December 20, 2018 Reference No. 11111591

Ms. Krista Rebello, P.Eng.
Project Manager, Impacted Sites
Pollution Prevention Division
Department of Municipal Affairs and Environment
100 Prince Philip Drive
4th Floor, Confederation Building, West Block
P.O. Box 8700
St. John's, NL A1B 4J6

Dear Ms. Rebello:

Re: Ambient Air Sampling and Closure Report
Butter Pot Provincial Park, Newfoundland and Labrador

GHD Limited (GHD) was retained by the Government of Newfoundland and Labrador Department of Tourism, Culture, Industry, and Innovation (DTCII) to complete an ambient air sampling program at the generator site located within Butter Pot Provincial Park (Site or Property), Newfoundland and Labrador (NL). A Site Location Map is attached as Figure 1 of Attachment A.

In 2017, a Supplemental Phase III Environmental Site Assessment (ESA) was completed to assess the presence of soil with concentrations that exceeded applicable criteria, located within the area of the generator shed. In addition, a Remedial Action Plan/Risk Management Plan (RAP/RMP) to bring the Site to closure was developed, from which an ambient air sampling program was selected as the best remedial option for the Site. This option involved the construction of a floor hatch for placement of an ambient air sample canister between the floor and soil under the workshop building, the collection of 2 ambient air samples (one heating and one non-heating season), followed by reinstatement of the hatch. In addition, the rear wall of the generator shed exhibiting petroleum hydrocarbon staining was replaced to prevent further soil contamination, and ensure a safe working environment for Park employees.

This letter provides the results of the field work associated with the ambient air sampling events and recommendations for closure.

1. Site Description

The Site is located at Butter Pot Provincial Park approximately 36 km southwest of St. John's, NL along the Trans-Canada Highway (See Figure 1 of Attachment A). The park covers an area of 2,833 hectares and has 175 campsites. Pit toilets and drinking water taps are located throughout the park. The generator Site is located approximately 1.6 km southeast of the main campsites and is located east of Trailer Pond, in the vicinity of the park office (See Figure 2 of Attachment A).

The majority of the generator Site exterior area is covered with gravel with some areas of grass, moss and shrubs. The ground surface on-Site gently slopes downward to the northwest towards a gravel parking

area. A large pond (Trailer Pond) is located approximately 180 m west of the Site. A small stream is located approximately 200 m southeast of the Site which flows in a northeasterly direction along the west side of the highway on/off ramp towards a small pond located northeast of the park access road. There is a drinking water well near the Park office building which is located approximately 80 m south of the generator shed. The well provides potable water to Park staff and campground users. There is an underground plastic waterline located along a trail that is situated south of the generator shed which connects the well to the warm-up building.

There are four building structures within the Site area of the Park: a warmup building, a workshop, a storage shed and a generator shed. These structures do not contain concrete basements or concrete slabs; however, the generator shed has a partial concrete slab beneath the generator. A steel diesel fuel AST is located adjacent to the east side of the generator shed which is stationed on a concrete pad. When in operation, the diesel generator, which is owned by the Park and stored inside the generator shed, is connected to the AST. A propane AST is also located to the southwest of the generator shed and underground lines supply the adjacent workshop building (see Figure 3 of Attachment A).

The generator Site is bound to the north by forested land followed by the Park access road, to the east by forested land followed by the Trans-Canada Highway, to the south by forested land followed by the gravel access road to the Park office, and to the west by the gravel access road followed by forested land and the waters of Trailer Pond.

The elevation at the Site is approximately 200 metres above sea level (masl) based on local topographic mapping. Stormwater run-off from the Site is mainly directed by overland flow in a west/northwest direction.

2. Site Assessment Objectives

The Site is located within a Provincial Park and the land-use would be commercial. The subject Site and adjacent properties are serviced by potable wells, the closest located 80 m south of the generator shed. Therefore, the Site is classified as a commercial property with potable groundwater and coarse-grained soil.

The analytical results of the ambient air assessment were compared to the Tier II Vapour Intrusion Screening Levels (VISLs), and used to calculate an Index of Additive Risk (IAR) in accordance with the 2016 Atlantic RBCA Version 3.0 Guidance for Vapour Intrusion Assessments for Impacted Sites in Atlantic Canada.

3. Background

In May 2009 a portable diesel generator was rented for use at the Park for the Victoria Day holiday weekend. The portable generator, supplied by United Rentals, was reportedly placed near the generator shed and was connected to the on-Site diesel fuel AST. On May 18, 2009, Park staff discovered a release

of approximately 100 to 150 Litres of diesel fuel from the generator onto the ground surface. Upon inspection, a crack in the generator fuel filter was identified as the source of the diesel fuel spill. Initial spill response measures reportedly included attempts by Park staff to absorb and contain the spilled diesel fuel using absorbents (i.e. paper, sawdust, spill kit absorbent) and hand excavation of the surface soil within the spill area.

Although no other reportable spills/releases at the Site were previously identified, based on a review of previous environmental reports, and discussions with Park personnel, GHD understands that historic (i.e. pre 2009) petroleum hydrocarbon impacts in soil are present in the area of the generator shed and may be attributable to the past practice of handling and disposing of waste oil in this area of the Site.

3.1 Previous Environmental Reports

Several environmental investigations have been completed at the Site, including a Phase II ESA, a Spill Remediation Program that included the removal, transportation and disposal of approximately 90 tonnes of petroleum hydrocarbon impacted soil related to the May 2009 spill, a Subsurface Assessment to evaluate the extent of petroleum hydrocarbon impacts related to other historical spill events, and most recently a Supplemental Phase III ESA. The following provides a summary of the previous work completed at the Site.

3.1.1 Phase II ESA – March 2009

A Phase II ESA was conducted by ADI Limited (ADI) in March 2009 that involved the excavation of four test pits and associated soil sampling at locations of potential environmental concern, as determined by surface soil staining in areas adjacent to the existing diesel generator and AST (see test pit locations on Figure 3). Based on the soil analytical results, one or more Benzene, Toluene, Ethylbenzene, and Xlyenes (BTEX) components were detected in four of the seven soil samples analyzed at concentrations that exceeded the applicable criteria of the time. Modified Total Petroleum Hydrocarbons (mTPH) were also detected in four of the seven soil samples analyzed at concentrations that exceeded applicable criteria. Based on the findings of the investigation, ADI recommended further assessment at the Site to further delineate the extent of petroleum hydrocarbon contamination in soils/groundwater and to develop a remedial action plan for the Site. Additional details are provided in the report entitled: "*Phase II Environmental Site Assessment, Diesel Generator Site – Butter Pot Provincial Park, Trans-Canada Highway, NL*" by ADI Limited dated April 2009.

3.1.2 Spill Remediation – May 2009

AMEC Earth & Environmental, a division of AMEC Americas Limited (AMEC), was retained by Environmental Management Inc. (EMI), on behalf of United Rentals, in May 2009 to conduct a soil remediation program in response to the reported diesel generator spill in the area of the generator shed. During the inspection, an area of surface staining, measuring approximately 7 metres long by 3 metres wide, was observed on the north side of the generator shed, near the United Rentals generator. Strong petroleum hydrocarbon odours were noted within the general area of the spill. Surface staining was also observed to the south of the generator shed within a shallow trench and on the south exterior wall of the

shed. According to the Park Manager, the shallow trench was excavated in the fall of 2008 for the purpose of installing electrical cables to the storage shed to the southeast. The surface staining in the trench was reportedly identified at that time and the electrical cable installation was not completed. The Park Manager indicated that the surface staining observed on the south side of the generator shed may have been the result of past practices of handling and dumping of waste oil from the Park generator in this area.

Based on the AMEC report, the Site remediation program included the excavation, removal, transportation and off-Site disposal of petroleum hydrocarbon impacted soil resulting from the May 2009 diesel fuel spill. Petroleum hydrocarbon impacted soils were excavated from the diesel generator spill area down to bedrock at depths ranging from approximately 1.4 metres below ground surface (mbgs) to 2.0 mbgs on May 22, 2009 using a track-mounted excavator. Approximately 90 tonnes of petroleum hydrocarbon impacted soil was excavated and transported to Newfoundland Soiltec Inc. for treatment and disposal. Following the excavation and removal of petroleum hydrocarbon impacted soil from the Site, soil samples were collected from the excavation area. Nine soil samples were collected from the upper and lower portion of the walls and from the floor of the remedial excavation. One soil sample was also collected from the shallow trench on the south side of the generator shed.

Based on the reported quantity of diesel fuel that had been released from the United Rentals generator, and the findings from the preliminary (i.e. ADI 2009) Site inspection that revealed other areas of pre-existing surface staining on-Site (i.e. south side of generator shed), it was reportedly agreed that no further assessment and/or remediation was required by United Rentals. As a result, the remedial area was backfilled with clean imported fill. Review of the letter report indicates that no confirmatory soil samples were analyzed. Additional details are provided in the letter report entitled: "S*oil Remediation – Final Report, United Rentals Diesel Generator Spill, Butter Pot provincial Park, Trans-Canada Highway, NL*" by AMEC, dated July 9, 2009.

3.1.3 Subsurface Assessment – September 2011

CBCL Limited (CBCL) conducted a Sub-Surface Soil Assessment in September 2011 to evaluate the extent of petroleum hydrocarbon impacts at the Site related to historical spill events. A summary of the conclusions and recommendations of the investigation is provided below:

- A total of 12 test pits (TP-1 to TP-12) were excavated in the vicinity of the generator shed and workshop building (See Figure 3). Test pits were terminated at depths ranging from 0.5 to 1.95 mbgs based on bedrock refusal.
- Groundwater was not encountered during test pit activities.
- Measured organic vapour concentrations in the soil samples collected from the test pits ranged from 0 to 420 ppm.
- Two selected soil samples from each test pit were submitted for BTEX and modified TPH analysis.

Soil analytical results from the test pits revealed elevated BTEX concentrations in three of the 12 test pits (TP-3, TP-4, and TP-6) exceeding the applicable criteria of the time. Elevated modified TPH concentrations were also detected in four of the 12 test pits (TP-3, TP-4, TP-5, and TP-6) exceeding the

applicable criteria of the time. Elevated modified TPH concentrations ranged from 10,000 mg/kg in TP-4 and TP-5 to 54,000 mg/kg in TP-4. Based on the results of the investigation, CBCL recommended the following:

- Drill four monitoring wells to further assess and delineate petroleum impacts in groundwater and to determine if identified petroleum hydrocarbon impacts have impacted the groundwater.
- Conduct additional borehole activities to the southeast and southwest of the generator shed to delineate the identified hydrocarbon impacts vertically and horizontally.
- Collect potable water sample for laboratory analysis.

Additional details are provided in the report entitled: "*Subsurface Assessment, Butter Pot Provincial Park, Newfoundland and Labrador*" by CBCL Limited, dated November 2011.

3.1.4 Phase III ESA – January to June 2015

SNC-Lavalin Inc. (SLI) was retained by DMAE to conduct a Phase III ESA to further assess the extent of petroleum hydrocarbon contamination at the Site. Field work included the excavation and sampling of nine test pits (TP1 to TP9), the installation and sampling of four monitoring wells (MW-1 to MW-4), and the collection of one potable water sample (TAP1). The soil, groundwater, and potable water samples were analyzed for BTEX/mTPH and Polycyclic Aromatic Hydrocarbons (PAHs). The field work was completed between January and June 2015. The results of the Phase III ESA included the following:

- A total of 15 soil samples, including one field duplicate, were submitted for petroleum hydrocarbon analysis and, with the exception of two soil samples, analytical results were below the applicable Tier I RBSLs and Tier I ESLs for the Site characteristics. Soil samples TP1-Bottom (350 mg/kg) and TP2-Surface (570 mg/kg) reported F2 fraction concentrations above the applicable Tier I ESL of 260 mg/kg.
- Results of the PAH analysis for the soil sampling program at the Site indicated all 15 soil samples reported non-detectable PAH concentrations and; therefore, were below the applicable Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Commercial Guidelines for the Protection of Environmental and Human Health guidelines.
- Results of the groundwater sampling program revealed that all groundwater samples (MW-1 to MW-4) submitted for BTEX/mTPH and PAHs were reported as non-detect; and therefore, below the Tier I RBSLs for a commercial site, with potable groundwater and coarse-grained soil.
- Results of the potable water sampling program revealed that the sample submitted for BTEX/mTPH and PAHs were reported as non-detect; and, therefore below the applicable Health Canada Drinking Water Quality Guidelines.
- Based on the field program, horizontal and vertical delineation was achieved southeast and southwest of the generator shed. Based on this information, it was estimated the area of petroleum hydrocarbon impacts was approximately 170 square metres (m^2) with an approximate volume of 250 cubic metres (m^3). It was noted that delineation to the west/northwest had not been achieved.

Based on the results of the investigation, SLI recommended the following:

- Conduct additional sampling to delineate soil impacts to the northwest of the generator shed.
- Conduct an indoor air sampling program to assess current human health risks associated with inhalation exposure to potentially petroleum hydrocarbon impacted indoor/outdoor air within the four building structures located at the Site.
- Remove and replace the wooden walls of the generator shed stained with petroleum hydrocarbons.

Additional details are provided in the report entitled: "*Phase III Environmental Site Assessment, Butter Pot Provincial Park, Newfoundland and Labrador*" by SNC Lavalin Inc., dated September 2015.

3.1.5 Supplemental Phase III ESA – December 2015

GHD was retained by DMAE to complete a Supplemental Phase III ESA at Site to review previous environmental reports, identify data gaps, and conduct additional sampling to the extent that a RAP/RMP could be developed to bring the Site to closure. The Supplemental Phase III ESA was completed between December 15 and 18, 2015, and consisted of the excavation of six test pits (15-TP1 to 15-TP6), groundwater sampling from all accessible on-Site monitoring wells, and the installation and sampling of one soil vapour probe (SV1) in the area of the generator shed. Based on anticipated future land use, the property was classified as a commercial site with potable groundwater and coarse-grained soil. In addition, analytical data was also compared to Atlantic RBCA Tier I ESL benchmarks.

Nine soil samples, including one field duplicate, were submitted to Maxxam for BTEX/mTPH analyses. The analytical results for all nine soil samples reported BTEX/mTPH concentrations below the Atlantic RBCA Tier I RBSLs and ESLs for a commercial site with potable groundwater and coarse-grained soil.

Three groundwater samples, plus one field duplicate (for MW-2), were submitted to Maxxam for BTEX/mTPH analyses. It is noted that MW-1 was not located due to regrading of the gravel parking area and; therefore, was not sampled. All samples reported BTEX/mTPH concentrations below the 2015 Tier I RBSL and ESLs for the Site characteristics. No free product or sheening was noted in the monitor wells during the sampling/gauging program.

It was estimated that approximately 800 tonnes of soil with concentrations above the 2015 Tier I RBSLs and Tier I ESLs for the Site characteristics was located within the area of the generator shed.

One soil vapour probe (SV1) was installed in the area of the highest historical petroleum hydrocarbon concentration (i.e. TP-4 located at the rear of the generator shed) to assess soil vapour conditions at the Site. The soil vapour probe was installed to sample soil vapour conditions for the assessment of human health risks associated with impacted soils on the Site and the risk of soil volatilization to indoor air for the adjacent commercial buildings. The soil vapour sample collected from SV1 was submitted to Maxxam for BTEX, and aromatic and aliphatic TPH sub fraction analyses. The analytical results of the soil vapour test were used to predict indoor air concentrations based on dilution factors and toxicity information provided in the Atlantic RBCA Version 2.0 User Guidance for Petroleum Impacted Sites in Atlantic Canada. The dilution factor is dependent on the distance from the vapour probe to the structure.

Given the soil vapour probes proximity to the surrounding buildings, and that all buildings were constructed with wood floor and no concrete slab, a dilution factor of 1 was used for the analysis. For comparison purposes and for resolutions to potential exceedances, a dilution factor of 50 for sub-slab was also used for the analysis. Using no dilution factor, Benzene, Xylenes, Aromatic C_8-C_{10}, and Aliphatic C_8-C_{10} and C_{12}-C_{16} Hazard Quotient levels were found to be above acceptable levels for a commercial building located in the immediate vicinity of the sampling location. In addition, the Benzene Risk was calculated to be 4.6×10^{-5} compared to an acceptable level of 1.0×10^{-5}. Using a dilution factor of 50 for sub-slab, soil vapour levels were determined to be within acceptable levels for a commercial building located in the immediate vicinity of the sampling location. Soil vapour data from the December 2015 sampling event was also compared to the 2016 Tier II VISLs, which confirmed the soil data was below the Tier II VISLs for a commercial property.

An evaluation of potential ecological receptors was completed using a Summary Table from Appendix 2 of the Atlantic RBCA for Petroleum Impacted Sites in Atlantic Canada, Version 3, User Guidance dated July 2012 (updated January 2015). Ecological receptors (Provincial Park, forested habitats, Trailer Pond) were identified within 200 metres of the Site. The waters of Trailer Pond are located approximately 180 metres west of the Site. The results indicated further ecological assessment is not required (Attachment F of this Letter Report).

Additional details are provided in the report entitled: "*Supplemental Phase III Environmental Site Assessment, Generator Site, Butter Pot Provincial Park, NL*" by GHD Limited, dated March 2016.

Soil and groundwater analytical results from all previous environmental programs conducted at the Site are compared to the current Atlantic RBCA Tier I RBSL Table values and/or Tier I ESLs in Tables B1 and B2, respectively, which are presented in Attachment B.

It is noted that analytical results for PAHs in soil from historical assessments were compared to the applicable CCME Soil Quality Guidelines (SQGs) for the Protection of Environmental and Human Health for a commercial site with potable groundwater and coarse-grained soil. Historical groundwater and/or potable water samples were also screened against the Ontario Ministry of the Environment – Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act (April 15, 2011) and/or Health Canada – Guidelines for Canadian Drinking Water Quality (October 2014).

Historical soil vapour analytical results were compared to the current criteria, and copies of the results are summarized in Table B3 of Attachment B.

All relevant sample locations are shown on Figure 3.

4. Ambient Air Sampling

Ambient air samples were collected from under the workshop floor (through the newly installed hatch) to assess the air quality and determine if any risk to the occupants of the Workshop building existed through inhalation of potential petroleum hydrocarbon vapours related to soil with concentrations that exceeded applicable criteria located within the area of the generator shed. Ambient air samples were collected using

a Summa™ canister calibrated for a 8-hour sample collection period. Initial canister vacuums were recorded; typically at around 30 inches of mercury (Hg) indicating the canisters were acceptable for use and had not lost vacuum pressure during shipping. The final canister vacuums were recorded, typically around 0 inches of Hg after sampling was completed, which indicated the sampling procedure was successful. At the time of the sampling events, the outdoor ambient air temperatures were +14°C for the non-heating season sample (September 2018) and 0°C for the heating season sample (November 2018).

The non-heating season ambient air sample (AS-01) was collected on September 14, 2018, and the heating season ambient air sample (AS-02) was collected on November 27, 2018, both of which were submitted to Maxxam in Mississauga, ON for BTEX, aromatic, and aliphatic TPH sub fractionation analyses.

The ambient air sample location is shown on the Site Plan with Sample Locations on Figure 3 of Attachment A and photographs of the ambient air sampling event are presented in Attachment E.

5. Ambient Air Analytical Results

The measured hydrocarbon levels in the ambient air samples were below the applicable 2016 Tier II VISLs in both the non-heating and heating seasons. The IARs were calculated as 1.2×10^{-2} for both AS-01 and AS-02, compared to an acceptable IAR of 1.0. The ambient air analytical results are presented and compared to the applicable criteria in Tables C1 and C2, of Attachment C, and the Laboratory Certificates of Analysis are included in Attachment D. The above results confirm acceptable ambient air hydrocarbon levels for the protection of the commercial receptor.

6. Generator Shed Repairs

The back wall of the Generator shed with petroleum impacts was removed and replaced in August 2018. In addition, the lower portion of the right front door was observed to be rotted, which was also repaired while on Site.

Photographs showing the original condition of the back of the Generator shed in December 2015 along with the completed repairs from August 2018 are presented in Attachment E.

7. Conclusions

GHD was retained by the Government of Newfoundland and Labrador Department of Tourism, Culture, Industry, and Innovation (DTCII) to complete an ambient air sampling program at the Generator site located in Butter Pot Provincial Park, NL.

The ambient air sampling program was completed to determine if petroleum hydrocarbon impacted soil remaining in the area of the Generator shed poses an actual risk to human health through the indoor air pathway in the Workshop building.

Two ambient air samples were collected from between the floor and soil under the Workshop building (through a newly constructed hatch), one in September 2018 for the non-heating season and one in November 2018 for the heating season. The ambient air samples reported measured hydrocarbon levels below their respective Tier II VISLs, and the calculated IARs were less than 1.

In addition, the rear wall of the Generator shed exhibiting petroleum hydrocarbon staining was replaced to prevent further soil contamination, and ensure a safe working environment for Park employees.

Following completion of the ambient air sampling, GHD confirmed that any residual petroleum hydrocarbon impacts from the Generator shed area will not pose a risk to occupants of the Workshop building.

GHD recommends Final Closure for the Property at the Generator site located within Butter Pot Provincial Park, NL. A copy of the Atlantic RBCA Site Closure Checklist is presented in Attachment G and the completed Record of Site Condition is presented as Attachment H.

8. Closure

We trust this work meets with your requirements; however, if you have any questions please contact the undersigned.

Sincerely,

GHD

Brian Luffman, P.Eng.
Associate | Senior Project Manager

Amy Copeland, P.Eng.
Senior Project Manager

BL/tc/4

Encl.

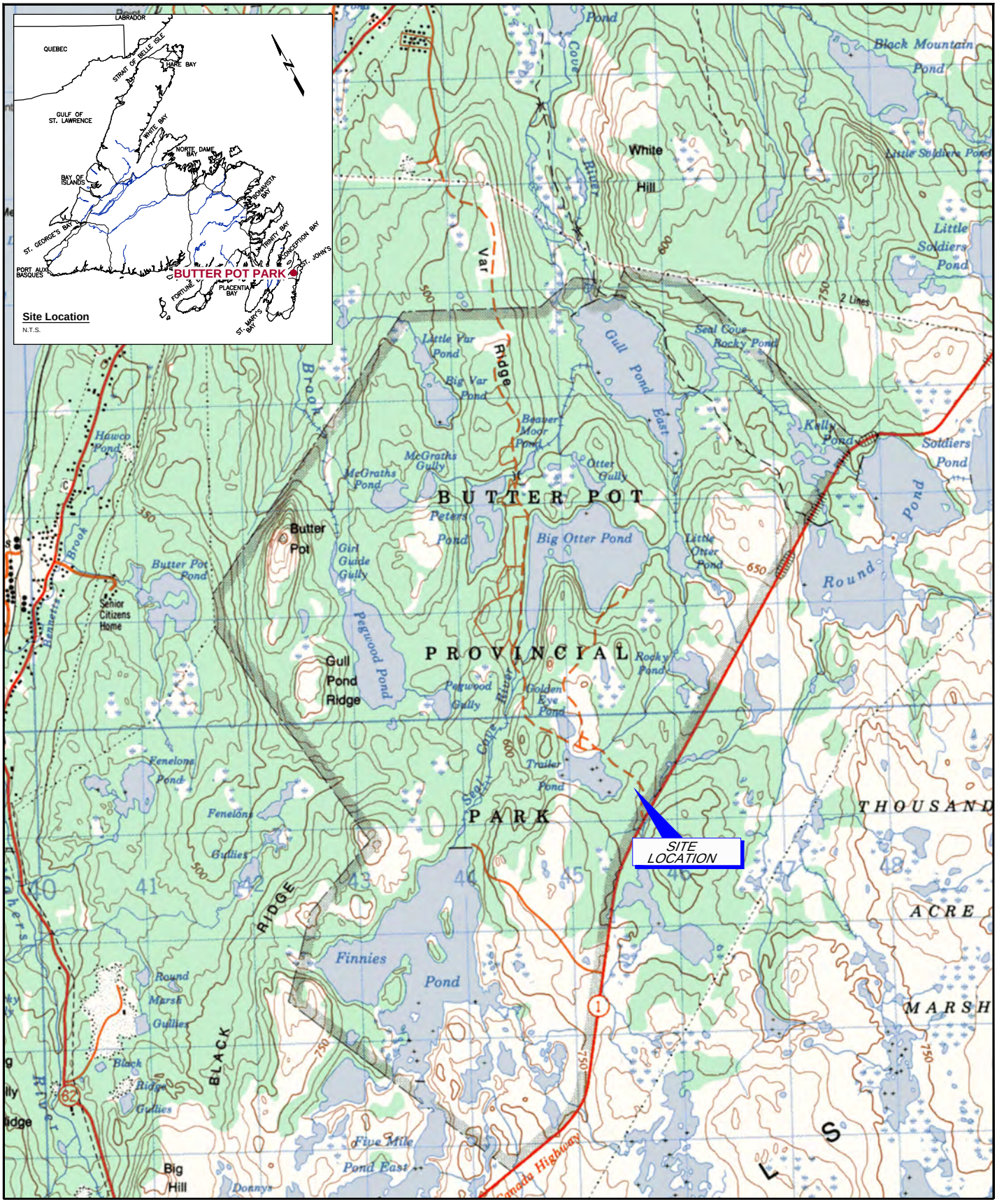
Attachment A	Figure 1	Site Location Map
	Figure 2	General Site Location Plan
	Figure 3	Site Plan with Sample Locations
Attachment B	Historical Analytical Results	
Attachment C	Table C1	Ambient Air Analytical Results (Non-Heating)
	Table C2	Ambient Air Analytical Results (Heating)
Attachment D	Laboratory Certificates of Analysis	
Attachment E	Photographs	
Attachment F	Atlantic RBCA Ecological Receptor Screening Protocol	
Attachment G	Atlantic RBCA Site Closure Checklist	
Attachment H	Record of Site Condition	

Attachment A

Figure 1 – Site Location Plan

Figure 2 – General Site Location Plan

Figure 3 – Site Plan with Sample Locations



0 500 1000 1500m

SCALE: 1:50,000

NEWFOUNDLAND AND LABRADOR PARKS AND NATURAL AREA DIVISION
BUTTER POT PROVINCIAL PARK
AMBIENT AIR SAMPLING & CLOSURE REPORT

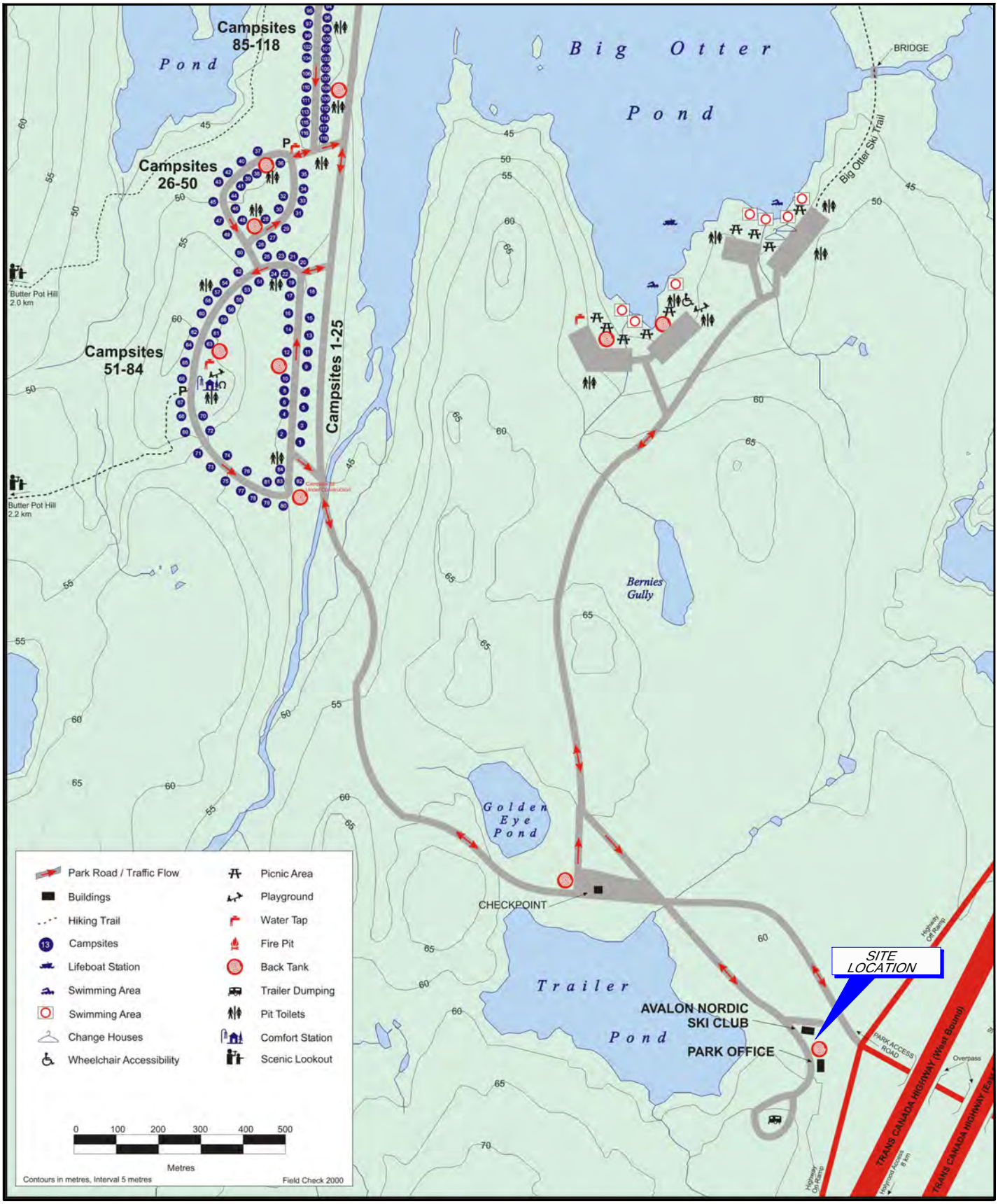
11111591

Dec 10, 2018

SITE LOCATION MAP

FIGURE 1

CAD File: I:\CAD\8-chars\11------\1111----\111115--\11111591\REBELLO4\11111591 (REBELLO4)GN-NL001.dwg



Source: http://www.env.gov.nl.ca/env/parks/maps/butterpot.pdf

0 125 250 375m

SCALE: 1:12,000

NEWFOUNDLAND AND LABRADOR PARKS
AND NATURAL AREA DIVISION
BUTTER POT PROVINCIAL PARK
AMBIENT AIR SAMPLING & CLOSURE REPORT

11111591

Dec 10, 2018

GENERAL SITE LOCATION PLAN

FIGURE 2

CAD File: I:\CAD\8-chars\11------\1111----\111115--\11111591\REBELLO4\11111591 (REBELLO4)GN-NL002.dwg

GRAVEL PARKING AREA

15-TP2 ■

TP-11

15-TP3 ■

15-TP4 ■

15-TP1 ■

TP-10

TP-12

TP1

WORKSHOP

TP1

15-TP5 ■

AS ▲

TP-2

TP-3

TP4

MW-1

TP-9

GENERATOR SHED

TP-8

TP-1

TP4

TP-4

TP2

DIESEL FUEL AST

SV1

WOODED AREA

TP9

TP7

TP-6

PROPANE AST

TP-5

TP2

■15-TP6

MW-2

TP-7

MW-4

TP3

GRAVEL PATHWAY

WOODED AREA

TP5

TP6

MW-3

TP3

WOODED AREA

TP8

STORAGE SHED

Source: Microsoft Product Screen Shot(s) Reprinted with permission from Microsoft Corporation, Acquisition Date AUG 2012 , Accessed: 2016

0 2.5 5 7.5m

SCALE: 1:250

LEGEND:

TP ■	TEST PIT LOCATION (GHD 2015)	AS ▲	AMBIENT AIR SAMPLE LOCATION (GHD 2015)
SV	SOIL VAPOUR WELL LOCATION (GHD 2015)		
MW ●	MONITOR WELL LOCATION (SLI, 2015)		
TP	HISTORICAL TEST PIT LOCATION (SLI, 2015)		
TP	HISTORICAL TEST PIT LOCATION (CBCL, 2011)		
TP	HISTORICAL TEST PIT LOCATION (ADI, 2009)		

NEWFOUNDLAND AND LABRADOR PARKS AND NATURAL AREA DIVISION
BUTTER POT PROVINCIAL PARK
AMBIENT AIR SAMPLING & CLOSURE REPORT

11111591

Dec 10, 2018

SITE PLAN WITH SAMPLE LOCATIONS

FIGURE 3

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Attachment B
Historical Analytical Results

Table B1
Historical Soil Analytical Results - BTEX/TPH
Ambient Air Sampling and Closure Report
Butter Pot Park, Newfoundland and Labrador

Location	Depth (m)	Date	BTEX Concentration (mg/kg)				TPH Concentration (mg/kg)				
			Benzene	Toluene	Ethyl Benzene	Xylenes	C6-C10	C10-C16	C16-C21	C21-C32	Modified TPH
ADI Limited - Phase II Environmental Site Assessment (2009)											
TP1-SA2	0.5-1.0	19-Mar-09	<0.03	<0.03	**0.6**	**3.2**	260	6900		800	**7900**
TP1-SA5	2.0-2.8	19-Mar-09	<0.03	<0.03	**0.12**	0.71	190	3600		430	**4200**
TP2-SA1	0.0-0.5	19-Mar-09	<0.03	**7.3**	**1.5**	**11**	140	28000		23000	**51000**
TP2-SA3	1.0-1.5	19-Mar-09	<0.03	0.04	**0.12**	**1.1**	130	1300		350	1800
TP3-SA4	2.0-2.5	19-Mar-09	<0.03	<0.03	<0.03	<0.05	<3	<15		<15	<20
QA/QC-S1 (TP3-SA4)	2.0-2.5	19-Mar-09	<0.03	<0.03	<0.03	<0.05	<3	<15		<15	<20
TP4-SA4	2.0-2.4	19-Mar-09	<0.03	<0.03	<0.03	<0.05	<3	<15		<15	<20
CBCL Limited - Subsurface Assessment (2011)											
TP1-02	0.3-1.0	15-Sep-11	<0.03	<0.03	<0.03	0.26	250	3800		1100	**5200**
TP1-03	1.0-1.3	15-Sep-11	<0.03	<0.03	<0.03	<0.05	7	260		86	360
TP2-02	0.3-1.0	15-Sep-11	<0.03	<0.03	<0.03	<0.05	<3	59		24	83
TP2-03	1.0-1.45	15-Sep-11	<0.03	<0.03	<0.03	<0.05	<3	<10		<10	<20
TP3-02	0.3-1.0	15-Sep-11	<0.03	**1**	**1.4**	**12**	**570**	38000		3800	**43000**
TP3-03	1.0-1.8	15-Sep-11	<0.03	<0.03	<0.03	0.13	160	3600		480	**4200**
TP4-02	0.3-0.8	15-Sep-11	<0.03	**7.9**	**3**	**19**	**490**	48000		5400	**54000**
TP4-03	0.8-1.15	15-Sep-11	<0.03	0.27	**1**	**5.4**	**630**	8900		940	**10000**
TP5-01	0-0.3	15-Sep-11	<0.03	<0.03	<0.03	<0.05	<3	7400		3100	**10000**
TP5-02	0.3-0.5	15-Sep-11	<0.03	<0.03	<0.03	<0.05	20	1020		190	1200
TP6-01	0-0.3	15-Sep-11	<0.03	<0.03	<0.03	<0.05	<3	307		68	370
TP6-02	0.3-1.1	15-Sep-11	<0.03	<0.03	**0.4**	**1.3**	330	4300		400	**5000**
TP7-01	0-0.3	15-Sep-11	<0.03	<0.03	<0.03	<0.05	<3	640		210	840
TP7-02	0.3-0.7	15-Sep-11	<0.03	<0.03	<0.03	<0.05	<3	480		110	600
TP8-02	0.3-1.0	15-Sep-11	<0.03	<0.03	<0.03	<0.05	<3	<10		18	<20
TP8-03	1.0-1.85	15-Sep-11	<0.03	<0.03	<0.03	<0.05	5	12		<10	<20
TP9-01	0-0.3	15-Sep-11	<0.03	<0.03	<0.03	<0.05	<3	<10		<10	<20
TP9-02	0.3-1.0	15-Sep-11	<0.03	<0.03	<0.03	<0.05	<3	<10		<10	<20
TP10-02	0.3-1.0	15-Sep-11	<0.03	<0.03	<0.03	<0.05	<3	115		89	200
TP10-03	1.0-1.55	15-Sep-11	<0.03	<0.03	<0.03	<0.05	<3	41		<10	41
TP11-01	0-0.3	15-Sep-11	<0.03	<0.03	<0.03	<0.05	<3	<10		<10	<20
TP11-02	0.3-1.05	15-Sep-11	<0.03	<0.03	<0.03	<0.05	<3	<10		<10	<20
TP12-02	0.3-1.0	15-Sep-11	<0.03	<0.03	<0.03	<0.05	<3	<10		<10	<20
TP12-03	1.0-1.95	15-Sep-11	<0.03	<0.03	<0.03	<0.05	<3	<10		<10	<20
SNC Lavalin - Phase III ESA (2015)											
TP1-SURFACE	0.0-0.15	19-Jan-15	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	<15	<20
TP1-BOTTOM	1.5	19-Jan-15	<0.03	<0.03	<0.03	<0.05	3.3	**350**	220	60	640
TP2-SURFACE	0.0-0.15	19-Jan-15	<0.03	<0.03	<0.03	<0.05	<3	**570**	640	270	1500
TP2-BOTTOM	1.6	19-Jan-15	<0.03	<0.03	<0.03	<0.05	<3	120	160	86	370
TP3-SURFACE	0.0-0.15	19-Jan-15	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	64	64
TP3-BOTTOM	1.9	19-Jan-15	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	<15	<20
TP4-SURFACE	0.0-0.15	19-Jan-15	<0.03	<0.03	<0.03	<0.05	<3	<10	27	36	63
TP4-BOTTOM	1.8	19-Jan-15	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	<15	<20
TP5-SURFACE	0.0-0.15	19-Jan-15	<0.03	<0.03	<0.03	<0.05	<3	<10	17	53	70
TP5-BOTTOM	1	19-Jan-15	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	<15	<20
TP10-SURFACE (Dup of TP1-SURFACE)	0.0-0.15	19-Jan-15	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	<15	<20
TP6-SURFACE	0.0-0.15	27-May-15	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	31	31
TP6-BOTTOM	1.5	27-May-15	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	<15	<20
TP7-SURFACE	0.0-0.15	27-May-15	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	71	71
TP7-BOTTOM	1.9	27-May-15	<0.03	<0.03	<0.03	<0.05	<3	<10	<10	<15	<20

Table B1
Historical Soil Analytical Results - BTEX/TPH
Ambient Air Sampling and Closure Report
Butter Pot Park, Newfoundland and Labrador

Location	Depth (m)	Date	BTEX Concentration (mg/kg)				TPH Concentration (mg/kg)				
			Benzene	Toluene	Ethyl Benzene	Xylenes	C6-C10	C10-C16	C16-C21	C21-C32	Modified TPH
GHD Limited - Supplemental Phase III ESA (2015)											
15-TP1-SS2	0.5-1.0	15-Dec-15	<0.025	<0.025	<0.025	<0.050	<2.5	<10	<10	<15	<15
15-TP1-SS2 Lab-Dup	0.5-1.0	15-Dec-15	<0.025	<0.025	<0.025	<0.050	<2.5	-	-	-	-
15-TP1-SS4	1.5-2.0	15-Dec-15	<0.025	<0.025	<0.025	<0.050	<2.5	<10	<10	<15	<15
15-TP2-SS2	1.0-2.0	15-Dec-15	<0.025	<0.025	<0.025	<0.050	<2.5	<10	<10	<15	<15
15-TP3-SS2	1.0-2.0	15-Dec-15	<0.025	<0.025	<0.025	<0.050	<2.5	<10	<10	<15	<15
15-TP4-SS3	1.0-1.5	15-Dec-15	<0.025	<0.025	<0.025	<0.050	<2.5	<10	<10	<15	<15
15-TP5-SS2	0.5-1.0	15-Dec-15	<0.025	<0.025	<0.025	<0.050	<2.5	<10	<10	<15	<15
15-TP5-SS3	1.0-1.5	15-Dec-15	<0.025	<0.025	<0.025	<0.050	<2.5	<10	<10	<15	<15
15-TP6-SS3	1.0-1.5	15-Dec-15	<0.025	<0.025	<0.025	<0.050	<2.5	<10	14	<15	<15
15-TP0-SS3	1.0-1.5	15-Dec-15	<0.025	<0.025	<0.025	<0.050	<2.5	<10	<10	<15	<15
2012 Tier I RBSL values - Commercial, Non-Potable			**0.042**	**0.35**	**0.043**	**0.73**	**--**	**--**	**--**	**--**	**870 / 1,800 / 10,000**
2012 Tier I ESL values - Commercial			**180**	**250**	**300**	**350**	**320**	**260**	**1,700**		**-**
2012 Tier I ESL values - Protection of Widllife Commercial			**18**	**980**	**640**	**2,600**	**1,100**	**9,800**	**16,000**		**-**

Note:

---	No established criteria or not analyzed
0.00	Concentration above Atlantic RBCA Tier I RBSL Table values - Commercial, Potable, Coarse-grained
0.00	Concentration above Atlantic RBCA Tier I ESL Table values (0 to 1.5 mbgs)
0.00	Concentration above Atlantic RBCA Tier I ESL Table values for protection of wildlife

;

(1)	Based on laboratory reporting gasoline fraction
(2)	Based on laboratory reporting diesel fraction
(3)	Based on laboratory reporting #6 oil fraction

15-TP0-SS3 is field duplicate of 15-TP6-SS3

Table B2
Historical Groundwater Analytical Results - BTEX/TPH
Ambient Air Sampling and Closure Report
Butter Pot Park, Newfoundland and Labrador

Location	Date	Groundwater Depth (mbgs)	BTEX Concentration (mg/L)				TPH Concentration (mg/L)				
			Benzene	Toluene	Ethyl Benzene	Xylenes	C6-C10	C10-C16	C16-C21	C21-C32	Modified TPH
MW1	9-Jun-15	5.97	<0.001	<0.001	<0.001	<0.002	<0.01	<0.05	<0.05	<0.1	<0.1
	18-Dec-15	-	Not Located								
MW2	9-Jun-15	4.48	<0.001	<0.001	<0.001	<0.002	<0.01	<0.05	<0.05	<0.1	<0.1
	18-Dec-15	4.45	<0.001	<0.001	<0.001	<0.002	<0.01	<0.05	<0.05	<0.1	<0.1
	18-Dec-15*	4.45	<0.001	<0.001	<0.001	<0.002	<0.01	<0.05	<0.05	<0.1	<0.1
MW3	9-Jun-15	3.34	<0.001	<0.001	<0.001	<0.002	<0.01	<0.05	<0.05	<0.1	<0.1
	18-Dec-15	4.43	<0.001	<0.001	<0.001	<0.002	<0.01	<0.05	<0.05	<0.1	<0.1
MW4	9-Jun-15	3.56	<0.001	<0.001	<0.001	<0.002	<0.01	<0.05	<0.05	<0.1	<0.1
	18-Dec-15	3.57	<0.001	<0.001	<0.001	<0.002	<0.01	<0.05	<0.05	<0.1	<0.1
2012 Tier I RBSL Commercial, Potable values			**0.005**	**0.024**	**0.0016**	**0.02**	**--**	**--**	**--**	**--**	**4.4 / 3.2 / 7.8**
2012 Tier I ESL Commercial, Coarse-grained values - Shallow groundwater			**350**	**200**	**110**	**120**	**11**	**3.1**	**na**	**na**	**na**
2012 Tier I ESL, Coarse-grained values - Aquatic Life (150 m)			**97**	**88**	**67**	**59**	**--**	**--**	**--**	**--**	**750 / >sol / >sol**

Note:

---	No established criteria or not analyzed
0.00	Concentration above Atlantic RBCA Tier I RBSLs - Commercial, Potable, Coarse-grained
0.00	Concentration above Atlantic RBCA Tier I ESLs with Groundwater < 3.0 mbgs
0.00	Concentration above Atlantic RBCA Tier I ESLs adjusted to 150 metres from receptor
(1)	Based on laboratory reporting gasoline fraction
(2)	Based on laboratory reporting diesel fraction
(3)	Based on laboratory reporting #6 oil fraction
*	Indicates Field duplicate

Table B3
Historical Soil Vapour Petroleum Hydrocarbon Results - TPH Fractionation
Ambient Air Sampling and Closure Report
Butter Pot Park, Newfoundland and Labrador

GHD Sample ID / Canister No. : SV1-AS1 / #2577

Sample Date: December 18, 2015

Parameters	Reportable Detection Limit, (mg/m^3)	Tier II VISLs Soil Vapour Commercial/ Industrial, (mg/m^3) (A)	Measured Hydrocarbon Level (mg/m^3) (B)	Hazard Quotient (HQ=B / A) Commercial/ Industrial
Benzene	0.0005	130	13.9	1.1E-01
Toluene	0.0016	34,000	384	1.1E-02
Ethyl Benzene	0.0016	10,000	59.8	6.0E-03
Xylenes	0.0022	1,800	151	8.4E-02
Total Petroleum Hydrocarbon Fractions (TPH)				
Ar C8-C10	0.005	4,600	252	5.5E-02
Ar C10-C12	0.005	4,600	80	1.7E-02
Ar C12-C16	0.005	4,600	10	2.2E-03
Al C6-C8	0.005	420,000	5960	1.4E-02
Al C8-C10	0.005	22,000	13500	6.1E-01
Al C10-C12	0.005	22,000	1230	5.6E-02
Al C12-C16	0.005	22,000	10	4.5E-04
Sum IAR	-	1.0	-	7.6E-01

Notes:

Summa Cannister Start Pressure: -30 in Hg

Summa Cannister End Pressure: -2.6 in Hg

Toluene, Ethyl Benzene, and Xylenes are excluded from the TPH carbon ranges, as they are evaluated separately

Non-detectable results are entered as half the RDL

IAR = Index of Additive Risk

0.1000	**Input**
3.3E+01	**Parameter above criterion**

Table B4
Ambient Air Analytical Results - Hydrocarbons - Non-Heating Season
Ambient Air Sampling and Closure Report
Butter Pot Provincial Park, Newfoundland and Labrador

GHD Sample ID / Canister No. : AS-01 / 317
Sample Date: September 14, 2018

Parameters	Reportable Detection Limit, mg/m^3	Tier II VISLs Indoor Air Commercial/ Industrial, mg/m^3 (A)	Measured Hydrocarbon Level (mg/m^3) (B)	Hazard Quotient (HQ=B / A) Commercial/ Industrial
Benzene	0.0005	0.025	0.00073	2.9E-02
Toluene	0.0016	13.0	0.0062	4.8E-04
Ethyl Benzene	0.0016	3.6	0.0008	2.2E-04
Xylenes	0.0022	0.65	0.0040	6.2E-03
Total Petroleum Hydrocarbon Fractions (TPH)				
Ar C8-C10	0.005	0.73	0.0025	3.4E-03
Ar C10-C12	0.005	0.73	0.0025	3.4E-03
Ar C12-C16	0.005	0.73	0.0025	3.4E-03
Al C6-C8	0.005	67	0.0080	1.2E-04
Al C8-C10	0.005	3.6	0.0025	6.9E-04
Al C10-C12	0.005	3.6	0.0025	6.9E-04
Al C12-C16	0.005	3.6	0.0025	6.9E-04
Sum IAR	-	1.0	-	1.2E-02

Notes:

Summa Canister Start Pressure: -28.5 in Hg

Summa Canister End Pressure: -1.6 in Hg

Toluene, Ethyl Benzene, and Xylenes are excluded from the TPH carbon ranges, as they are evaluated separately

Non-detectable results are entered as half the RDL

IAR = Index of Additive Risk

0.1000	**Input**
3.3E+01	**Parameter above criterion**

Table B5
Ambient Air Analytical Results - Hydrocarbons - Heating Season
Ambient Air Sampling and Closure Report
Butter Pot Provincial Park, Newfoundland and Labrador

GHD Sample ID / Canister No. : AS-02 / 2790
Sample Date: November 13, 2018

Parameters	Reportable Detection Limit, mg/m^3	Tier II VISLs Indoor Air Commercial/ Industrial, mg/m^3 (A)	Measured Hydrocarbon Level (mg/m^3) (B)	Hazard Quotient (HQ=B / A) Commercial/ Industrial
Benzene	0.0005	0.025	0.00025	1.0E-02
Toluene	0.0016	13.0	0.0008	6.2E-05
Ethyl Benzene	0.0016	3.6	0.0008	2.2E-04
Xylenes	0.0022	0.65	0.0011	1.7E-03
Total Petroleum Hydrocarbon Fractions (TPH)				
Ar C8-C10	0.005	0.73	0.0025	3.4E-03
Ar C10-C12	0.005	0.73	0.0025	3.4E-03
Ar C12-C16	0.005	0.73	0.0025	3.4E-03
Al C6-C8	0.005	67	0.0025	3.7E-05
Al C8-C10	0.005	3.6	0.0025	6.9E-04
Al C10-C12	0.005	3.6	0.0025	6.9E-04
Al C12-C16	0.005	3.6	0.0025	6.9E-04
Sum IAR	-	1.0	-	1.2E-02

Notes:

Summa Canister Start Pressure: -27.5 in Hg

Summa Canister End Pressure: -9.2 in Hg

Toluene, Ethyl Benzene, and Xylenes are excluded from the TPH carbon ranges, as they are evaluated separately

Non-detectable results are entered as half the RDL

IAR = Index of Additive Risk

0.1000	**Input**
3.3E+01	**Parameter above criterion**

Attachment C

Table C1 – Ambient Air Analytical Results (Non-Heating)

Table C2 – Ambient Air Analytical Results (Heating)

Table C1
Ambient Air Analytical Results - Hydrocarbons - Non-Heating Season
Ambient Air Sampling and Closure Report
Butter Pot Provincial Park, Newfoundland and Labrador

GHD Sample ID / Canister No. : AS-01 / 317
Sample Date: September 14, 2018

Parameters	Reportable Detection Limit, mg/m^3	Tier II VISLs Indoor Air Commercial/ Industrial, mg/m^3 (A)	Measured Hydrocarbon Level (mg/m^3) (B)	Hazard Quotient (HQ=B / A) Commercial/ Industrial
Benzene	0.0005	0.025	0.00073	2.9E-02
Toluene	0.0016	13.0	0.0062	4.8E-04
Ethyl Benzene	0.0016	3.6	0.0008	2.2E-04
Xylenes	0.0022	0.65	0.0040	6.2E-03
Total Petroleum Hydrocarbon Fractions (TPH)				
Ar C8-C10	0.005	0.73	0.0025	3.4E-03
Ar C10-C12	0.005	0.73	0.0025	3.4E-03
Ar C12-C16	0.005	0.73	0.0025	3.4E-03
Al C6-C8	0.005	67	0.0080	1.2E-04
Al C8-C10	0.005	3.6	0.0025	6.9E-04
Al C10-C12	0.005	3.6	0.0025	6.9E-04
Al C12-C16	0.005	3.6	0.0025	6.9E-04
Sum IAR	-	1.0	-	1.2E-02

Notes:

Summa Canister Start Pressure: -28.5 in Hg

Summa Canister End Pressure: -1.6 in Hg

Toluene, Ethyl Benzene, and Xylenes are excluded from the TPH carbon ranges, as they are evaluated separately

Non-detectable results are entered as half the RDL

IAR = Index of Additive Risk

0.1000	**Input**
3.3E+01	**Parameter above criterion**

Table C2
Ambient Air Analytical Results - Hydrocarbons - Heating Season
Ambient Air Sampling and Closure Report
Butter Pot Provincial Park, Newfoundland and Labrador

GHD Sample ID / Canister No. : AS-02 / 2790
Sample Date: November 13, 2018

Parameters	Reportable Detection Limit, mg/m^3	Tier II VISLs Indoor Air Commercial/ Industrial, mg/m^3 (A)	Measured Hydrocarbon Level (mg/m^3) (B)	Hazard Quotient (HQ=B / A) Commercial/ Industrial
Benzene	0.0005	0.025	0.00025	1.0E-02
Toluene	0.0016	13.0	0.0008	6.2E-05
Ethyl Benzene	0.0016	3.6	0.0008	2.2E-04
Xylenes	0.0022	0.65	0.0011	1.7E-03
Total Petroleum Hydrocarbon Fractions (TPH)				
Ar C8-C10	0.005	0.73	0.0025	3.4E-03
Ar C10-C12	0.005	0.73	0.0025	3.4E-03
Ar C12-C16	0.005	0.73	0.0025	3.4E-03
Al C6-C8	0.005	67	0.0025	3.7E-05
Al C8-C10	0.005	3.6	0.0025	6.9E-04
Al C10-C12	0.005	3.6	0.0025	6.9E-04
Al C12-C16	0.005	3.6	0.0025	6.9E-04
Sum IAR	-	1.0	-	1.2E-02

Notes:

Summa Canister Start Pressure: -27.5 in Hg

Summa Canister End Pressure: -9.2 in Hg

Toluene, Ethyl Benzene, and Xylenes are excluded from the TPH carbon ranges, as they are evaluated separately

Non-detectable results are entered as half the RDL

IAR = Index of Additive Risk

0.1000	**Input**
3.3E+01	**Parameter above criterion**

Attachment D

Laboratory Certificates of Analysis

Maxxam
A Bureau Veritas Group Company

Your P.O. #: 73512966
Your Project #: 11111591-01
Your C.O.C. #: 33912

Attention: Brian Luffman

GHD Limited
Mount Pearl/St. John's
PO Box 8353 Stn A
1118 Topsail Rd
St. John's, NL
CANADA A1B 3N7

Report Date: 2018/09/17
Report #: R5402926
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8N2362
Received: 2018/09/07, 10:27

Sample Matrix: AIR
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
BTEX and CCME Compounds in Air(TO-15mod)	1	N/A	2018/09/14	BRL SOP-00304	EPA TO-15 m
BTEX Fractionation in Air (TO-15mod)	1	N/A	2018/09/14	BRL SOP-00304	EPA TO-15 m
Canister Pressure (TO-15)	1	N/A	2018/09/14	BRL SOP-00304	EPA TO-15 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Encryption Key

Cristina (Maria) Bacchus
Project Manager
17 Sep 2018 17:17:21

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Cristina (Maria) Bacchus, Project Manager
Email: CBacchus@maxxam.ca
Phone# (905)817-5763

==========

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8N2362
Report Date: 2018/09/17

GHD Limited
Client Project #: 11111591-01
Your P.O. #: 73512966
Sampler Initials: BL

RESULTS OF ANALYSES OF AIR

Maxxam ID		HRJ918	
Sampling Date		2018/09/05	
COC Number		33912	
	UNITS	**AS-01/317**	**QC Batch**
Pressure on Receipt	psig	(-0.8)	5734521
QC Batch = Quality Control Batch			

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8N2362
Report Date: 2018/09/17

GHD Limited
Client Project #: 11111591-01
Your P.O. #: 73512966
Sampler Initials: BL

VOLATILE ORGANIC HYDROCARBONS BY GC/MS (AIR)

Maxxam ID		HRJ918	HRJ918		
Sampling Date		2018/09/05	2018/09/05		
COC Number		33912	33912		
	UNITS	AS-01/317	AS-01/317 Lab-Dup	RDL	QC Batch
F1-BTEX, C6-C10 (as Toluene)	mg/m3	0.0300	0.0308	0.0050	5734760
F2, C10-C16 (as Decane)	mg/m3	0.0175	0.0136	0.0050	5734760
Benzene	mg/m3	0.00073	0.00080	0.00050	5734751
Toluene	mg/m3	0.0062	0.0062	0.0016	5734751
Ethylbenzene	mg/m3	<0.0016	<0.0016	0.0016	5734751
Total Xylenes	mg/m3	0.0040	0.0039	0.0022	5734751
Aliphatic >C5-C6	mg/m3	0.0061	0.0062	0.0050	5734751
Aliphatic >C6-C8	mg/m3	0.0080	0.0077	0.0050	5734751
Aliphatic >C8-C10	mg/m3	<0.0050	<0.0050	0.0050	5734751
Aliphatic >C10-C12	mg/m3	<0.0050	<0.0050	0.0050	5734751
Aliphatic >C12-C16	mg/m3	<0.0050	<0.0050	0.0050	5734751
Aromatic >C7-C8 (TEX Excluded)	mg/m3	<0.0050	<0.0050	0.0050	5734751
Aromatic >C8-C10	mg/m3	<0.0050	<0.0050	0.0050	5734751
Aromatic >C10-C12	mg/m3	<0.0050	<0.0050	0.0050	5734751
Aromatic >C12-C16	mg/m3	<0.0050	<0.0050	0.0050	5734751
Surrogate Recovery (%)					
1,4-Difluorobenzene	%	85	82		5734751
Bromochloromethane	%	87	84		5734751
D5-Chlorobenzene	%	83	82		5734751

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Maxxam Job #: B8N2362
Report Date: 2018/09/17

GHD Limited
Client Project #: 11111591-01
Your P.O. #: 73512966
Sampler Initials: BL

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B8N2362
Report Date: 2018/09/17

GHD Limited
Client Project #: 11111591-01
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Sampler Initials: BL

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5734751	LSY	Spiked Blank	1,4-Difluorobenzene	2018/09/14		107	%	60 - 140
			Bromochloromethane	2018/09/14		106	%	60 - 140
			D5-Chlorobenzene	2018/09/14		108	%	60 - 140
			Benzene	2018/09/14		101	%	70 - 130
			Toluene	2018/09/14		102	%	70 - 130
			Ethylbenzene	2018/09/14		95	%	70 - 130
			Total Xylenes	2018/09/14		90	%	70 - 130
5734751	LSY	Method Blank	1,4-Difluorobenzene	2018/09/14		92	%	60 - 140
			Bromochloromethane	2018/09/14		93	%	60 - 140
			D5-Chlorobenzene	2018/09/14		87	%	60 - 140
			Benzene	2018/09/14	<0.00050		mg/m3	
			Toluene	2018/09/14	<0.0016		mg/m3	
			Ethylbenzene	2018/09/14	<0.0016		mg/m3	
			Total Xylenes	2018/09/14	<0.0022		mg/m3	
			Aliphatic >C5-C6	2018/09/14	<0.0050		mg/m3	
			Aliphatic >C6-C8	2018/09/14	<0.0050		mg/m3	
			Aliphatic >C8-C10	2018/09/14	<0.0050		mg/m3	
			Aliphatic >C10-C12	2018/09/14	<0.0050		mg/m3	
			Aliphatic >C12-C16	2018/09/14	<0.0050		mg/m3	
			Aromatic >C7-C8 (TEX Excluded)	2018/09/14	<0.0050		mg/m3	
			Aromatic >C8-C10	2018/09/14	<0.0050		mg/m3	
			Aromatic >C10-C12	2018/09/14	<0.0050		mg/m3	
			Aromatic >C12-C16	2018/09/14	<0.0050		mg/m3	
5734751	LSY	RPD [HRJ918-01]	Benzene	2018/09/14	8.3		%	25
			Toluene	2018/09/14	0		%	25
			Ethylbenzene	2018/09/14	NC		%	25
			Total Xylenes	2018/09/14	2.2		%	25
			Aliphatic >C5-C6	2018/09/14	1.3		%	25
			Aliphatic >C6-C8	2018/09/14	3.6		%	25
			Aliphatic >C8-C10	2018/09/14	NC		%	25
			Aliphatic >C10-C12	2018/09/14	NC		%	25
			Aliphatic >C12-C16	2018/09/14	NC		%	25
			Aromatic >C7-C8 (TEX Excluded)	2018/09/14	NC		%	25
			Aromatic >C8-C10	2018/09/14	NC		%	25
			Aromatic >C10-C12	2018/09/14	NC		%	25
			Aromatic >C12-C16	2018/09/14	NC		%	25
5734760	LSY	Method Blank	F1-BTEX, C6-C10 (as Toluene)	2018/09/14	<0.0050		mg/m3	
			F2, C10-C16 (as Decane)	2018/09/14	<0.0050		mg/m3	
5734760	LSY	RPD [HRJ918-01]	F1-BTEX, C6-C10 (as Toluene)	2018/09/14	2.4		%	25
			F2, C10-C16 (as Decane)	2018/09/14	NC		%	25

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

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

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

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

NC (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 (absolute difference <= 2x RDL).

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B8N2362
Report Date: 2018/09/17

GHD Limited
Client Project #: 11111591-01
Your P.O. #: 73512966
Sampler Initials: BL

VALIDATION SIGNATURE PAGE

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

Maureen Smith

Maureen Smith, Supervisor, Volatiles

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Your P.O. #: 73512966
Your Project #: 11111591-01
Your C.O.C. #: 39046

Attention: Brian Luffman

GHD Limited
Mount Pearl/St. John's
PO Box 8353 Stn A
1118 Topsail Rd
St. John's, NL
CANADA A1B 3N7

Report Date: 2018/11/30
Report #: R5506091
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8U8104
Received: 2018/11/19, 10:36

Sample Matrix: AIR
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
BTEX and CCME Compounds in Air(TO-15mod)	1	N/A	2018/11/27	BRL SOP-00304	EPA TO-15 m
BTEX Fractionation in Air (TO-15mod)	1	N/A	2018/11/27	BRL SOP-00304	EPA TO-15 m
Canister Pressure (TO-15)	1	N/A	2018/11/27	BRL SOP-00304	EPA TO-15 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

Encryption Key

Cristina (Maria) Bacchus
Project Manager
30 Nov 2018 15:07:44

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Cristina (Maria) Bacchus, Project Manager
Email: CBacchus@maxxam.ca
Phone# (905)817-5763

==========

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Maxxam Job #: B8U8104
Report Date: 2018/11/30

GHD Limited
Client Project #: 11111591-01
Your P.O. #: 73512966
Sampler Initials: BL

RESULTS OF ANALYSES OF AIR

Maxxam ID		IIE458	
Sampling Date		2018/11/13	
COC Number		39046	
	UNITS	**AS-02/2790**	**QC Batch**
Pressure on Receipt	psig	(-4.5)	5858112
QC Batch = Quality Control Batch			

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Maxxam Job #: B8U8104
Report Date: 2018/11/30

GHD Limited
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Your P.O. #: 73512966
Sampler Initials: BL

VOLATILE ORGANIC HYDROCARBONS BY GC/MS (AIR)

Maxxam ID		IIE458		
Sampling Date		2018/11/13		
COC Number		39046		
	UNITS	AS-02/2790	RDL	QC Batch
F1-BTEX, C6-C10 (as Toluene)	mg/m3	0.0164	0.0050	5860537
F2, C10-C16 (as Decane)	mg/m3	<0.0050	0.0050	5860537
Benzene	mg/m3	<0.00050	0.00050	5860542
Toluene	mg/m3	<0.0016	0.0016	5860542
Ethylbenzene	mg/m3	<0.0016	0.0016	5860542
Total Xylenes	mg/m3	<0.0022	0.0022	5860542
Aliphatic >C5-C6	mg/m3	<0.0050	0.0050	5860542
Aliphatic >C6-C8	mg/m3	<0.0050	0.0050	5860542
Aliphatic >C8-C10	mg/m3	<0.0050	0.0050	5860542
Aliphatic >C10-C12	mg/m3	<0.0050	0.0050	5860542
Aliphatic >C12-C16	mg/m3	<0.0050	0.0050	5860542
Aromatic >C7-C8 (TEX Excluded)	mg/m3	<0.0050	0.0050	5860542
Aromatic >C8-C10	mg/m3	<0.0050	0.0050	5860542
Aromatic >C10-C12	mg/m3	<0.0050	0.0050	5860542
Aromatic >C12-C16	mg/m3	<0.0050	0.0050	5860542
Surrogate Recovery (%)				
1,4-Difluorobenzene	%	72		5860542
Bromochloromethane	%	78		5860542
D5-Chlorobenzene	%	67		5860542

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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GENERAL COMMENTS

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5860537	DM2	Method Blank	F1-BTEX, C6-C10 (as Toluene)	2018/11/27	<0.0050		mg/m3	
			F2, C10-C16 (as Decane)	2018/11/27	<0.0050		mg/m3	
5860537	DM2	RPD	F1-BTEX, C6-C10 (as Toluene)	2018/11/27	5.2		%	25
			F2, C10-C16 (as Decane)	2018/11/27	NC		%	25
5860542	DM2	Spiked Blank	1,4-Difluorobenzene	2018/11/27		96	%	60 - 140
			Bromochloromethane	2018/11/27		94	%	60 - 140
			D5-Chlorobenzene	2018/11/27		93	%	60 - 140
			Benzene	2018/11/27		105	%	70 - 130
			Toluene	2018/11/27		112	%	70 - 130
			Ethylbenzene	2018/11/27		107	%	70 - 130
			Total Xylenes	2018/11/27		104	%	70 - 130
5860542	DM2	Method Blank	1,4-Difluorobenzene	2018/11/27		85	%	60 - 140
			Bromochloromethane	2018/11/27		88	%	60 - 140
			D5-Chlorobenzene	2018/11/27		76	%	60 - 140
			Benzene	2018/11/27	<0.00050		mg/m3	
			Toluene	2018/11/27	<0.0016		mg/m3	
			Ethylbenzene	2018/11/27	<0.0016		mg/m3	
			Total Xylenes	2018/11/27	<0.0022		mg/m3	
			Aliphatic >C5-C6	2018/11/27	<0.0050		mg/m3	
			Aliphatic >C6-C8	2018/11/27	<0.0050		mg/m3	
			Aliphatic >C8-C10	2018/11/27	<0.0050		mg/m3	
			Aliphatic >C10-C12	2018/11/27	<0.0050		mg/m3	
			Aliphatic >C12-C16	2018/11/27	<0.0050		mg/m3	
			Aromatic >C7-C8 (TEX Excluded)	2018/11/27	<0.0050		mg/m3	
			Aromatic >C8-C10	2018/11/27	<0.0050		mg/m3	
			Aromatic >C10-C12	2018/11/27	<0.0050		mg/m3	
			Aromatic >C12-C16	2018/11/27	<0.0050		mg/m3	
5860542	DM2	RPD	Aliphatic >C5-C6	2018/11/27	NC		%	25
			Aliphatic >C6-C8	2018/11/27	NC		%	25
			Aliphatic >C8-C10	2018/11/27	NC		%	25
			Aliphatic >C10-C12	2018/11/27	NC		%	25
			Aliphatic >C12-C16	2018/11/27	NC		%	25
			Aromatic >C7-C8 (TEX Excluded)	2018/11/27	NC		%	25
			Aromatic >C8-C10	2018/11/27	NC		%	25
			Aromatic >C10-C12	2018/11/27	NC		%	25
			Aromatic >C12-C16	2018/11/27	NC		%	25

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

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

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

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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 (absolute difference <= 2x RDL).

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Maxxam Job #: B8U8104
Report Date: 2018/11/30

GHD Limited
Client Project #: 11111591-01
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Maureen Smith, Supervisor, Volatiles

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Attachment E
Photographs

Photo 1 – View, looking northwest towards the generator shed and workshop during the December 2015 Site inspection.

Photo 2 – View, looking east, that shows replacement of the petroleum impacted shed wall during the August 2018 Site inspection.

Site Photographs

Photo 3 – View, looking northwest towards the generator shed and workshop during the September 2018 Site inspection after the generator shed repairs and painting.

Photo 4 – View, looking south towards the generator shed during the September 2018 Site inspection after the generator shed after rot was repaired on the lower right door.

Site Photographs

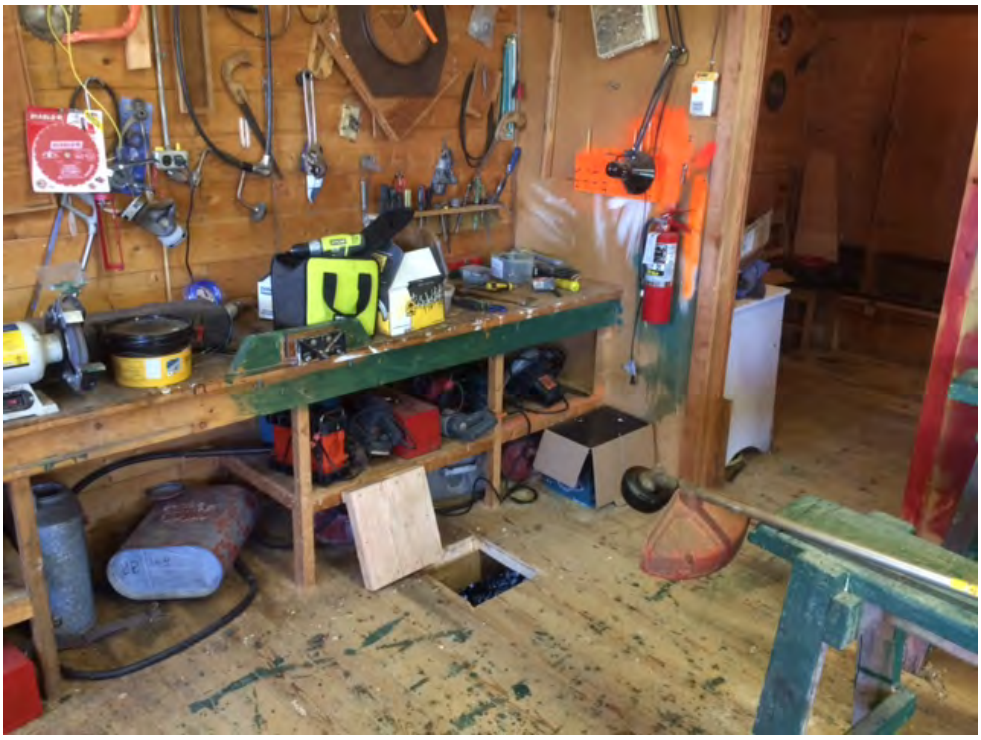

Photo 5 – View of the east side of the Workshop showing the location of the access hatch for collection of ambient air samples under the floor during the September 2018 Site inspection.

Photo 6 – View of the ambient air sample collection Suma canister in the access hatch of the Workshop during the September 2018 sampling event.

Site Photographs

Attachment F

Atlantic RBCA Ecological Receptor Screening Protocol

SUMMARY TABLE – RESULTS OF ECOLOGICAL SCREENING PROTOCOL FOR PETROLEUM IMPACTED SITES

Instructions to Practitioners: This table is intended to summarize the results of the Ecological Screening Protocol and must be completed in consultation with guidance provided in the protocol. Users should include this completed table in their Environmental Assessment or Closure Report. Details and explanations are to be provided in the body of the Report.

Ecological Screening Component	Yes or No	Report name and location of details and explanations
Part I – Identification of petroleum hydrocarbons in media		
1. Do site characterization data indicate the presence of PHC in site surface soil (depth < 1.5 m) above the appropriate screening levels in Tables 1a and 1b?	Yes	**Air Sampling & Closure Report Attachment B** Site characterization data identified the presence of petroleum hydrocarbons in surface soil samples at a depth of less than 1.5 mbgs that was above the Tier I Soil ESLs for the Protection of Plants and Soil Invertebrates through Direct Soil Contact (Atlantic RBCA Table 1a). Five historical soil samples (TP3-02, TP4-02, TP4-03, TP1-Bottom and TP2-Surface) collected in the general area of the generator shed reported C10–C16 and/or C10 C16 carbon fractions above the Tier I Soil ESLs for coarse grained soil. However, given the location of these samples are in an area of the active generator shed and are predominantly covered with gravel access roads/parking areas, buildings, and/or concrete AST slabs, impacts to plant and soil invertebrates are not expected. In ecological risk assessments, the upper 0.6 metres of the soil horizon is commonly considered the ecologically active soil horizon. Soil greater than 0.6 metres depth is generally considered to be at a depth that eliminates the ecological receptor to soil contact pathway, specifically in areas that lack deep rooting plants such as trees and shrubs. Visible observations obtained during the assessment work indicated that vegetation in the area of the five historical samples noted above primarily consisted of gravel and grasses/forbs with no areas of stressed vegetation identified. As such, it is reasonable to assume that direct contact soil contact pathway for plants and invertebrates is not operable and therefore, hydrocarbon concentrations in this sample pose a low risk to ecological receptors.

2. Do site characterization data indicate the presence of PHC in shallow site groundwater (depth < 3.0 m) above appropriate ecological screening levels that were derived for the protection of terrestrial plants and soil invertebrates in contact with site groundwater in Table 2?	No	**Air Sampling & Closure Report Attachment B** All Site Groundwater results are within the applicable Tier I ESLs.
3. Do existing site characterization data indicate the presence of PHC in site groundwater above appropriate ecological screening levels derived for the protection of aquatic receptors in Table 3a/3b?	No	**Air Sampling & Closure Report Attachment B** All Site Groundwater results are within the applicable Tier I ESLs.
4. Do site characterization data indicate the presence of PHC in the site surface water above the appropriate screening levels in Table 3?	No	**Air Sampling & Closure Report Attachment B** Given the groundwater and soil sample analytical results collected from the perimeter of the Site indicated non-detect concentrations of petroleum hydrocarbons, further evaluation of the adjacent surface water is not required for the Site.
5. Does site characterization indicate the presence of PHC in on-site or adjacent sediments above the appropriate screening levels in Table 4?	No	**Air Sampling & Closure Report Attachment B** Given the groundwater/soil sample analytical results collected from the perimeter of the Site indicated non-detect concentrations of petroleum hydrocarbons, further evaluation of the adjacent sediment is not required for the Site.
IF ALL ANSWERS IN PART I ARE "NO" THEN NO FURTHER ACTION IS REQUIRED		
Part II – Identification of habitat and ecological receptors		
1. Are the following habitat types or conditions present on the site or proximate to the site within a minimum of 200 metres? • wetland habitats • aquatic habitats • forested habitats • grassland habitats • provincial/national parks or ecological reserves • known rare, threatened or endangered species • other known critical or sensitive habitat • other local or regional receptor or habitat concerns	Yes	**Air Sampling & Closure Report Attachment B** Site is located within Butter Pot Provincial Park and both forested and aquatic habitats are located within 200 metres of the Site.
2a. Are there visible indications of stressed vegetation on the site?	No	NA
2b. Is there evidence that the site vegetation community differs from what would be expected?	No	NA
2c. Are there indications that the site soil cannot support a soil invertebrate community?	No	NA
3. Is there evidence that terrestrial plants in the habitats above are likely to be in root contact with site groundwater above screening levels?	No	NA

4. Would wildlife receptors be expected to forage on or near the contaminated areas of the site?	No	NA
Part III – Identification of exposure pathways for ecological receptors		
1a. Is it reasonable to conclude that site hydrocarbons in surface soil with concentrations exceeding applicable screening levels, will come into contact with terrestrial plants and invertebrates in a suitable habitat?	No	NA
1b. Is it reasonable to conclude that site hydrocarbons in surface soil with concentrations exceeding applicable screening levels, will come into contact with mammalian, avian or herptile terrestrial receptors within an agricultural land use in suitable habitat?	No	NA
2. Is it reasonable to conclude that dissolved hydrocarbons in site groundwater with concentrations exceeding applicable screening levels will come into contact with plants or soil invertebrates in a suitable habitat?	No	NA
3. Is it reasonable to conclude that dissolved hydrocarbons in the site groundwater with concentrations exceeding applicable screening levels will come into contact with aquatic receptors or aquatic receptor habitat?	No	NA
4. Is it reasonable to conclude that site petroleum hydrocarbon contamination could impact aquatic receptors or aquatic habitat in surface water bodies via the following: a. surface run-off (*e.g*. Erosion, windblown contaminants) b. groundwater flow c. preferential overland flow pathways (*e.g*. drainage ditch, slope, swale) d. preferential subsurface flow pathways (*e.g.* culvert, trench, sewer line, pipelines, swales) such that aqueous media concentrations would potentially exceed surface water and/or sediment quality screening levels?	No	NA
Are there site specific conditions present, which were not considered in any section above that should require further ecological assessment?	No	NA
IF ALL ANSWERS IN PART III ARE “”NO” THEN NO FURTHER ACTION IS REQUIRED		

Attachment G

Atlantic RBCA Site Closure Checklist

APPENDIX 7

ATLANTIC RBCA SITE CLOSURE CHECKLIST

Provide contact and mailing information for all relevant submitting parties.

Current Site Owner	**Mailing Address:** Company Name: NL Department of Tourism, Culture, Industry, and Innovation Address: 117 Riverside Drive PO Box 550 City: Corner Brook, NL A2H 6E6 Contact Name: Mr. Geoff Bailey Phone: (709) 637-2411 Fax: (709) 637-8060 E-mail: geoffbailey@gov.nl.ca
Approved Agent (if different than above)	**Mailing Address:** Company Name: NA Address: City: Postal Code: Contact Name: Phone: Fax: E-mail:
Site Professional	**Mailing Address:** Company Name: GHD Limited Address: 1118 Topsail Road, P.O. Box 8353 City: St. John's, NL A1B 3N7 Contact Name: Brian Luffman, P.Eng. Phone: 709-364-5353 Fax: 709-364-5368 E-mail: Brian.Luffman@GHD.com

Part 1. Site Information

Site Name, Civic Address and Community:	**Generator Site, Butter Pot Provincial Park Trans-Canada Highway, NL**
Property Identification Number:	**N/A**
Atlantic RBCA Tier : **(Check the highest that applies):**	**Tier I ☐ Tier II ☒ Tier III ☐**
Submission date:	**December 2018**
Name of Managing Site Professional:	**Brian Luffman, P.Eng.**

Part 2. Documents Summary

List all known contaminated sites management documents completed for the site that are relevant to the regulatory site closure submission. This should include site previous investigation reports (all phases), notification reports, screening level and quantitative risk assessment studies, remediation plans, confirmation of remediation reports (including monitoring) and any other supporting correspondence for the subject site and all affected off-site or third-party impacted properties. All listed documents must be submitted to the regulator.

#	Document Title	Author/Company	Document Date d/m/yr	Submission Date d/m/yr:
1	Phase II ESA, Diesel Generator Site Butter Pot Provincial Park, TCH, NL	ADI Limited	April 2009	April 2009
2	Soil Remediation, United Rentals Diesel Generator Spill Butter Pot Provincial Park, TCH, NL	AMEC	July 2009	July 2009
3	Subsurface Assessment Butter Pot Provincial Park, NL	CBCL Limited	November 2011	November 2011
4	Phase III ESA Butter Pot Provincial Park, NL	SNC Lavalin Inc.	September 2015	September 2015
5	Supplemental Phase III ESA Generator Site Butter Pot Provincial Park, NL	Jamie O'Neill, P.Eng. GHD Limited	March 2016	March 2016
6	Ambient Air Sampling and Closure Butter Pot Provincial Park, NL	Brian Luffman, P.Eng. GHD Limited	December 2018	December 2018

Part 3. Site Closure Checklist with Minimum Submission Requirements

The following checklist information is typically required by provincial regulators in order to process "site closure" of a contaminated site. However, additional requirements may also apply. Check with your provincial jurisdiction. All applicable and/or required reports must be provided to the Department of Environment prior to consideration of site closure.

If the information is contained in more than one document, this information must be cross-referenced to the applicable document (from Part 2 above) in the checklist below. **Please note that it is highly preferred if all required information for site closure is provided in one comprehensive summary report.**

Required Information	Reference Document(s)		
	Document #	Section	Page number
1. Location details of the source property and affected third party properties	6	1.0	1
2. Description of previous environmental work (ESAs, Remedial Actions, etc.) completed at the site	6	3.1	3-7
3. Description of source property information, including site use, water/sewer, building details, historical information, any preferential pathways for contaminant migration.	6	1.0	1-2
4. Description of third property information, including site use, water/sewer, building details, and historical information	NA	NA	NA
5. A completed Summary Table of the Ecological Screening Protocol as provided in Appendix 2A of the Atlantic RBCA User Guidance	6	Att	F
6. A completed "Site Assessment and Tier I/II Table Checklist" as provided in Appendix 6 of the Atlantic RBCA User Guidance	NA	NA	NA
7. Site plan(s) clearly showing the following information as a minimum: • Relevant buildings and roadways (both on and off-site) • Surrounding natural features • Identified underground/above ground services • Groundwater flow information • Sampling locations (TPs, BHs, MWs, bulk samples, etc.) • Original area of contamination as delineated in affected soil, sediment, groundwater and surface water • Limits of excavation, if applicable • Remediation confirmatory sample locations	6	Fig	3
8. Physical site characteristics including descriptions of topography, soils, geology, hydrogeology, surface water features, etc.	6	1.0	1-2
9. When site contamination is the result of a petroleum product release, information on: • Date of spill/leak • Quantify of product • Type of product • Summary of Emergency response, including dates.	6	3.0	2-3

Required Information	Reference Document(s)		
	Document #	Section	Page number
10. Field procedures – Description of all testing and sampling methods on the source and third party properties (soil, groundwater, vapour, etc)	6	3.1 4.0	3-7 7-8
11. Monitoring well, test pit and borehole logs	1 3 4 5	App NA App App	2 NA F B
12. Laboratory analytical certificates (including fine grained soil sieve analysis, petroleum hydrocarbon analyses, TPH fractionation etc.) and hydraulic conductivity tests results, if conducted.	1 2 3 4 5 6	App NA App App App Att	3 NA D C D D
13. Description of contaminant delineation in soil, sediment, groundwater or surface water	6	3.1	3-7
14. Identification of chemicals of concern, exposure pathways and receptors for Tier II/III	6	4.0	7-8
15. Remedial numerical criteria developed for source property and affected third party properties	6	2.0	2
16. Summary of inputs used for Tier II RBCA or other (Tier III) risk assessment modeling, including justification for changing Atlantic RBCA defaults, if applicable	NA	NA	NA
17. Tier II RBCA or other (Tier III) risk assessment modeling runs, if applicable.	NA	NA	NA
18. Details of remediation technologies/methodologies used at the source property and affected third party properties	6	3.1	3-7
19. Dates for implementation, milestones, and completion	6	4.0	7-8
20. Details of confirmatory soil sampling – locations, logs, laboratory analytical certificates	6	3.1	3-7
21. Confirmation that applicable remedial numerical criteria have been achieved for all affected site(s) /OR confirmation of applicable site management controls	6	3.1	3-7
22. Details of monitoring program, if applicable (frequency, methodologies, results, reporting dates)	NA	NA	NA
23. Detailed conclusions and recommendations regarding site closure	6	7.0	8-9
24. Correspondence indicating third party notification information and agreements, if applicable	NA	NA	NA
25. All necessary stakeholder written agreements regarding any required institutional or engineered controls	NA	NA	NA
26. Written agreement from the Owner/Responsible Party regarding the decommissioning of monitoring wells, when applicable and subsequent to acknowledgment of site closure	NA	NA	NA

27. Name of Site Closure managing site professional, names of significant contributors (ie. Risk Assessor, Site Assessor etc.) and professional stamps on significant documents where required by each jurisdiction (this information may be in a Site Closure report if one has been prepared, or may be supplied in a separate cover document)	6	Att	G
28. Completed Record of Site Condition or Certificate of Compliance (or other similar jurisdictional regulatory document)	6	Att	H

Attachment H
Record of Site Condition

RECORD OF SITE CONDITION

Part 1 of 7: Source Property Information

Civic Address: Generator Site, Butter Pot Provincial Park, Trans-Canada Highway, NL

Person Responsible(name and address): NL Department of Tourism, Culture, Industry, and Innovation
Mr. Geoff Bailey
Manager of Park Operations & Visitor Services
117 Riverside Drive
PO Box 550
Corner Brook, NL A2H 6E6

Part 2 of 7: List of Reports

Prepared by Others - The following reports pertaining to the source property cited in Part 1 and/or any other related impacted properties have been prepared by others and reviewed under the supervision of the Site Professional (expand the table as required):

Report Title	Prepared by	Date
Phase II Environmental Site Assessment, Diesel Generator Site – Butter Pot Provincial Park, Trans-Canada Highway, NL	ADI Limited	April 2009
Soil Remediation – Final Report, United Rentals Diesel Generator Spill, Butter Pot provincial Park, Trans-Canada Highway, NL	AMEC	July 2009
Subsurface Assessment, Butter Pot Provincial Park, NL	CBCL Limited	November 2011
Phase III Environmental Site Assessment, Butter Pot Provincial Park, NL	SNC Lavalin Inc.	September 2015

Prepared by and/or overseen by the Site Professional - The following reports pertaining to the source property cited in Part 1 and/or any other related impacted properties have been prepared by and/or overseen by the Site Professional (expand the table as required):

Report Title	Date
Supplemental Phase III Environmental Site Assessment, Generator Site, Butter Pot Provincial Park, NL	March 2016
Ambient Air Sampling and Closure Report	December 2018

Part 3 of 7: Remedial Action

List the Contaminants of Potential Concern (CoPCs) on the property (i.e., what was analysed?):

(BTEX/TPH)

List the CoCs on or originating from the source property (i.e., CoCs above applicable guidelines):

Petroleum Hydrocarbons

Summarize the site assessment and remedial actions completed at the site complete with timelines:

March 2009: A Phase II ESA was conducted by ADI Limited (ADI) that involved the excavation of four test pits and associated soil sampling at locations of potential environmental concern, as determined by surface soil staining in areas adjacent to the existing diesel generator and AST. Based on the soil analytical results, one or more BTEX components were detected in four of the seven soil samples analyzed at concentrations that exceeded the applicable criteria of the time. Modified TPH (mTPH) were also detected in four of the seven soil samples analyzed at concentrations that exceeded applicable criteria. Based on the findings of the investigation, ADI recommended further assessment to further delineate the extent of PHC contamination in soils/groundwater and to develop a remedial action plan for the Site.

May 2009: AMEC Earth & Environmental, a division of AMEC Americas Limited (AMEC), was retained by Environmental Management Inc. (EMI), on behalf of United Rentals, to conduct a soil remediation program in response to the diesel generator spill in the area of the Generator shed. During the inspection, an area of surface staining, measuring approximately 7 metres long by 3 metres wide was observed on the north side of the Generator shed near the United Rentals generator. Strong PHC odours were noted in the general area of the spill. Surface staining was also observed to the south of the Generator shed within a shallow trench and on the south exterior wall of the shed. According to the Park Manager, the shallow trench was excavated in the fall of 2008 for the purpose of installing electrical cables to the storage shed to the southeast. The surface staining in the trench was reportedly identified at that time and the electrical cable installation was not completed. The Park Manager indicated that surface staining observed on the south side of the Generator shed may have been the result of past practices of handling and dumping of waste oil from the Park generator in this area.

Based on the AMEC report, the Site remediation program included the excavation, removal, transportation and off-Site disposal of PHC impacted soil resulting diesel fuel spill. PHC impacted soils were excavated from the diesel generator spill area down to bedrock at depths ranging from approximately 1.4 to 2.0 metres below ground surface (mbgs) using a track-mounted excavator. Approximately 90 tonnes of PHC impacted soil was excavated and transported to Newfoundland Soiltec Inc. for treatment and disposal. Following the excavation and removal of PHC impacted soil

from the Site, soil samples were collected from the excavation area. Nine soil samples were collected from the upper and lower portion of the walls and from the floor of the remedial excavation. One soil sample was also collected from the shallow trench on the south side of the generator shed.

Based on the reported quantity of diesel fuel released from the United Rentals generator and findings from the 2009 Site inspection that revealed other areas of pre-existing surface staining on-Site (i.e. south side of Generator shed), it was reportedly agreed that no further assessment and/or remediation was required by United Rentals. As a result, the remedial area was backfilled with clean imported fill. Review of the letter report indicates that no confirmatory soil samples were analyzed.

September 2011: CBCL Limited (CBCL) conducted a Sub-Surface Soil Assessment to evaluate the extent of PHC impacts at the Site related to historical spill events. A total of 12 test pits were excavated in the area of the Generator shed and Workshop building. Test pits were terminated at depths ranging from 0.5 to 1.95 mbgs based on bedrock refusal. Groundwater was not encountered during test pit activities. Measured organic vapour concentrations in the soil samples collected from the test pits ranged from 0 to 420 ppm. Two selected soil samples from each test pit were submitted for BTEX and modified TPH analysis.

Soil analytical results from the test pits revealed elevated BTEX concentrations in three of the 12 test pits exceeding the applicable criteria of the time. Elevated modified TPH concentrations were also detected in four of the 12 test pits exceeding the applicable criteria of the time. Based on the results of the investigation, CBCL recommended the following:

- Drill four monitoring wells to further assess and delineate petroleum impacts in groundwater and to determine if identified PHC impacts had impacted the groundwater.
- Conduct additional borehole activities to the southeast and southwest of the Generator shed to delineate the identified hydrocarbon impacts vertically and horizontally.
- Collect potable water sample for laboratory analysis.

January to June 2015: SNC-Lavalin Inc. (SLI) was retained by DMAE to conduct a Phase III ESA to further assess the extent of PHC contamination at the Site. Field work included the excavation and sampling of nine test pits, the installation and sampling of four monitoring wells, and the collection of one potable water sample. The soil, groundwater, and potable water samples were analyzed for BTEX/mTPH and Polycyclic Aromatic Hydrocarbons (PAHs). A total of 15 soil samples, including one field duplicate, were submitted for petroleum hydrocarbon analysis and, with the exception of two soil samples, analytical results were below the applicable Tier I RBSLs and Tier I ESLd for the Site characteristics. Two soil samples also reported F2 fraction concentrations above the applicable Tier I ESL. All 15 soil samples analyzed for PAHs reported non-detectable concentrations that were below the applicable Canadian Council of Ministers of the Environment (CCME) Canadian Soil Quality Commercial Guidelines for the Protection of Environmental and Human Health guidelines.

Results of the groundwater sampling program revealed that all groundwater samples submitted for BTEX/mTPH and PAHs were reported as non-detect; and therefore, below the Tier I RBSLs for a commercial site with potable groundwater and coarse-grained soil.

Results of the potable water sampling program revealed that the sample submitted for BTEX/mTPH and PAHs were reported as non-detect; and, therefore below the applicable Health Canada Drinking Water Quality Guidelines.

Based on the field program, horizontal and vertical delineation was achieved southeast and southwest of the Generator shed. Based on this information, it was estimated the area of PHC impacts was approximately 170 m2 with an approximate volume of 250 m3. It was noted that delineation to the west/northwest had not been achieved.

Based on the results of the investigation, SLI recommended the following:

- Conduct additional sampling to delineate soil impacts northwest of the Generator shed.
- Conduct an indoor air sampling program to assess current human health risks associated with inhalation exposure to potentially PHC impacted indoor/outdoor air within the four nearby building structures located at the Site.
- Remove and replace the wooden walls of the generator shed stained with PHCs.

December 2015: GHD was retained by DMAE to complete a Supplemental Phase III ESA at Site to review previous environmental reports, identify data gaps, and conduct additional sampling to the extent that a Remedial Action Plan/Risk Management Plan (RAP/RMP) could be developed to bring the Site to closure. The Supplemental Phase III ESA consisted of the excavation of six test pits, groundwater sampling from all accessible on-Site monitoring wells, and the installation and sampling of one soil vapour probe in the area of the Generator shed. Based on anticipated future land use, the property is classified as a commercial site with potable groundwater and coarse-grained soil. In addition, analytical data was also compared to Atlantic RBCA Tier I ESLs.

Nine soil samples, including one field duplicate, were submitted to Maxxam for BTEX/mTPH analyses, all of which reported BTEX/mTPH concentrations below the Tier I RBSLs and ESLs for the Site characteristics.

Three groundwater samples, plus one field duplicate, were submitted to Maxxam for BTEX/mTPH analyses; one monitor well was not located due to regrading of the gravel parking area and could not be sampled. All samples reported BTEX/mTPH concentrations below the 2015 Tier I RBSLs and ESLs for the Site characteristics. No free product or sheening was noted in the monitor wells during the sampling/gauging program.

It is estimated that approximately 800 tonnes of soil with concentrations above the 2015 Tier I RBSLs and Tier I ESLs for the Site characteristics is located in the Generator shed area.

One soil vapour probe was installed in the area of the highest historical PHC concentration to assess soil vapour conditions at the Site. The soil vapour sample was submitted to Maxxam for BTEX, and aromatic and aliphatic TPH sub fraction analyses. Based on the criteria of the day and using no dilution factor, Benzene, Xylenes, Aromatic C8-C10, and Aliphatic C8-C10 and C12-C16 hazard quotient levels were above acceptable levels for a commercial building located in the immediate vicinity of the sampling location. In addition, the Benzene Risk was calculated as 4.6 x 10-5 compared to an acceptable level of 1.0 x 10-5. Using a dilution factor for sub-slab, soil vapour levels were determined to be within acceptable levels for a commercial building located in the immediate vicinity of the sampling location. This soil vapour sample was below the 2016 Tier II VISLs for the Site characteristics.

An evaluation of potential ecological receptors was completed where ecological receptors (Provincial Park, forested habitats, Trailer Pond) were identified within 200 metres of the Site. Based on a review of historical assessment information, further ecological assessment is not required.

August to November 2018: GHD was retained by DMAE to complete an ambient air sampling program at the Generator site. Two ambient air samples were collected from between the floor and soil under the Workshop building (through a newly constructed hatch) with one in September for the non-heating season and one in November for the heating season. The ambient air samples reported measured hydrocarbon levels below their respective Tier II VISLs, and the calculated IARs.

In addition, the rear wall of the generator shed had PHC staining that was replaced to prevent further soil contamination, and ensure a safe working environment for Park employees.

Was a risk assessment completed at the site (includes qualitative, quantitative, human health, ecological, vapour sampling, etc.)? ☒ Yes ☐ No

If yes, identify the risk assessment methodology and the resulting site-specific remedial criteria in the below table (expand the table as required).

If no site-specific remedial criteria were derived, please provide additional details of the assessment:

List the Tier I guidelines used for all analysed parameters, unless listed in the above table, noting the guideline reference (i.e., CCME, RBCA, CWS, etc): (expand the table as required)

Media	Units	Benzene		Toluene		Ethylbenzene		Xylenes		TPH	
		Guideline	Ref.	Guideline	Ref.	Guideline	Ref.	Guideline	Ref.	Guideline	Ref.
Soil – HH	mg/kg	0.042	RBCA	0.35	RBCA	0.043	RBCA	0.73	RBCA	Gasoline – 870 Fuel – 1,800 #6 Oil – 10,000	RBCA
Soil – Eco	mg/kg	180	RBCA	250	RBCA	300	RBCA	350	RBCA	F1 – 320 F2 – 260 F3 – 1,700	RBCA
Soil – Eco (wildlife)	mg/kg	18	RBCA	980	RBCA	640	RBCA	2,600	RBCA	F1 – 1,100 F2 – 9,800 F3 – 16,000	RBCA
GW – HH	mg/L	0.005	RBCA	0.024	RBCA	0.0016	RBCA	0.02	RBCA	Gasoline – 4.4 Fuel – 3.2 #6 Oil – 7.8	RBCA
GW – Eco (Shallow)	mg/L	350	RBCA	200	RBCA	110	RBCA	120	RBCA	C6-C10 – 11 C10-C16 – 3.1	RBCA
GW – Eco (150 m from receptor)	mg/L	97	RBCA	88	RBCA	67	RBCA	59	RBCA	F1 – 750 F2 – N/A F3 – N/A	RBCA
Tier II VISLs (Soil Vapour Commercial)	Mg/m^3	130	RBCA	34,000	RBCA	10,000	RBCA	1,800	RBCA	Ar C8-C10 – 4,600 Ar C10-C12 – 4,600 Ar C12-C16 – 4,600 Al C6-C8 – 420,000 Al C8-C10 – 22,000 Al C10-C12 – 22,000 Al C12-C16 – 22,000	RBCA
Tier II VISLs (Ambient Air Commercial)	Mg/m^3	0.025	RBCA	13	RBCA	3.6	RBCA	0.65	RBCA	Ar C8-C10 – 0.73 Ar C10-C12 – 0.73 Ar C12-C16 – 0.73 Al C6-C8 – 67 Al C8-C10 – 3.6 Al C10-C12 – 3.6 Al C12-C16 – 3.6	RBCA

If a peer review of the Remedial Action Plan and/or the Risk Assessment/Closure Report was requested by Service NL or DOEC, provide the following information:

Consultant Name/Address:

Date & Title of Report:

Part 4 of 7: Off-Site Impacts

Precautionary duty of the Person Responsible: Based on the work completed, the following third party properties (identified by civic address or property description) were identified by the Person Responsible/Site Professional, in accordance with section 5.8(1)d of the *Environmental Protection Act*, as being affected or threatened by the contamination originating from the source property.

Where appropriate, indicate the type of impact and summarize what assessment was completed and if any mitigative/remedial actions were taken: (expand the table as required)

Civic Address or Property Description	Type of Impact Identified	Summary of Actions and Outcome
NA	N/A	N/A

Part 5 of 7: Site Activities

Based on the work completed, the source property cited in Part 1 is suitable for the following site activity(s), subject to any conditions and assumptions stated in the report(s) listed in Part 2. Check appropriate box and provide comments if necessary.

IF LAND USE CHANGES – LEVEL OF RISK MUST BE RE-EVALUATED

☐ Agricultural ☐ Residential/Parkland ☒ Commercial ☐ Industrial

☐ Other (Specify Details):

Are there any monitoring requirements for this site? ☐ Yes ☒ No

If yes, please provide details: **N/A**

Are any engineered controls in place to mitigate potential unacceptable risks? ☐ Yes ☒ No

If yes, please provide details: **N/A**

Are any institutional controls in place to mitigate potential unacceptable risks? ☐ Yes ☒ No

If yes, please provide details: **N/A**

Additional comments or special considerations: YES

1. During any future construction activities, residual petroleum hydrocarbon impacted soil that remains below the Site building should be managed on-Site or directed to a licensed facility for disposal.

2. In the event of any construction activities that would require removal of impacted soil at depth, construction workers would have to use appropriate PPE.

Part 6 of 7: Summary Statement of Site Professional

The Minister considers Statements 1 to 7, below to be **mandatory** for submission of the Record of Site Condition. The signature of the Site Professional on this form indicates the fulfillment of these mandatory requirements as well as the requirements of all other checked statements. Please check appropriate statements:

1.	This Record of Site Condition form is identical to the one provided in the Province of Newfoundland & Labrador Policy Document for the Management of Impacted Sites and the content of the form has not been altered.	☒
2.	All work on which this Record of Site Condition is based was prepared, overseen and/or reviewed by the Site Professional.	☒
3.	The site was managed in accordance with the current version of the Province of Newfoundland & Labrador Policy Document for the Management of Impacted Sites.	☒
4.	The applicable quality criteria (Tier I, II or III) for the site as defined by the Site Professional and as cited in Part 3 have been achieved for the current or reasonably foreseeable future site activities as cited in Part 5.	☒
5.	A site plan with scale indicated, identifying the referenced properties is attached to this Record of Site Condition.	☒
6.	All reports cited in Part 2 and other related documents that have been prepared by the Site Professional have been delivered to the Person Responsible.	☒
7.	With respect to notification, the requirements of section 8(d) of the Environmental Protection Act have been fulfilled	☒
8.	The Remedial Action Plan, Risk Assessment or Closure Report was peer reviewed by a qualified, independent Site Professional.	☐
9.	If peer reviewed, the results of the Peer Review were appropriately incorporated into the final Remedial Action Plan and/or Closure Report.	☐
10.	Based on the results of the site evaluation, the applicable quality criteria (Tier I, II or III) were not exceeded on the source property and therefore, remedial action and/or on-going site management is not required for the current or reasonably foreseeable future site activities.	☐
11.	Based on results of the site evaluation, the applicable quality criteria (Tier I, II or III) were not exceeded on the third party properties and therefore, remedial action and/or on-going site management is not required for the current or reasonably foreseeable future site activities.	☐
12.	The source property has been remediated to an acceptable level for the current or reasonably foreseeable future site activities as cited in Part 5.	☒
13.	The source property requires on-going site management to satisfy the current or reasonably foreseeable future site activities as cited in Part 5.	☐
14.	Third party properties affected by the contamination of the source property have been addressed and remediated to an acceptable level for the current or reasonably foreseeable future site activities as cited in Part 5.	☐
15.	Third party properties affected by the contamination of the source property have been addressed and require on-going site management to satisfy the current or reasonably foreseeable future site activities as cited in Part 5.	☐

☐ The source property is recommended for **Conditional Closure,** subject to monitoring requirements specified in Part 5.
☒ The source property is recommended for **Final Closure**

Signature  Date:December 21, 2018

Name (Please Print): Brian Luffman, P.Eng.
Site Professional Registration No.: SP008
Company: GHD Limited
Address: 1118 Topsail Road, P.O. Box 8353, Station A
St. John's, NL A1B 3N7

Part 7 of 7: Acknowledgement by Newfoundland and Labrador Department of Municipal Affairs and Environment

The Department acknowledges receipt of this Record of Site Condition. The Department has processed the report(s) cited in Part 2 of this Record of Site Condition for the purpose of ensuring the site has been managed in accordance with the Newfoundland and Labrador Department of Municipal Affairs and Environment *Guidance Document for the Management of Impacted Sites.*

Based solely on the report(s) cited in Part 2 and on the conclusions of the Site Professional stated in Part 6 of this Record of Site Condition, the Department is satisfied, at this point in time, that the stated level of contamination remaining on the subject property, in the portions of the subject property addressed by the report(s), does not pose an unacceptable risk to human health or to the environment. Notwithstanding this opinion, the Department reserves the right to re-evaluate this decision should new information come to light, or should site activities, site uses or circumstances change which may result in an increase in contamination or in contaminant migration or which may cause changes in site conditions or site classification that may pose a risk to human health or to the environment.

The Department has not directly supervised the work undertaken at the site and does not assume any responsibility or liability for this work, or for notifying future owners, or for notifying present or future occupants of the property, of the work completed. In no way does this acknowledgement make any representation with respect to any environmental damage or liability that may have occurred at the above mentioned property due to contamination that was not discovered, reported or investigated. Any persons intending to purchase or occupy the property should make their own independent determination of the environmental condition of the property and the extent of responsibility and liability, if any, that may arise from taking ownership or occupancy. In addition, workers that are engaged in future sub-surface excavations on site must be made aware of the potential risks of exposure to the remaining contamination.

Unconditional Closure

☐ It is understood from the information provided that the site has been managed in accordance with the Newfoundland and Labrador Department of Municipal Affairs and Environment *Guidance Document for the Management of Impacted Sites* and that **further remedial action and/or site-specific engineered or institutional controls are not required** to ensure compatibility with the current or reasonably foreseeable future site activities (as cited in Part 5).

Conditional Closure

☐ It is understood from the information provided that the site has been managed in accordance with the Newfoundland and Labrador Department of Municipal Affairs and Environment *Guidance Document for the Management of Impacted Sites* and that **site-specific engineered or institutional controls are required** to ensure compatibility with the current or reasonably foreseeable future site activities (as cited in Part 5).

Department of Municipal Affairs and Environment Date