Relative % Difference		N/A	N/A	44.9	34.0	35.3	100.0	18.0	54.0	N/A	N/A	N/A	N/A	N/A
Inter-Lab Duplicate Samples (Exova-Maxxam)														
P414-3W	Exova	0.0009	0.00008	0.1800	0.0078	0.0210	0.0010	0.0546	0.092	0.015	<0.1	<0.2	<0.2	<0.1
	Maxxam	0.0012	0.00007	0.2400	0.0093	0.0270	0.0033	0.1000	0.140	0.028	<0.05	<0.1	<0.71	<1.4
Relative % Difference		N/A	N/A	28.6	17.5	25.0	107.0	58.7	41.4	N/A	N/A	N/A	N/A	N/A
P414-FB	Field Blank	<0.0002	<0.00001	<0.0005	<0.0001	<0.001	<0.0001	<0.0005	<0.001	<0.005	<0.1	<0.2	<0.2	<0.1

ANNEX 3

Field Notes and Chain of Custody Forms

AUGUST 25, 2014 FOG, RAIN LT.
PINT & DOMINION BAY, 20-30 km/h SW
4-5°C

TIER II DISPOSAL FACILITY

WP 318 MW-1 1.1mW, V-E
P4+4-A/B DK BRN SAND & GRAVEL, DAMP.

50mm dia SS wells SWL = 63-12
⊻ 1.48 bott 2.15
T 12.5/12.6/13.1 COND 7.07/6.22/6.12
pH 8.4/8.2/8.1 MS TURB: 78,
COLLECT ALL C+C PURGE 1.5L
2x1L, 3x40, 1x40, 1x250pL

319 MW-2 water ponded all around well, 3m NW. Best swell well
42mm dia SWL 70-12
⊻ 78.5 bott 1.65
T - 2.7/2.8/3.2 COND 2.88/2.61/2.25
pH - 7.2/7.4/7.4 MS COLLECT ALL C+C
V-SE BLK-ORG + GREY CLAY TURB 88
0-10 40-50

P4+4 3W A/B

320 MW-3 V-S 1.6mN
0-dk brn/blk org 0-10
20 dk grey/brn clay + silt 40-50
SWL = 58-11 W/ gravel/Rock
⊻ 8.6 bott 2.76
T = 2.9/2.5/2.2 COND - 3.59/3.41/3.32
pH 7.4/7.5/7.5 MS TURB 186
COLLECT 4x500, 2x1L, 3x250pL, 2x40, 9x40
1x700 gL PURGE 45L
(1900W1)

321 MW-4 V-E, 2mW.
0 brn sand & gravel 0-10
P4+4 4W/A/B (B01) 40-50

SWL = 51-13
⊻ 8.5 bott 2.10
T - 4.5/3.1/2.1 Cond 0.681 mS/cm
pH 7.8/7.7/7.6 TURB 151.
COLLECT ALL PURGE 3.0L

322 V-E/N & SW CRNR TOE
323 " " ESW TOP CRNR, PAN SE-N
ROUGH GRADING ON COVER W/ ORG.
324 V-T-1 V-N
325 V-N/W & SE CRNR, PAN NE/W.

LEVEL

325 V-SE/E @ SLOPE DEPRESSION SE CREST. 1.5×2×15W.

326 MIN EROS @ CREST 5wL, 20W, 25t V-E/W.

327 VT-2 V-W.

328 VT-3 V-E

329 MIN SETT @ CREST, LIN t. 5x, 15W ↓ V-N/W.

330 V-S/E @ NW CNR, PAN SW/E

331 " S/E @ NW TOE

332 VT-4, V-NNE

333 V-W/S, PAN NW-SE NE CNR

334 V-W/S @ TOE

335 V-SW.

336 POOL ON SE CNR; V-W/N @ TOE

337 V-NW.

NORTHWEST LANDFILL LOBE D

338 V-E/N @ TOE 2013, TENSION CRACK NOT VIS. INFILLED ?

339 V-NE @ TOE

340 V-S, SPARSE VEG ON SLOPE

34[illegible] 2x POTHOLES NEAR/BELOW CREST 30x30x10, 20x20x5, V-N/W

34[illegible] V-N/W @ CNR, PAN NE-SSW

348 PAN. W-E.

LOBE C - NO VEG/EROS/SETTLEMENT

344 V-E FROM RD

345 V-E/N @ SW CNR, PAN SE-NW

346 V-S/E @ NW

347 V-S/E @ NE CNR, PAN. NW-SSE

348 V-N/W @ SE CNR @ TOE.

LOBE B

349 V-W/SW

350 CNR V-NE/W-, NOTE VEG ON CNR TRACK PAN NE-W.

350 V-E/N @ SW CNR, NOTE VEG, PAN-SE/N.

351 V-S/E @ NW CNR

352 2x MIN DEPR. ON COVER 15×15×5t, 40×10×3t V-E/S

353 V-E & MINEROS ALONG TOE see track 10-15W x 2t TO CNR. ~30wL.

NORTH LANDFILL - LOBE C

353 V-SW

354 V-W/S- PAN W-SE.

355 V-S/E PAN: SW-E

356 V-E/S @ NW EROS-@ NW CNR. 2-3t 2wL 15-40W: ON SLOPE + CREST - FEW ONLY @ LEVEL

357 V-NE@SW CRNR
358 V-W/N, PAN NE-W-@SE CRNR
359 V-N/W@MID, END @ TOE OF MID SLOPE 4mL 10mx½-3↓

LOBE B

360 V-N@SE CRNR, V-W,
361 V-E@SLOUGH ON CREST OF TYPE 1 LIN. SETTLE? 5mx15x10-15½(EW)
362 PAN NNE-W
363 V-E ALONG TOP
364 - V-S UPSLOPE
365 - PAN SW-E@MID BEND
366 - V-S@N END/SLOPE
367 PAN W-S.
368 V-NW@TOE OF MID SLOPE
369 V-SW UPSLOPE

LOBE A

370 V-SE @SLOPE (NW)
371 V-SE ALONG TOE
372 V-SSW@ORG (EDGE) UPSLOPE
373 PAN NNW-S@TOE
374 V-W UPSLOPE@EDGE, POSS SETTLEMENT AT EDGE OF TYPE 1 5mL, 30-50x10-20
375 N-S @ ORG ON SLOPE

376 V-SW, SE, N.
377 V-NE, PAN NW-SE ACROSS COVER
378 V-E @ EDGE OF ORG, SW UPPER TOE
379 PAN-S-NE @ W CRNR
380-81 - 14mL x 10 x 1-2↓ MW BRUS ACROSS COVER V-SE/NW.
- NO OIL STAINS - ??

NON-HAZARDOUS WASTE LANDFILL

382 V-SW/NE@E CRNR - TOE
383 V- " " @E CRNR PAN NW-SE
384 MIN DEPR@CREST, V-NW/SW. 70x30x10-1
385 V-SE/SW, PAN EW-E@N CRNR
386 V-SE/SW@N TOE
387 V-NE/SE@SW CRNR PAN N-S
388 V-NE/SE@SW TOE
389 V-NW/NE@SE CRNR, PAN NE-S.
390 V-NW/NE@SE TOE.
391 TYP. RUTS ON COVER (H.EQUIP.) + V-W.
392 3 PIECES OF METAL - SURF DEBRIS
393 ?

LEVEL

STATION AREA LANDFILL WEST

394 V-NW CTOE

395 V-SE/NNW, MIN EROS
41↓ V-W ALONG TOE OF MND SLOPE
13mLx10x1↓

396 V-NE (600) 397 - V-S

397 PAN S-NW

398-99 MIN EROS CTOE OF MND SLOPE 18mLx10-20x2-3↓ V-E/W
SEE TRACK

400 V-NE CTOE

401 POTHOLE 30x30x15↓ V-E-N

402 PAN E-NW CROSSOVER

403 V-~~SE~~ NE/SE @ W CRNR

404 V-NW/NE @ S CRNR

405 V-NW/NE @ DEEP ONCRST
1.5Wx1x15↓

406 V-W/E @ TOE

407 TYP MIN EROS ON COVER, FINES.
10-15W, 1↓ S-LOL.

408 NW @ 30↑ MOUND of SOIL from Grading

409 V-NW ALONG S TOE

410 DEPR 40x60x10↓ V-W

411 STAIN 30x60

412 LIN DEPR 5mLx20Wx5↓ V/N/E

AIRSTRIP LANDFILL

413 V-SE

414 V-S

415 V-WNW

416 V-NW

419 V-WNW

421 V-NE @ CRACK

422 DEBRIS COVER

423 PAN S-NW

417 PAN NE-W

418 T.CRACK V-N
3mLx2.3mmW.

420 V-E/W CRACK 2-6mx INFILLED
40x5↓, ¼ sand.
MAJ. EROSION 6mx/0x5

1mx30x15↓ V-E/N

USA=

~~424~~ V-NE/NW @ SW CRNR

425 V-NE ALONG N TOE

426 V-SW/SE @ NE CRNR

427 " SW TOE

~~428~~ V-NE @ NW CRN TOE

428 S of wetted area @ toe V-N
PAN NE-NW, seepage 429
2 locations, V-W, WALL CRN

VT-1 1203012 SER 9.2-L
1134, BSP BAT.

LEVEL

13448	1.0633	3.9687	0.7794	-5.5565
15253	0.9866	1.4524	0. 22.37	-6.2433
16405	0.9422	-0.0166	22.97	-6.8004
17012	0.9320	-0.6898	23.64	-7.3540
1818	0.8810	-2.0647	24.21	-7.6825
1911	0.8528	-3.0219		
2065	0.8242	-4.0019		
2045	0.8065	-4.8683		

21.70

VT-2 Ser. 07060012.

BATT - unable to communicate
repl. batteries - still error

removed 9V Lithium battery inside

1	10.013	9	16.867
2	10.216	10	17.123
3	11.607	11	18.109
4	12.467	12	18.645
5	13.423	13	19.370
6	14.803	14	
7	15.158	15	
8	15.979	16	

AUGUST 26, 2014 CAMBRIDGE BAY
RAIN, 6°C

VT-3

Ser 07040011

batt 11.43 / 13.50

1	9.4294	9.513	9	-2.2142	15.756
2	9.1176	9.518	10	-3.2901	16.496
3	7.7880	10.137	11	-4.0413	17.026
4	5.9675	10.021	12	-4.7595	17.516
5	3.1969	12.446	13	-5.4976	18.110
6	1.3292	13.516			
7	0.0620	14.282			
8	-0.9836	14.969			

VT-4

Ser 07060014

batt 11.54 / 13.50

1	9.0118	9.531	10	-3.8549	16.751
2	7.9485	10.009	11	-4.5688	17.186
3	6.2721	10.776	12	-5.2890	17.679
4	3.0944	12.400	13	-5.7659	17.96
5	1.3896	13355	14	-6.3679	18.38
6	-0.1383	14.277	15	-6.7131	18.45
7	-1.1755	14.890	16	-6.9096	18.60
8	-2.2142	15.595			
9	-3.0037	16.119			

DEPART SITE LEVEL 7:00

Exova — Testing, calibrating, advising

www.exova.com ED 120-02

Project Information

Project ID: 2014 LFM.
Project Name: PIN-4 2014
Project Location: BYRON BAY
Legal Location:
PO/AFE#:
Proj. Acct. Code:
Quote # 14-091-309663

Invoice to:

Company: SILA REMEDIATION
Address: 1260 BOULEBOURGNEUF QUEBEC, QC
Attention: J-P PELLETIER
Phone: 418-626-1638 ext 5892
Cell:
Fax:
E-mail: jean-pierre.pelletier@lvm.ca
Agreement ID:
Copy of report: andrew.assalis@gmail.com

Report To:

Company:
Address:
Attention:
Phone:
Cell:
Fax:
E-mail 1:
E-mail 2:
Copy of invoice:

Report Results		Regulatory Requirement	
E-Mail	X	HCDWQG	
Mail		Ab Tier 1	
Online		SPIGEC	
Fax		BCCSR	
PDF	X	Other (list below)	
Excel	X		
QA/QC	X		

Sample Custody (please print)

Sampled by: N. PASSALIS
Company: SILA

This section for Lab use only

Date/Time stamp:
AUG 23 PM 12:27

RUSH Priority

- Emergency (contact lab for turnaround and pricing)
- Priority 1-2 working days (100% surcharge)
- Urgent 2-3 working days (50% surcharge)

When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and turn around time to match. Please contact the lab prior to submitting RUSH samples. If not all samples require RUSH, please indicate in the special instructions.

Date Required: _____ Signature: _____

Special Instructions/Comments (please include contact information including ph. # if different from above)

	Site I.D.	Sample Description	Depth start in cm	Depth end m	Date/Time Sampled	Matrix	Sampling Method	Number of Containers	TPH (F1-F3)	Metals	PCBs	T. metals (As, Co, Cu, Cr, Ni, Pb, Hg, Zn)	Enter tests above (√ relevant samples below)
1		PH4-1WA				Soil		2					
2		1WB						2					
3		2WA						2					
4		2WB						2					
5		3WA						2					
6		3WB						2					
7		4WA						2					
8		4WB						2					
9		BD1						2					
10		PH4-3W				GW		2					
11		-BDW1				"		2					
12		-FB				Water		2					
13													
14													
15													

Indicate in the space allotted any deficiencies by the corresponding number.

1. Indicate any samples that were not packaged well
2. Indicate any samples not received in Exova supplies
3. Indicate any samples that were not clearly labeled
4. Indicate any samples not received within the required hold time or temp.
5. Indicate any missing or extra samples
6. Indicate any samples that were received broken
7. Indicate any samples where sufficient volume was not received
8. Indicate any samples received in an inappropriate container

ED 120-02

Submission of this form acknowledges acceptance of Exova's Standard Terms and Conditions (http://www.exova.com/about/terms-and-conditions/)

Please indicate any potentially hazardous samples

Page 1 of 1 Control # C0042764

LOT: 1023106 COC

Shipping: COD Y/ N
and size of coolers
Temp. received: 4.6
Delivery Method:
Waybill:
Received by:

Maxxam

Calgary: 4000 19st St. NE, T2E 6P8. Ph: (403) 291-3077, Fax: (403) 735-2240, Toll free: (800) 386-7247
Edmonton: 9331 - 48 Street, T6B 2R4. Ph: (780) 577-7100, Fax: (780) 450-4187, Toll free: (877) 465-8889
www.maxxamanalytics.com

09/19(2) MPC

Chain of Custody A135191

Page: 1 of 1

	Invoice To:	C/O Report Address ☐
Company:	SILA REMEDIATION	
Contact:	J.P. PELLETIER	
Address:	1760 BOUL LEBOURGNEUF	
	Prov: QUEBEC, QC PC:	
Contact #s:	Ph: 418-626-1688 EXT 5892	

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

Report Distribution (E-Mail):
jean-pierre.pelletier@lvm.ca
andrew.passalis@gmail.com

REGULATORY GUIDELINES:
☐ AT1
☐ CCME
☐ Regulated Drinking Water
☑ Other:

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

PO #:
Project # / Name: ~~P.N-4~~ LFM
Site Location: BYRON BAY
Quote #: B30371
Sampled By: A.PASSALIS

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

See reverse for package specifics

	Sample ID	Depth (unit)	Matrix GW / SW Soil	Date/Time Sampled YY/MM/DD 24:00	SOIL: ~~BTEX F1-F4~~ F1-F3	Sieve (75 micron)	Regulated Metals (CCME / AT1)	Salinity 4	Assessment ICP Metals (See List)	Basic Class II Landfill	PCBs	WATER: ~~BTEX F1-F3~~ VOCs	BTEX F1-F2	Routine Water ☐ Turb ☐ F	TOC ☐ DOC	Regulated Metals (CCME / AT1): Total	Dissolved	Total ☐ Dissolved: Mercury	Other Analysis: PCBs	HOLD - Do not Analyze	# of Containers Submitted
1	P414 - 4WB		SOIL	14/08/25	X				X		X										2
2	P414 - 3W		GW	"								X				X		X	X		9
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					

RECEIVED IN YELLOWKNIFE
By: [signature] 10:45
2014 -09- 04

Temp: 6/7/7

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

Relinquished By (Signature/Print): [signature] Date (YY/MM/DD): 14/08/25 Time (24:00):
Relinquished By (Signature/Print): Date (YY/MM/DD): Time (24:00):
Special Instructions: METALS (As, Co, Cr, Cu, Ni, Pb, Zn, Hg) ONLY # of Jars Used & Not Submitted:

LAB USE ONLY
Received By: AMAHON HIMMELLE Date: 20140905 Time: 1040
Maxxam Job #: B472404
Custody Seal: intact on both
Temperature: 2.2, 1.3 present in both
Ice:
Lab Comments:

AB FCD-00331 Rev3 2010/05

Maxxam Analytics International Corporation o/a Maxxam Analytics